UK Business Data User Conference 2021

21 September 2021

Research paper abstracts and biographies

Research Paper Abstracts

Parallel session 1: Business productivity, R&D, and innovation

1. Issues in estimating production functions and capital stock, in a study of the relationship between migration and productivity
Jennifer C Smith, Economics Department, University of Warwick
The ultimate aim of the paper is to uncover the impact of migration on productivity. The first step therefore involves the estimation of reporting-unit-level production functions, to obtain an estimate of TFP. The second stage of the work merges, at region level, a measure of migration with reporting unit data, and estimates the impact of migration on reporting unit productivity. Issues and challenges addressed include: production function estimation, including addressing endogeneity, and techniques to best estimate the capital stock coefficient; estimation of reporting-unit-level capital stock; control for firm exit (attrition, selection); deflators for investment, capital stock and value added; how to attribute a geographical location to multi-unit enterprises; instrumentation of migration measures; control variables when estimating impacts on productivity growth. ARDx business data 2008-2015 are combined with migration data from the LFS. Of the range of production function estimation methods investigated, the arguments in principle in favour of the Collard-Wexler and DeLoecker (2016) method appear borne out in practice. Estimates indicate that migration is strongly positively correlated with business productivity.

2. Is public support for business R&D optimal? UK evidence from business microdata.
Mehmet Ugur, School of International Business and Economics, University of Greenwich
The case for public funding of business research and development (R&D) investment is based on the existence of an R&D gap, which reflects the extent to which a firm's actual level of R&D investment is below the socially optimal level for two reasons: (i) knowledge externalities and the low cost of imitation (Arrow, 1962; 1996; Romer, 1990); and (ii) information asymmetry, adverse selection and moral hazard problems (Bloom et al., 2007; Czarnitzki and Toole, 2007; Hall, 1992; 2002; 2010; Minton and Schrand, 1999).

The aim of this paper is to uncover the observable sources of heterogeneity in the effects of R&D subsidies, paying attention to firm age, firm size and market share, and the type of business R&D investment (e.g., basic versus applied or capital versus current R&D investment). It draws on two ONS business databases accessed remotely though the UK Data Service's secure data access: The Business Research and Development Database (BERD) and The Business Structure Database (BSD).

Our findings indicate that the average treatment effect (ATT) in the sample of 43,650 British firms is positive but highly heterogenous. The ATTs tend to be:

- Insignificant or negligible when the perceived risk of R&D investment is high due to crisis episodes or because of investment in basic research
- Insignificant among larger and older firms and firms closer to the R&D frontier; and
- Positive and larger than the average among small and young firms and firms further away from the R&D frontier.

We point out to conundrums in the use of R&D subsidies as an innovation policy tool: The case for R&D subsidies is stronger during economic downturns, when the investment is in basic R&D and when firms have a higher probability of innovation success; but the subsidy is less likely to increase business R&D under these conditions.

3. The Effect of Knowledge Collaboration on Business Model Reconfiguration: Evidence from the United Kingdom

Maksim Belitski, Henley Business School, University of Reading

Understanding and analysing what triggers business model reconfiguration (BMR) has been a central concern in management literature. However, there are few studies that examine the effect of inbound open innovation on different modes of BMR. This study researches the effect of firm-level knowledge collaboration breadth (i.e., the variety of collaboration partner types) and collaboration depth (i.e., the intensity of the interactions with these partners) on the BMR modes – sustaining, radical and disruptive. The econometric analyses using the Business Registry (BSD) and the second – the UK Innovation Survey (UKIS). We also used six cross-sectional surveys with a panel element over 2002-2014. Firstly, we collected and matched six consecutive UKIS waves conducted by the Office of National Statistics (ONS): UKIS 4 2002-04, UKIS 5 2004-06, UKIS 6 2006-08, UKIS 7 2008-10, UKIS 8 2010-12 and UKIS 9 2012-14. Secondly, we used BSD and BERD data for 2002, 2004, 2006, 2008, 2010 and 2012. The data was matched to the correspondent UKIS survey. Our sample includes 24,211 observations and 17,985 firms who reported the absence or presence of all three modes of BMR. There is a small panel element of 2,651 firms observed at least twice over 2002-2014. A sample of 17,985 innovative firms in the United Kingdom observed over 2002-2014, reveals that the breadth and depth of knowledge collaboration have idiosyncratic positive effect on three modes of BMR. These heterogeneous effects speak to the high sensitivity of business model mode to the extent of collaboration and partner type. This helps understanding of firm-level inbound open innovation strategies and to the overall understanding of the knowledge collaboration premium for firms that aim at entering new markets, develop new products and switch industries.

Parallel session 2: Impact of investments and policy

4. Commuting Fast and Slow: the Effects of High-Speed Rail

Helen Simpson, University of Bristol

We conduct an econometric analysis of the effects of a major transport investment, High Speed Rail 1 (HS1), which dramatically reduced commuting times to central London from South East England. We exploit novel data at a fine spatial scale on changes in rush-hour public transport commuting times, together with data on house prices (Land Registry), Census data on population demographics, and business microdata (the Business Structure Database and ARD-X). The paper aims to provide a holistic view of the impact of reductions in travel times to a major agglomeration, and highlight in greater detail who might gain and who might lose from such transport investments.

We find that for locations with a pre-HS1 commute of 90 minutes plus, a 10% reduction in commuting time was associated with around 1.5%-3% higher house prices, increased use of the train for commuting, and a working age population around 6% higher. This was accompanied by changes in the industrial and occupational composition of employed residents, and by changes in the composition of residents by skill levels.

We find descriptive evidence that lower commuting times are associated with higher plant-level employment and in some industries, such as retail and business services, lower plant entry and higher plant exit. The analysis also shows that lower commuting times are associated with higher value-added, labour productivity and wages. This pattern could be driven by sorting – for example, the exit of lower performing plants - rather than within-plant improvements, the latter being difficult to detect econometrically. Our results are suggestive of reductions in travel time leading to increased competition and sorting, as businesses now compete more closely with those in London, with HS1 potentially leading to a widening of the geographic market for consumption, intermediate inputs and services, as well as for labour.

5. The impact of minimum wage upratings on wage growth and the wage distribution
Silvia Avram, University of Essex, and Susan Harkness, University of Bristol
In this paper we use data from the Annual Survey of Hours and Earnings (ASHE) to examine how hikes in the minimum wage, and in particular the introduction of the National Living Wage (NLW) in April 2016, affected wage growth at different points of the hourly earnings distribution and, consequently, the wage inequality. We examine wage growth at the 5th, 10th, 15th, 20th, 30th and 50th percentile of the local wage distribution, allowing us to identify both direct and spill over effects. Unconditional quantile regressions are used alongside information on changes in the share of minimum wage workers within travel to work areas (TTWAs) (a strategy similar to the Bartik shift-share instrument (Goldsmith-Pinkham, Sorkin, & Swift, 2018)) to identify the effect of changes in the minimum wage on wage growth. We find that NMW uprating after 2014, and especially the introduction of the NLW in 2016, had a sizeable effect in boosting hourly wage growth for the lowest paid workers. We find a large direct effect at the 5th percentile but also significant effects going up to the 30th percentile. Overall, the effect of minimum wage increases has been to compress hourly wage inequality in the bottom half of the distribution, with stronger effects in areas with more minimum wage workers. Our results confirm the previous findings of a significant negative effect of minimum wage increases on wage inequality. In contrast to the literature focusing on the introduction of the NMW, we also find significant spill over effects going up to the 30th percentile of the hourly wage distribution.

6. Do creative industries generate multiplier effects? Evidence from UK Cities, 1997-2018
Anastasios Kitsos, City-REDI, University of Birmingham
We examine the local multiplier effects of creative industries in UK cities between 1997 and 2018. Creative industries have received much attention from economic geographers and others, both for their propensity to co-locate in urban settings and their potential to drive urban economic development via local spending, cluster and knowledge spillover effects. However, evidence on the economic impact of creative industries is sparse.

In this paper we explore the long-term, causal impacts of the creative industries on surrounding urban economies. We advance existing studies by using a robust causal framework based on Moretti's local multipliers work to examine creative industries impacts, deriving a number of new results both for the creative industries as a whole, and for specific creative subsectors. In doing so we deploy microdata from the Business Structure Database and other datasets over a long-time frame, exploring variation across periods of economic growth and recession.

We find that, over time, creative industries concentrate in a small number of cities. We also find robust positive effects from creative industries to local services with each creative job generating at least 1.9 non-tradable jobs between 1998 and 2018. These effects are associated with creative services workers' local spending, rather than visitors to urban amenities such as galleries and museums. We do not find the same effects for workplaces, and find no causal evidence for spillovers from creative activity to other tradable sectors. Given the small numbers of creative jobs in most cities, the overall effect size of the creative multiplier is small, and shapes only a minority of non-tradable urban employment change. Overall, our results suggest creative economy-led policies for cities can have positive – albeit partial – local economic impacts.

Parallel session 3: Business trade and international markets

7. Research on Digital Trade: Microdata analysis
Jakub Zagdanski, Economist, Cambridge Econometrics
The overarching aim of this study, funded jointly by the Department for International Trade and the Department for Culture, Media and Sports, is to review the evidence base on digital trade activity of UK firms.

An understanding of the quantity and type of digital trade is important, given its increasing prominence in the modern economy, and the complexity of the domain. The nature of digital trade is very different to traditional methods of trade. This has implications for policy-makers and legislators who need to understand the challenges associated with these forms of cross-border transactions. However, the existing statistics are based on surveys that were not originally designed to capture cross-border digital trade activity, and are therefore inadequate for such purposes.

We add to the evidence by analysing data on prevalence of e-commerce exporting activity in the UK, the types of firms engaging in e-commerce exports and their characteristics. To answer these questions, we utilise microdata linking of the ONS E-commerce Survey and the ONS International Trade in Services Survey (ITIS). We link data on e-commerce exporting activity collected as part of the E-commerce Survey with data on services exports (destination markets, types of services) collected as part of the ONS ITIS Survey. We present a range of statistics for years 2010-2018 describing characteristics of firms engaging in e-commerce exports, such as their size, location within the UK, sectors of activity, as well as the market destinations for their exports of services, and the types of exported services.

Based on the review of available data, we provide suggestions on how statistics on digital trade can be improved in the future.

8. Returns to Scale and the Role of Intangibles
Joel Kariel, University of Oxford and University of Kent
Intangible capital has changed the way firms produce. For example, information technology and software have affected firm cost structures, by introducing different fixed and marginal costs. This can affect scale economies. The aim of this project is to measure returns to scale using the ARDx dataset from 1998 – 2014, which covers firms across all sectors in the UK economy. We estimate production functions using control function methods and sum the output factor elasticities to compute industry-level returns to scale. This dataset presents some challenges, such as the lack of capital stock or missing investment data. We deal with this using the perpetual inventory method and allocating aggregate capital stock to the firm-level. Furthermore, some of the industry-level elasticities are imprecisely estimated, due to low sample size, and so are removed from the analysis. We document returns to scale across industries, and over time, with a change in the last decade of the data which corresponds with a slowdown in productivity growth. We document the relationship of intangibles to the changing patterns of scale economies. A theory is developed which highlights how technology endogenously affects returns to scale, and thus allows firms to grow faster and expand their market power.

9. International servitization of manufacturing: learning by serving
Jun Du, Aston Business School, Aston University
Today manufacturing firms' competitiveness increasingly depends on the capability to servitize. We study this under-explored topic and identify factors that drive manufacturing firms to export services cross borders. The empirical analysis draws on the linked granular data of International trade in services data (ITIS) and the Annual Business Survey (ABS) over the period of 2011-2018, both collected yearly by the UK Office of National Statistics (ONS). We employ the linked granular data to explore the driving forces of firm's international service export participation, intensive and extensive margins, as well product and market diversification strategies. We find that servitization at home market helps firms to servitize internationally. Productivity and other firm-specific advantages help firms to transform the learning outcome from serving at home to service abroad. The results have important implications when considering internationalisation strategies of building manufacturing firm competitiveness in the slowing globalisation.

Biographies

Welcome
Louise Corti, Office for National Statistics and Vanessa Higgins, UK Data Service

Louise Corti is Head of Insights, Development and Impact for the Secure Research Service at the Office for National Statistics. She has worked in data services for over 30 years and spent 20 years as Associate Director of the UK Data Archive, where she directed a broad range of activities - within the social sciences - from collections development, data publishing, data governance and user services, and outreach and training.

Vanessa Higgins is Director of User Support and Training at the UK Data Service, where she leads the programme of data literacy training and support. She has a PhD in Social Statistics and she is a specialist in government surveys, having previously worked as a Survey Researcher in the Social Survey Division of the Office for National Statistics. She is a co-investigator on the EmpoderaData project, which aims to increase data literacy skills in Latin America, and on the EU-funded EOSC-future project which will give European researchers access to a wide variety of research data.

Morning Session: Data collection and primary analysis

Chair: Chris Woods, UK Data Service
Chris works at the UK Data Service where she provides support and training to researchers accessing business and social survey data via SecureLab. She has a range of experience in secure data access and is Chair of the Safe Data Access Professionals Group. Prior to joining the UK Data Service, Chris held social research posts at the Home Office, University of Manchester and Office for National Statistics.

Keynote presentation

Donna Leong, Director of Economic Statistics Change, ONS
Donna is the Director of Economic Statistics Change at ONS, with responsibility for overseeing the economic statistics transformation programme. She also heads up ONS's work on subnational statistics and analysis ("levelling up"). An experienced senior civil service leader and economist, Donna has previously worked at the Department for Business, Energy and Industrial Strategy, HM Treasury and the NZ Treasury. She has an MSc in Economics from LSE.

Panel Q&A
Donna Leong, Jon Gough, Richard Heys, Ed Palmer and Heather Bovill, ONS

Jon Gough, ONS

Jon is the current head of the Statistical Design and Legacy within Business Statistics Transformation in ONS. He has over 20 years of working in a statistical environment across both economic and social statistics within ONS. Jon has extensive experience in developing, delivering and leading a wide range of business surveys within ONS to meet user requirements and has led the development and implementation of the Business Insights and Conditions Survey (BICS) and the Annual Purchases Survey (APS) in recent years.

Prior to this Jon has undertaken various other roles within ONS, leading the Annual Business Survey, ProdCom and BRES together with defining and leading a Census Analysis work programme to produce a joined up set of analytical outputs across government to maximise the use and accessibility of the Census data.

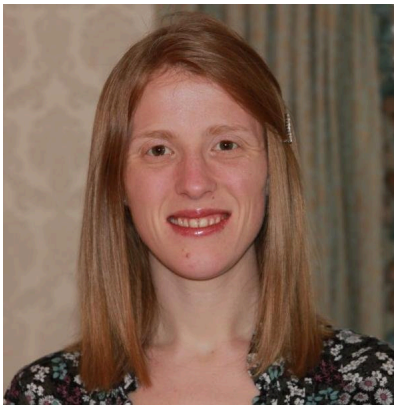
Richard Heys, ONS

Richard Heys is Deputy Chief Economist at the ONS and for the last five years has led production of productivity statistics and research into economic statistics more generally. He is currently part of the UN task-team updating the System of National Accounts, the international manual setting standards for national accounts production, with a particular focus on digitalisation. He has published on the treatment of gold and other valuables in the national accounts, public service productivity, welfare measurement, the economic impact of free digital services, crypto-assets, data and telecommunications. He has experience of working in both the public and private sectors and degrees from Oxford and London.

Chair: Ed Palmer, ONS

Ed Palmer is Deputy Chief Economist and head of Analysis, Microdata and Engagement at the Office for National Statistics. Ed joined the ONS from the Department for Transport where he was head of Rail Analysis for seven years. Previous to this he worked as a government economist at the Department for Communities and Local Government, the Office of the Deputy Prime Minister, and the Department for Trade and Industry. Ed also worked in economics consulting for nine years, at Coopers & Lybrand, PricewaterhouseCoopers and IBM. He has economics degrees from the University of Cambridge and the London School of Economics and Political Science.

Heather Bovil, ONS



Heather leads the work on business survey outputs, which include the short term surveys, such as Retail Sales Index and the Business Insights and Conditions Survey (BICS), as well as the key structural business surveys such as the Annual Business Survey, UK Manufacture Sales by Product (Prodcom), Research and Development and E-Commerce. The role also oversees the processing of VAT data and its use in producing quarterly regional Gross Domestic Product.

Prior to this position Heather has undertaken various roles within ONS most recently co-leading the analysis of the Coronavirus Infection Survey during the initial 6 months of the pandemic.

Economic and Business Data updates

Emily Hopson, ONS

Emily Hopson is head of the Business Insights and Conditions Survey (BICS) at the Office for National Statistics, fostering its development from a few questions to one of ONS' highest-profile economic surveys. Previously, Emily worked as an operational research analyst in the Business Prices team in the ONS and graduated from the University of Exeter with a BSc. in Mathematics.

Daniel Robinson, ONS

Daniel Robinson is the Head of the Allcom and R&D branch within the Office for National Statistics (ONS). He has worked in the ONS for over 20 years and has developed experience in a number of roles covering both business and social surveys spanning both data collection and results production.

Jakob Schneebacher, ONS

Jakob Schneebacher heads the firm-level business dynamism and management practices research in ONS. Before joining ONS, he was a Research Fellow in Economics at the University of Oxford.

Tom Wickersham, ONS

Tom leads the Economic Microdata Research team at the ONS. The team specialises in developing linked firm-level datasets to improve national accounts estimates and for research into business economic performance such as productivity, business dynamism and innovation. Before joining the ONS, Tom worked in various economist roles in the National Infrastructure Commission and HM Treasury.

Optional Brown bag session with experts

James Scott, UK Data Service
James is part of the User Support Team at the UK Data Archive. He is largely involved with the UK Data Service SecureLab and the training associated with its use. He has worked on research projects covering such diverse topics as perceptions of social class, young people's involvement in gangs, schools, households' response to job loss, and Christmas. He is vice-chair of the Safe Data Access Professionals group.

Afternoon Session: Secondary analysis of economic and business data
Chair: Louise Corti, ONS

Panel: Economic and business data; From research idea to evidence:
Chair: Nick O'Donnell, ONS, with Frances Pottier, Head of Business Statistics, Data Analytics and Business Statistics, Department for Business, Energy and Industrial Strategy (BEIS) and Grant Filtzner, Chief Economist and Director, Macroeconomic Statistics and Analysis, Economic, Social and Environmental Group, ONS.

Nick O'Donnell, ONS
Nick joined ONS is 2009 to manage the stakeholder engagement for the 2011 Census for England and Wales. Since 2016, he has managed the engagement, impact and insight for the Secure Research Service, and since July this year, the Integrated Data Service. Nick has over 30 years' experience of managing operational policy and stakeholder engagement for a range of government projects or services focusing on energy, health and safety, local government and regulatory reform.

Frances Pottier heads the Business Statistics team at BEIS, which produces official and National statistics on business and supports business-related analysis and research across the department. She has previously been Deputy Head of Profession for Statistics in BEIS as well as managing the production of National Statistics on construction in BERR and during the transfer of responsibility to ONS.

Grant Fitzner, ONS
Grant Fitzner is the chief economist and director of macroeconomic statistics and analysis at the UK Office for National Statistics. He also led the organisation's COVID-19 response in spring/summer 2020. Grant has previously led economic and analytical teams in the NHS, MHCLG and BEIS, as well as senior roles in investment banking, commercial property, market research, and the Australian federal government. He holds an MCom from the University of New South Wales.

Parallel research paper sessions

Parallel session 1: Business productivity, R&D, and innovation

Chair: Josh Martin, ONS
Josh Martin is an Economist and Head of the Productivity team at the UK Office for National Statistics. He has worked on a range of topics relating to productivity, capital and intangible assets for a number of years. He is also a Topic Lead for the Economic Statistics Centre of Excellence, focussing on productivity and related topics.

Jennifer C Smith, Economics Department, University of Warwick
Jennifer has worked at Warwick University since 1996 and is currently Associate Professor and Director of Studies in Economics and holds several university administrative positions. She was a member of the Migration Advisory Committee between 2012 and 2021.

Mehmet Ugur, School of International Business and Economics, University of Greenwich
Mehmet Ugur is a Professor of Economics and Institutions at the University of Greenwich Business School, Department of Economics and International Business. Mehmet's main research areas are: (i) micro-econometrics of innovation, productivity and employment; (ii) economic consequences of intellectual property protection; and (iii) meta-analysis of evidence from empirical research in economics. He is Deputy Director of the Greenwich Political Economy Research Centre (GPERC) and Institute of Political Economy, Governance, Finance and Accountability (PEGFA) at the University of Greenwich. He has worked with UK Business Datasets as part of an ESRC project funded under the Secondary Data Analysis Initiative (SDAI).

Maksim Belitski, Henley Business School, University of Reading
Maksim Belitski is a Professor of Entrepreneurship and Innovation at Henley Business School and is a member of the Henley Centre for Entrepreneurship. His research interests lie in the area of entrepreneurship, innovation and regional economics, with a particular focus on entrepreneurship as a spill-over of knowledge and creativity. Maksim holds a PhD in Applied Economics from the University of Leicester and another PhD in Economics from the University of Milan, Italy. He is an editor of Small Business Economic Journal.

Parallel session 2: Impact of investments and policy

Chair: Ed Palmer, ONS
Ed Palmer is Deputy Chief Economist and head of Analysis, Microdata and Engagement at the Office for National Statistics. Ed joined the ONS from the Department for Transport where he was head of Rail Analysis for seven years. Previous to this he worked as a government economist at the Department for Communities and Local Government, the Office of the Deputy Prime Minister, and the Department for Trade and Industry. Ed also worked in economics consulting for nine years, at Coopers & Lybrand, PricewaterhouseCoopers and IBM. He has economics degrees from the University of Cambridge and the London School of Economics and Political Science.

Helen Simpson, University of Bristol
Helen Simpson is a Professor of Economics at the University of Bristol and is Director of the Centre for Evidence-based Public Services.

Silvia Avram, University of Essex, and Susan Harkness, University of Bristol

Silvia Avram is a Research Fellow at the Institute for Social and Economic Research at the University of Essex. Her work mixes theories and methods from social policy, sociology and economics to examine the causes of income and labour market inequalities and the role played by public policies.

Susan Harkness is a Professor of Public Policy at the University of Bristol, Visiting Professor at CASE, London School of Economics and a co-Investigator at the ESRC Centre for Micro-Social Change (MiSoc). Her research examines labour markets, inequality and poverty with a focus on female employment and earnings and single parent families.

Anastasios Kitsos, City-REDI, University of Birmingham
Tasos Kitsos is a Research Fellow at City-REDI, University of Birmingham. He is a regional economist working on regional economic resilience; the impact of digital and creative industries; entrepreneurship and the role of politics in local development.

Parallel session 3: Business trade and international markets
Chair: Chris Goldsworthy, Co-Head of Subnational Trade, Global Trade and Investment, Macroeconomic Statistics and Analysis, ONS

Jakub Zagdanski, Cambridge Econometrics
Jakub is a senior economist at Cambridge Econometrics, where his analysis is focused on sectors, trade and competitiveness. In the area of trade, he has researched the UK's trade position in a number of studies conducted for the UK Department for International Trade, on themes such as global value chains, defence exports and digital trade. He has expertise in trade datasets, multi-region input-output analysis and experimental statistics on trade in value added.

Joel Kariel, University of Oxford and University of Kent
Joel is a postdoctoral researcher at the University of Kent, working on returns to scale, productivity, and firms in the UK. He is finishing his PhD at the University of Oxford, where his research focused on automation, labour markets, and firm dynamics.

Jun Du, Aston Business School, Aston University
Jun Du is Professor of Economics at the Economics, Finance and Entrepreneurship Department at Aston Business School. She is the Director of Centre for Business Prosperity leading research on international trade and productivity