JONATHAN DAVID TIMMIS
Curriculum Vitae

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Highlights:

- PhD Economist with almost a decade of experience working for the Government of Rwanda, OECD, IFC and World Bank.
- Extensive research experience on digitalization and technological change and the impact on firm performance.
- Track record of high-quality publications, such as Review of Economics and Statistics, and presentations at top international conferences, such as NBER IT and Digitalization Summer Institute and ASSA.
- More than 14 years' private and public sector experience working with and managing broad teams of consultants, various experts, and research collaborations.

EMPLOYMENT:

2020 – present **Senior Economist – East Asia and Pacific Chief Economist's Office, World Bank.**
Key part of research collaborations on the firm-level impact of new technologies and draft inputs for East Asia and Pacific (EAP) flagship publications, including the biannual "EAP update". Co-leading a flagship on firms and technology and one on technology decoupling. Review and provide inputs for publications and operations in the region. Organized EAP chief economist office external events and outreach, including launching a conference series with Georgetown University on AI, Big Data and Policy.

2019 – 2020 **Economist – IFC, World Bank Group.**
Responsibilities involved collaborating on the report "Making It Big: Why Developing Countries Need More Large Firms" examining the importance of large firms for development outcomes and their growth paths over their life cycle. Led a chapter on modern industrial policy with Professor Philippe Aghion (Harvard University) and IFC colleagues, part of an IFC publication on Creating Markets.

2016 – 2019 **Research Economist – Productivity and Business Dynamics Division, OECD.**
Responsible for research on the link between firm productivity and innovation and Global Value Chains (GVCs) and new technologies – managing research collaborations with external academics and policymakers. Developed new evidence on industry concentration trends across countries, and the link to intangible investments at the industry and firm level. Extensive experience communicating policy implications, through drafting policy notes, chapters of flagship reports, G20 background papers and presenting to senior policymakers at OECD committees.

2014 – 2016 **Economic Advisor – Overseas Development Institute Fellowship, Rwanda: Rwanda Energy Group and Ministry of Trade and Industry.**
Led a cross-ministry team to develop Rwanda's first energy demand forecast, developing and advising on household survey implementation and matching to large dataset of previously unused transaction-level data on energy purchases.

Developed the first quarterly private sector development report, using detailed micro-level customs data on firm performance.

2010 – 2014 **Graduate Teaching Assistant – University of Nottingham.**
Led tutorials and guest lectures for undergraduate modules: International Economics, Microeconomics, Macroeconomics and Applied Econometrics.

2005 – 2010 **Actuary – PriceWaterhouseCoopers LLP.**
Led an inter-disciplinary team for one of largest global insurers to design and build a Montecarlo simulation stochastic model to value financial options and integrate into their business processes. Managed many teams with varied backgrounds, including actuaries, accountants, IT specialists and regulatory experts.

EDUCATION:

2010 – 2015 **PhD Economics (without corrections),** University of Nottingham
Thesis Title: "Internet Diffusion and International Trade"

2004 – 2005 **MSc Economics (*Summa Cum Laude* equivalent)**, University of Nottingham
Ranked 1st in class of 2004-5

2001 – 2004 **BSc Economics (*Summa Cum Laude* equivalent)**, University of Nottingham
Ranked 1st in class of 2001-4

ACADEMIC AND POLICY PUBLICATIONS:

Accepted **"Cloud Computing and Firm Growth"** ***Review of Economics and Statistics,*** with Tim DeStefano and Richard Kneller.
The arrival of the cloud has enabled a shift in the nature of ICT use, from investment in sunk capital to a pay-on-demand service. This paper uses new firm-level data to examine the impact of cloud on firm growth in the UK, using zipcode-level instruments of high-speed fiber availability and speeds. We find that cloud leads to the growth of young firms in terms of employment and productivity. For older firms we find no such growth, but instead these firms reorganize activity by closing plants and moving employment further from the headquarters.

2023 **"Industry Concentration in Europe and North America"** ***Industrial and Corporate Change,*** with Matej Bajgar, Giuseppe Berlingieri, Sara Calligaris and Chiara Criscuolo.
Featured in The Economist – "Special Report on Competition" (15 November 2018) and in Harvard Business Review – "Superstar Firms Are Running Away with the Global Economy" (14 November 2019)
We present new evidence on industry concentration trends in Europe and in North America. The paper uses two novel data sources: representative firm-level concentration measures from the OECD MultiProd project, and business-group-level concentration measures using matched Orbis-Worldscope-Zephyr data. We find a clear increase in industry concentration in Europe and North America, both for manufacturing and nonfinancial services, which is not driven by digital-intensive sectors.

2023 **"Participation in the Global Value Chains and Domestic Technology Change: Evidence from Japanese Patent-Firm-Matched Data"** ***Research Policy,*** with Antonin Bergeaud, Chiara Criscuolo, Keiko Ito and Kenta Ikeuchi.
This paper explores how changes in both position and participation in Global Value Chain networks affect firm innovation. The analysis combines matched patent-firm data for Japan with measures of GVC network centrality and GVC participation.

Japan's position in the GVCs has shifted from being at the core of Asian value chains towards the periphery relative to other countries in the network, i.e. becoming less "central". These decreases in forward centrality – from key suppliers - are associated with decreasing firm patent applications.

2023 **"Agglomeration Economies in Developing Countries: A Meta-Analysis"** ***Regional Science and Urban Economics,*** with Arti Grover and Somik Lall.

Conventional wisdom is that the elasticity of wages with respect to city size are huge – especially in developing economies. We conduct a meta-analysis of 1200 elasticity estimates from nearly 80 studies in 33 countries and construct novel estimates of urban cost elasticities to recognize the "net" benefits of locating in developing world cities. Our meta-analysis suggests that the elasticity estimates in developing countries are at most 1 percentage point higher than in advanced economies. However, once urban costs are controlled for, there are minimal returns to cities in any country.

2022 **"The Digital Divide: Universal Broadband and Firm Performance"** ***Journal of Economic Geography***, with Tim DeStefano and Richard Kneller. *We exploit geographical discontinuities in the availability of broadband across the UK, to capture the causal effects of the digital divide. Using a regression discontinuity design, our analysis strongly suggests that broadband leads to increases in firm scale, but not labor productivity, and these effects are stronger in urban areas.*

2018 **"Broadband Infrastructure, ICT use and Firm Performance: Evidence for UK Firms",** ***Journal of Economic Behavior and Organization*****,** with Tim DeStefano and Richard Kneller.

We use the arrival of a new communication technology, broadband, to study the causal effects of heterogeneous types of ICT on firm performance. We construct instruments using zipcode-level geographic variation in the pre-existing telephone network, which determines the firm-level availability and speed of broadband. In turn, we find that ICT causally affects firm size, but not productivity.

2016 **"ICT and Exporting: The Effects of Broadband on the Extensive Margin of Business Service Exports",** ***Review of International Economics*** with Richard Kneller.

We provide empirical evidence for the effects of broadband use on the firm-extensive margin of UK service exports. To deal with endogeneity we build a novel instrument that exploits exogenous variation in access to broadband technologies due to the historic telephone network. We find evidence for a causal effect from broadband on trade in business services, but no evidence for an effect on trade in services more generally.

WORKING PAPERS:

2021 **"Industrial Robotics and Export Quality"** with Tim DeStefano. *2nd round Revise and Resubmit, Journal of Development Economics.*

Robotics are rapidly becoming a key part of precision processes within modern manufacturing. This paper combines novel data on industrial robotics with cross-country HS 10-digit trade data to estimate the effects of robot use on export quality. The findings show that robot diffusion leads to increases in the quality of exported products. Quality improvements are predominantly driven by the upgrading of developing country exports; and within countries, quality improvements are driven by upgrading of (initially) lower-quality exports of developed and developing countries.

2020 **"Supersize Me: Intangibles and Industry Concentration"** with Matej Bajgar, Giuseppe Berlingieri, Sara Calligaris and Chiara Criscuolo. *Revise and Resubmit, Oxford Bulletin of Economics and Statistics.*

Featured in Harvard Business Review– "Superstar Firms Are Running Away with the Global Economy" (14 November 2019)
We present new evidence on the growing scale of big businesses in the US, Japan and Europe. We find broad evidence of rising industry concentration across 2002-2014, particularly in industries with the fastest growth in intangible investments – particularly innovation. At the firm-level, we find large firms are disproportionately able to increase their scale, as a result of investments in R&D and patents.

2022 **"Global Transition Online"** with Alex Ragoussis. *Submitted.*
This paper presents new evidence on the growth of digital technology in response to the COVID-19 pandemic. The findings show that, over 2020, there was rapid adoption of both e-commerce and online payments across all countries, with greatest rates of adoption in countries that had lower initial levels of technology use. The timing of COVID-19 lockdowns strongly predicts increased use of these technologies, accounting for about a third of the overall increase in e-commerce or online payments usage over 2020.

2023 **"Firm Adoption of Randomized Experiments"** with Tim DeStefano. *Submitted.*
This paper provides some of the first systematic evidence on the types of firms adopting experiments and how this impacts performance. Our analysis relies on novel high frequency (monthly) data on the diffusion on the most common form of randomized experiments known as AB testing for 654,915 firms across 16 countries. Using a triple difference framework, that combines the timing of COVID across countries with differences in the data-intensity of worker tasks, we find that the shock led to a large increase in the adoption of experiments, particularly amongst data-intensive firms, and those with complementary technologies already in place. Those that adopted randomized experiments, particularly data-intensive firms, experience increases in labor productivity and revenue.

2020 **"Cloud and Big Data Diffusion: Are Capital Incentives and Incentive?"** with Tim DeStefano, Nick Johnstone and Richard Kneller. *Being revised for Submission.*
Cloud computing allows firms to access digital technologies through an "on-demand" service. However, policies are often targeted towards investment in physical ICT capital, rather than as a service. We use the introduction of a UK tax incentive for physical capital investment – the Annual Investment Allowance (AIA) – to examine firm investment in physical ICT vs cloud computing. Our results show that the AIA increases investment in total capital and ICT capital as one would expect; but reduces adoption of the cloud and big-data analytics. Policies with a traditional view of ICT may inadvertently be delaying diffusion of cutting-edge technologies.

WORK IN PROGRESS:

- **"Buyer-Supplier Reorganization and Firm Productivity"** with Tim DeStefano, Keiko Ito and Richard Kneller.
- **"Trade Network Reorganization and Technology During Covid-19"** with Ana Fernandes, Devaki Ghose and Aaditya Mattoo.

IT SKILLS:

Stata including Mata (advanced), ArcGIS / QGIS (advanced), SQL (advanced), MS Office including VBA (advanced), C++ (intermediate), PySpark (intermediate), Python (intermediate), R (intermediate).

HONORS, SCHOLARSHIPS, AND FELLOWSHIPS:

2018 – present	External Affiliate Researcher, The Nottingham Centre for Research on Globalisation and Economic Policy, University of Nottingham
2017 – present	Research Affiliate, Economics of Digitization, CESIfo

2009 – present	Fellow of the Institute and Faculty of Actuaries
2014 – 2016	Overseas Development Institute Fellowship
2013 – 2014	Royal Economic Society (RES) Junior Fellowship
2010 – 2013	Economic and Social Research Council (ESRC) Full Studentship Quota Award for Postgraduate Studies
2011 –2014	Graduate Teaching Assistant Teaching Excellence Award for Academic Years ending 2012, 2013 and 2014, University of Nottingham