

Institution: University of York
Unit of Assessment: 16 - Economics and Econometrics
1. Unit context and structure, research and impact strategy

Context and structure

The Department of Economics and Related Studies (DERS) at the University of York is one of the largest economics departments in the UK. We create and disseminate original, significant, and rigorous research that spans the breadth of economics and related areas, including economic history and finance. This underpins research-led teaching across our undergraduate (c. 700 students) and postgraduate (c. 250 students) programmes. While we are committed to excellence in all areas, we have distinctive strengths in econometrics, economic theory, macro-finance, and health economics.

Since REF2014, we have:

- **Published over 450 outputs** in academic journals, with significant growth in the number of outputs that can be judged as world-leading.
- **Achieved funding successes and research capacity investments**, with an average annual research income of £400k from a wide range of funders.
- **Achieved wider economic and social impact** in the fields of health, macro-finance, labour, and mechanism design.
- **Actively and effectively supported career progression and investment in our staff**, with promotion of 12 lecturers to senior lecturers (SLs), 1 SL to reader, and 5 SLs to professors. Appointment of 2 new professors, 1 SL, 9 lecturers and 5 post-doctoral researchers. Among the 5 SLs promoted to professorships, 2 are women.
- **Been awarded an Athena SWAN Bronze Award** in Spring 2020, one of just 11 economics units (submitted to UOA Economics and Econometrics in REF2014) to hold the award.
- **Expanded dissemination**, with 30 research conferences, 6 new seminar series, 6 *Ken Dixon* Public Lectures, 2 Royal Economic Society Public Lectures, and 17 mini-courses for early career researchers.
- **Expanded our networks**, hosting 80 distinguished visitors, 120 regular visitors and 260 seminar speakers.
- **Ranked as a “top 100” (76th) economics department in the world** in the most recent Tilburg Ranking (2015-2019). In IDEAS/RePEc, York ranks 54th in the world (in the UK top 10) for economics, 6th in the world for health economics, and 17th for econometrics.

This success is underpinned by **effective organisation and a collegial atmosphere** in which staff feel valued and supported, combined with our strategic goals and commitment to research excellence. Research is organised within a cluster structure, which has been in place for more than ten years, with all researchers, including post-doctoral researchers (PDRs) and postgraduate research students (PGRs), affiliated with at least one cluster.

We have seven **research clusters**: Applied Microeconometrics; Econometrics; Economic History; Economic Theory; Health Economics; Macroeconomics and Finance; and Political Economy. The cluster structure stimulates and supports research by promoting and monitoring research excellence and embracing opportunities for funding, organising events, international and interdisciplinary collaboration, engagement with research users, and impact. The clusters are beneficial to all researchers and particularly to early career researchers (ECRs) and PGRs. This structure respects autonomy while encouraging interaction across clusters. Many members belong to two or more clusters, which nurtures new synergies across different areas and expertise.

Research policy and strategy are managed by the Departmental Research Committee (DRC). The DRC is an important driver of research strategy and policy within the Department, and the membership composition (e.g., elected and by role) is key to this. Membership includes at least one representative of each research cluster, the Head of Department (HoD), and three elected ART representatives (at least one of whom is a lecturer), as well as the Department's representative on the University's Ethics Committee, the Research Concordat coordinator, Postgraduate Research Student Coordinator, Research Facilitator (RF), Research Grants Champion, Impact Champion, and elected representative of the PDRs.

Achievement of strategic aims during the assessment period

The **strategic aims** in our REF2014 submission, were:

“Strength across all areas is a core aspiration but ... our research strategy has identified priority areas ... mechanism and institution design, heterogeneity and interactions in panel data, and the economics of the family and early life.”

The **evidence** that we have achieved these objectives is:

- **High-quality outputs.** We achieved a significant growth in the number of outputs that can be judged as world-leading. During the REF2021 census period we developed the international reach of our research through publishing in the following leading peer-reviewed international journals: *American Economic Review*, *Annals of Statistics*, *Econometrica*, *Economic Journal*, *Journal of Econometrics*, *Journal of Economic Theory*, *Journal of Financial Economics*, *Journal of Monetary Economics*, *Journal of Political Economy*, *Journal of the American Statistical Association*, *Review of Economic Studies*, *Review of Economics and Statistics*. This represents a 64% increase in the number of publications in these journals compared to the previous REF period.
- **Research impact.** Besides the long-established societal impact of our health economics research, there has been significant impact in new areas. For example, our research on methods and software for interest-rate forecasting is used by prominent policy institutions and commercial companies; our developments of the GVAR approach are used by central banks and financial institutions; and our research on kidney exchange mechanisms contributed to the establishment of the Swedish kidney exchange programme, which has evolved into the Scandiatransplant Kidney Exchange Programme (STEP).
- **External research income.** The number of academics in the Department with one or more external funding successes during the REF2021 period increased from the previous REF period from 13 to 28 (within a roughly stable overall Department FTE), spanning funding from individual fellowships and large grants, to conference grants and funding for interdisciplinary projects. The Department has been successful in obtaining EU funding, particularly under the European Commission's Marie Skłodowska-Curie scheme, with four individual fellowships awarded since 2017.

Research clusters and their contributions

Applied Microeconometrics:

The cluster excels in the areas of social networks, child development and outcomes, investments in children, and policy interventions. It has built a strong reputation in estimating the role of peers in decision-making using administrative data and evaluation of how public policies and investments in children help to protect families. Using administrative data for the UK, Norway, and Germany to identify social networks has provided credible estimates of peer effects in co-workers' spillovers on productivity (*American Economic Review*, 2017), mothers' labour supply (*American Economic Journal: Applied Economics*, 2018), and sibling spillovers on school achievements (*Journal of Applied Econometrics*, 2019). Our research on the effect of public interventions on families has provided insights into the effects on child skills of time

investments in formative activities (*Journal of Labor Economics*, 2017), universal childcare (*Journal of Political Economy*, 2018), early school exposure (*American Economic Journal: Economic Policy*, 2019), school expenditure (*Journal of Royal Economic Society A*, 2018), and the role of policies in protecting families (*European Economic Review*, 2016). A new research strand is on family formation and dissolution and an empirical framework for matching (*Journal of Political Economy*, 2019).

Econometrics:

The cluster is flourishing in the areas of methods for the analysis of panel data, high-dimensional data, and time-series analysis. For panel data analysis, we have proposed methods of estimation and inference for panel data models with multi-factor or hierarchical factor structures (*Journal of Econometrics*, 2014, 2016, 2017, 2018, 2019a, 2019b, 2020), as well as methods to efficiently analyse unbalanced panels (*Annals of Statistics*, 2015). Having developed novel econometric methods for networks, we have provided new insights into financial contagions (*Journal of Econometrics*, 2016, 2018). For high-dimensional data analysis, we have developed a method for constructing financial portfolios (*Journal of Econometrics*, 2016), semiparametric dimension-reduction methods for forecasting (*Journal of the American Statistical Association*, 2018), estimation in a high-dimensional quantile setup (*Journal of Business and Economic Statistics*, 2018), and a novel method for two-step semiparametric empirical likelihood estimation (*Annals of Statistics*, 2020). For time-series analysis, we have a new approach for estimating localised temperature risk (*Journal of the American Statistical Association*, 2016) and have extended the autoregressive distributed-lag approach into quantile regression (*Journal of Econometrics*, 2015).

Economic History:

The cluster spans development economics, monetary history, and Eastern European economic history. Our research has demonstrated the influence of environmental factors (*European Economic Review*, 2017) and infrastructure projects (*Canadian Journal of Economics*, 2019) on economic development in the very long run. We have shown how a successful government response to major health challenges, such as pandemics, can increase the legitimacy of a state (*Economic Journal*, 2019).

Economic Theory:

Our research has resolved some important open problems in economic theory by proposing an efficient and incentive compatible dynamic auction for selling multiple complementary goods (*Journal of Political Economy*, 2014), a strategic framework to analyse multilateral bargaining with coalitional externalities (*Journal of Economic Theory*, 2015), and beliefs-based explanations for the winner's curse (*Econometrica*, 2015). Matching markets and mechanism design have produced notable results, with a breakthrough in the incorporation of blood group incompatible transplantation in kidney exchange programmes (*Review of Economic Studies*, 2020), a general random decentralised market process that almost certainly converges to a competitive equilibrium (*Journal of Economic Theory*, 2016), a dynamic competitive adjustment process for partnership formation that either finds an equilibrium or exclusively disproves the existence of any equilibrium (*Games and Economic Behavior*, 2014), a school choice mechanism that is fair and satisfies diversity objectives (*Games and Economic Behavior*, 2016), and a college admissions mechanism that is fair, while ensuring that students cannot benefit from strategising over affirmative action privileges (*American Economic Journal: Microeconomics*, 2020).

Health Economics:

Our research has estimated the health opportunity costs associated with additional health care, which is central to a range of resource allocation decisions (*Health Economics*, 2018). We have shown that more competition in the hospital market can increase or reduce quality depending on the type of health services and institutional context (*Journal of Health Economics*, 2019, *RAND Journal of Economics*, 2020). We have provided methods to equitably allocate resources to providers of care, and investigated the rise in health care expenditures and the determinants

of expenditure at the end-of-life (*Journal of Health Economics*, 2018). We have developed a programme of work that explores inequality of opportunity in health using the new biosocial data available in Understanding Society (*Journal of Health Economics*, 2020).

Macroeconomics and Finance:

Our key contributions in macroeconomics have been on the impact of monetary policy announcements on financial markets (*Review of Economics and Statistics*, 2019), the effects of labour on inflation dynamics (*Review of Economics and Statistics*, 2014), the effect of demographic structure on automatic stabilisers (*Journal of Monetary Economics*, 2016), the relevance of capital rigidities to explain movements in macroeconomic variables (*European Economic Review*, 2015), how trade integration leads to greater business-cycle synchronisation (*European Economic Review*, 2017), new tests of optimal policy in linear-quadratic frameworks (*Journal of Applied Econometrics*, 2018), and how and when government deficits in open economies provide Keynesian fiscal stimulus (*Journal of International Money and Finance*, 2020). Our research in Finance has advanced our understanding of the effect of cash-flow pledgeability on firm investment (*Journal of Financial Economics*, 2020), how ambiguity aversion can improve welfare (*Journal of Economic Theory*, 2014), how optimal allocations can be implemented in insurance markets with adverse selection (*Games and Economic Behavior*, 2018), the importance of new tools in the empirical analysis of the term structure of interest rates (*Journal of Financial Economics*, 2017), the links between monetary policy and interest rates (*Journal of Econometrics*, 2016), the yield curve of government bonds (*Journal of Economic Dynamics and Control*, 2020) and its relation to macroeconomic fundamentals (*Journal of Business and Economic Statistics*, 2015) and forecast evaluation (*Journal of Applied Econometrics*, 2020).

Political Economy:

This new cluster serves as evidence of the organic growth of our research clusters and support for interdisciplinary research. In collaboration with Daron Acemoglu (MIT), we have shown the impact of the Mafia on electoral results (*American Economic Journal: Economic Policy*, 2017) and human development and public policy (*Review of Economic Studies*, 2020). A second theme has analysed political polarisation and its implications for corruption (*European Economic Review*, 2020). Using innovative night-lights data, we found systematic evidence across the globe of favouritism in public policy linked to the ethnicity of political leaders (*Journal of Development Economics*, 2018).

Impact strategy

Our impact strategy is to view the relationship between research and impact as self-reinforcing. Engagement with policy makers and their agendas shapes our research, and we believe significant research should **reach non-academic audiences and enhance policy-making**. Our strategy is twofold: to embed an understanding and recognition of impact within each academic's research plans and the Department's research culture; and to enable meaningful engagement with partners outside academia. Our strategy addresses all our research clusters/academics, and is supported by our Impact Champion (Rice) and approach to external disseminations/engagement (Section 4.2).

Our REF2021 **impact case studies** (ICSs) have emerged from areas where there is critical mass of research activity, external funding, and long-term engagement with government and non-academic organisations. All our impact has been promoted and developed by our integrated approach to research, impact, and income generation coupled with our support for staff development (Section 2.1).

Our research that has achieved the most enduring impact on policy is within **health economics**. We note that our strong links with the Centre for Health Economics (CHE), through strategic joint appointments (Claxton and Rice) and long-standing collaborations (Siciliani and Jones) have been particularly conducive to linking with policy-makers to guide and shape research that

responds directly to their needs and has public relevance. For example, Claxton has led on research to inform the opportunity cost of adopting new technologies in the NHS (REF3), and also on characterising uncertainty and value of information in health care decisions (REF3), and has received widespread media coverage; and Siciliani has informed policy thinking/practice at the EU (waiting times, effective investments in health) and OECD (performance measurement, waiting times) (REF3).

In recent years the breadth of our impact and engagement has significantly widened (Section 4.3) and now includes **macro-finance**. In particular we highlight research on the methodological developed of the Global VAR approach to the estimation of the macroeconomic impact of shocks to global markets accounting for the complexities and interdependencies that exist across countries (Smith), and research to develop tests to reliably assess the accuracy of economic forecasts (Coroneo) (REF3). Together these methods and supporting software have been influential in guiding policy analysis and risk management strategies to inform monetary policy development and financial decisions across a large number of international organisations (IMF, ECB), central banks and commercial businesses (e.g., Citi Research).

Strategic initiatives to facilitate our achievements

Our achievements across research outputs, impact, and income have been facilitated by a series of **strategic initiatives**:

- **Consolidating and establishing policies** for our Research Expectations, Impact Strategy, Peer-Review Process for Grant Applicants, and Additional Research and Impact Leave, in order to streamline administration and improve transparency and equity in research management.
- **Extending the support provided** with appointments of a Research Facilitator (RF), an academic Research Grants Champion who coordinates peer support for funding applications, and an academic Impact Champion to lead on developing impact initiatives and to support colleagues in fostering external partnerships with research users and policy makers. The RF's role has been extended to support the strategic planning of impact and aid linkages across the Department's research clusters and institutional research themes (i.e., "Health and Wellbeing", "Justice and Equality", REF5a:4) and interdisciplinary research initiatives (i.e., Interdisciplinary Global Development Centre (IGDC), REF5a:10).
- **Enhancing financial support for research and impact** by increasing the annual personal research and impact allowance by a third (to £2,000), the annual research cluster budgets from £1,000 to £1,500, and providing a Research and Impact Support (RIS) Fund, with an average of £56k annually allocated to stimulate research collaborations, develop early-stage research ideas and funding applications, and to promote research impact. Additionally, staff accessed a wide range of financial support for travel and events, or for time, research assistance etc. to actively support potential ICSs.
- **Expanding our research priorities.** We added a seventh research cluster in the area of political economy, recognising the development of our research expertise in this area. We reviewed our Research Strategy and added a new priority area, on risk and decision-making in financial markets and the macroeconomy.
- **Strategic hiring** in priority areas to strengthen research excellence, and for additional professional support and Teaching & Scholarship (T&S) colleagues to ensure time for ART staff to advance their research and impact agendas.
- **Developing research talent.** With external funding successes we have hosted 5 PDRs since 2014 (1 British Academy (BA), 3 Marie Skłodowska-Curie, and 1 Economic and Social Research Council (ESRC)). This shows the attractiveness of the Department to talented new researchers and contributes to a more vibrant research environment. By providing resources and dedicated mentoring to support their career development, PDRs have gone on to academic posts in the UK and overseas (e.g., University of Southampton, University of Groningen).
- Hosting **high-calibre conferences and symposia** on our research themes and promising new areas. We are actively engaged in international events and collaborations, not only

presenting at leading conferences, but also organising major international conferences. The York Annual Game Theory Symposium (since 2010), York Econometrics Symposium (since 2012), and Workshop for Labour and Family Economics (since 2016) have all become prominent events.

Future strategic aims and goals for research and impact

Our **objective** is to be a world-leading, research-intensive department that generates innovative ideas and rigorous evidence on the economic issues that drive societal challenges such as COVID-19. We will support existing areas of research excellence and develop exciting new research themes that contribute to the discipline, our teaching, wider society, and the public good, both responding to and shaping policy (Section 4.3 and REF5a:18).

Our **specific research goals** include:

- Designing private and public resource allocation mechanisms under complex and practical environments that are efficient, fair, robust, incentive-compatible, and easy-to-understand and implement.
- Advancing high-dimensional statistical methods for machine learning and artificial intelligence that enable analysis of heterogeneous and dependent financial, economic and biosocial panel data.
- Combining rigorous empirical and theoretical analysis focusing on child human capital, household decisions and investment in children, matching and family dissolution, social learning, and the division of labour and allocation of resources within the household.
- Extending our work on public expenditure and allocation decisions across diverse health and care systems, and exploring welfare-improving market configurations and reforms.
- Developing our international reputation in applied macro-finance by consolidating our expertise on linkages between risk and decision-making in financial markets and the macroeconomy.

Our **specific impact goals** include:

- To maintain and strengthen the outstanding significance and reach of **health economics** research impact at York. This is enhanced by close collaboration with researchers at the Centre for Health Economics (CHE).
- To support the development of impact in the **Centre for Applied Macro-Finance (CAMF)** through engagement with central banks and networks of independent fiscal institutions.
- To develop an agenda of high-calibre policy engagement, at national and international levels, in **family, education, and labour market economics**.
- To develop public and commercial partnerships, for example through our research on market design in the **economic theory** cluster.
- To build upon successes with the ESRC Knowledge Exchange and Impact Accelerator Awards and to use **collaborative projects** with local partners, such as City of York Council and Joseph Rowntree Foundation to build and enhance opportunities for research at a local level.

We will achieve this within a **research environment** that maintains and extends:

- An inclusive and collegiate working culture that promotes equality and diversity.
- High standards of research integrity and open research.
- Allocation of resources to foster impact-oriented research, knowledge exchange activities, and interdisciplinary research.
- Streamlined and simplified decision-making, whenever possible and appropriate, to face new challenges with agility and protect time for research.
- Further support for the development of talented colleagues, at all stages of their academic career, building on the successes of our academic hiring during this REF cycle.

- From 2021/22 we will offer an Integrated PhD, which is a four-year doctoral programme and will provide a thorough training in economics for researchers, and a structured graduate-training pathway equipping our PGRs with the necessary skills and knowledge to pursue research in economics.

Supporting interdisciplinary research

Working with the Politics Department, we established the Political Economy cluster and a partnership with the IGDC. The Centre for Historical Economics and Related Research at York (CHERRY) includes members from History and the Management School (UYMS). Colleagues (Smith, Swaffield) have established research connections with UYMS under their research themes, i.e., Equality, Justice, and Ethics. Our Econometrics cluster undertakes joint research with the Mathematics Department as well as holding joint workshops and seminars. The Game Theory Symposium brings together researchers in game theory from multiple disciplines, with presenters specialising in mathematics, political economy, finance, information, computer science, and more. The 18th Foundations of Utility and Risk Conference in 2018 was a major interdisciplinary conference hosted by the Department, spanning multiple disciplines including decision theory, philosophy, psychology, and neuroscience. The Department's commitment to promoting interdisciplinary research is also demonstrated by its role in founding the interdisciplinary *Journal of Mechanism and Institution Design* in 2016, which publishes research from computer science, economics, finance, mathematics, operations research, and social policy. Finally, we have positioned our interdisciplinary research contributions under the most relevant UOA in REF2021 and REF2014 (i.e., *History, Business and Management Studies*) rather than flagging outputs as interdisciplinary on UOA Economics and Econometrics.

Open Research

Open Research and **open access** is of fundamental importance for producing rigorous research that can be scrutinised and communicated to key stakeholders and the public. We are committed to developing an open research environment and our open access strategy goes beyond complying with REF and funders' open access rules. This includes requiring all research outputs to be deposited in the institutional repository (White Rose Research Online), making colleagues aware of publishers with a limited embargo period for green open access, ensuring that open access publishing fees are built into grant applications, and ensuring that our Data Management Plans, submitted as part of UKRI applications, allow collected data to be accessible to a wide audience (REF5a:17).

As one of the three founding institutions, our Department provides significant financial and administrative resources in establishing and running the open-access *Journal of Mechanism and Institution Design*. Also, in 2014, V. Smith developed and released a suite of tools for macroeconomic modelling, the *GVAR Toolbox*, which is currently used by researchers and institutions such as the International Monetary Fund (IMF) and the European Central Bank (ECB). V. Smith has also led in disseminating the GVAR approach through the running of modelling courses to participants from the EcoMod Network, Bank of Italy, and Banco Central Do Brasil.

Research integrity

The Department's **research integrity and ethics processes** are embedded within the wider University policies and provision in support of research (REF5a:14). The Department has developed a research culture where the highest standards in research practice are expected, based on the principles of honesty, rigour, transparency, and open communication. The Department is compliant with the UUK Concordat codes of practice on research integrity, principles of good ethical governance, and research misconduct. All our PhD students undertake an online research integrity tutorial and supervisors ensure students have a clear understanding of appropriate practice.

No data collection of any kind can be undertaken without the explicit approval granted by the **Economics, Law, Management, Politics and Sociology ethics committee (ELMPS)**, which meets throughout the year to review staff and PhD research project applications. ELMPS comprises 11 members of academic staff from across the five departments together with two PhD representatives and one lay member. The ELMPS member for the Department sits on the DRC and contributes to the development of research strategy and policy in respect to research integrity.

2. People

2.1 Staffing strategy and staff development

Our **staffing and recruitment strategy** has four core principles:

- Appointment of high-quality ECRs who are nurtured and developed for professional advancement, promotion and succession planning.
- Embedded commitment to Equality, Diversity, and Inclusion practices across all strategies and policies.
- Clear expectations on research activity and achievement for all academics on research & teaching (ART) contracts.
- Developing a mix of academic (ART, T&S, and PDR) and professional support roles so we can deliver, individually and collectively, our aspirations for research and impact.

Recruitment and staff development

During the REF2021 period, the Department appointed twelve open-contract ART staff and seven T&S staff, and hosted five PDRs. All our REF2021 census staff are on full-time, open contracts. Our PDRs are all on fixed-term contracts due to their external funding (Marie Skłodowska-Curie, UKRI). We have chosen to actively recruit junior colleagues, and this has supported a significant rebalancing of the Department's seniority profile when set against professorial retirements (nine since summer 2015).

We provide support for academic career development throughout the career-cycle, covering peer support, resourcing, benchmarking, research expectations, support for impact and a culture of research that, whilst being collegial and supportive, is also ambitious and challenging. For ART staff, our strategy has been shaped by investing in academic leadership; by identifying, recruiting, and developing high-quality ECRs; and by building and consolidating research excellence in areas identified as strategic priorities.

The University offers a structured programme for staff development at all career points. We have robust staff development, mentoring and support processes informed by a collegiate and mutually supportive ethos, and framed by the University Statement on Research Performance Expectations (REF5a:22). The Department has a comprehensive peer-support system covering teaching, research, and grant applications. DRC (in partnership with the HoD) leads on the ongoing assessment of academic research performance and identification of specific training and resource needs.

Additional training needs are identified via annual performance review and addressed through the University's Researcher Development Framework, the White Rose University Consortium, and other internal and external training opportunities. The University's Research Excellence Training Team provides facilities and training sessions for all staff, with a particular focus on

researcher development (ECRs and beyond) (REF5a:32). Training includes grant writing sessions tailored to the social sciences, and courses on research leadership and management for senior staff. Engagement is reviewed on an on-going basis by DRC.

All ART staff are eligible for research and/or impact sabbatical terms, accrued at a rate of one term in nine and subject to a satisfactory proposal. During a sabbatical, teaching and administration commitments are removed to enable focus on research and external engagement/impact. In addition, the Department RIS fund has been used to develop significant impact: via support for research assistance to find and document external engagement, and evidence of impact; support for policy focused symposia; and departmental peer-review.

Support for early career researchers

The appointment of ECRs, who are nurtured and developed for professional advancement, promotion, and succession planning, is a key approach to our staffing and recruitment strategy (REF5a:29). All ART lecturers appointed between January 2009 and December 2013 have been promoted to either SL/reader at the REF2021 census point (Coroneo, Madeira, Pickering, Santos Monteiro, Smith, and Thornton), or to SL then full professor (Chen, De Luca, Tominey) by summer 2020. Since REF2014, we have made seven new ART lectureship appointments, in 2015, 2018, 2019 and 2020. The first of these (Cornelissen) published in the American Economic Review and the Journal of Political Economy, with research excellence recognised by promotion to SL in 2017, and to full professor one year later. The other six appointments all have high-quality research profiles; two (Kratz, Weber) have published in the Review of Economic Studies and Journal of Political Economy since joining the Department.

We support the personal development of new appointments at all levels of seniority with initial teaching workload reductions, and by pairing ECRs with a senior mentor. For newly appointed staff, there is a 1/5th reduction in teaching load in the first year, as well as a 1/3rd reduction in the number of student supervisees allocated. All our ECRs receive a further reduction in teaching load to enable completion of the University's Postgraduate Certificate of Academic Practice. Our Promotion Advisory Panel (including the HoD, DRC Chair, and at least two additional senior colleagues) provides advice and consultation for academic colleagues who are preparing a promotion application. This initiative has been very successful; in the last five years, 13 ART staff who used the panel were subsequently promoted.

A major development is that, since 2014, we have hosted five PDRs. Our large department provides a critical mass that supports their progress, and we embrace "The Concordat to Support the Career Development of Researchers" (REF5a:27-28). In doing so we have set up a comprehensive programme of support:

- A dedicated Concordat Coordinator role.
- Each PDR is given a tailored induction.
- PDRs are paired with an academic mentor.
- PDRs belong to at least one research cluster.
- DRC Chair is the performance reviewer for each PDR.
- PDRs are included in all departmental activities.
- Peer review and administrative support from the RF when the PDRs apply for external research grants and through our annual research-funding forum.

2.2 Research Students

Recruitment of PGRs

Our research students contribute to the strength and diversity of the Department's research community, offering innovation and capacity, and creating opportunities for impact. We view our PGRs as both students and co-researchers. Our PGR programme currently has 58 registered students and has awarded 97 doctoral degrees during the REF2021 period, many involving joint supervision with CHE, UYMS (66.3 attributed to UOA16). The group is internationally diverse

and our PGRs originate from 31 different countries. We are as committed to EDI in our PGR recruitment as we are for staff. Our aim is to recruit a student body that reflects the full diversity of graduates in the UK and internationally. We have monitored EDI data at application, shortlisting, and recruitment stages and have analysed these data for trends to assist with the ongoing re-evaluation and improvement of our EDI policies and procedures. For example, our 2019 Athena SWAN submission noted that the percentage of female PGR students recruited over the assessment period was above the Russell Group average (39-44% female, compared to the Russell Group average of c. 36-38%). Our female PGR applications rose from c. 29% to 40% in this period, and offers were evenly split by gender. Although the number of acceptances was lower for female PGRs, female PGR students are not receiving fewer scholarships than male students: 16.2% of our male students were awarded a scholarship, compared to 16.4% of female. Further understanding of PGR recruitment by gender is part of our Athena SWAN action plan.

Funding for PGRs

Most of our students hold scholarships, including ESRC, Commonwealth, Marie Skłodowska-Curie, CHE, Departmental Studentships, and government scholarships (e.g., China, Indonesia, Mexico, and Pakistan). Since 2014, we have on average been awarded two ESRC studentships annually through the White Rose Doctoral Training Partnership (WRDTP), a joint venture between the Universities of Leeds, Sheffield, and York. Attracting talented PGR students and integrating them within our research programmes is key to a vibrant research environment, and we devote substantial resources to our studentships (c. £1.05 million from January 2014 to December 2019). The Department has awarded 21 studentships since 2014, while CHE has awarded 4 studentships over the last 4 academic years, as well as a 'Thanzi la Onse' (Health of All) studentship for 2019/20 (REF5a:11e).

Support for progression and completion

Our PGR students have biannual thesis advisory panel (TAP) meetings to **support and monitor progress** up to the end of the third year. Additionally, PGR students meet their supervisors and TAP members regularly and receive guidance on their research. Each PGR student is assigned to at least one cluster relevant to their research interests, receiving support from the cluster members through PGR presentations, round-table discussions, and reviewing of ongoing research.

We have **formal progression points** in the summers of years 1 and 2, with progression contingent upon completion of examined modules, a progress report (year 1) or draft chapter (year 2); completion of two TAP meetings, with satisfactory reports; and presentation of a research workshop (year 2). If progression to year 3 is not recommended, the student is given the option of switching to the MPhil degree, or withdrawing from the programme.

Evidence shows that the process is effective; during this REF2014 period only two students have switched to the MPhil, while, in that time, 97 students have been awarded their PhD. 112 students have registered on our PhD programme since August 2013, of whom 58 are current, 41 have completed, and 13 have withdrawn. We did not award any research-based professional doctorates during this period.

Support for skills development and future careers

Specific **training** sessions are offered to strengthen our PGRs' skills, and are also available to other academics (i.e., ECRs). Topics include academic writing, presentations, viva preparation, conference attendance, academic publishing in economics, and participating in the economics job market. Training in conference participation is also provided through an annual one-day WRDTC conference for PGRs in economics, organised jointly by the three WRDTC economics departments. The conference attracts around 80 participants and all presentations are by students.

All PGRs in the Department are given the opportunity to acquire **teaching experience**, improving their teaching skills and employability. Every year around 25 Departmental Graduate Teaching Assistantships (GTAs) are awarded to provide experience in teaching undergraduate seminars (for which GTAs are trained by experienced colleagues) and generous financial support.

PGRs are directly involved in organising **major research events** in the Department. Since 2014, the Department has hosted more than 30 major events, many co-organised by PGRs, enabling them to gain valuable skills. The Department's "Distinguished Visitor" scheme invites world-leading economists (e.g., Johannes Horner (Yale), Joel Sobel (UCSD), Michael Ostrovsky (Stanford), Shmuel Zamir (HU Jerusalem), Alessandro Pavan (Northwestern)) to visit the Department for a week, engage with colleagues, share their research, and deliver specialised mini-courses to PGRs. Our PGRs actively engage with the seminar programmes and have one-on-one meetings with the external speakers. In addition to attending the Departmental and cluster seminars, PGRs play an important role in the Thursday Workshops, in which internal speakers present their research. PGRs also present their work in the Research Student Workshop series, attended by the student's supervisory team, other interested academics, and fellow PGRs. Opportunities for PGRs to disseminate their research to wider external audiences are provided, and the Department offers financial support (up to £750 annually) to students presenting at international academic conferences.

Our academic **PhD Placement Officer** helps with the job search process. We have developed initiatives to improve the competitiveness of our PGRs on the academic and professional job markets, including: use of internal workshops to practice their job market presentation, mock job interviews, funds to attend job market events (AEA, EEA, RES), and dedicated profile pages on the Departmental website for job market candidates. PGRs receive support in applying for post-doctoral grants; we had one successful BA application in 2017 and one successful ESRC application in 2018.

Among the students awarded PhD degrees since 2014, around 80% proceeded to a job at a university or a research institution, around 10% to a job in the public sector, and 10% found employment in the private sector. Finally, averaging results from the **Postgraduate Research Experience Survey** run in 2015, 2017, and 2019 reveals that more than 90% of respondents are fully satisfied with the supervision and training provided at the Department, and 87% are satisfied with their overall experience in our doctoral programme.

2.3 Equality and diversity

Our Department is large and diverse, with academic staff from more than fifteen countries. **EDI** is central to our values and practices. We are committed to transparency and fairness in all our staff and student policies and have undertaken much work connected to our successful Athena SWAN Bronze submission, led by our HoD and colleagues on the Department's Equality Challenge Working Group.

Our **recruitment, retention and promotion policies** for academic ART staff have delivered diversity across age, ethnicity, and gender. For example, at the REF2021 census our UOA16 submission included 26% female academics, and 25% of the professoriate were female (Chen, Nicoletti, Tominey, and Wang) comparing favourably (though not creating any complacency) to the latest 2017 Royal Economic Society (RES) Women Committee's statistics of 15.5%. Further we note that one in three female academics (ART, T&S, and Research-only) across the Department are professors, compared with equivalent RES figures of one in seven. Our Athena SWAN Bronze award in May 2020 demonstrates our commitment to having EDI at the core of all our 'people' policies. Our Department, like our discipline, is on a journey to deliver substantial improvement on EDI in culture and composition of academic staffing. We have achieved improvements and have committed ourselves to a serious and challenging future agenda.

The Department has introduced several **initiatives** in recent years. We support promotion applications via the Department's promotion advisory committee. We offer substantial flexibility and support for staff with caring responsibilities for children or adults, or with other challenging

personal circumstances. We promote an inclusive culture by scheduling meetings and research activities within core working hours. All staff can submit a request for timetable adjustments to meet their caring responsibilities, and we ensure staff are informed of our part-time and parental leave arrangements. Three members of staff took maternity leave during the REF2021 period. As part of our Athena SWAN action plan, staff returning from maternity leave are offered one term's research leave during their first year of return, or a tapered return to full teaching and citizenship roles, as they prefer. We actively balance gender, BAME, and academic rank composition across our committees. We have an Athena SWAN coordinator (Wang) and a Departmental Diversity Champion (Ahmed).

To **monitor our progress**, we have a standing Departmental EDI committee that includes ART and T&S staff, student representatives, and professional support staff (across all grades), chaired by our HoD. Our EDI committee is working towards an Athena SWAN silver award, and addresses other protected characteristics in addition to gender, including race and ethnicity. The Department gives leadership to gender and equality work in the economics discipline via the RES Women's Committee (i.e., Nicoletti).

Our **process for selecting REF2021** outputs was undertaken by a panel that was diverse in gender, ethnicity, and nationality, and all members successfully completed the University's unconscious bias training. Of the staff on the REF2021 census date, 73.2% were male and 26.8% female, while 72.6% of outputs are from male staff and 27.4% from female staff. Further, we note that our EDI processes and outcomes for REF2021 mirror the approach we took in REF2014 where (in a selective submission) a larger share of female staff were submitted (71.4%) than male (62.9%).

3. Income, infrastructure and facilities

3.1 Income

Research income has grown, from about £220k around the end of the last REF cycle to the average annual income of £488k in the last 5 years. Our strategy has been to support all colleagues with external research grant applications, through peer support/review, horizon scanning, and viewing external grant engagement as both a core research activity and an *enabler* to delivering research outputs and impact. We are conscious that supporting colleagues to apply for the right grant, rather than *any* grant, is key. This has resulted in a diversification of applications and successes. We have been awarded significant income from research councils (ESRC, BA, Medical Research Council), governmental health research funders (National Institute for Health Research, Department of Health and Social Care), and charitable organisations, most notably the Leverhulme Trust, the Health Foundation, and Joseph Rowntree Foundation. The Department has been successful in obtaining EU funding, particularly under the European Commission's Marie Skłodowska-Curie Action Individual Fellowships scheme, with four fellowships since 2017. The Department received a significant award under the European Commission's Horizon 2020 programme (Zerilli: Co-I and Scientific Coordinator) for a substantial research collaboration focused on the development and adoption of renewable energy and technologies which has potential to lead to significant policy impact (XPRESS; €2,999,974 total award, £223,518 to York).

Claxton, Rice, and Siciliani have significant collaborations with CHE and are involved (two as Co-Is, one as project lead) in two major programmes of research (jointly with LSE and University of Sheffield) on the economics of health and social care (ESHCRU) and on healthcare economic evaluation (EEPRU), funded through the NIHR Programme Research Units. These are substantial awards of £5m (£3m to York) for ESHCRU and £4.5m (£3m to York) for EEPRU over a five-year period.

The Department has pursued smaller awards to provide experience of developing funding applications for ECRs and as a means to obtain funds to hold prestigious research conferences.

This has brought success from the Bank of England, British Academy, Department for International Development, Fritz-Thyssen Foundation, Japan Society for the Promotion of Science, Money Macro and Finance Research Group, Newton Fund, and RES.

In addition to supporting research excellence and building capacity, external funds have allowed the Department to shift the balance of our income towards research activity. Increased grant funding has enabled dedicated and sustained staff research time, leading to high-calibre peer-reviewed publications. This has reinforced the culture of applying for funding, which has led to more proactive and strategic planning of research activities. An emphasis on impact has enhanced our thinking on influencing policy, disseminating research findings to appropriate stakeholders, and considering the wider social impact of our work (Sections 1 and 4.3).

3.2 Infrastructure

The Department has **supported research** activity by increasing the internal funding and operational infrastructure available to all academics. For example, the annual personal research and impact allowance has increased over the course of the REF period by a third (to £2000). We have also introduced an enhanced teaching buyout policy that allocates a greater share of time to research than the previous scheme. The aim of this policy is to encourage staff to apply for ambitious research funding schemes, and to provide time for excellent research to take place.

The Department has a subcommittee of DRC to manage the Department's **RIS fund** to foster applications for external research and impact funding. In the academic years 2013-14 to 2019-20, RIS has allocated £390,000 in awards ranging from £150 to £5,000 for research and impact-generating activities, such as the organisation of workshops and conferences (e.g., Game Theory Symposium, York Fiscal Policy Symposium 2016, Asset Pricing Workshop (CAMF and BoE), support for staff visits, and engagement with non-HEI organisations (e.g., CAMF Advisory panel meetings 2019), conference attendance (e.g., AEA Chicago 2017 / Philadelphia 2018 / AEA Atlanta 2019, co-author visits (e.g., Acemoglu, MIT), dataset purchases, and research assistance. These funds are awarded on a competitive basis. Further research funding opportunities are available in the form of several University-level research theme-based and other priming funds (REF5a:10).

Financial management of internal and external research funding is undertaken within the Department by our experienced Finance Officer, while pre-award and administrative support for projects is provided by the Department's RF. The Research Grants Champion provides support with identifying funding opportunities and preparing grant applications. Established departmental procedures ensure all applications receive peer-review and feedback prior to submission and, particularly, advice and support on delivering impact at an early stage of proposal development. Where relevant, mock interviews are provided to help prepare candidates in advance of presenting to funding panels. Mentoring and support for grant applications is also provided within the research clusters.

The Faculty Research Development Manager provides strategic advice on external bid development and coordination of cross-departmental funding applications. Advice on impact and knowledge exchange activities can be sought from the Social Sciences Impact Manager and Partnerships Manager, who also coordinate applications to the University's allocation of funding from the ESRC Impact Acceleration Account (REF5a:50) and National Productivity Investment Fund. University-level approval of applications, along with post-award financial management and reports to funders, are provided by the University's Research Grants and Contracts team.

3.3 Facilities

A bright, spacious and comfortable staff room (open to our PGRs) is the hub of the **Department** and serves as the venue for our Thursday Workshops. In 2018, investment in the building resulted in a new seminar room - used for research seminars, workshops and training sessions

- and an informal departmental library space where publications and PhD theses are stored. Both facilities are located in an area largely given over to PGR offices, giving the students access to local facilities and further integrating them into the life of the Department. This space has recently been extended and entirely refurbished to maximise its integration within the Department and improve the quality of our PGRs' working environment. Individual offices are allocated to PGR students in their 3rd and 4th years of study. The management of the dedicated study area is the responsibility of elected PGR students.

The University's **Research Centre for Social Sciences**, established in 2013 with a dedicated building (c. £1.8m), provides all social science departments in the Faculty with facilities for additional research development, impact and research training, collaboration and support (REF5a:48). The Centre has workspaces for research groups, research meetings, workshops, and conferences, as well as a multi-functioning training suite, and interview and focus group rooms. This social science hub has supported the interdisciplinary research undertaken in the Department, e.g., between our AME research cluster and Social Policy, between our Political Economy research cluster and Politics, and between our Department and the School of PPE. In addition, the Alcuin Research Resource Centre houses a first-rate auditorium, which is used to host high-profile visiting speakers and conferences, and also houses the Experimental Economics Laboratory.

The **University Library** provides access to over 21,000 journals, has ample study spaces, and has made significant investments in data centres and IT services that have further enhanced a high-quality research resource. For computationally intensive tasks, there is local and remote access to the University's new high performance Viking computing cluster. The availability of **high-performance computing** is critical to our strategic plans for econometrics and applied microeconometrics, including the initiatives in panel data analysis and economics of the family (REF5a:41). The Department has a dedicated full-time IT officer covering all IT-related issues across research, teaching, and support functions.

4. Collaboration and contribution to the research base, economy and society

4.1 Research collaborations, networks and partnerships

National and international academic research collaborations are critical to our delivery of research excellence. The extent of our successful research collaborations is demonstrated by the fact that 81.9% of our research outputs during the REF2021 period are co-authored and, of these, almost 90% include external/international collaborations with co-authors based outside of York and/or the UK, including Acemoglu (MIT), Chernozhukov (MIT), Del Boca (Turin), Greene (NYU), Pesaran (USC), Roemer (Yale), Salvanes (NHH Bergen), Sjöström (Rutgers), and Wooldridge (MSU).

Our faculty members have extensive international networks, are regularly offered visiting fellowships, and are invited to visit internationally prestigious institutions for academic interaction and collaborations, including: CEPR (Siciliani), Oxford, Cambridge, and Bielefeld (Yang), MIT (de Luca), IZA Bonn (Nicoletti, Tominey), Academia Sinica and Max Planck Institute for Tax Law and Public Finance (Ju), Monash University (Jones, V. Smith, Yamagata), Tokyo University (Yamagata), Southern California (Smith, Yamagata), Pompeu Fabra and Brown University (Flueckiger), Princeton, Chicago, and Michigan State University (Wang), Bank of Finland (Coroneo, Golinski), Federal Reserve Dallas (V. Smith), Federal Reserve Saint Louis and Central Bank of Portugal (Coroneo).

The Department encourages **partnerships** with other organisations. Since 2019 our Department and the School of Business and Economics at Maastricht University have established the York-Maastricht partnership in Economics and Finance to foster research collaboration (REF5a:6). Together with the economic theory group at Durham University, we have established annual Durham-York economic theory workshops.

Our staff contribute to a broad range of national and international professional associations that support and sustain research in economics and the development of the profession. For example:

- Yang is the president of the Society for the Promotion of Mechanism and Institution Design.
- Jones was president of the European Health Economics Association, 2016-2018.
- Siciliani chairs the International Health Economics Association Kenneth J Arrow Award Committee.

Colleagues also serve as organisation committee members of major international conferences, such as the Econometric Society European Meetings (Coroneo) and the RES Conference (Pickering). The Department has increased its engagement with our main professional societies such as the RES, and has hosted the RES Annual Public Lecture since 2018.

Our commitment to disseminating research is further evidenced by our activities in supporting the discipline through **editorial work**. The two main international journals in the field of health economics (*Health Economics* and *Journal of Health Economics*) have been edited from York with Claxton, Jones, Siciliani, and Rice all serving as editors. Jones edited the *Oxford Encyclopedia of Health Economics*, published in 2020. The *Journal of Mechanism and Institution Design* (Editor: Yang) and the *Bulletin of Economic Research* are also edited from York (Co-editor: Ju), and 13 colleagues belong to the editorial boards of other journals.

We have hosted major **international conferences**. In 2017, the Society for Economic Design invited the Department to host its 10th Conference on Economic Design. This biannual international conference is a leading event for the area and the invitation is a recognition of our research strength in mechanism design. In 2018, we hosted the 18th Foundations of Utility and Risk (FUR) Conference, another large-scale biannual international conference, featuring more than 200 presentations. FUR is one of the most prestigious conferences in behavioural science, and this invitation recognises the outstanding quality of our research in behavioural economics and related themes on risk and decision-making.

International esteem is also highlighted through **prizes and keynotes**. For example, in 2018 Shin received the Maekyung Korea-America Economic Association (KAEA) Economist Award for his outstanding professional achievement; Jones and Rice were awarded the inaugural Willard G. Manning Memorial Award for the Best Research in Health Econometrics in 2016; Yang was a plenary speaker at the 2016 China Meeting of the Econometric Society; and Morys was a keynote speaker at the 2019 BALTIC Social Science History Conference.

4.2 Research users, beneficiaries and audiences

Our engagement with **users and beneficiaries** takes place locally, nationally, and internationally.

In applied macro-finance, we have developed important links with OECD and EU networks of independent fiscal institutions (IFIs) and their individual members. These are independent official bodies that provide oversight over and/or input into the process of preparation and evaluation of national general government budgets. The institutions we have engaged with include the UK Office for Budget Responsibility, the Spanish Independent Fiscal Responsibility Authority AIReF, the Portuguese Public Finance Council CFP, and the Italian Parliamentary Budget Office UPB. In 2017, CAMF co-organised a fiscal policy workshop at the Nuffield Foundation in London with a panel involving executives from prominent IFIs. The event was funded from an award received from the UK-wide Money Macro and Finance Research Group. Staff and PGRs from CAMF now contribute to the network's biannual publication, the European Fiscal Monitor. Staff expertise includes:

- Coroneo is an executive committee member of the Money, Macro and Finance (MMF) Society.
- Horvath was a member of the Fiscal Council of the Republic of Serbia, Slovakia Council for Budget Responsibility, committee member of the National Bank of Slovakia, panel member

for the National Audit Office of Lithuania, Network of EU Independent Fiscal Institutions, and is now Chief Economist at the National Bank of Slovakia.

- Monteiro sat on the Advisory Group for the European Commission: Directorate General for Internal Market, Industry, Entrepreneurship and SMEs.
- V. Smith served as a consultant for the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).
- Spencer (Emeritus Professor) is an Advisory Panel member of the Office of Budget Responsibility.
- Wickens (Emeritus Professor) was Specialist Advisor to the House of Lords Economic Affairs Committee.

We have strong links with external partners in health policy (REF3 Claxton and Siciliani). Members of the Health Economics cluster have strong and long-lasting relationships with policy makers within the Department of Health and Social Care (DHSC), the NHS, and bodies such as the National Institute for Health and Care Excellence (NICE), the Bill and Melinda Gates foundation, and international institutions such as the OECD, World Bank, and World Health Organisation:

- Claxton is a member of a WHO working group for the Fair Pricing Forum and advised the DHSC, NHSE, NAO, ONS, Canadian Patented Medicines Price Review Board, and Ministry of Health in Malawi.
- Rice was a member of the DHSC's Technical Advisory Group for healthcare resource allocation.
- Siciliani is a member of the European Commission Expert Panel on Effective Ways of Investing in Health, which is part of the Directorate General for Health and Food Safety.

We have promoted our work via **dissemination to non-academic audiences** through talks to local groups and business-people (e.g., Aviva and the North Yorkshire Chamber of Commerce), and non-technical publications (e.g., The Conversation, The RES Media Briefings, and the VOX CEPR Policy Portal). Our commitment to knowledge exchange and dissemination to the wider society can also be evidenced by our hosting of large-scale public lectures, such as the RES Public Lecture (2018-21) series, of which the 2018 lecture was delivered by Professor Oriana Bandiera (LSE) on 'what economists really do' to a large audience of school pupils from across the North of England. Our Department also hosts the long-running annual *Ken Dixon* Lecture to the public, with speakers such as Andy Haldane, Martin Wolf and Lord David Sainsbury.

While our non-academic audiences are generally policymakers, colleagues have had notable success in disseminating research findings to a broader audience through **engagement with the media**, including BBC News, BBC Radio 4 and 5, Sky News, the *Daily Mail*, the *Daily Telegraph*, the *Financial Times*, the *Guardian*, the *Independent*, and *The Times*. For example, research by Claxton and Rice on the opportunity costs to the NHS of buying expensive drugs received significant media attention both nationally and internationally, and major national newspapers reported on Jones' research on the value added of grammar schools.

Our Web Committee (Horvath, Wagner) coordinates the Department's online and social media presence. Our research blog (<https://economicsatork.blog/>) along with our Department's Twitter account is a highly effective mechanism for disseminating our research in an approachable form to a non-academic audience. The blog has received 1,948 unique visitors since its inception in 2017, with the most-read article - 'Coronometrics: Using Econometrics to Forecast the Effects of COVID-19', by Golinski and Spencer - receiving 335 views.

4.3 Contributions to the research base, economy and society

Our research has greatest impact in guiding debates on **public policy and services**, for example: forms of regulation (e.g., value-based pricing for new pharmaceuticals health, wages in the labour market); shaping or influencing government policy (e.g., macro-financial policy advice); changes to the delivery of public services (e.g., resource and health care decisions in

the NHS and education sector); and informing policy debate more broadly (via blogs, the media, etc.).

Building on the foundation provided by our success in health economics, in recent years the breadth of our impact and engagement has widened significantly to include **macro-finance** (Section 1 and REF3). For example, our research has impacted a number of countries by influencing policy research and analysis in major financial institutions (e.g., the Bank of England, ECB, the EU Directorate General for Economic and Financial Affairs, US Federal Reserve Banks, Bank of Canada, IMF, World Bank, the Bundesbank, Reserve Bank of Australia, Central Bank of Iceland, National Bank of Belgium, and Central Bank of Turkey), as well as independent assessors of governments' macroeconomic and budgetary projections (e.g., IMF, Office of Budget Responsibility and the Network of Independent Fiscal Institutions).

Our impact and engagement also includes **microeconomics**, both theoretical and applied. This includes our work in labour economics (e.g., Low Pay Commission, Department for Work and Pensions, Joseph Rowntree Foundation, and City of York Council), experimental (e.g., Department for Environment Food and Rural Affairs), public sector (e.g., Ofsted and Department for Education), and mechanism design (STEP). Finally, Rice was part of a multidisciplinary research team of G8 Northern Universities studying the links between health and productivity in the Northern Powerhouse, culminating in a report launched at a Westminster Ministerial Reception.

Our response to COVID-19

Given our research strengths, we have been able to contribute to the wider economy and society on the many **challenges posed by COVID-19**. Before the end of July 2020, our staff members engaged with the following research activities on COVID-19. Siciliani was part of the working group and contributed to the policy report "The organisation of resilient health and social care following the COVID-19 pandemic" for the European Commission. Jones has studied the impact of COVID-19 on inequality of opportunity in psychological distress, as well as unmet need and horizontal equity in access during the pandemic. Rice is a Co-I on a grant funded by the Health Foundation - *The effects of the COVID-19 pandemic, and the policy response, on health, work and health inequality* - which delivered a draft report to the funder together with written and oral evidence to the Work and Pensions Committee's inquiry into the disability employment gap during the pandemic. Rice is also an advisor for a DHSC project, "Unmet needs deep dive", which is a review of the implications of the COVID-19 on unmet health care needs. Tominey is on the editorial board of The Economics Observatory – a project aiming to bridge the gap between research, policy, and the general public in matters related to COVID-19 – and wrote two articles for Observatory focusing on the scarring effect on the young and inequalities in the impact of COVID-19 on children. In a VOX article, Nicoletti and Tominey investigated the likely mental health effects of COVID-19 on children. Using econometric tools, Coroneo and Monteiro tested the predictive accuracy of the COVID-19 forecasts, Smith and Yamagata assessed the impact of COVID-19 on global fossil fuel consumption and CO₂ emissions, Madeira studied spatial and temporal clustering of the COVID-19 contaminations in China, Flueckiger analysed the role of networks in the spatial spread of the COVID-19, and Golinski modelled and forecasted the evolution of the COVID-19 epidemic.

Our collective effort to understand and respond to the impact of COVID-19 on the economy and society illustrates how our research will inform the future evolution of policy and practice.