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| <p>Institution: University of York</p> |
| <p>Unit of Assessment: 18 - Economics and Econometrics</p> |
| <p>a. Overview</p> <p>The Department of Economics and Related Studies (DERS) at the University of York is one of the largest in the UK and has been through a period of regeneration and recruitment with 20 of our current academic staff joining us since 2008. We have recruited at all levels but with a particular focus on building for the future through the appointment of early career researchers. We have an international reputation for original, significant and rigorous research that spans a broad range of our subject and underpins research-led teaching across our large undergraduate (c.700 students) and postgraduate (c.250 students) programmes. Our research strategy is founded on six research clusters (Microeconomic Theory, Macroeconomics and Finance, Econometrics, Applied Microeconometrics, Health Economics, and Economic History) which promote, sustain and monitor research excellence and embrace opportunities for external funding, engagement with research users and impact.</p> <p>All researchers included in our submission to UoA18 are based in DERS; two of these (Claxton, Rice) have joint appointments with the Centre for Health Economics (CHE). The Department spans a broad range of research in economics and related areas, including economic history and finance. To best reflect their research contributions some members of DERS are being submitted to UoA30 (History) or to UoA19 (Business and Management Studies).</p> |
| <p>b. Research strategy</p> <p>Outline and evaluation</p> <p>Our strategic aim in RAE 2008 was to “build on the core areas of microeconomics, macroeconomics and econometrics and to support applications in health economics, experimental economics, economic and business history, and finance”. Sustaining a broad range of excellent research remains our goal but we have refined our strategy to exploit new opportunities and focus on our comparative strengths. To achieve this we have actively developed a more cohesive and collegiate research culture. This strategy has been pursued through two complementary initiatives: i) extending the range of support provided to our academics to conduct research of the highest standard (see sections c and d); and ii) by significantly developing the six research clusters that make our research more collaborative and the environment more supportive for delivering research excellence.</p> <p>In the period since 2008 we have achieved the original objectives and gone beyond them in order to develop and implement a significantly more ambitious research strategy built around the research clusters. Evidence that these objectives have been achieved includes publications in top international journals (e.g., <i>Econometrica</i>, <i>Economic Journal</i>, <i>Games and Economic Behavior</i>, <i>Journal of Economic Theory</i>, <i>Journal of Econometrics</i>, <i>Review of Economics and Statistics</i>); UK Research Council funding (ESRC and MRC Grants, ESRC Knowledge Exchange, early career fellowships from the BA, MRC and the ESRC Future Leaders scheme); as well as a broad range of international conferences, workshops and symposia all hosted at York (Economic Theory Workshops 2012, 2013; Econometrics Workshops 2012, 2013; General Equilibrium Days 2010, 2011, 2012, 2013; York Annual Game Theory Symposium 2010, 2011, 2012, 2013 with associated 2013 Royal Economic Society Game Theory Summer School). This, combined with a thriving doctoral programme, indicates a vibrant, supportive and sustainable research environment.</p> <p>Priorities and achievements</p> <p>Since 2008 we have developed six research clusters in Microeconomic Theory, Macroeconomics and Finance, Econometrics, Applied Microeconometrics (AME), Health Economics, and Economic History. Our policy for these clusters, adopted by Departmental Research Committee (DRC) in January 2009, provides a supportive research environment which is essential within such a large department. The clusters generate academic discussion and increased collegiality, and provide a springboard for activity e.g. collaborative bids within, between and beyond the clusters, and (crucially) they engage the PhD students with the academic faculty. Cluster leaders have a formal role in the Department’s administrative structure, with responsibility for coordinating activities and feeding back recommendations for academic recruitment and other strategic initiatives. Research cluster membership includes both academics and PhD students, with staff and PGR students each affiliated with at least one cluster.</p> |

Although the significant development of the six research clusters is a strategy embraced since early 2009, these themes are deeply rooted in the intellectual history of the Department and have grown out of our long-established research contributions in microeconomic theory, macroeconomics, econometrics and health economics. This legacy can be evidenced by significant monographs published during the REF period: Balasko's *General Equilibrium Theory of Value* (Princeton University Press, 2011), Culyer's *The Humble Economist: Tony Culyer on Health, Health Care and Social Decision Making* (Office of Health Economics, 2012), Godfrey's *Bootstrap Tests for Regression Models* (Palgrave MacMillan, 2009) and Wickens's *Macroeconomic Theory: A Dynamic General Equilibrium Approach* (Princeton University Press, 2008 & 2012).

Our research clusters are tasked to provide constructive criticism of on-going research via peer review and support on both academic papers and grant applications. In addition the clusters help us to recruit and integrate internationally recognised researchers, to attract visitors (see the Distinguished Visitor programme below), and provide an efficient collaborative working environment. Each cluster has a devolved annual budget giving it the means to support co-author research visits and invite seminar speakers as part of a cluster-based seminar series, both of which deliver a vibrancy to the research environment benefiting faculty and PhD students. The development of the research clusters has also resulted in an improved engagement with the Department's research strategy via the DRC. The DRC now includes a member from each cluster and our strategic research aims have been articulated as a direct result of the collaborative research environment that the clusters have fostered. Interaction between clusters is facilitated by departmental workshops, seminars and cross-cluster membership.

The clusters have improved our research environment by providing a way of harnessing the enthusiasm for communal academic activities that enrich both the local research environment at York and beyond. For example, the annual *Symposia on Game Theory and General Equilibrium (GE) Days* that have, since 2010, attracted economists of the highest international calibre (e.g. Vince Crawford (Oxford), Fuhito Kujima (Stanford), Ariel Rubinstein (Tel Aviv & NYU), Larry Samuelson (Yale), Karl Shell (Cornell)), making York an annual hub for networking and peer review in these core areas of economic theory. Our regular conferences in econometrics have attracted a similar quality of content and calibre of participant (e.g. Hashem Pesaran (USC), Peter Philips (Yale), Lung-Fei Lee (Ohio State)).

Strategic aims and new initiatives for the future

Strength across all areas is a core aspiration but, since 2008, we have recognised that the targeting of resources to specific research themes and activities (research visitors, additional research sabbaticals, pump priming and infrastructure investments) offers the potential for additional returns in terms of achieving excellent research (as measured by journal publications and external research income). Our research strategy has identified priority areas for development based on key research themes within the research clusters for Microeconomics, Econometrics and Applied Microeconometrics. These are:

Mechanism and institution design: The creation of a DERS Centre for Mechanism and Institution Design (CMID) in 2012 builds on the long established contributions within the Microeconomic Theory cluster and supports interdisciplinary research activity across the fields of economics, game theory, politics, law, and mathematics. CMID has the capacity to answer fundamental and critically important questions relating to the optimal design of mechanisms for resource allocation such as housing, school choice, voting systems, taxation and environmental trading mechanisms. The development of CMID has been led by Yang and Schweinzer along with colleagues across a broad range of research clusters in DERS (research theme leaders include Ju, Thijssen, Krause, P.Smith, Siciliani) along with international collaborators (including Alex Gershkov (Hebrew University of Jerusalem), Ella Segev (Ben Gurion University), Jean-Jacques Herings (Maastricht University), Tommy Andersson (Lund University), Flavio Toxvaerd (Cambridge) and Aytel Erdil (Cambridge)). CMID has been supported financially by the DERS Research and Impact Support (RIS) Fund 2011-12 & 2012-13 to support research collaborations, visits and seminars. During the next REF period CMID will apply for funding (e.g. ESRC and EU) to establish itself as an externally funded research centre. Evidence of the research excellence on which this initiative is founded is provided by publications during the REF2014 period in *Econometrica* (Yang), *Games and Economic Behavior* (Yang), *Journal of Economic Theory* (Thijssen, Yang), *Journal of Public Economics* (Krause, Siciliani) and the *RAND Journal of Economics* (Schweinzer)

Heterogeneity and interactions in panel data: New developments led by the Econometrics cluster will focus on econometric methods for models with interactions of potentially heterogeneous agents such as individuals, regions or countries, which will provide indispensable analytical tools for increasingly interlinked communities, international economies, and international financial markets. The Econometrics cluster, which has been strengthened and enhanced by key academic appointments (Chen, Shin, V. Smith, Thornton) and professorial promotions (Yamagata), have adopted a focus on panel data. This theme has been identified as a priority due to York's contributions in developing several innovative econometric methods for estimation and inference in panel data models with cross-sectional dependence, which have pushed the methodological boundary of panel data regression analysis. A new centre for panel data analysis (PanDA) will be created to support these developments. Evidence of the research excellence to support this is provided by publications by a number of colleagues in the Econometrics research cluster during the REF period in the *Journal of Econometrics* (Chen, Iacone, V. Smith, Thornton, Yamagata) and *Econometric Theory* (Iacone, Thornton).

The economics of the family and early life: Strong academic appointments (Nicoletti, Scholder, Tominey, Wilke) allow us to build on our well-established research strength in health economics with a significant move into complementary policy areas including education and economics of the family. This is coupled with methodological developments through the use of complex data such as linked administrative datasets ('Big Data'). Contributions in this area not only have applied policy relevance but can also make methodological contributions and will be achieved through cross-cluster research collaborations. This will be taken forward by the Applied Microeconometrics cluster through a portfolio of current research grants (ESRC, JRF) and on-going submissions (ESRC, MRC), driven by departmental, interdisciplinary (e.g. Health Sciences, Social Policy) and external (e.g. ISER, IFS) research collaborations. Evidence of excellence upon which these initiatives are founded include; publications during the REF2014 period in the *Economic Journal* (Scholder & Tominey, Swaffield), *European Economic Review* (Scholder), *Journal of Business and Economic Statistics* (Nicoletti), *Journal of Econometrics* (Nicoletti) and *Journals of the Royal Statistical Society* (Forster, Jones, Rice, Wilke); and our internationally recognised strength in health economics evidenced by the award of a Queen's Anniversary Prize for Higher Education, 2008 for our work in health economics and by recent bibliometric analysis by the World Bank that places York as the only UK institution in the World top 10 in health economics, alongside Harvard, Stanford and Berkeley (<http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-5829>).

c. People:

i. Staffing strategy and staff development

Staffing policy and recruitment

Our staffing policy has been shaped by three principal objectives: (1) investing in academic leadership; (2) identifying, recruiting and developing high-quality early career researchers; and (3) building and consolidating research excellence in areas identified as strategic priorities. We have appointed outstanding researchers to support academic leadership and build capacity within the research themes identified in our research strategy, for example in econometrics (Chen, Shin, V. Smith, Thornton), applied microeconometrics (Nicoletti, Scholder, Tominey, Wilke) and economic theory (Schweinzer, Thijssen, Yang). To achieve our staffing objectives, since 2011 we have explicitly converted vacant professorships into lectureships to broaden the Department's age profile and invigorate the research clusters. We now have over 60% of academic staff under the age of 50. Our commitment to the future sustainability of the strategy is evidenced by the breadth and quality of our early career researcher (ECR) appointments. For example, three hold early career personal research fellowships including the ESRC Future Leaders Awards (Coroneo), British Academy (Tominey) and Medical Research Council (Scholder), and publications during the REF2014 in leading journals include the *Economic Journal* (Scholder & Tominey), *Journal of Econometrics* (Chen, V. Smith, Thornton) and *European Economic Review* (Scholder). This recruitment strategy was underpinned by significant University investment together with the opportunities arising from retirement, with some former colleagues retaining links through emeritus status (Godfrey, Hartley, Hutton). The staffing policy has delivered a more sustainable demographic balance, a more international profile and an improved gender balance. For example 28% of our colleagues submitted under the REF2 research outputs are women in REF2014 compared to only 12% in RAE2008.

Staff development, mentoring and support

Our research strategy is promoted through robust staff development, mentoring and support processes informed by an ethos of collegiality and mutual support, and framed by the University Statement on Research Performance Expectations. At the core of this is our engagement with the "The Concordat to Support the Career Development of Researchers". The experience of embedding the Concordat led us to take the relevant principles and develop best practice for the development of all our staff. All ECRs are assigned an academic mentor for their probationary period to provide guidance and support on research, teaching and career development. We support the development of all new appointments at all levels of seniority. For example 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 which supports continued and significant research activity for colleagues whilst managing the demands of a new academic post. Appointees with less than three years of full-time teaching experience receive a further reduction in teaching load to enable completion of the University's Postgraduate Certificate of Academic Practice.

DRC coordinates a termly research register to monitor staff research performance and activity (covering research outputs, grant applications and developing research projects/plans) and to identify specific training and resource needs. Published research outputs, funded grant applications and research related activities (conferences, user engagement etc.) are then recorded in the University of York's Research Database (YRD). 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 Development Team provides facilities and training sessions for all our staff with a particular focus on researcher development (ECR and beyond). For example the newly developed grant writing sessions tailored for the social sciences, courses on research leadership, and management for heads of departments and other senior staff. York's Researcher Development Team won the Times Higher Education Award for Outstanding Support for Early Career Researchers in 2012. All academic staff are eligible for research sabbatical terms, subject to a satisfactory research proposal to DRC. Research terms can be accrued by colleagues at a rate of one term for every nine. During a research term, teaching and administration commitments are re-arranged to enable the academic staff member to focus on progressing their research.

We are committed to supporting colleagues through internal promotion. To achieve better outcomes during the REF2014 period we proactively set up a Departmental Promotion Advisory Panel which staff members considering making a promotion application are encouraged to consult. The advisory panel (including Head of Department (HoD), DRC Chair and two other senior DERS colleagues) offers advice to colleagues covering the timeliness of their application and how best to present their promotion case. This promotion advisory panel has been operating since autumn 2009 as part of an initiative to improve our internal promotion outcomes and retain outstanding research staff. This initiative has been very successful, for example eight of ten staff who used the panel to date have been promoted on their first attempt (November 2009-July 2013) without a retention offer (which compares to two of nine over the previous four year period).

DERS is a large and diverse Department with academic staff from more than fifteen countries. We are committed to transparency and fairness in all our policies for staff and students. This is monitored by the HoD, who leads on the Equality Challenge Unit charter mark, and our Department Manager, who has the role of Equal Opportunities Officer among her responsibilities, and the Student Services Manager, who has the role of Disability Officer. We support flexible working. For example, during the REF period two senior academics have been supported in their requests to take a flexible retirement option as a way of sustaining their research activity. Staff taking maternity leave (four members of staff on five occasions during the REF2014 period) receive proactive support, led by the Department Manager, to ensure that their preferences are respected and they are supported through their return to work. During the REF2014 period we have been especially successful in recruiting talented researchers early in their career and have ensured that they have been able to develop their potential at York; this is evidenced by internal promotions and three externally funded early career fellowships that are all held by young women (Coroneo, Scholder, Tominey). Since the beginning of the current REF2014 period the number of female professors within the Department has risen from one to five, representing an increase from 7% to 22% of the professoriate, an increase arising from three promotions within the Department

Environment template (REF5)

(Mumford, Ozkan, Swaffield) and one new recruit (Nicoletti), and key leadership roles in the Department's senior management team are held by women in the REF2014 period (most notably the deputy heads for research and teaching). Across the whole Department the proportion (number) of female academics has increased from 17% (8) to 25% (13). We have benefitted from the activities of the Royal Economic Society (RES) Women's Committee, which seeks to identify the underlying causes of the under-representation of women in economics and to change them. We have been particularly fortunate in this regard as the current chair (since 2009) is a senior member of the Department (Mumford). The inaugural RES mentoring meetings were hosted by York. We have enthusiastically embraced the Athena Swan/ECU Charter Mark initiative and have established a working party, chaired by the HoD, to advance this and to provide a foundation for the ECU race charter mark over the next REF period.

Standards for research quality and integrity

Departmental research activities are subject to professional and institutional oversight in terms of research governance and, where appropriate, research projects with ethical dimensions e.g. primary data collection (social surveys or experimental economics) are reviewed by the University of York's ethics committee for Economics, Law, Management, Politics and Sociology (ELMPS). In addition the Department (in conjunction with the institution) is reviewing Data Management Processes to ensure best practice in our data usage and subsequent storage. Research quality of grant applications is monitored through the DRC's policy of having within and cross cluster-based peer review and feedback which has improved our submission rates as well as developing good research support practices more generally. The DRC provides a synthesis of published journal rankings to highlight how particular journals are viewed within the discipline and provide guidance to staff in planning their publication strategy. The publication process is aided by disseminating research through our Discussion Paper series and is further supported by (departmental) peer review facilitated via research clusters, mentors and performance reviewers.

ii. Research students***Quality of post-graduate research (PGR) training, supervision and support***

Our PGR programme currently has 55 students registered. Its international diversity is shown by the fact that these come from 25 different countries with a number holding government scholarships (e.g., Chilean, Korean, Mexican, Royal Thai). We have substantially strengthened our provision of taught courses for PGR students. From 2013/14 we have four core PhD-level 10-credit modules: Microeconomics for Research, Macroeconomics for Research, Applied Econometrics for Research, and Mathematics for Economists. There are also specialist PhD-level modules such as the Research Seminar in Health Econometrics. Short, intensive, non-credit-bearing PhD-level courses are provided by our Visiting Scholars' lecture programme. For example, in 2012/13, courses were given by Andrew Harvey (Cambridge), Pietro Peretto (Duke), and Ray Rees (Munich). Training in conference participation is also provided through an annual one-day White Rose Doctoral Training Centre (WRDTC) conference for PhD students in economics, organised jointly by the three economics departments in the WRDTC. The conference attracts about 80 participants and all presentations are by students. The first was in Leeds in March 2012, the second in York in March 2013, and the third is planned for Sheffield in 2014. All PGR students in the department have the opportunity to acquire teaching experience. During 2008-2013, 20-25 departmental Teaching Fellowships were awarded annually to provide experience of teaching in undergraduate tutorials.

We have a successful track record in bringing in ESRC studentship funding, with a total of 12 new awards made between 2008 and 2012, and 3 more commencing in 2013/14. We have been awarded two ESRC studentships annually as discipline awards through the WRDTC, which is a joint venture between the universities of Leeds, Sheffield and York. In addition, we have been able to attract more ESRC studentships through competitions: for example, the ESRC Large Grant for HEDG included three linked ESRC studentships. Since attracting the very best PhD students and integrating them within our research programme is critical to a vital and sustainable environment the Department of Economics and the Centre for Health Economics now also devote substantial amounts of their own resources to the funding of studentships. The Department has funded 11 studentships since 2008/9, with 4 more awarded for 2013/14. The Centre for Health Economics has awarded 2 studentships since 2008/9 with 3 more for 2013/14.

PGR culture and outcomes

The research clusters play an important role in integrating PGR students into the culture of the Department and all students belong to at least one cluster. All PGR students are required to give a research student workshop during their second year and many of these are arranged as meetings of a cluster. 62 Research Student Workshops were given during 2008-2013. In addition, many PGR students give ad hoc presentations of their work in progress to the clusters. Opportunities for PGR students to disseminate their research are provided in a variety of ways. Every year we have more than 20 presentations or attendances at external conferences and summer schools, in most cases with financial support from the Department. During 2008-2013, PGR students were authors of 13 articles published in refereed economics journals.

Of our students achieving PhD and MPhil Degrees between January 2008 and July 2013, almost 60% proceeded to a job at a university or a research institution, around 25% to a job in the public sector, and 10% in the private sector. Amongst those taking jobs in the university/research sector, the UK employers included LSE, Oxford, Warwick, Glasgow, Queen Mary and Imperial College; while outside the UK they included INSEAD, Carlos III Madrid, Lausanne, and Melbourne. Amongst public sector destinations were HM Treasury, the IMF, the World Bank, the European Commission, the Central Bank of Turkey, and the Japanese Cabinet Office. In the private sector, examples of employers were the China Development Bank, Stock Exchange of Thailand, Commerzbank and Moody's Analytics.

d. Income, infrastructure and facilities

Research funding

The generation of external research income is vital for the sustainability of our research and key to our research strategy. During the REF2014 period our external research grant income has included an ESRC Large Grant along with other research income from the European Commission, ESRC, MRC, BA, Nuffield Foundation, NIHR, government departments (Low Pay Commission, Department of Health, Department for Communities and Local Government, National Probation Service, and North Yorkshire Police) and charities (e.g. Joseph Rowntree Foundation (JRF), Catch 22). Our externally-funded projects have a track record of producing excellent outcomes. For example, the Health, Econometrics and Data Group (HEDG), led by Rice and Jones, received £1.35m from the ESRC through their Large Grant Scheme between 2009 and 2013. During the four years of ESRC funding, HEDG staff have published and edited 5 books, 8 book chapters, 16 peer-reviewed publications, with a further 7 under consideration with journals, and 11 non-peer reviewed articles and working papers. HEDG staff have disseminated their work through 86 conference and workshop presentations including 22 keynote and plenary contributions.

Support for research and the generation of external research grants

External funding for our research is key as, in addition to supporting research excellence and building capacity, the generation of external funds allows us to shift the balance of our income towards research. To achieve this we are: developing a more structured approach to grant applications in relation to planning for large/centre ESRC grants and also fellowships such as the BA, ESRC professorial fellowships, EU mid-career consolidator grants; supporting a portfolio of research grants applications e.g. across funders ESRC, EU and grant sizes; supporting (large) collaborative research grant applications whether across York departments, other UK economics departments or internationally; and further developing our departmental research grant application and review process (initiated by DRC in May 2011 as a response to the ESRC Delivery Plan for 2011-2015) so that we not only increase the quantity of applications but also the quality. Teaching relief for those who generate external research funding, through the DRC policy on teaching buy-outs for external grants, provides a further incentive for staff to apply for competitive grants and support to delivering research excellence on funded research.

The appointments in 2012 of a Research Support Officer (RSO) for DERS and a Research Development Manager (Social Sciences) within the University provide important support to facilitate applications for external research grant income. Our Departmental commitment to increase our externally generated research income is a positive development for DERS, and the DRC has a clear role in delivering this objective. Over the last 12 months, and since the appointment of the RSO, we have been developing and extending our research grant application support for colleagues in DERS. This has been successful; there has been a 3-fold increase in the number of research proposals submitted (from 6 to 20) and a 9-fold increase in their value (from £920k to £8.2m) between 2011/12 and 2012/13.

DRC allocates resources to support external seminars, internal workshops and visitor programmes, research sabbaticals, junior staff mentoring, discussion paper series and personal academic research budgets (£1500pa). It also funds journal submission fees and equipment grants. Departmental funds are also available to support and pump-prime research through the Research and Impact Support (RIS) Fund. The DERS RIS Fund has been in place since 2009 and represents a major investment by the Department in supporting the research activities and outcomes of our colleagues. The RIS funds a range of research activities across four broad categories covering funding for prestigious external conference presentations, hosting international conferences locally at York, supporting co-author research visits to and from York, and resources for research. Significant RIS Fund investments over the period include £58k in 2009/10, £93k in 2010/11, £45k in 2011/12 and £63k in 2012/13. In 2013/14 the RIS Fund stands at £75k. The RIS budget is binding and is awarded competitively by a sub-committee of DRC. To date we have funded more than 200 applications ranging between £200 and £16,500 in value. The development of the RIS Fund is on-going and we continue to improve the method of targeting funds (informed by the Research Strategy objectives) and by post-award assessment of research outcomes.

Illustrations of the type of outcomes that the RIS Fund has supported include: advancing international research collaborations such as Balasko's Distinguished International Scholar position (2012/13) PUC-Rio, Brazil which arose from earlier research visits funded by the University's International Seedcorn Fund 2011/12, RIS Fund 2009/10 & 2011/12 to work with co-authors on the theory and practice of computable general equilibrium models; co-author research visits such as Wettstein (Ben Gurion University) RIS 2012/13 to work with Yang, Gershkov (Hebrew University) RIS 2010/11 to work with Schweinzer, Sarafidis (Sydney) RIS 2010/11 & 2012/13 to work with Yamagata, Shell (Cornell) RIS 2011/12 to work with Balasko; conferences hosted in York (in addition to our annual GE Days, Game Theory Symposia, and Economic Theory Workshops) including the Econometrics of Social Interaction Symposium RIS 2012/13 which supported an AME/Econometrics research cluster MRC large grant collaboration; as well as support for data, research assistance and experimental economics pilot/pump-priming projects.

Infrastructure and facilities

The University of York Library has excellent holdings in all our research fields. Researchers have access to 10,900 journal titles, 111 databases and over one million books. The Library's commitment to supporting research was recognised with an invitation to join Research Libraries UK in 2012. York's Digital Library and partner repositories allow researchers access to over 105,000 further information resources and materials. The recent £20m investment in the Library buildings has increased the number of study spaces available to 1400 including dedicated spaces for research students and offers researchers physical as well as online access to materials 24/7. The Department has benefited from significant additions to its research resources through a range of new online information packages.

IT investment over the REF2014 period has seen the University build two new data centres at a cost of £5m, and it is investing a further £1.2m for improvements to the wireless network. Such infrastructure and the move to Google Apps for Education has enabled a strong commitment to promoting and maintaining collaborative tools. Colleagues in DERS use high-specification desktop machines, and mobile device/laptop/tablets. For computationally intensive tasks there is local and remote access to our 20 application servers, each having 2 oct-core Intel E5-2690 processors, 192gb Ram and a 10Gbit network connection to our local file server. This is used for processing beyond the desktop and can run up to 10 sessions simultaneously. The availability of high performance computing such as this is critical to our strategic plans for econometrics and applied microeconometrics, including the initiatives in panel data analysis and the economics of the family and early life, involving large and complex datasets and computationally intensive methods.

The recently established Research Centre for Social Sciences (RCSS) brings together staff, postgraduates, and academic visitors within a dedicated building (c. £1.8m) to provide all social science disciplines at York with additional research training facilities and scope for research collaborations. This social science hub is already supporting the interdisciplinary research underway in DERS (e.g. between our AME research cluster and Social Policy), and will support the further development of our research links with the School of PEP. In particular we expect that the establishment of the social science research theme seminar series hosted by the RCSS will initiate further research collaborations across departments. This new facility is an additional resource for DERS, complementing the Alcuin Research Resource Centre (ARRC) established through funding

from the Wellcome Trust/ESRC Joint Infrastructure Fund and provides a range of specialist labs, facilities and services including the Experimental Economics (ExEc) lab.

e. Collaboration or contribution to the discipline or research base

National and international academic collaborations

National and international academic research collaborations are critical to delivering research excellence. The extent of our research collaborations is evidenced by 81% of our REF2 research outputs being co-authored and of these 63% representing international collaborations with co-authors based at institutions outside the UK. Research collaborations include co-authors across many UK institutions, including Bristol, Cambridge, Essex, Imperial, LSE and Warwick, and worldwide including Bollinger (University of Kentucky), Cawley (Cornell), Gershkov (Hebrew University), Licandro (IEA, Barcelona), Peracchi (Tor Vergata), Pesaran (University of Southern California), Roemer (Yale), Salvanes (NHH Bergen), Shell (Cornell), Talman (Tilburg) and Wettstein (Ben-Gurion University). Evidence of the excellence of our research collaborations include the cooperation between Yang and Ning Sun of Shanghai University of Finance and Economics on dynamic auction design which won the prestigious Chinese National Award (Silver Medal) for Outstanding Research Achievement in the Humanities, Social and Economic Sciences for All Chinese Universities (2009) awarded tri-annually.

To support networking and interaction between DERS and the international economics community the Department runs a Distinguished Visitor programme where visitors are nominated to DRC and then visit the department for a week, giving a departmental seminar, along with PhD/advanced specialist lectures and they interact with interested staff and students. Over the REF2014 period we have had 21 Distinguished Visitors. The Department runs a weekly departmental research seminar, weekly internal workshop, and research cluster based seminar series as well as an online Discussion Paper series. We have a vibrant weekly international department seminar for the whole department which has brought to York top academics from institutions including; LSE, Oxford, Cambridge, Warwick, Essex, Edinburgh and Bristol in the UK; Berkeley, Boston College, Caltech, Cornell and Yale from the US; and Milan, Tilburg, Zurich, ZEW, Mannheim in Europe. Networking is achieved through participation in external conferences and the hosting of international conferences/networks locally at York. DERS has invested heavily in these activities. They have breadth and depth ensuring sustainability and since they are recurrent they also demonstrate the vitality of our activity. They promote research progression (e.g. our PGR's have presented their work at our international conferences), openness and collegial support.

Interdisciplinary and collaborative research

The research clusters foster interdisciplinary research appropriate to their themes. For example, members of the Microeconomic Theory and Macro/Finance clusters work in collaboration with mathematicians and computer scientists at York and at other international departments of mathematics (Florence, Kyoto, La Rochelle, Pisa, PUC-Rio and IMPA Rio de Janeiro, Tohoku, Western Sydney). Researchers in the Applied Microeconometrics and Health Economics clusters work with colleagues in education, health sciences and social policy (Bristol, Essex, Imperial College, IOE University of London, Iowa). Senior DERS academics (Claxton, Jones, Mumford, Rice, Siciliani, Swaffield) are actively engaged in externally funded projects in collaboration with CHE, the Centre for Housing Policy and the Social Policy Research Unit. These collaborations include projects funded by the ESRC, NIHR and MRC with senior academics providing leadership, supervision and mentoring to junior researchers contributing directly to project outcomes and their career development as post-doctoral researchers.

Networks and collaborations with research users

All our research clusters have connections with research users. We view research and its impact to be fundamentally inter-linked within our discipline and we actively support such engagement through our impact strategy. Networks engaged with particularly closely include the Money, Macro & Finance (MMF) Research Group (P. Smith, Chair 2008-2013, Ozkan Secretary), Work, Pensions and Labour Economics Study Group (WPEG) (Mumford steering committee (2008-2010, 2012-13)), and the Global Development Network's (GDN) project "Evaluating Innovative Health Programs" (EIHP) project (Jones). Collaborations with industry e.g. Winton Capital Management have resulted in external funding, as have research collaborations with local York partners (JRF, CYC, YSJU) under the ESRC Knowledge Exchange Opportunities Scheme (commencing January 2014). Engagement with the Federal Reserve Bank of Saint Louis (US) and IMF, Washington DC produced Visiting Scholarships, and research with government economists (Bank of Guatemala,

Bank of Korea) produced joint publications. Our close and frequent engagement with research users via the dissemination (e.g. Bank of England, H.M. Treasury, European Central Bank (ECB), US Federal Reserve Banks, Bank of Canada, World Bank and Central Bank of Turkey) and funding of our research (e.g. National Institute for Health and Clinical Excellence (NICE), Department of Health, Low Pay Commission, Joseph Rowntree Foundation, Nuffield Foundation, Department for Work and Pensions), along with our membership of national level committees (e.g. NICE (Culyer, Claxton), Office for Budgetary Responsibility (Spencer)) has focused our research on key policy questions and challenges. Departmental recognition of the importance of such collaborations is evidenced by our new centre, CMID developing a 'public service platform' to provide expertise in solving real world problems with partners in industry and the public sector.

Effective academic dissemination, publication and engagement

The vibrancy of our research culture and our contribution to the profession is reflected in the range of activities that our staff are engaged with, some of which are highlighted here:-

International conferences: International conferences organised and hosted by DERS include the Game Theory Symposia (2010, 2011, 2012 & 2013), General Equilibrium Days (2010, 2011, 2012 & 2013), Economic Theory Workshop (2012 & 2013), Finance Conference (2013), White Rose DTC Economics Conference (2013), Econometrics of Social Interaction Symposium (2013), Conference in Honour of Professor PCB Phillips (2012) and Workshop in Econometrics (2008 & 2009). Our researchers have presented their work at many external conferences including the American Economic Association (ASSA), European Economic Association (EEA) and the European and Latin American meetings of the Econometric Society (ESEM, LAMES) and the RES. Staff have been invited to deliver more than 20 invited/keynotes conference presentation in the REF2014 period including micro theory (Balasko), health economics (Jones, Siciliani), labour economics (Mumford), macroeconomics (Ozkan) and econometrics (Wilke, Yamagata).

Editorial contributions: The strength of our research base is also evidenced by our activities in supporting the discipline via editorial and peer review contributions. York hosts the two leading health economics journals, the *Journal of Health Economics* (Co-editors: Rice, Siciliani) and *Health Economics* (Editor: Jones) and staff have edited most of the best-known reference works in the field. The *Bulletin of Economic Research* is edited from York (Co-editors: Krause & Ozkan) and 13 colleagues belong to the editorial boards of other journals including *Journal of Risk and Uncertainty*, *Journal of Economic Dynamics and Control* and as a Guest editor (Balasko) on a special issue of *Journal of Economic Theory*, 2012.

Research and visiting fellowships: These link us in to important international networks and collaborations including CEPR (Siciliani and Wickens), CESifo (Schweinzer, Wickens), Centre for Applied Macroeconomic Analysis, ANU (Mumford), Institut d'Anàlisi Econòmica (IAE) Barcelona (Bambi), IFS Research Associate (Scholder), Institute for Employment Research (IAB) (Wilke), IZA Bonn (Mumford, Swaffield, Tominey), National Institute of Labor Studies, Flinders University (Mumford), Monash (Jones), Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio) (Balasko), PSI London (Wilke), University of Bergen (Jones, Siciliani), ZEW Mannheim (Wilke).

Contributions to ESRC: Advisory work for ESRC is another channel through which we help shape the development of research and research training in the discipline and the social sciences more broadly. During the period of REF2014 members of our staff have served as members of the Commissioning Panel, ESRC Seminar Competition (Mumford), Academic Quality Committee of the ESRC White Rose Doctoral Training Centre (Wilke), ESRC Peer Review College (Coroneo, Rice, Scholder, Wilke) and the ESRC Training and Skills Committee (P. Smith). Colleagues have also acted as grant assessors for other RCUK funders (in addition to the ESRC) including the Medical Research Council (MRC), as well as international funders (e.g. National Science Foundation).

Contributions to professional associations: There is a broad range of participation in national and international professional associations that support and sustain research in economics and the development of the profession. For example: Balasko is a member of the council of the newly formed Society for Economic Measurement; Jones has strong involvement with the International Health Economics Association (iHEA) as Co-Chair, Kenneth J Arrow Award Committee and as an elected member of their Executive Board, he also serves on the Scientific Oversight Group, Institute for Health Metrics and Evaluation in Seattle; Mumford works with the RES (Women's Committee Chair; Executive Council Member; Trustee 2012; Conference Programme Committee 2013) and is on the European Economic Association Standing Committee of Women in Economics.