

Institution: University of Edinburgh
Unit of Assessment: 17 Business and Management
<p>Section 1: Unit context and structure, research and impact strategy</p> <p>1.1 Unit context and structure</p> <p>The University of Edinburgh Business School (UEBS) is a thriving, interdisciplinary, and inclusive community of 112 (101.75FTE) Category A researchers, committed to research and engagement to improve the performance, inclusivity and sustainability of organisations, markets and public institutions. Research expertise from the full spectrum of sub-disciplines in Business and Management is organised into themes, many of which are cross-disciplinary. Over the REF period we have reinforced existing strengths in interdisciplinary accounting, management science, and leadership, organisations and society. We have also built new areas of expertise in the themes of corporate finance, entrepreneurship, and climate change and sustainability.</p> <p>We have applied our expertise to exploit our location in a capital city and major financial and cultural hub, by developing new foci in tourism and creative industries and Fintech and financial services. We are playing a driving role in the (£237m) UK and Scottish Government investment in data-driven innovation (DDI) as part of the Edinburgh and South East Scotland City Deal. We led the development of the vision for the new Edinburgh Futures Institute (EFI) (£140m investment, opening in 2022/23), partnering with government and industry to harness data to transform financial and public services, tourism and creative industries. We are leading the research for the University's Global Open Finance Centre for Excellence (GOFCoE), which received £22.5m from the UK Strength in Places initiative in June 2020.</p> <p>Our focus has been on transforming research performance and culture, by driving up quality, expanding research income, and building an inclusive and supportive environment in which all staff can flourish.</p> <p>Major achievements and successes in the assessment period include:</p> <ul style="list-style-type: none"> • Appointing 33 early-career faculty on open-ended contracts to extend existing areas of research strength and to invest in emerging areas of significance; and promoting 26 faculty, including eight to professorships. • Almost doubling articles published in FT50 journals (from 35 to 66) compared to the previous REF period, and almost tripling those in AJG 4/4* (from 53 to 144). • Almost tripling our research income (from £2.35m in REF2014 to £6.75m in 2014-2020), and increasing the number of research awards from 58 in 2008-13 to 108 in 2014-2020. • Increasing industry income from £619k in 2008-13 to £2m in 2014-2020, including through strategic partnerships with companies such as BHP and Costain. • Establishing global leadership in our recognised fields of excellence, with 30 staff in senior editorship positions with leading journals. • Doubling numbers of PhDs awarded from 71.9 in 2008-2013 to 148.3 for 2014-20. • Being recognised for the impact of our work, notably through an ESRC Award of Outstanding Impact on Business 2015 and 2018 Academy of Management Entrepreneurship Practice Award (both R Harrison), and the 2019 Journal of Management Impact Award (Potocnik).

1.2 Research Strategy

UEBS' strategic goal is to conduct excellent research and impact to make **organisations, markets and public institutions work better**. We encourage research that promotes sustainability, fairness and enhanced performance, working closely with business and policy stakeholders to improve working lives. Over the REF period, the focus has been framed around three objectives:

1. Building on areas of existing strength in Interdisciplinary Accounting, Management Science and Leadership, Organisations and Society.
2. Developing areas of emerging strength in Corporate Finance, Climate Change and Sustainability, and Entrepreneurship.
3. Harnessing the advantages offered by our location within the wider University and city to apply our research to cross-disciplinary areas (Fintech and Financial Services; Creative Industries and Digital Tourism).

These objectives have been achieved by investing in the recruitment and development of talented researchers; and by securing resource through grant income and executive education to deliver excellent support and services. We strengthened our research enablers (Section 3), targeted world-class researchers in our recruitment strategy, devoted substantial resources to developing early career scholars, and implemented tailored support for all colleagues to attain the highest standards of research (all Section 2). Additionally, the School has invested £147k to establish research centres and networks to enhance knowledge exchange and impact (Section 1.3), and has extended research capacity through funding 55 PhD studentships (2014-20).

We outline each objective in turn, illustrating the main achievements and the investment and support given to achieve these.

Objective 1: Building on areas of existing strength

We have invested in areas of existing strength to augment the quality, reach and impact of our research, and to promote leadership and sustainability within the theme.

(i) Interdisciplinary Accounting

UEBS has expanded expertise in this area through new appointments at Chair (C. Cooper, D. Cooper) and earlier career levels (Gatzweiler, Hoffman) and by committing £28.5k to establish the **Culture, Accounting and Society Research Network (CASRN)** in 2016. Funding was used to establish a hub to advance agenda-setting research into how accounting, the profession, and calculative practices impact on the management of organisations and cultural formations, and define economic and social relationships. Its members continue to push the frontiers of knowledge in the discipline. In accounting history, Walker's work on New Deal America (2014, 2015) has reignited interest in accounting in rural communities, and has inspired investigations by others into accounting histories of agriculture. Work by Walker and Jeacle has introduced visual sources and methods to accounting history research. The new staff and the establishment of CASRN have enabled a significant advancement in understanding of the role of accounting in crises, and the impact of crises on accounting and the accountancy profession. Focal crises have been World War (Walker), natural disasters (Walker), hyperinflation (Hoffman and Walker) and humanitarian disasters (Gatzweiler). Carter's work on the profession continues to lead

research agenda and build capacity (see Section 4.2 for full details). The individual and collective global reputation of CASRN members is illustrated through editorial leadership in all three major journals in their field, hosting the Interdisciplinary Perspectives in Accounting Conference (2018), and receiving prestigious awards, e.g. C. Cooper - British Accounting and Finance Association Life-Time achievement award, 2017 (see Section 4.3 for full awards details).

Research and impact in Interdisciplinary Accounting reflects UEBS' commitment to equality and fairness. Examples include: Walker's work on the history of women in the accounting profession being used by ACCA and ICEAW to promote gender diversity in the contemporary profession; Gatzweiler's (2018) article on technological innovation in humanitarian crises is in the top 10 of best articles on migration that year in *The Conversation*, with 10,000+ downloads; and C. Cooper's (2018) report on reforming the audit industry which developed the concept of 'special audits' to investigate companies, giving greater voice to employees and other stakeholders.

(ii) Management Science

UEBS has made significant investments in this area, by creating 10 new posts since 2014, nine of whom are early-career faculty, and by enhancing leadership through five promotions (including Ouenniche and Rossi to chairs). In line with the University's DDI initiative, four of the new appointments (Calabrese, Cao, de Smedt, Lu) have built critical mass in predictive modelling and data science. This capacity-building strategy has enabled innovation in long-standing areas of expertise (banking and credit; supply chain management/logistics), as well as facilitating extension into new areas of contemporary global relevance, such as disaster and aid logistics and major assets infrastructure. Alem's highly cited work (*EJOR*, 2016) on disaster and humanitarian aid logistics was acknowledged by the highly prestigious EURO (Association of European Operational Research Societies) Award for the Best *EJOR* Paper 2018. The combined investment has enabled collaboration across the sub-fields (Calabrese & Crook, de Smedt & Ouenniche, Cao & Dong) as well as within (Calabrese & Andreeva). We continue to advance research methodologies, for example Caunhye's innovative models for location-routing and Archibald's model for transshipment in retail networks. Our research has also benefited practitioners, notably Tomasella's involvement with Edinburgh airport in scheduling optimisation and Crook's impact case study. Innovation, supported by UEBS research enablers (Section 3.3), has led to prestigious funding, e.g. Martin-Barragan's success in achieving an EPSRC New Investigator's grant (£125k) for her research into machine-learning explainability. Funding from industry has driven research which is responsive, relevant and engaged with business and society. Examples include: Rossi's partnership with Costain on major construction projects asset design and operations under uncertainty (£98k), and with Volvo on carbon lifecycle analysis (£180k); as well as three projects (Andreeva, Calabrese and de Smedt) funded by the UoE Covid-19 Response and Recovery scheme focused on Scotland's economic recovery, especially for vulnerable groups or industries, all of which are in collaboration with businesses.

The Management Science theme includes the **Credit Research Centre (CRC)**. Directed by Crook, CRC has pioneered research into the use of survival models for credit risk (Andreeva, Calabrese, Crook, Djeundje, Rozo), geographic contagion in credit risk (Calabrese, Crook), assessing risk of SMEs (Andreeva, Ansell, Calabrese) and financial awareness of young people (T. Harrison, Ansell). The research has increasingly included a focus on improving inclusion, such as exposing indirect gender bias in scoring models (Andreeva), extending scoring methods to help those hitherto unable to gain credit (Crook), and devising alternative measures if

applicants have no credit history and cannot be scored using conventional methods (Andreeva, Calabrese, Crook, Djeundje).

Over the assessment period, members of the CRC have worked in collaboration with 22 financial institutions, from UK to Brazil to China, and have secured over £776k of research funding from grant bodies, industry and charitable sources. Their research has effected change in credit scoring practice and is improving financial education among young people (see Impact Case Studies). The close relationship between research and industry is exemplified through CRC hosting the largest academic conference on credit scoring in the world, held biennially. The £666k surplus generated by the three conferences in the REF period has been invested in supporting two full-time post-doctoral research fellows (Djeundje, Rozo) and extension of a PhD scholarship to further develop capacity in the field and ensure sustainability of the Centre and its work.

(iii) Leadership, Organisations and Society

UEBS invested in 17 new faculty over the REF period to support its commitment to understanding societal and organisational transformations, in the context of equality and fairness. Research has made distinctive contributions to the debates on equality and inclusion (Amis, Calvard, R. Harrison, Murphy, O'Toole), innovation and the future of work (Curchod, Loretto, Potocnik), the creative industries (Formilan, Jones), collective action and public life (Amaeshi, Cucciniello, Kornberger, McWha-Hermann, Osborne), and strategic resilience (Oliver).

The group's demonstrable expertise in institutional theory has advanced international research agendas through: contributions to methodology in institutional logics (Jones, winner of best paper prize from *Strategic Organization* 2016); enhancing the field's understanding of stigma (Greenwood); and applying institutional theory to tackling inequality (Amis). These researchers are committed to stimulating research and building capacity in institutional theory through editorial leadership (Section 4.4) and providing development activities for earlier-career researchers (Section 4.2).

We have recruited new faculty at early career *and* senior level to increase expertise in organisational practices and processes. Work by Kornberger on collective action and strategy applied to refugee crisis has developed a theoretical understanding of organising and governing collective action. Debates on equality and inclusion have been expanded into new subjects (O'Toole's work on volunteering and on bisexuality), and extended to the middle east, Africa and India through work from Aldossari, Greenwood and Limki. New staff have also brought a novel interdisciplinary lens to societal problems, for example Curchod's ASQ article on power and agency in online work settings brought research on algorithms from IS to management and organisation. Recruitment also created more opportunities for collaborative and interdisciplinary research, in line with School strategy. Examples here include: Kwon, who collaborated with Clarke and Linguistics to produce new insights into boardroom decision-making (OS); and Kornberger's research on strategy as practice, which has been taken up by other disciplines (*Urban Studies*) and is being used by Edinburgh City Council to develop their 2050 vision. The recruitment of Cucciniello has complemented Osborne's work to reinforce UEBS' international position as a leader in service theory thinking and value in public service management.

Staff appointed in the previous REF period have firmly established their academic influence and wider societal impact. For example, Amis' *Academy of Management Annals* 2020 article on the organisational reproduction of inequality is the second most downloaded article in the journal's history, as well as being named by *Forbes* magazine as one of the 'must read' papers for business leaders confronting racism; and Murphy's widely-cited article on stereotype threat, women and leadership (*Leadership Quarterly*, 2016, 247 Google Scholar citations) has underpinned a very successful women's leadership development programme (see Impact Case Study). Quattrone's work on governance led to him being asked to develop the vision for the Edinburgh Futures Institute, thereby ensuring that business research is driving the institution's intellectual future. Furthermore, colleagues promoted over the REF period are making their mark. Potocnik's (promoted to senior lecturer) review of innovation and creativity in organisations received the 2019 *Journal of Management's* Scholarly Impact Award. This has been cited more than 2,000 times and has formed the basis of talks to academics in business, engineering, architecture and design, in the UK, Italy and Spain. Amaeshi's (promoted to chair) research on Africapitalism has been cited on two occasions by *The Economist*. Leadership across the grouping is also evidenced via prominence in editorship of major journals (Section 4.4).

In 2014 UEBS invested £84k to establish the **Centre for Strategic Leadership (CSL)** (Directors: Amis and Murphy) to create closer links with private, public and third sector organisations, and to build further capacity in the theme of leadership, organisations and society. The investment, and follow-on money, funded two PhD studentships and has generated over £235k of research and Executive Education income in the REF period (see also Section 3.2), creating routes to research impact. For example, an 18-month programme drew on CSL members' research to co-design a development programme for senior leaders at the National Trust for Scotland which helped the organisation develop its strategy. Two other examples can be seen in impact case studies led by Amis/Carter and Murphy. CSL has also led on pioneering interdisciplinary and international collaborations, such as the *Compassionate Leadership Initiative*. Together with the University's Global Health Academy, it hosted several breakfast leadership briefings, and a 'Compassion in the Age of Disruption' workshop (talks from James Doty – Stanford University; Monica Worline – University of Michigan). In terms of capacity building, CSL has supported nearly 300 early-career researchers from 14 countries through the annual *Organisational and Institutional Change Writer's Workshop* (Section 4.2).

Objective 2: Developing areas of emerging strength

(i) Corporate Finance

We have developed closer links with the vibrant financial industry in Edinburgh (see Section 3.2 for enablers) to drive growth in our finance group. We have recruited internationally-excellent leaders in corporate finance (Barbopoulos, Hagendorff, Sarkissian), and invested in talented earlier career colleagues (Leung, Sila, Srivastav). Together with existing members of the group, they have produced innovative research in a wide range of topics, including pay-out decisions of companies (Armitage), cross-listings (Sarkissian), corporate governance (Hou), particularly concerning the role of individual managers (Hagendorff), as well as mergers and acquisitions (Barbopoulos, Danbolt), publishing in the top journals in their field.

This group exemplifies UEBS' focus on fairness and enhanced performance, attracting global attention. For example, Hagendorff (with Eshraghi – was at UEBS, now a chair in Cardiff, and

Nguyen – PhD Edinburgh) published an article in *Review of Financial Studies* (2018), on the effect of CEO's cultural heritage on performance under pressure; while Sila, Gonzalez and Hagendorff published a widely-cited article on boardroom gender diversity and risk in *Journal of Corporate Finance* (2016; 389 Google Scholar citations). International reputation is reflected in collaborations with global elite finance schools, including the University of Chicago, Princeton (Barbopoulos), NYU Stern School of Business (Barbopoulos, Hagendorff) and Frankfurt School (Hagendorff) as well as with government agencies, such as Federal Reserve Bank of Atlanta and Bank of Spain (Hagendorff). In turn, these international high-level networks create a dynamic research and knowledge exchange culture, reflected in a seminar series which attracts globally-leading corporate finance speakers, and in the group hosting the Edinburgh Corporate Finance Conference (2014–17). Researchers have developed a close relationship with the Chartered Institute of Bankers, co-hosting seven knowledge exchange events (2018-20) for the local finance community. Each event was attended by more than 100 finance professionals and paired a UEBS researcher with an industry speaker (e.g. Gonzalez with Head of Japanese Equities, Baillie Gifford).

(ii) Climate change and sustainability

During the REF period, UEBS has significantly expanded its focus on climate change and sustainability. We invested in four additional faculty (Cochran, Ivory, Kaesehage, Taschini) to establish a presence in five areas: financing a sustainable world; accounting for climate change and sustainability; transforming to a sustainable society; doing business sustainably; and transitioning to a low carbon economy. The investment enabled a step change in research expertise and impact. For example, Taschini's work on carbon markets complements Ibikunle's body of research on the pricing of carbon financial instruments trading in the EU Emissions Trading System to underpin changes to UK and European private and public institutions, including EU Commission, IHS Markit and Promethum Carbon. In 2020 we brought together two existing centres (Centre for Business and Climate Change and Sustainable Business Initiative) to form the **Centre for Business, Climate Change and Sustainability** (B-CaSS) to build on previous successes in funding (£2M over the REF period) industry engagement, and policy-relevant research. Major partners have included: Volvo and Costain Groups in carbon accounting; China Resources Power, Guangdong Electric Power Design Institute, and BHP in carbon capture and storage; the World Bank and Asian Development Bank in climate investment and finance. See also Section 4.5 and Brander's Impact Case Study.

(iii) Entrepreneurship

UEBS has invested in five new staff (Greene, Kitagawa, Mozaffar, Rosiello, Viotto da Cruz), developed early career faculty (Spigel promoted from Chancellors' Fellow to Senior Lecturer), and encouraged collaboration with existing expertise (R. Harrison, Pollock) to successfully influence debates in entrepreneurship theory and actively shape policy. Spigel, Kitagawa and R. Harrison's focus on the geography of entrepreneurship has contributed to better understanding of entrepreneurial ecosystems and the ways in which localised social and economic systems affect the entrepreneurship process and firm strategy, in Scotland and Canada (Spigel), in Japan (Kitagawa) and in emerging economies, including Malaysia (R. Harrison). R. Harrison has continued his award-winning work (Section 4.3) on entrepreneurial finance, extending this to the analysis of the returns to angel investors and to impact investing. This has been incorporated into a collaborative project, led by Pollock, which highlights the importance of narrative, storytelling and improvisation in the 'second pitch' of entrepreneurs to industry analysts in securing

funding and establishing legitimacy. Viotto da Cruz's work on crowdfunding extends the commitment to entrepreneurial finance research in the School. The role of gender in the entrepreneurial process and policy is an important cross-cutting theme (Greene, R. Harrison). Greene's research into scaling up businesses led to him being appointed Director of the Scottish University Scale-Up Consortium to lead 15 Universities in developing a world-leading, entrepreneur-led and evidence-based education programme to help new businesses to grow beyond initial start-up phase.

Objective 3: Leveraging the University and city to apply expertise to new cross-disciplinary areas and challenges

We have capitalised on opportunities afforded by our Edinburgh location and cultivated links with other parts of the University to develop and lead new areas of expertise, in financial services and FinTech, creative industries, and digital tourism. The key unifying factor is **Data-Driven Innovation (DDI)**. The University is a core partner in the Edinburgh City Region Deal (£1.3bn, 2018), leading the £661m programme in DDI, including £237m investment by UK and Scottish Governments in the University of Edinburgh. The DDI programme aims to create world-leading research and data analytics capabilities in partnership with public, private and third sector organisations to improve products and services, transforming the City Region into the data capital of Europe.

UEBS is heavily involved in the DDI programme through its leadership of the **Edinburgh Futures Institute (EFI)** (opening 2022/23, but activities already underway). Quattrone initiated and developed the EFI concept and the initial bid for funding, and other UEBS researchers are driving the main themes, which include: FinTech (Ibikunle and Spears); Creative Industries (Jones); and Services Design and Management (Osborne). The School's Director of Engagement (Kelly) is also Deputy Director of EFI, ensuring alignment of engagement strategies. Investment in EFI has opened new routes to collaboration with colleagues from Informatics, Engineering, Geosciences, Social and Political Sciences and Edinburgh College of Art, and provided access to more Edinburgh-based industry partners. These opportunities have led to a step-change in developing new areas of interdisciplinary distinctiveness. For example: Jones (with ECA) securing major AHRC funding (£5.8m to UoE); a new specialised FinTech PhD pathway, where students work closely with a FinTech company and receive industry-funded scholarships (four awards since the scheme's foundation in 2019, worth £500k); and two projects, FinTech and Digital Tourism, established under the Train@Ed scheme, which involve £358k of funding from the DDI programme, the EU and industry partnerships. Train@Ed provides innovative research training, and opportunities for career progression, knowledge exchange and international mobility for early-career researchers, aligned to the values of Horizon 2020.

Our long-standing expertise in credit research, combined with new strengths in finance and FinTech, was instrumental to the University's success in leading a £22.5M bid to the UK Strength in Places initiative to fund the **Global Open Finance Centre of Excellence (GOFCoE)** (June 2020) which aims to 'safely unlock the potential of customer data as a force to improve lives'.

UEBS researchers (Crook, Calabrese, Rossi, de Smedt, and Tomasella) have been supported to collaborate in DDI projects via the **Bayes Centre** (£40m; opened in 2018), the University's innovation centre for data science and artificial intelligence. It brings together over 500

researchers and graduate students, and hosts over 30 data innovative companies. Examples of projects include Calabrese's work to develop financial well-being and credit risk models being used by national and international banks (see also 4.1).

Alongside this DDI focus, we have significantly strengthened our engagement with key government, finance and entrepreneurial partners in the city to develop and deliver impactful research, including through facilitating the City of Edinburgh's 2050 Vision (Kornberger); shaping policy on entrepreneurial ecosystems (Spigel), and advising on SME resilience (Greene).

1.3 Impact Strategy

In 2014, we developed an Impact Strategy aligned with the School's commitment to improving the performance, inclusivity and sustainability of organisations, markets and public institutions. Our strategy adopts a matrix approach, to promote engagement and impact **at local/national and global levels, across business and policy communities**, achieved through three initiatives aimed at building a strong infrastructure.

(i) Investing in specialised support roles and staff. We have created a Deputy Director of Research (Impact) to ensure that impact aligns with our research strategy, and two additional leadership roles (0.4FTE combined) – Director of Engagement and Director of Impact Enhancement. The Director of Engagement is the primary point of contact between UEBS and our external business and policy stakeholders, and has been instrumental in broadening and deepening relationships. For example, they introduced Carter to the Chief Executive of STV, which led to research-led Executive Education opportunities, ultimately influencing STV's leadership practice (Impact Case Study). The post also provides a formal engagement link between UEBS and EFI, enabling cross fertilisation of impact opportunities between the School and the University. The Director of Impact Enhancement helps faculty to realise the impact potential of their work, for example by mentoring them in applying for impact funding or in organising impact events.

In addition, we significantly expanded professional support staff in our engagement teams to 22.9FTE (see Section 3.2 for details), and re-oriented their activities to focus explicitly on enhancing impact from research.

(ii) Embedding impact into our expectations of research contribution and performance.

We expect all faculty to carry out knowledge exchange and impact as part of their academic duties. Expectations and support are part of our induction process – new staff are encouraged to incorporate plans for impact into their objectives. Knowledge exchange and impact are discussed in Annual Reviews for all staff. As with our overall research strategy, we have a key focus on developing our early career researchers (ECRs). R. Harrison (winner of ESRC Impact Award 2015 for his work which stimulated business angel investment in the UK worth £750m a year) has run workshops on developing impact cases and the impact journey. A notable result of this process has been ECRs producing work reported in current impact case studies (e.g. Brander, Airey).

(iii) Substantially increasing financial support for staff to leverage the impact of their research.

In parallel to the academic conference fund (Section 3.3), we devoted £68k over the REF period to a Practitioner Conference Fund which enables staff to attend events that provide opportunities to advance research impact. In addition, all staff can apply for a rapid-response

School Impact Grant (£137k over the REF period), which has funded activities such as practitioner workshops and practitioner-oriented publications. Staff successfully used these schemes to open up, advance or consolidate pathways to impact, e.g. Loretto's links with the Chartered Institute for Personnel and Development (Impact Case Study) were strengthened via a Keynote Presentation on age and employment to the *CIPD research conference* in 2018; while Brander's impact on influencing standards for accounting for carbon emissions (Impact Case Study) was enhanced by funding him to bring his research directly to the attention of policy-makers in the annual *International Organisation for Standardisation (ISO) Standards for Greenhouse Gas Accounting* meetings (2015-18).

This strategy has broadened our engagement in terms of both the range and types of organisations we interact with, and embedded impact into the School's research culture. The success of this can be seen in the fact that our eight Impact Case Studies are authored by faculty from five different subject areas, include earlier-career as well as senior colleagues, and illustrate national and international impact. Beyond the case studies, our strategy has also fostered deeper relationships with key partners. For example, Mozaffar's research on e-prescribing led to the creation of a toolkit for NHS practitioners; and Liang's research on carbon capture, utilisation and storage in China influenced key stakeholder perceptions across government and industry, by showing that the focus of concern had shifted from third-party exposure issues (e.g. health and safety risks) to direct risks (e.g. the cost and energy penalty of CO₂ capture).

1.4 Open Research and Research Integrity

We appointed a Deputy Director of Research (Ethics Director) in 2017 to oversee rigorous ethical practice in the planning, conduct and dissemination of research. The Ethics Director chairs our Ethics Committee and ensures UEBS is working with the University to constantly update best practice, and to design and deliver training, for example in the ethical consideration of the opening up of the digital sphere for research and the rise of netography methodologies. The School's stance on ethical research is informed and guided by the University's adherence to various initiatives, such as the UK Research Integrity Office's code of practice for research and the Universities UK Concordat to support research integrity. The University is a signatory to the Declaration on Research Assessment, and the School is fully implementing its principles, which align with our strategic focus on diversity and inclusion in research. We are careful to ensure staff are not judged by journal metrics in the course of recruitment, reward, promotion or selection of REF outputs, instead prioritising the contribution of research using the criteria of originality, significance and rigour.

Given that much of our research involves managing and sharing personal or commercially sensitive data, we have appointed an Academic Research Data Management champion, who participates in a wider University network, linking the School to best practice in information systems and GDPR requirements. We are committed to sharing data and publications, appointing an Open Research Champion to provide leadership in this area, resulting in over 98% compliance with Open Access requirements across all UEBS outputs. The School has also paid for Gold Open Access in order to increase public engagement with significant outputs, such as the article on lessons from the Air France 447 disaster (Oliver, Calvard and Potocnik, Organization Science, 2017).

UEBS staff have been leading in discussions around research integrity and open research, through widespread editorial roles and membership of editorial boards and professional bodies and influential committees (e.g. C. Cooper's membership of the AJG committee, and Crook's membership of the CABS research committee). Knowledge and best practice developed from the CRC's extensive and long-standing research links with financial institutions is informing data-sharing protocols for University data-driven initiatives such as the newly formed GOFCoE.

1.5 Future Strategy

We will seize opportunities to integrate our longer-standing and newer areas of research expertise to create novel and interdisciplinary approaches to addressing key business and societal challenges through the lens of fairness and inclusion. We will:

(i) Exploit opportunities to develop new cross-School collaborations and centres. The first of these will be **digital markets and consumption**, where we have recruited a dynamic group of early-career scholars (Lacka, Marder, Palo, and Viotto da Cruz). We are supporting them via internal funding (Section 2.4) and through enabling cross-University and external collaboration (e.g. Train@Ed scheme). We will also capitalise on emerging synergies to deliver new, interdisciplinary, insights into collective action in **crisis management and humanitarian** challenges. This will bring together established and early career scholars (Alem, Gatzweiler, R. Harrison, Kornberger, McWha-Hermann).

(ii) Use our expertise in DDI to establish new interdisciplinary research across the University. Under the auspices of EFI's Centre for Data, Culture and Society, UEBS researchers are leading the establishment of three new research clusters:

- **FinTech and Financial Services Research Cluster** (Ibikunle): established in 2020, bringing together 17 researchers in Management Science and Finance with researchers from Informatics, Maths, Economics, Law and Philosophy and a range of external partners (e.g. Sopra Steria, Baillie Gifford, Equifax, InBest.AI, Scottish Government). It will explore new business models and benefits linked to the delivery of financial services, including through the GOFCoE research agenda led by Ibikunle (Objective 2 above).
- **Tourism, Technology and Data** (Lacka) will incorporate work on data-led approaches to tourism management on the Isle of Skye (Ansell and Lacka), and on the hospitality sector's response to Covid-19 (Andreeva), to assist the development of sustainable and resilient tourism. This complements UEBS' expertise on post-Covid recovery, SME resilience and eco-systems and scale-ups (Greene, Pollock, Spigel).
- **Analytics for Good** (Andreeva) will focus on applying data science and AI in innovative and meaningful ways to support prosperity and well-being.

UEBS is also heavily involved in the **Advanced Care Research Centre**, a joint UoE/Legal and General initiative, through Loretto's research on the ageing workforce and Crook's work on data prediction. Legal & General will invest £20m over the next seven years to enable data-driven, personalised and affordable care that delivers independence, dignity and high quality-of-life for people living in their own homes or supported environments.

Fostering interdisciplinary collaboration will enable us to access more major sources of funding, to support the production of high-quality research and impact. For example, we have partnered

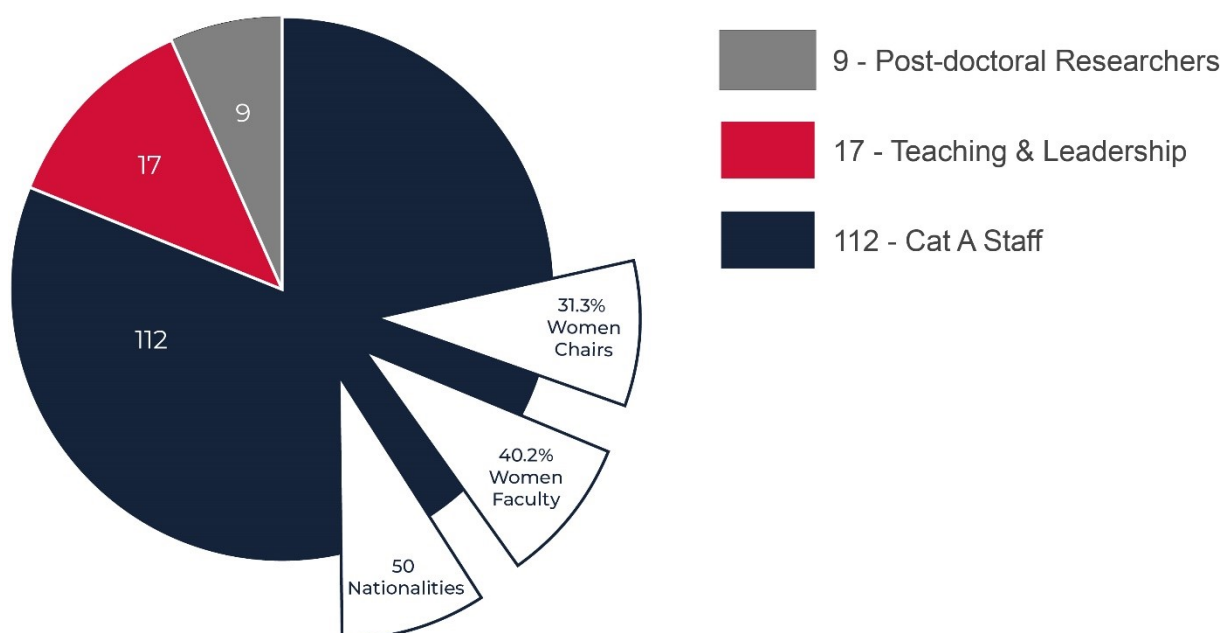
with GOFCoE to use to open banking data to leverage Industrial Strategy Challenge Fund monies (£2m bid submitted to ISCF Healthy Ageing Challenge, July 2020). The newly established Centre for Business, Climate Change and Sustainability has developed a funding strategy (including £2m bid submitted to NERC on climate risk analytics) to support its ambitious research agenda, with the clear aim of making it one of the top-10 centres in the world. As well as diversifying funding sources, these new initiatives allow us to embed our research firmly into business from the outset.

Section 2. People

2.1 Strategy and overview

UEBS' staffing strategy focuses on hiring, developing and promoting gifted academics across the course of their careers, with a firm commitment to diversity and inclusion. Numbers have grown steadily from 98 (REF2014 census date) to 138 in July 2020. The current total includes 112 (101.75FTE) Category A staff, 17 teaching and leadership faculty, and nine post-doctoral researchers. We are proud to have increased gender and international diversity. We have increased the proportion of women faculty (from 28.3% to 40.2%) and Chairs (16.7% to 31.3%). In 2014, our staff represented 31 nationalities, with 45.92% being UK-nationals; by 2020, the number of nationalities had grown to 50, with 31.2% being UK-nationals. Mindful of succession planning, we have invested in earlier career appointments to achieve a healthy age diversity – with 53% of staff aged 25-44; 22% 45-54; 16% 55-64; and 9% aged 65+. In 2019 we created a new role of Director of Faculty (DoF) to support the Dean in advancing all aspects of faculty management and development.

Figure 1: Faculty profile (July 2020; n=138)



2.2 Recruitment and Promotion

Recruitment has focused on enhancing established areas of research excellence and building new streams (Section 1.1). We have paid careful attention to striking a balance between recruiting early career academics with longer-term potential and making higher-level academic appointments to provide the required research leadership.

Since 2014, we have made 33 high-calibre early career appointments. While most (23) of these have been lecturers, we also have taken advantage of the University's Chancellor's Fellowship scheme (a prestigious five-year tenure-track programme) to recruit three outstanding colleagues (Calabrese, Kwon, and Spears), and have created seven Early Career Fellowships, designed to capture promising scholars who are just finishing their PhDs. These ECFs have realised notable research and impact achievements, such as McWha-Hermann's research on equitable remuneration in International NGOs, which resulted in her being asked to convert her research findings into an e-learning module for the aid and humanitarian sector.

Strategic professorial recruitment has focused on attracting both international research excellence and significant research leadership and mentoring expertise to support and extend our research. We have made five full-time external appointments since 2014 (C. Cooper, Greene, Hagendorff, Jones and Kornberger), and have appointed seven 0.2FTE Professorial Fellows to further the UEBS aim of supporting all staff, whatever their career stage, in producing world-leading research. Following the success of initial appointments in 2014, a strategic decision was made in 2018 to extend these appointments into other subject areas across the School. All were appointed via an open, competitive process. Our current cohort is as follows: Boyd (Marketing; University of Central Florida, appointed in 2019), Candi (Entrepreneurship; University of Reykjavik, 2018), D. Cooper (Accounting; University of Alberta, 2017), Greenwood (Strategy and Organisation; University of Alberta, 2014), Putnins (Finance; Macquarie University, 2019), Sarkissian (Finance; McGill University, 2019), and Toh (Leadership; University of Toronto, 2019). Collectively, they have organised 38 workshops and masterclasses, attended by over 120 staff and PhD students, covering writing for and publishing in leading journals, mentoring and career development; the revise and resubmission process; building impact and user engagement into funding proposals. Additionally, they act as mentors for 32 faculty and supervise 10 PhD students.

UEBS' focus on development (see 2.3 below) has seen eight faculty (Amaeshi, Brennan, T. Harrison, Hou, Ibikunle, Ouenniche, Rossi, and Tregear) **promoted** to Chair. Seven Early Career Fellows have been promoted to Lecturer (Henderson, Ivory, Kaesehage, Rodionova, Safavi, Sila and Zhou). Seven lecturers were promoted to Senior Lecturer (Calvard, Dunnett, Gonzalez, Marder, Moreira, Potocnik, Voltes-Dorta). Two Chancellor's Fellows (Calabrese and Spigel) successfully completed their tenure and were also promoted to Senior Lecturer; while two Research Fellows moved from fixed-term to open-ended contracts and received promotion (Gatzweiler to Lecturer, and Brander, twice, to Senior Lecturer). All promotions are made on individual merit via assessing an individual's profile against relevant grade descriptors. The DoF runs an annual workshop open to all, along with individual clinics, to support faculty in how to best present their cases for promotion.

Fifteen faculty have left over the past five years, many taking up prominent promoted appointments in higher education (e.g. Eshraghi, Chair, Cardiff; Kirkup, Pro-Vice-Chancellor,

Westminster University; MacKay, Senior Vice Principal, University of St Andrews) or industry (e.g. Mare, World Bank).

2.3 Development and Support

In line with our research strategy, UEBS devotes considerable attention and resource to ensuring all staff have opportunities to conduct high quality research and impact, and that these opportunities can be sustained.

A structured six-week **induction** process for all new staff involves a range of one-to-one meetings, supported by extensive digital content. As part of this, new colleagues meet with the Director of Research to discuss research priorities, and with the Research Manager to highlight the School's research support systems, details of the various research enablers and the ethics and Open Access procedures. Induction concludes with a discussion between the new colleague, their subject head and the Dean of their first-year objectives, set in the context of medium and longer-term career aspirations and plans. Integral to the meeting is the development and agreement of research and impact plans. A mentor is allocated at this meeting, tailored to the individual's needs, while the plans are followed up six months after appointment and then at Annual Review.

All staff participate in an **Annual Review (AR)** which provides constructive feedback on research and impact achievements as well as setting future objectives and priorities for the year ahead. In 2019, we introduced both one-year and three-year objectives to encourage staff to think about their immediate activity in the context of their longer-term development goals and career planning aspirations. We also introduced a 'light touch' interim check-in between ARs to give an early opportunity to discuss any issues or concerns. This has been extremely useful to respond to Covid-related disruptions. The details of AR discussions are confidential, but the agreed actions are reviewed by the DoF and Dean to gain insight into training or development needs as well as identify those who may be thinking about applying for promotion in order to help support their application. These developmentally-focused ARs are complemented by a **performance review**, whereby we provide additional support for those who may be struggling to achieve the required standards of research. Our approach is sensitive to a staff member's particular situation, taking into account the varied nature of support that might be needed. This policy has helped colleagues develop their research expertise and improve their publication profiles. All staff have a **mentor**, and further coaching support is provided by the School's Executive Development unit.

We protect 42% of **staff time** annually for research and impact; this increases to 55% when sabbatical leave of one semester for every 3.5 years is taken into account. Early Career Fellows and new Lecturers benefit from an additional 15% research time in their first year of appointment. Furthermore, we offer extra research buy-out for large research grants of over £200k (Section 3). We have also introduced a 'mini-sabbatical', a period of up to one month to e.g. complete field work, prepare a grant application, or address a 'Revise and Resubmit' decision. These provide support for staff on performance improvement plans, or offer respite to those carrying major leadership responsibilities.

Further support for research and impact is delivered via a range of **research culture enablers and strengthened research leadership**. We have augmented the funds available internally to support research and impact through our Research and Impact Enablers (Section 3.3),

increasing the budget from £173k in 2013/14 to £243k on 2019/20. Our expanded research leadership has helped raise the quality of research outputs via successful innovations such as paper-reading groups where draft papers, those under revision, and even rejections, are worked on collectively.

2.4 Support for Early Career Researchers

UEBS has a proven track record of recruiting early career researchers (ECRs) and nurturing their career development through to scholars of international standing. Examples of people who joined the School as doctoral students or ECRs include Professors Archibald, Loretto and Walker. Details of promotions in the current REF period are contained in Section 2.2.

We **ring-fence targeted support** for ECRs. For example, the First Grant Venture Fund awards seed-corn funding for new projects, while also providing the recipients experience in applying for research funds, managing a grant and delivering on outcomes. Since 2014 we have invested nearly £200k in the scheme, and recipients have gone on to generate £500k of external research funding from, inter alia, EPSRC (Martin-Barragan), Horizon 2020 (Kaesehage), BA/Leverhulme (Alem) and UKRI Covid fund (Spigel), as well as publishing their research in high-quality journals (e.g. Sila in *British Journal of Management*; Alem in *European Journal of Operational Research*).

The School has provided funding to **foster collaboration between researchers at different career stages**, enabling earlier career colleagues to establish their external research and impact profile and reputation. For example, we brought staff in Strategy, Leadership and Organisations together with Management Science to develop a programme of research into resilient teams, organisations and infrastructures. The investment (£80k) supported a PhD scholarship and a post-doctoral research fellowship to produce influential co-authored outputs on resilience and teams in the car industry and in air disasters (Calvard, Oliver, Potocnik, with Senturk). It also bought out time to incorporate work on resilient infrastructure in the airport industry (Tomasella), a collaboration which led to a highly successful training programme for Edinburgh City Council, as well as underpinning an educational programme to build individual and team resilience (delivered to 905 MBA/MSc participants in 113 teams). Most groups engage in co-authoring articles, which has contributed to the School's emerging areas of research strength, such as Corporate Finance group, who co-authored 22 articles in the REF period.

The School strongly endorses and supports the principles of the UK Concordat to Support the Career Development of Researchers. In addition to having a mentor and time for career development (Section 2.3), in 2019 we established an **early-career network** to help support the needs of ECRs and late-stage PhD students. Information on relevant funding and career development opportunities are circulated to the network and the School convenes an 'ECR REF group', where ECRs engage with issues relating research management more broadly.

2.5 Research Students

As part of the School's drive to raise research quality, we have made significant investments in our Doctoral community, with 148 students having graduated over the REF period. In 2015, we launched our strategic **Building a World-Class Doctoral Programme**, benchmarked against world-leading PhD programmes (Alberta, Cambridge, Oxford and Imperial College). We have created eight new PhD scholarships per year, and raised entry requirements, with recruitment

now including an interview. We have expanded our portfolio to include a 'Professional PhD', where the thesis topic directly tackles an organisational problem. In January 2020, we launched the FinTech PhD programme that incorporates periods of industry engagement for participants as part of their programme. We also provide students with an alternative 'three paper' thesis format.

We have further strengthened development and support for PGR students. In their first year, students take a bespoke course: 'Introduction to the PhD in Management Research', alongside choices from a wide range of other School courses as well as those offered by the Scottish Graduate School for Social Sciences, an ESRC/SFC funded consortium. In years 1-2, students receive guidance on activities beyond writing a thesis (writing workshops, publishing talks, advanced methodological workshops). In the completing years, we provide advice on developing employability and research leadership skills. We ran a series of events in 2019/20 which focused on, inter alia, developing a five-year research plan and applying for research funding. These have been attended by around 45 students, and have resulted in a successful bid to the University's DDI scheme. The Doctoral Society, funded by the School, offers peer-to-peer support and organises additional training and career events.

The School treats PhD students as faculty members; they are given full access to group/school events, and are eligible for conference funding and publishing prizes. Additionally they receive a range of bespoke financial supports. We pay for membership of an academic body for all first-year students. Over the REF period, we invested £237k in the Excellence through Collaboration fund, designed to encourage supervisors to co-author with their students in the highest-level conferences. This has led to 205 co-authored conference contributions. In 2019, we established a Go Abroad fund (initially £9k, increased to £15k). which has enabled nine students to conduct research visits to prestigious universities such as Monash, Pennsylvania, Columbia and Universidad San Francisco de Quito. The total value of PGR financial supports from 2014-20 was £927k.

All PhD students can undertake Teaching Associate and Research Associate work. We have a robust recruitment and development programme for these roles, with students receiving training and support from the University's Institute for Academic Development, and further supported via Annual Reviews and on-going training.

These changes have led to a vibrant, high quality doctoral community. Measures of success include 54 peer-reviewed articles over the REF period, half of which are in journals rated 3 or above in the AJG. PGRs reported almost 90% satisfaction with supervisory experience and research skills in the 2019 survey, with 'overall experience' scores rising across 2015, 2017 and 2019. Our most recent alumni study reported that 80% of PhD graduates remained in academia; the remaining 20% took up a range of roles in government, business and finance, including senior positions in the Scottish Government (Cummings), and corporate law (Hayoun). Graduates from our programme during this REF period have secured faculty positions at, for example, Amsterdam (Klein); Bath (Stoyanov); Cardiff (Ferns); Durham (Millar); Edinburgh (Ascui, Brander, Gatzweiler; Henderson, Ivory, Jandric; Rodionova, Sila, Xiang and Zhou); Exeter (Lambert); King's (Ong); Manchester (Ronzani); Strathclyde (Nazifi; Stoyanova); and Sydney (Eshraghian).

2.6 Equality and Diversity (E&D)

The School has significantly increased its gender and international diversity over the REF period (see Section 2.1). This diversity is reflected in the 2020 Financial Times MBA rankings: 2nd in the UK and joint 7th globally for the proportion of women faculty; 2nd in the UK and joint 8th globally for the percentage of women students; and 2nd in the UK and joint 6th globally for the percentage of international students.

As Dean, Loretto has made E&D front and centre of her leadership. The School has used its attainment of the Athena Swan bronze award in 2016 to promote a culture of inclusiveness, dignity and respect in a variety of ways. These include: creating an E&D committee, co-chaired by academic and professional services directors; rolling out E&D training to ensure all new staff undertake E&D training, and that members of the School Executive and recruitment panels undertake Unconscious Bias training; and identifying groups which might benefit from additional support, which led to the launch in 2019 of an informal support network for women of colour. Focused support is available at both School and University level via networks for research staff, female staff and for lesbian, gay, bisexual and transgender (LGBT+) staff. The School undertook two E&D surveys (2016, 2019) which showed an increase in the proportion of staff who feel the School culture is inclusive (61% to 78.5%) and non-sexist (41% to 60%), and an increase in PGR students who feel individual differences are respected (88% to 100%).

Mindful of the wide range of international backgrounds of our staff, some of whom have been trained in very different research cultures and many of whom will be publishing outside their native language, we have a range of practical supports to assist the production of research outputs. Staff are eligible for up to £2,500 per annum in support of producing a high-quality output. This covers e.g. research assistance, proof reading, and copy editing services.

In terms of family-friendly policies, returnees from leave can request a phased return, a reduced teaching load to increase their opportunities for development and research, and/or temporary or permanent changes to their working hours. We also encourage requests for alternative forms of working to help people at different stages of their life and career. In this REF period, we received and approved 15 flexible working requests from faculty. School meetings are scheduled between 10 am and 4 pm, avoiding local school holidays and Friday afternoons as Scottish schools close on Friday afternoons.

Staff can draw on a raft of health and well-being activities promoted more generally by the University. The Counselling Service, for example, offers workshops on mindfulness, confidence, presentations, and managing anxiety, mood, perfectionism, sleep, people, pressure, procrastination, and time management. In response to the disruption and continuing uncertainty caused by Covid-19, the School has brought in experts to provide well-being advice, and has introduced a new section into the AR to capture disruption. This will feed into University processes designed to ensure circumstances are taken into account in the next promotions round. We are also identifying and supporting staff to apply to the University's Research Adaptation Fund, which provides grants of £500-£3,000 to fund activities such as training in new methods, purchasing data/software, or research assistance. Furthermore, we diverted some of the PGR conference funding in 2019/20 into an emergency Covid-fund to minimise barriers to continuing research.

The School's research emphasis on diversity has served to promote equality and diversity more widely; for instance in 2019, Loretto's research led to UEBS sponsoring the inaugural Glasgow Herald and GenAnalytics Diversity Award for Age Inclusiveness, and to her appointment to the External Advisory Board for the UKRI's EDI committee; while Murphy's focus on leadership development for women has led directly to 200 women across Scotland undergoing tailored Executive Women's Leadership training.

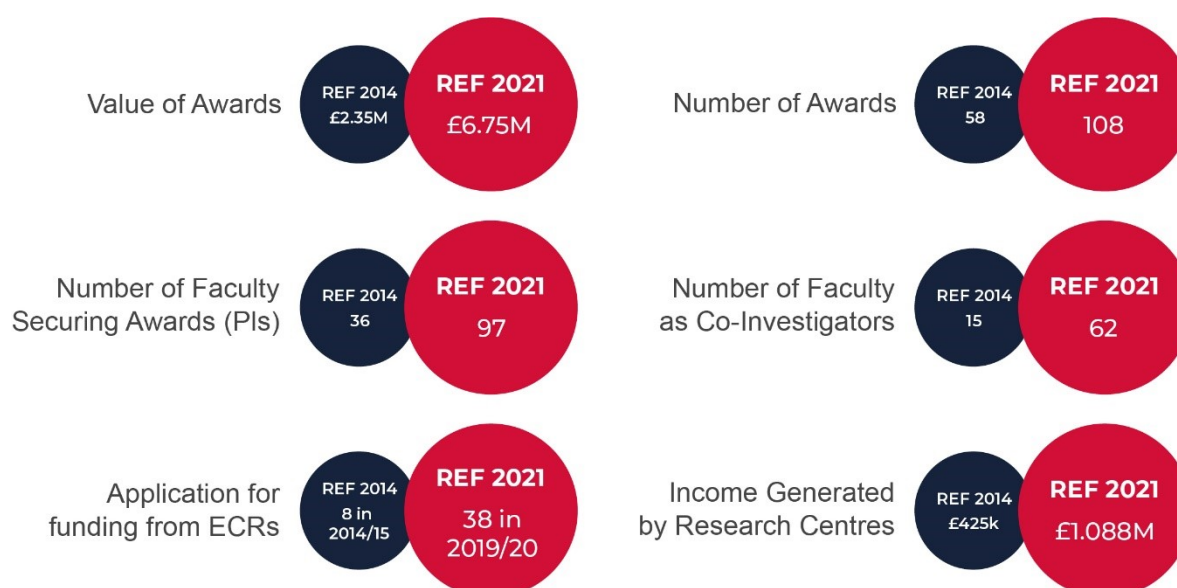
In line with the University's REF2021 Code of Practice, we have adopted an inclusive approach to defining 'independent researcher', and have embraced the decision to return 100% of eligible academic staff. We adopted a rigorous, fair and transparent approach to selecting outputs, fully accounting for staff special circumstances which have affected their research activity. The process took full account of E&D considerations, building in unconscious bias and E&D training. We also set up an independent E&D group to review the distribution of outputs across staff by gender and career stage (accurate data on other protected characteristics were not available). The result of this review demonstrated a balanced spread of outputs across gender and career stage, with 64% of staff contributing two or more outputs.

Section 3. Income, infrastructure and facilities

3.1 Research Income

We have improved our research support resources and infrastructure to proactively identify funding opportunities, to support bid-preparation, and to strengthen internal review of applications (detailed in 3.2). This has led to an increase in the value and number of external funding awards in the assessment period. The overall amount, £6.75m, is more than double the amount achieved in the previous REF period, with the number of faculty securing awards increasing. Ninety-seven (up from 36 in 2008-13) were PIs; while 62 (up from 15 in 2008-13) were Co-Is, either alongside another UEBS colleague or via collaborations with other units/institutions. Our focus on developing early career scholars (Section 2 above) yielded dividends, with a significant rise in applications from these colleagues from 8 in 2014/15 to 38 in 2019/20). We have been successful in increasing funding from industry sources, from £620k in 2008-13 to £1.6m in 2014-20. In addition, our research centres, notably CRC and CSL, generated a revenue of £1.1M over the REF period from conferences and executive development activity. While these monies do not appear in our HESA figures, they have enabled additional investment in research activities and capacity, such as CRC employment of two PDRAs (Section 1.2).

This funding has enabled us to deepen and **expand areas of existing strength, driving an international and comparative focus**. As an illustration, within Leadership, Organisations and Society, key examples include Osborne's FP7 and Horizon 2020 grants (£346k) on solidarity in European societies and value co-creation in transforming 11 European public administrations; Brennan and Tregear's (Horizon 2020; £290k) grant on strengthening European food chain sustainability; and Loretto's (NORFACE; £280k) five-country collaboration to examine age and employment across different European contexts. Beyond Europe, Amaeshi's grant from the Tony Elumelu Foundation (£310k) allowed him to further develop his work on comparative capitalism and CSR, projecting Africapitalism as a paradigm for Africa's development in a variety of policy and government spaces.

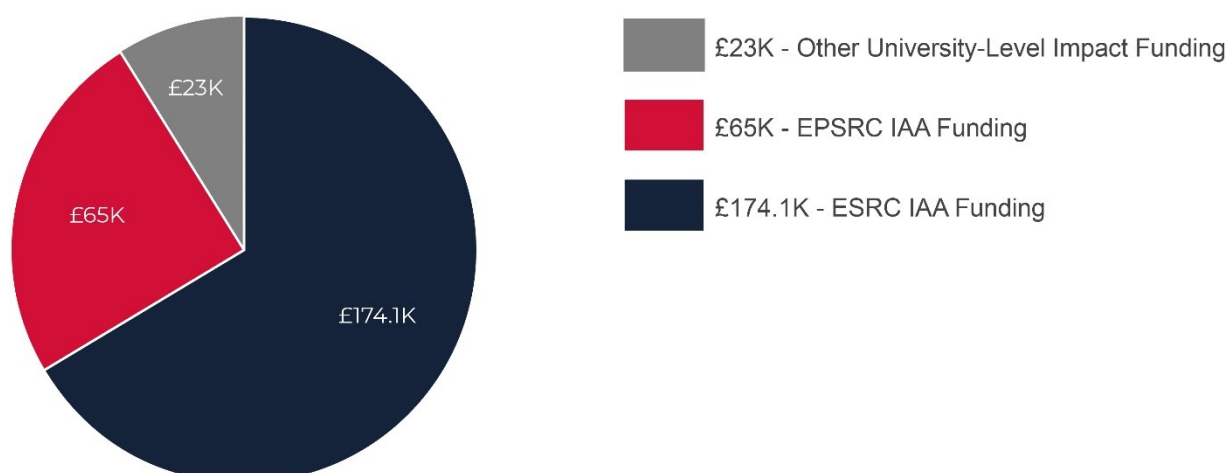
Figure 2: Research Income

International funding has also enabled a **step-change in international impact**. Examples include: Liang's funding (£1.1m) from BHP Billiton to investigate Carbon Capture, Utilisation and Storage; and Brander's award (£283k) from Volvo Construction Equipment to develop a Carbon Infrastructure Transformation Tool.

Income has been instrumental to the **development of our emerging areas of expertise**, e.g. entrepreneurship. Grant success has underpinned research into: technology markets (Ranking the Rankers; Pollock, ESRC £193k); the scale-up of technology firms (Second Most Important Pitch; R. Harrison and Pollock, ESRC £326k); innovation ecosystems (Kitagawa, ESRC £42k); and entrepreneurial scale-ups (Greene, Scottish Funding Council £600k).

Third, increased success with smaller grants across staff from a range of career stages has allowed us **to build relationships and reputations in order to secure major funding** to scale up and sustain research areas. One key illustration of this is how research by Crook (£60k ShopDirect), Calabrese (Scottish Funding Council) and colleagues played a major part in the University gaining £22.5m from UK Strength in Places in June 2020 to set up a world centre for Open Finance research and impact. Beyond UoE, Jones' AHRC (£167k) funding for the Creative Industries is part of a much wider collaborative grant of £5.8m (see Section 4 for details).

UEBS researchers have been awarded over £259k of **impact funding** in the REF period. £171.4k of this was funded through the ESRC IAA, enabling impact enhancement of 15 projects, including four of our REF impact case studies. £65k covering four projects in data-driven innovation was received from EPSRC IAA funding; with £23k from College and other university funds (seven projects). Activities supported by this funding have resulted in some exciting innovations, such as Tregear's work on the carbon footprint of school meals leading to the development of a prototype carbon calculator tool in conjunction with Public Sector Catering UK.

Figure 3: Impact Funding

Faculty members are currently working on a range of COVID-related projects. By 31st July 2020, nine UEBS projects had received funding of £248k from the Scottish Funding Council, UKRI and other external funding bodies. Topics include entrepreneurial survival resilience (Spigel and Kitigawa), affordable loans for people on benefits (Calabrese), and tourism recovery in Edinburgh (Lacka and Ansell).

3.2 Research and Impact Infrastructure and Support

The Director of Research and Research Committee oversee the implementation of research strategy and support. All subject groups, ECRs, and research centres are represented on the Committee, ensuring two-way communication and staff input into policy and strategy. We encourage talented mid-career staff to take on the role of subject Research Champions to develop research leadership skills as part of their career development. As outlined in Section 1, we appointed Directors of Engagement and Impact Enhancement to work alongside our Deputy Director of Research for Impact in embedding impact into our research culture and in training and supporting staff. The Directors of Research and Impact benefit from close interaction with their counterparts across College, vital to ensure close collaboration around the exciting large-scale interdisciplinary initiatives outlined in Section 1.

Figure 4: Professional staff supporting research and impact

UEBS' **Research Office (RO)** plays a fundamental role in achieving our research, engagement and impact objectives and is at the core of providing support to academics. We have more than doubled its capacity over the assessment period (from 4.1 FTE to 10 FTE) to support our

strategy of increasing research funding and delivering a thriving research culture. In line with the School's emphasis on capacity building, the team includes a colleague employed on the Modern Apprenticeship Scheme. PhD support is integrated into the RO to ensure that PGRs gain access to the same resources and support as academic colleagues.

The RO was restructured in 2018 to offer more specialist advice for tailored funding opportunities and to streamline pre- and post-award support. Over the REF period, the RO has organised 40 research development workshops, with over 400 faculty and PhD attendances. These workshops have included training in writing grant applications and in peer-reviewing funding bids, the latter part of a significant upgrade of the School's Internal Peer Review scheme. The RO has worked closely with other specialist support in the University, including Edinburgh Innovation (UoE's commercialisation arm), to secure industry funding, e.g. from BHP, Costain.

In 2014, following a strategic review conducted with external consultants, UEBS made substantial investments in enhancing the **wider research support infrastructure** to create new teams in Alumni and Business Engagement, Executive Development, Events, and Digital Services, comprising 26 people (22.9 FTE) in total. Their objective is to help the School's researchers maximise the impact of their work with relevant commercial, governmental and cultural organisations. Key contributions have been as follows:

The **Digital Services team** supports UEBS researchers using Edinburgh's High-Performance Computing facilities. Eddie Mark 3 is the latest iteration of the University's computer cluster and is available to all University of Edinburgh researchers. It consists of 4,000 Intel Xeon cores with up to 2TB of memory available per compute node. The cluster is used by management science researchers to parameterise Bayesian models through Monte Carlo Markov Chain simulations, while FinTech researchers have used it to manipulate large financial datasets, e.g. applying econometrics-based methodologies to investigate the microstructure of conventional wealth-driven capital markets (e.g. London Stock Exchange, BATS Chi-X Europe), and of unconventional markets (e.g. the European Climate Exchange).

The **Alumni and Business Engagement Team** assists in identifying opportunities for collaboration and impact with corporate partners. The team also played a significant role in helping secure the £1.1m award from BHP, and have forged close relationships with professional bodies such as the Chartered Banker Institute (CBI) and the Institute of Chartered Accountants Scotland. CBI has been a joint partner in seven events at UEBS since 2018, each attracting over 100 attendees, and another 17 events have been organised with partners such as Competition and Markets Authority, London Stock Exchange Academy, Scotland Russia Forum and British Institute of Energy Economics over this period.

The professional expertise provided by the **Events Team** enabled UEBS to host large and high-profile world-leading research and practitioner conferences, such as: scaling up CRC's financial surplus (from £186k in 2013 to £268k in 2019) in order to invest in supporting the next generation of early career credit researchers; and enabling UEBS to host EGOS in 2019, with 2,200 delegates and which made an estimated £2.7m economic contribution to the city.

UEBS strategically deploys **Executive Development (ED)** to further research and impact. Over the REF census period, we have delivered 128 courses, involving 4,319 participants from private, public and not-for-profit centres in UK, Denmark, China, India, America, Australia and

Dubai. Collectively these activities have generated £2.61m in income in the census period. All of our courses are research-led, and we invest the income into further research. Examples of the synergistic relationship between ED and impactful research can be seen in two of our Impact Case Studies (Carter/Amis and Murphy). In these and other courses, the course content was informed directly by staff research, and the course design focused on building relationships with the clients in order to offer them opportunities to be part of ongoing research and impact. We have adapted ED during Covid for online delivery, thereby increasing our capacity to scale up our offer. For example, converting a bespoke course for NatWest Group on Climate Change Transformation from in-person to online increased the numbers participating from 30 to 1000.

These teams work together to generate and support opportunities for engagement and impact arising from research. This integrated approach has led to, for example, a more targeted social media strategy, where we have focused our attention on LinkedIn, as its aim, to help professionals be 'more productive and successful', aligns with ours. Total 'organic impressions' increased from 15k in 2019 to 107k by mid-2020. Another example is using Walker's accounting history research (our first graduate was a pioneer for the rights of married women to work) to underpin our programme celebrating 100-years of Business at the University of Edinburgh.

3.3 Research Enablers

UEBS has invested £1.19m in supporting research and impact over the REF period, targeting activity and groups to realise the highest return in terms of quality and profile.

Conference funding (£488k for staff and £543k for PhDs) has allowed researchers individually and in small groups to present their research at prestigious international conferences, resulting in some significant personal awards (Section 4.3), and enabling the development of networks to raise the profile of UEBS. This profile-raising has led directly to UEBS being successful in bids to host world-renowned conferences, such as EGOS (2019) and American Academy of Marketing (2019). As detailed in Section 1.3, we also devote an average of £38k per year in our **Practitioner Conference and Impact funds**. While we continue to offer conference funding, we are reviewing our practices as the Covid-19 situation evolves, while also considering the environmental impact of travel.

Groups receive a collective budget of £50k annually for organising their **seminar series** to allow them to attract leading international scholars. Around 50 seminars take place each year, many open to the rest of the University. Some visitors have conducted additional PhD and/or early career events such as publishing workshops. This investment is crucial for maintaining a vibrant, international and contemporary research culture within each subject area, with the activity being maintained online since the start of 2020.

We have two schemes to support **external funding applications**. The First Grant Venture Fund, targeted towards ECRs, was discussed in Section 2.4. In 2015/16, we established the Large Grant Application Fund (£750 to the PI's research account) to fund activities needed to prepare substantial bids. The School enhances buyout time by 50% if a grant generates >£200k for the School. These measures have incentivised more colleagues to apply for larger grants (14 applications before the introduction of the policy, 36 after), with six being successful (total=£2.52m). PIs have used the additional time to maximise publications arising from their projects or to invest in opportunities for impact.

3.4 Built Environment, Facilities and Location

The School, located in George Square in the city centre, is housed in a building refurbished in 2009, with further improvements in 2014, to provide research and study space for staff and PhD students. Accessible, flexible and optimally equipped spaces provide excellent locations for public events such as conferences and lectures as well for other forms of civic engagement such as meetings, workshops, training seminars and exhibitions. We invest £424k annually in the Hub, our in-house library with a dedicated librarian, which provides staff and students access to 17 specialist accounting and finance databases for research. We are adjacent to the University of Edinburgh main library, a world-class resource with 2m books, 1.4m e-books, and 185k e-journals, and a 10 minute walk from the National Library of Scotland, one of the UK's six Legal Deposit Libraries, with 15m printed books, 7m manuscripts items, almost 2m maps, and 100k journals, magazine and newspaper titles.

Our central campus location facilitates the interdisciplinary collaboration outlined in Section 1, and we are also physically proximate to a range of critical institutions, including the Scottish Parliament and the financial and entrepreneurial centres of Edinburgh. George Square is the hub of The Edinburgh Fringe, the largest arts festival in the world. UEBS has used this opportunity to deliver the Media at the Fringe series (2015-19) drawing on Carter's media and professional research partners to deliver 20 events featuring such eminent speakers as John Bercow, Vince Cable, Will Hutton, Chris Mullin, James Naughtie, John Prescott and Polly Toynbee.

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

As discussed in Section 1, collaboration is a central element of UEBS' research strategy, with institutional and national and international collaborations being instrumental to developing the visibility and strength of our research.

4.1 Collaborations within the University of Edinburgh

As presented in Section 1.2, a key strategic focus over the assessment period has been to leverage the interdisciplinary richness of the University by brokering relationships and playing an active role in the conception and delivery of major institutional initiatives, such as EFI and GOFCoE. Continuing to shape these collaborations will also be instrumental to further increasing quality of research outputs, opportunities for large-scale research funding, and reach and significance of impact (Section 1.4).

Other, long-standing collaborations continue to thrive. For example, the Institute for the Study of Science, Technology and Innovation (ISSTI) has underpinned long-standing research collaborations (e.g. Pollock) into digital technologies that culminated in the distinctive 'Biography of Artefacts and Practices' research approach, which has been utilised, adapted and extended by researchers from a range of disciplines (*Science and Technology Studies*, 2019). This work continues with ongoing research awards in digital health (Williams, ISSTI Director, and Mozaffar); digital entrepreneurship (Pollock, R. Harrison with D'Adderio from the University's Usher Institute); and artificial intelligence (Kitagawa with Raab, Social and Political Sciences). ISSTI and UEBS colleagues jointly supervise PhD students, co-sponsor seminars, and members of UEBS participate in the annual ISSTI retreat.

Newer collaborations to emerge over the assessment period have been instrumental in building capacity and creating pathways to impact. Examples include:

- Brennan represents *Food Researchers in Edinburgh (FRIED)*, a network across multiple Schools/Colleges, on the Scottish Food Coalition, an alliance campaigning for food justice. As Chair of the Coalition, she has ensured the work of FRIED has been instrumental in shaping a Good Nation Food Bill, currently progressing through the Scottish Parliament.
- Kaesehage has collaborated with several schools (Architecture, Global Academy of Agriculture and Food Security, Engineering and Geosciences) to gain funding for research into climate change and risk adaptation in Latin America, and examining the impact of Covid on the fisheries socio-ecosystem of Galapagos.
- Calabrese has collaborated on four projects with Mathematics and Informatics to create financial and credit-risk models which are now being used by Bankia (Spain) and Nationwide Building Society. Two projects involve industry-funded PhD scholarships in Financial Technology (£201k).
- Kitagawa collaborates on a joint research project with Chemistry and Medicine as part of the Centre for Doctoral Training OPTIMA, helping PGRs integrate business analysis into the development of healthcare technology.
- Jones' collaborations with Edinburgh College of Art have led to AHRC funding of £3.3M (£94k to UEBS) to establish a Centre of Excellence for Policy and Evidence in the Creative Industries, and £6M (£78k to UEBS) to grow Edinburgh's creative industries through data-driven innovation.

4.2 National and International Collaborations

Support for conferences and networking (Section 3.3) has led to the development of an extensive range of relationships which have increased the quality and reach of our research and impact. **Nationally**, UEBS has taken a central role in brokering cross-university collaboration in a specific area of Scottish Government policy concern: scaling up SMEs. Led by Greene, *'Think. Act. Scale'* is a consortium of 15 Scottish universities, working closely with the government and the SME community, researching how entrepreneurs can scale up from micro to small businesses. Carter is joint lead of the Professions' Fest, established 2012 as a collaboration between the Universities of Edinburgh, Glasgow, Lancaster, York and King's College London. The annual event brings together scholars studying professionals and professional groups, and has a strong focus on providing engagement with practitioners and developing ECRs. Outputs have appeared in top journals (*Accounting, Organizations & Society, Contemporary Accounting Research, Organization Studies, Journal of Management Studies, Human Relations*) and in 2015, organisers edited a collection of articles for *Accounting, Auditing and Accountability Journal* (Carter et al., 2015).

International collaboration takes a variety of forms. First, the School has engaged in high profile **collaborative research grants** such as Osborne's Horizon 2020 Co-Val project (4.46m euros in total; £241k to UEBS), a consortium of 13 teams from 11 EU countries working with stakeholders to integrate co-creation of value in public administrations. Other examples include: the extension of work on ageing workforces internationally via Loretto's NORFACE grant (1.5m euros in total; £280k to UEBS) across five European countries; and O'Donohoe's research into

grandparents' and grandchildren's relations through the prism of consumption in the UK, Denmark, New Zealand and Sweden (Danish Ministry of Higher Education).

Second, we have established a small number of deep **international partnerships** in order to collaborate in a more sustained way. UEBS' alliance with **Guanghua School of Management (PKU)** secured the £1.1m award from BHP to investigate the development of Carbon Capture Utilisation and Storage in the Chinese steel industry. Also in China, UEBS (Brander, R. Harrison), along with ECCI and the Schools of Geosciences and Engineering have developed a joint venture **with Shanghai Jiaotong University** to develop the Low Carbon College, a research programme and teaching curriculum around the shift to a low carbon economy. In Europe, the partnership with **Copenhagen Business School** has delivered annual research masterclasses (2017-20) on 'Strategy as Practice'. These have brought together 84 scholars and practitioners from Denmark and Edinburgh to exchange learning on City Development Strategy, Tourism Strategy, Healthcare and Social Care Integration Strategy and development of National Investment Banks. The last of these involved one of UEBS eminent Honorary Professors, Benny Higgins, who led the establishment of the Scottish National Investment Bank.

Third, collaboration has been extended via international exchanges and appointments. UEBS received 105 international academic visitors between 2014-20, facilitating joint publications (e.g. Voltes Dorta with Inchausti-Sintes, University of Las Palmas), and grants (e.g. Potocnik and Unger, University of Konstanz). Twenty-eight UEBS staff have fulfilled **visiting professorships** at a range of leading international universities. Examples of successful outcomes include Barbopoulos' visiting appointment at NYU Stern School of Business which delivered two papers in the *Journal of Corporate Finance*. Two staff have won competitive University of Edinburgh/Sydney funding to conduct collaborative research into: prisons (C. Cooper), charting a new direction in interdisciplinary accounting; and international comparisons of family food consumption (Marshall). Loretto and Potocnik's leadership of the EU COST Action on Extended Working Lives, involving 26 countries, enabled incoming and outgoing research exchanges for ECRs. This high level of exchange activity has encouraged cross-HEI writing collaborations: 77.6% of our REF outputs involve non-UoE co-authors, 26.5% from other UK HEIs and 51.1% from international institutions.

Fourth, UEBS has contributed to the strength and vitality of the sub-disciplines of Business and Management by organising nine **large international and national conferences** since 2014:

- *European Group of Organization Studies Conference* (2019, 2,200 delegates);
- *Interdisciplinary Perspectives on Accounting colloquium* (2018, 350 delegates);
- *15th International Studying Leadership Conference* (2015, 120 participants);
- *Three biennial Credit Risk Conferences* (2015, 2017 and 2019, 400+ delegates);
- *International Research Society for Public Management* (2018, 640 delegates);
- *CABS Annual Research Conference* (2019, 200 delegates);
- *Association of Marketing Science World Congress* (2019, 350 delegates).

Hosting such conferences has provided opportunities for UEBS to lead and shape intellectual agendas. For example, the theme of EGOS 2019 reflected Edinburgh's central role in the

Enlightenment between the 17th and 19th centuries. Through this, UEBS was able to shape the contours of debate for Europe's premier conference for organisation and management scholars.

We also regularly host **smaller-scale research events**, including workshops, symposia and public lectures (over 300 since 2014, with almost 7k attendees). Recurring events include:

- *Writer's Paper Development Workshop*. (annually 2014-) Organised in conjunction with various partners including the *Academy of Management's Organization & Management Theory* and *Organization Development & Change* divisions, the *Society for the Advancement of Management Studies*, and *Academy of Management Journal*, this has supported nearly 300 doctoral students and ECRs from 60 universities across 14 countries to develop draft publications to a standard for submission to top journals.
- *Edinburgh Corporate Finance Conference* annually from 2014–17. This is one of the highest quality finance conferences globally: from the 12 papers on the 2014 programme, nine were subsequently accepted for publication by one of the top-field journals ('Top 3') in Finance.
- *Dean's International Visitor* programme (2016-). Fifteen distinguished visitors, including editors of leading US journals, have each provided research seminars, hosted publishing workshop and provided feedback on UEBS faculty manuscripts-in process.

4.3 Scholarly Recognition

The research excellence of faculty has been recognised through prizes and awards: **Alem** (Best European Journal of Operational Research paper (innovative application), 2018); **Caunhye** (IISE Transactions Design & Manufacturing best application paper – 2019); **Danbolt** (British Accounting Review Best Paper in finance, 2018); **R. Harrison** ((with Colin Mason) the ESRC 'Our Celebrating Impact Prize' for achieving outstanding economic or societal impacts, 2015 and the *Academy of Management* Entrepreneurship Practice Award, 2018); **Jeacle** (Highly Commended Award, Emerald Literati Network, 2017); **Jones** (2021 SO! WHAT winner for 2016 *Strategic Organization* article); **Osborne** (Outstanding Contribution Award from the Emerald Literati Network for the most cited paper in Emerald journals, 2016 and IRSPM Prize for Outstanding Contribution to the discipline of Public Management, 2015); **Potocnik** (*Journal of Management* Scholarly Impact Award, 2019; Emerald Citation of Excellence Award, 2017); **Putnins** (Best published paper, Securities Industry Research centre of Asia-Pacific, 2020; Rosetta Institute research award, 2019); and **Wang** (Blockchain Stable Economic Model Design Competition Championship, 2018). Sixty faculty have received Best Paper prizes at the top international conferences in their field, including outstanding achievements by early-career scholars, e.g. **Gatzweiler** (European Group of Organization Studies Best Doctoral paper, 2018); **Leung** (Best paper award in financial institutions, FMA Annual Conference, 2016); **Mozaffar** (AMIA Diana Forsythe Best Paper Award 2019 and Best of Medical Informatics Paper Award, 2019).

Sustained contributions to the research disciplines have been recognised by membership of learned societies and honorary appointments. These include: **C. Cooper** (British Accounting and Finance Association Life-Time Achievement award, 2017); **Crook** (elected as a Fellow of the Academy of Social Science, 2017); **Greenwood** (Distinguished Scholar, OMT Division, Academy of Management, 2014; Honorary Doctorate, University of Zurich 2018, Top 1% Thompson-Reuters World's Most Influential Scientific Minds, 2019); **Jeacle** (elected to the AAAJ

Hall of Fame 2019); **Jones** (Social Interaction and Organizing Residency (Invited Scholar) Northwestern University, 2015); **Osborne** (Honorary Doctorate and chair at Corvinus University, 2015; Honorary Membership of Chartered Institute of Public Finance Accountants (Japan), 2017); **Walker**, Elected Honorary Member of Italian Accounting History Society 2018 (for contribution to the discipline).

4.4 Editorial Contributions

Contribution to business and management research bases is demonstrated by extensive editorial activity. During the REF period School faculty were on the **editorial boards** of 67 leading journals, with a further 30 faculty in senior editorial roles. Examples of **Associate Editor/Editor** positions include: **Amis**, *Academy of Management Review*; **Archibald and Crook**, *Journal of the Operational Research Society*; **C. Cooper**, *Critical Perspectives on Accounting*; **D. Cooper**, *Accounting, Organisations and Society*; **Greene**, *International Small Business Journal*; **R. Harrison**, *Venture Capital: An International Journal of Entrepreneurial Finance*; **Jeacle**, *Accounting, Auditing and Accountability Journal* and *Contemporary Accounting Research*; **Kornberger**, *Organization Studies*; **Osborne**, *Public Management Review*; **Pollock**, *Information and Organization*. In addition, faculty have edited 26 **Special Issues** in journals across the range of subject areas, including 11 in Organisations and Society, two in Management Science, four in Interdisciplinary Accounting, one in Entrepreneurship, four in Corporate Finance, one on Carbon Finance, and three in Marketing. Four faculty have won **Best Reviewer Awards** for their contributions to leading journals in their field: **Amis** (2015) and **Jones** (2016) (*Academy of Management Review*); **Candi** (*Journal of Product Innovation Management*, 2018); **Greenwood** (*Academy of Management Journal*, 2016).

4.5 Contribution to economy and society

UEBS' commitment to research and impact that improves performance, fairness and sustainability is reflected in our impact case studies which have: led to substantial cost savings; influenced standards on achieving carbon reduction; shaped CSR in policy and professional standards; improved fair employment practice; and reduced societal inequality. This commitment has also been recognised by requests to provide **input into employment and public policy**. Examples include: **Amaeshi** serves on the Nigerian Government Ministry of Budget and National Planning's Technical Working Group on Disaster Management; **Brander** is Member of Advisory Committee for the Woodland Carbon Code, and International Expert on ISO working group (2014-16); **Brennan** is Chair of the Scottish Food Coalition; **Cochran** is Director of the Secretariat of the Climate Action in Financial Institutions Initiative; **C. Cooper** is academic advisor to the Living Wage Campaign, Scotland; **R. Harrison** was commissioned by Innovate UK to develop a thought piece on policy options to increase business and innovation scale-up; **Loretto's** research influenced Scottish Government Fair Work Policy; **Rosiello** provided advice to the OECD HEInnovate Programme in 2018; **Taschini** has provided evidence to Government consultations on Future of Carbon Pricing (2019), Carbon Emissions Tax (2020) and made a submission to the Bank of England 2021 biennial exploratory scenario on the financial risks from climate change (2020).

4.6 Agenda setting and capacity building

Expertise from faculty across all subject areas has also been instrumental in shaping future research agendas and in capacity building in relevant fields, as illustrated by the following

examples: **Archibald** (REF2021 sub-panel member for UoA17); **C. Cooper** (member of Academic Journal Guide committee, 2018-); **Crook** (CABS research committee, 2014-20); **Hou** (elected co-chair of the *Royal Society of Edinburgh Young Academy of Scotland* (2019-); **Kelly** (Trustee of *David Hume Institute*, 2013-19, member of the *Royal Society of Edinburgh Economy and Enterprise*, 2020-; member of *Advisory board* for Confucius Institute for Scotland, 2018-; Chair, *Historic Scotland Foundation*, 2020-); **Loretto** (Trustee, *Standard Life Foundation*, 2018-, Trustee, *Society for the Advancement of Management Studies*, 2020-, Trustee, *Association of MBAs*, 2019-, Member of *UKRI EDI External Advisory Board*, 2018-); **McWha-Hermann**, Board member, *Global Organisation for Humanitarian Work Psychology* (2018-).