

Institution: Imperial College London

Unit of Assessment: 17 – Business & Management Studies

1. Unit context and structure, research and impact strategy

Imperial College Business School

Imperial College Business School (hereafter “The School”) was established as the fourth faculty of Imperial College London in 2003, alongside world-class faculties in science, engineering and medicine. The School is a leading institution driving global business and social transformation through the fusion of business, technology and an entrepreneurial mindset.

The College and School are institutions that care not only about knowing, but also about doing. As such, the School has been consolidating a position of distinctive research excellence, with relevance to industry, policymakers, funders and students alike. It offers staff, students and partners a research environment differentiated from that of its competitors. Business schools typically research primarily within the underlying social science disciplines and on core business and management topics. While the School is anchored in excellent social science and management topics, it embraces the College’s mission to foster interdisciplinarity, with many of its research activities conducted in partnership with other faculties.

The School has identified a set of key interdisciplinary themes aligned with the College’s Academic Strategy (to which the School directly contributed). These are supported by leading research centres that collaborate across College in areas such as climate change (Centre for Climate Finance and Investment), corporate social responsibility and sustainability (Leonardo Centre), health management (Centre for Health Economics and Policy Innovation) and Digital (Centre for Financial Technology and Imperial Business Analytics). Entrepreneurship has long been an important focus of the School, with leading research work in the area and an important engagement with College’s activities. The School is also leading a new Initiative on Deep Tech Entrepreneurship in the context of the College’s Academic Strategy, which aims to become an institute that will change our understanding of how these ventures are funded and successfully develop.

How Research is Structured

Academic Departments and Areas

The School’s research has at its core four academic departments. They play the central role in ensuring the vitality and sustainability of the School’s research and supporting its translation into significant impact on social and economic well-being. They do this through the recruitment and development of outstanding talent, fostering a strong and inclusive research culture, and supporting broader societal engagement. They identify research priorities within their disciplines and alongside overarching research themes set by the School and College. Heads of Department (HoDs) ensure the highest quality of faculty and researchers are recruited and promoted, and that they find a diverse and supportive environment, with meaningful interactions with colleagues across the School, College, and broader community, so they can produce research of the highest quality and impact (see Section 4). There are four departments in the School.

*Analytics, Marketing and Operations (AMO) HoD **Eisingerich***

AMO has 17 faculty researching across the marketing and operations areas, with a common emphasis on the areas of analytics, quantitative methods and digital transformation, including crossover relations with other areas of the School and College. Operations focuses more on the management of processes across manufacturing and services, with prominent results in health, energy and transportation. Marketing research has particular strengths in marketing analytics and has made significant contributions to topics such as aggregating and understanding diverse information sources in decision-making, the nature of purchase decisions across settings and contexts, differing notions of brand attachment and managing employees, and customer behaviour. The research offers valuable insights and solutions for firms and organisations in a range of industries.

*Economics and Public Policy (EPP) HoD **Valletti***

With 14 faculty, EPP focuses on applied economics and its connections to public policy. They investigate a diverse range of topics with connections to the strategic priorities of the School and College. These include leading international results related to the effect of energy and climate change policies on business, the contribution of knowledge assets to economic growth, fairness and competition in the telecommunications industry, competition policy, and how to improve the quality of service in the public sector. It has a focus on health economics and policy, studying incentives for individuals and health organisations. The Impact Case Studies by **Green** (Informing Decisions and Debate on Low-carbon Electricity) and **Valletti** (Innovation Theory of Harm and EU Merger Policy) exemplify the reach and significance of this work.

*Finance (FIN) HoD **Michaelides***

The 28 Finance faculty have been at the forefront of international research, ranging from core areas of asset pricing, corporate finance, financial intermediation and risk management, to new and important topics such as climate and investment, entrepreneurial finance, and financial technology (fintech). There is a strong analytical dimension underpinning the work of the department, and important connectivity across the School and College to explore how digital and technology are shaping the future of finance. Engagement and dissemination to peers, practitioners and policymakers is key, with several high-level academic and practitioner conferences occurring at the School, offering unique opportunities to students, alumni and faculty alongside external organisations and academics.

*Management and Entrepreneurship (M&E) HoD **Zollo***

The main areas of research of the 30 M&E faculty include innovation and entrepreneurship (I&E), as well as strategy and organisational behaviour (OB). I&E research has made significant advances in our understanding of topics such as identifying and leveraging entrepreneurial opportunities, managing the innovation process, building and operating entrepreneurial ecosystems in both developed and emerging economies, and commercialising science innovations. The Impact Case by **ter Wal** and **Criscuolo** (Management of Top Technical Talent in Corporate R&D) is but one example of the application of this work. Research in strategy and OB has made key contributions to the management of platform leadership, the social dynamics of technology adoption, the link between senior managerial style and firm strategy, and the effect of team selection processes on success. The advent of new technologies, together with ongoing social, environmental and organisational changes, results in important emphases and results on sustainability, digital transformation and social entrepreneurship. There is strong M&E engagement

effort across the College in promotion of innovation and entrepreneurship, including the development of the new White City Imperial campus (see Section 4) as a major London tech hub.

Research Centres and Interdisciplinarity

Alongside the School's departments, several excellent research centres support the in-depth pursuit of thematic areas and interdisciplinary perspectives. They serve a critical complementary role in ensuring the vitality and sustainability of the research environment within and across disciplines. They are also strategic structures to assure the development, vibrancy and impact of the key strategic themes identified by the School and College (see further below). In addition to the cross-College centres and initiative mentioned above, the School centres in the REF period were: the Brevan Howard Centre for Financial Analysis (led by **Allen**); the Centre for Management Buy-Out Research (CMBOR) (**Wright**, until 2019); the Centre for Responsible Leadership (**Moore**); the Gandhi Centre for Inclusive Innovation (**Chaturvedi**); and Imperial Business Analytics (**Kennedy**). **Kennedy** is also the Co-Director of the cross-College Data Science Institute.

The Centres act as instruments of engagement across departments, the broader College and outside partners. They also have an important role as attractors for public and private research project funding, and a key means to develop corporate sponsorship and collaboration within and beyond academe in the UK and abroad. The Centres are further described in Section 3.

Striving for Impact

The College and School care not only about knowing, but also about doing. Thus, the relevance for, and impact of, our research on business and society is central to the School's approach. It influences the establishment of centres and research programmes, the faculty we recruit, expectations in terms of projects and initiatives that are encouraged, the support structures that are in place, and expectations for promotion. The importance of impact in the School's research strategy is recognised by its inclusion in the annual process of staff assessment and reward (see Section 2).

The School's approach to impact recognises that reach and significance require a long-term integrated process. Connections with potential beneficiaries must be made, a successful means of delivery identified, and actual impacts secured. It also recognises that the primary attraction of external organisations to interact with the School arises from the excellence of individual researchers and groups, the originality and relevance of the ideas and research, and the receptiveness of the institution for which they work.

The School as a whole and its departments and centres run a wide range of policy and corporate events showcasing research where such connections may be made. There is also an annual flagship industry-focused conference showcasing the School's research. These activities are supported by the School's Institutional Communications and Marketing function, which strategically promotes our research efforts (see Section 4). The School also supports staff secondments to national and international policy agencies, promotes the acceptance of public-sector-funded projects and celebrates the appointment of individuals to major external advisory bodies. It supports the development of knowledge exchange and impact delivery through advisory and consultancy roles with public and private bodies (see Section 4).

The overall objective is to develop impact of international reach and significance across the public and private sectors. This is exemplified in our REF case portfolio. **Valletti** (Innovation Theory of

Harm and EU Merger Policy), and **Miles and Ramadorai** (Household Finance and Mortgage Market Regulation in UK and India) are each associated with periods of secondment to national or international agencies, or chairing major review bodies (respectively, EU Competition Commission, Bank of England and HM Treasury, Reserve Bank of India).

Moreover, as discussed in detail in Section 4, the School encourages the development of corporate sponsorship and collaborative research projects with public and private sector bodies. These are also reflected in our case study portfolio. For example, **ter Wal and Criscuolo** (Management of Top Technical Talent in Corporate R&D) is based on long-term research with Neptune; **Wright** (Impacts on the Early-stage Business Financing Eco-system of the UK) is based on long-run sponsorship for CMBOR from Equistone Partners and Investec, and specific project funding from BVCA and NESTA; **Green** (Informing Decisions and Debate on Low-carbon Electricity) was part-sponsored by the European Commission and DRAX; **Biffis and Chavez** (Financial Inclusion – Supporting Africa’s Poorest Farmers) was part-funded by the African Development Bank; and **Buraschi, Distaso and Kosowski** (Risk Measurement and Portfolio Construction) derives from collaboration with Barclays Bank, Fideuram Asset Management and Unigestion.

COVID-19

The international excellence of the School’s research, its embeddedness in the College’s context, and its commitment to address problems of pressing global significance is captured by its response to the COVID-19 pandemic. To date, it has produced a body of work that comprises over 20 academic papers, policy briefings and articles. These cover issues such as: contact tracing; hospital capacity; educational challenges; and the adverse impacts on the economy and financial markets. In doing this, our faculty have collaborated with colleagues from national and international public and private institutions, while further strengthening the School’s connections across Imperial. The School’s faculty has participated in the discussion and policy participation process based on this work. For example, **Propper** has given evidence to the UK Parliament’s Science and Technology Committee on the Economics of COVID-19. Her work was also cited in an October 2020 report by the Scottish Government on mental health aspects of recovery from COVID-19. **Haskel’s** work on COVID-19 has informed his contributions as a member of the Bank of England Monetary Policy Committee. **Ramadorai** discussed the Indian economy’s recovery from the pandemic on the BBC World News in April 2020. **Miraldo** was co-author of four reports by the Imperial College COVID-19 Response Team for SAGE: two covered scheduling rules for elective care; a third covered criteria to keep schools and universities open; the fourth was concerned with developing and using a hospital capacity planning tool. Based at CHEPI and the EPP Department, her collaborating co-authors included **Wiesemann** of the AMO Department and colleagues at the College’s School of Public Health, alongside researchers at the MRC Centre for Global Infectious Disease Analysis, the WHO, the Health Foundation, Umeå School of Business, and the Universities of Oxford and York.

Research Position Relative to the 2014 REF Assessment

In the REF 2014 Environment Statement, a 5-year high-level research strategy was outlined with three objectives: To pursue a distinctive niche, and achieve recognised excellence, in areas aligned with the strength of Imperial; to establish important collaborations and produce significant research with other College departments and faculties; and to do so with a view to translating research outcomes to achieve wide-ranging impact for the benefit of the economy and society.

To support these goals, we indicated there would be: significant growth in our capabilities in terms

of faculty numbers and the PhD programme; mobilisation of necessary resources to support our growth through grants, sponsorship and other means; and a significant increase in our presence in elite academic journals, while continuing to strive for impact on business and society.

The evolution of the School and its research met the strategy and objectives outlined in 2014 in most dimensions. First, the School and its research capabilities have grown significantly since 2014. In particular, the number of Category A FTE staff increased by 59% from 58 FTE (2014) to 92 (FTE) (2020). An important part of this growth was achieved through hiring new assistant professors. There was also an effort to attract senior researchers who could bring experience, visibility and leadership to important areas and an active policy of faculty promotion (see Section 2).

At the time of the last REF, there were four departments: Finance; Innovation and Entrepreneurship; Health Management; and Organisation and Management. The latter hosted a large set of diverse academic areas, from economics to organisational behaviour, marketing and operations. As the School grew, this structure became unbalanced. Following a major strategic review in 2018, led by the new dean, there was an important reorganisation to the current structure. This is clear and cohesive, creating a more supportive environment for researchers and enabling the evolution and impact of their work, while still retaining the distinctive elements of the School.

To implement the REF 2014 strategy, important initiatives were launched to bolster the distinctive elements of the School and achieve recognised excellence in areas aligned with the strengths of Imperial. An important element was the launch of research centres to further support the development of School capabilities around key themes. These were established in three stages. The first saw the creation of the Imperial Business Analytics Centre, with support from KPMG in 2014, the Centre for Financial Technology, created with support from Citibank in 2016, the Centre for Climate Change, Finance and Investment, with support from Quinbrook Partners, as well as CHEPI, both established in 2017. In 2020, the Leonardo Centre, focusing on sustainability, and the Centre for Responsible Leadership were also launched. The Initiative for Deep Tech Entrepreneurship that was developed during 2020 will also play an important role in aligning the School with Imperial's strength in technology commercialisation. All of these have important elements of connectivity to other parts of Imperial and engagement with business and society. More details on each of them are presented below and in Section 3.

The growth in faculty and researchers, and a change in leadership of the School led to decisions to shift the balance on some dimensions towards excellence and distinctiveness rather than volume. This included realignment of our PhD strategy to focus first on quality by keeping a stable intake and adopting a new structure that involves students beginning with an MRes pre-PhD year (see Section 2). Another aspect of this evolution was a greater emphasis on higher visibility and prestigious grants, rather than a wholesale increase in research funding from the already very high levels pertaining at the end of the last REF period. By 2020, the faculty had been awarded seven prestigious ERC grants across starter, consolidator and advanced levels. The income and expenditure streams from some of the more significant recent grants are not yet fully reflected in the annual flows within the current period. Still, the School continues to be consistently among the top 3 in the UK in terms of the research income it obtains, despite our smaller size compared with some competitors (see Section 3).

The 2014 REF included important growth expectations, not only in terms of active researchers, but also in terms of outputs and particularly their quality. The College is a signatory to DORA and the

School accordingly does not assess output quality in terms of journal impact factor. But external entities do assess performance against journal lists, including the Financial Times, through its annual rankings. It is thus possible to have an element of comparison for the School's publication performance since 2014 by looking at outputs in the FT 50 list of journals that it provides to the FT. Between 2011-2014 and 2017-2020, the number of papers published by School faculty in these journals grew by 32%, alongside a 5% improvement in the average number of publications per eligible faculty.

Aims and Strategy for the Next Five Years

Following his appointment in 2017, Dean **Veloso** led a strategy review for the School which resulted in a new 10-year strategy for the period 2018-28. It includes: a plan for supporting and developing the vitality and sustainability of research in the School; aspirational strategic goals for research and for the reach and significance of wider impact based upon it; and key metrics for measuring progress towards our strategic goals.

The increased importance of research in the School, and the level of our aspirations, are clear in the new strategic vision, which is to be *“a world-leading business school with a diverse, engaged and supportive research and learning environment that leverages technology and entrepreneurship to benefit business and improve society.”*

The 10-year strategy to achieve this vision is based around four pillars: research and intellectual leadership; learning and teaching; people and resources; and College collaboration and external relations

The first pillar includes a set of key priorities, as well as strategic interdisciplinary research engagement themes.

Key Priorities and Strategic Goals

First, increasing the size to around 110-115 FT world-class faculty is key to becoming a leading business school with sufficient depth and impact in key disciplines such as marketing and operations, together with the capacity to address the key strategic themes noted below.

Second, the School will strengthen its PhD programme, expanding it when applicant quality is high enough, since excellence here is a key part of developing a strong research culture and increasing the research productivity of faculty. The goal is to be recruiting among the best international candidates and providing a strong academic placement for most of the graduates.

Third, it will balance and strengthen academic research areas, assuring academic excellence, while further developing interdisciplinary engagement themes focused on real world problems. This is fundamental to both the impact of our research and our unique focus as a business school embedded in a STEM-based university.

The fourth element is to provide an inclusive, collaborative and rewarding culture. To accomplish this, the School will increase accountability through transparency, evidence, assessment and training, as well as commit to increasing gender diversity to at least a third and BAME representation to at least a quarter of faculty.

Interdisciplinary Engagement Themes

These are central to our interaction with the broader College and with our external stakeholders and impact agenda. They will build on strengths currently in place and be further developed to focus on important problems that cut across multiple traditional areas of research with impact potential, mobilising donors and funding agencies to support them.

The strategy includes interdisciplinary themes that are also at the heart of the strategy for Imperial College as a whole (see the Institutional Environment Statement). As such, they connect to and benefit from a variety of cross-College academic initiatives. They are listed below, with the related College themes in brackets.

- 1) Sustainability: climate change & social responsibility (*Sustainable Society*)
- 2) Digital transformation (*Smart Society*)
- 3) Entrepreneurship (*Entrepreneurial Capability*)
- 4) Financial and institutional resilience (*Resilient Society*)
- 5) Health management and policy (*Healthy Society*)

The School's five strategic themes cut across traditional departments and academic areas and will be supported through the centre structure, both existing and new (see Section 3). These themes are already very salient in the life of the school, as all but one of the impact cases are connected to one or more of them.

During the next 5 years, we expect the School, with its centres, to be internationally reputed across the five strategic themes, and at least two recognized as leading global knowledge and impact hubs.

To support our engagement and impact aspirations, there will be a strong effort to develop a leading-edge digital presence that will become an important resource for UK and international decision and policy makers.

2. People

A core component of the strategy to improve the research environment since 2014 has been to hire and nurture an excellent and diverse pool of faculty at all levels across the School, with an emphasis on the strategic themes. As documented below, we believe we have been successful in this regard. A deeper pool of talented people has allowed us to improve the quality and relevance of the research the School produces, as well as the quality of the PhD programme, of the conferences, seminar series and other events we hold, and the other aspects of a vibrant research environment. As a result of these improvements, we have been able to expand the activities of research centres in the School as well as the number and significance of recent major research projects. This has been associated with the highest quality, and important impact of, research outputs.

Recruitment, Development and Promotion of Academics

To sustain its development goals and meet expansion targets, the School has been both actively hiring at all levels and supporting the progression and promotion of its academic staff. Every year, the School interviews and recruits recently minted PhDs who can be the intellectual leaders of tomorrow. This ensures a flow of new talent who contribute to the vibrancy and sustainability of our research environment. At the same time, the School protects and nurtures junior talent, so they

can develop their research agenda and progress in their academic careers. The support and promotion of junior faculty is seen by the School as essential in ensuring a strong and supportive research culture.

In addition, because of its youth, the School did not have an established and diverse cadre of senior faculty who could adequately support the development of the growing number of juniors, take on the relevant administrative roles required for its activity, and lead critical engagement efforts. As a result, a significant effort has also been placed on attracting leading senior faculty to help build a stronger school at all levels.

Full Professors

The School has hired 13 excellent faculty at full professor level since 2014 who are still at the school. These include **Allen** (Pennsylvania) 2014; **Anderson** (Sydney) 2020; **Bolton** (Columbia) 2019; **Hughes** (Cambridge) 2014; **Moore** (Bocconi) 2019; **Nanda** (Harvard) 2019; **Peydro** (Pompeu Fabra) 2018; **Ramadorai** (Oxford) 2016; **Röell** (Columbia) 2019; **Sassi** (OECD) 2016; **Talluri** (Pompeu Fabra) 2014; **Tucci** (EPFL) 2020; and **Zollo** (Bocconi) 2019.

Among them, two have been President of the American Finance Association, one has been President of the European Academy of Management, one is a Fellow of the American Academy of Arts and Sciences, one is a Fellow of the British Academy, one is a Corresponding Fellow of the British Academy, two are Fellows of the Econometric Society, and one is a Fellow of the Strategic Management Society. The group includes individuals who have been Managing Editor (or equivalent) of the *European Management Review*, *Organization & Environment*, *Journal of the European Economic Association*, *Review of Economic Studies*, *Review of Finance*, and *Review of Financial Studies*. In addition to their intrinsic quality and recognition, most are bringing important skills and experience directly relevant and connected to the strategic drive of the School. For example, **Zollo** is leading the new Leonardo Centre in sustainability, **Tucci** is launching a Centre for Digital Transformation, **Nanda** is heading the College's Deep Tech Entrepreneurship Initiative, **Bolton** became the Academic Director of the Centre for Climate Change, Finance and Investment, and **Moore** is developing a Centre in Responsible Leadership.

Associate Professors

Similarly to the recruitment of full professors, the attraction of associate professors brings seasoned researchers to the School, allowing it to accelerate particular research agendas. A set of 8 outstanding associate professors were hired; **Haugh** (Columbia), **Iyer** (MIT), **Hansen** (Oxford), **Seiler** (Stanford), **Custodio** (NOVASBE), **Rogan** (North Carolina), **Rosa Dias** (Sussex) and **Wadwha** (EPFL).

Assistant Professors

Since 2014, the School has hired 26 assistant professors. This has involved very competitive processes, many of them with well over 100, and sometimes 200, applications for a given position. Faculty were recruited with PhDs from a wide range of universities including Columbia, INSEAD, KU Leuven, LBS, Northwestern, British Columbia, Cambridge, Chicago, Oslo, St. Gallen, Toronto, Western Ontario, and Vienna.

Faculty Support and Development Structure

The School expends considerable effort on developing the research skills of its research staff, monitoring their evolution and rewarding their research successes. First, a new faculty member receives at least a 25% reduction in teaching load during the first one or two years after their arrival. The School also tries hard to reduce the number of preparations for different courses during the first few years and to concentrate the teaching period. Second, every faculty member, including juniors, has access to an annual research budget of at least £7,500 to support their research efforts with a possibility for more funds from their HoD or the centres.

There are three main mechanisms for helping to develop, assess and help the progression of faculty. These are the Adviser/Mentor programme for new assistant professors, the Personnel Review Committee (PRC), and the Personal Review and Development Process (PRDP).

Each assistant professor is assigned a mentor when they join the School. The mentor and advisee meet at least once a term and discuss any advice that is needed or how to deal with research, teaching, service or other issues that have arisen. The mentor provides input to the PRC each year.

The PRC is a faculty committee chaired by the Vice-Dean for Research and Faculty and has members from each of the four departments as well as a representative for the teaching fellows who are appointed with the help of advisory ballots. The HoDs also provide input to the committee. Research faculty are assessed each year on three dimensions over the past three-year rolling period: research, teaching and service. Assessment of research is also based on three elements: quality of published output including journal articles and significant monographs; research grants obtained; and research impact. The three dimensions of research, teaching and service are weighted differently according to rank and administrative duties. Except for people with heavy administrative loads such as HoDs and vice-deans, research is a majority of the weighting. Impact is explicitly recognised in the research evaluation to fit with the School and College impact mission. The PRC scores of individuals are the primary determinant of their annual salary increase.

While the PRC focuses on the past three years, the PDRP is mostly a forward-looking process. This is conducted by each staff member's line manager every year. For most people, this is their HoD (for some it may be the director of a research centre or the Dean). The line manager and staff member discuss past performance, incorporating the results of the PRC, as well as future plans, including guidance for areas where performance can be improved and suggesting the tools to do so. This is an important part of everybody's development, and for staff with research duties includes both research and impact development.

Career Progression

In 2015, we introduced an associate professor career-track in which new assistant professors have a six-year fixed-term contract. This was done because junior faculty are typically recruited as they finish their PhDs. Given the lengthy publication cycles in social sciences, there is limited evidence on how successful they will be as academics in early stages of their career. After six years, a much better assessment can be made. Progression from assistant to associate professor is not automatic and requires review by School and College committees. The decisions are based on the candidate's research quality and impact, the quality of teaching, relevant service, and other measures of international esteem, including outside letters. Of the four people in the first cohort with the fixed-term contract who came up for promotion in 2019-20, two were promoted and given open-ended contracts. This model is the norm at international business schools.

There is no timing established for progression from associate to full professor. Faculty apply when there is perception that their experience, contribution and especially their international recognition for research output and impact are commensurate with that of a full professor in leading international business schools and Imperial College. There is an assessment process at the School and College level, which can lead to a decision to promote an associate professor to full.

The School regards its support and promotions structure as an essential factor, alongside recruitment, in ensuring we maintain a vibrant and sustainable research environment. During the period since the last REF exercise, there have been 17 people promoted to associate and 5 associates promoted to full professor. This is testament to the importance the School has been placing not just on attracting talented faculty but also creating the conditions that allow their careers to progress.

Secondments and Sabbatical Leave

Individuals approached to serve on external public sector bodies or who wish to apply for such positions discuss them with their HoD and, where secondments are full-time, with the Dean. The School supports and celebrates such activity and provides replacement teaching and administrative cover where that is required. Individuals are also encouraged to foster research and impact relationships with the private sector, including board memberships and advisory roles. There are at least 17 faculty with such roles during the REF period, including very visible recent positions such as **Haskel** in the MPC, **Propper** as President of the Royal Economic Society and **Valletti** as Chief Competition Economist, EU DG COMP, among many others discussed in Section 4.

Faculty can also apply for six months' sabbatical leave for each three years of qualifying service. Sabbaticals must be for research purposes and applications that involve visits to other academic institutions, or that are connected to a research grant, are prioritised. These are an important way for faculty to extend their research abilities and horizons. Six people took sabbaticals during the REF period.

PGR Students and Research Fellows

MRes and PhD

The School is fully committed to developing the next generation of academics and increasing the number and quality of its placements. To strengthen the students' training and skillset, the Doctoral programme introduced in 2015 a new one-year Master of Research (MRes) prior to the PhD component. The programme provides a solid foundation in theory and research methods within the finance, economics, management, marketing and operations disciplines. To achieve the programme's objective, the cohort target intake was fixed at 15 students, and the quality of candidates admitted to the programme has increased. While in 2015 there were 153 applications for 15-20 slots, in the past year we had 245 applicants to these 15 slots. The proportion of students with a postgraduate distinction equivalent rose from 50% in 2014 to 64% in 2017 and 73% in 2020.

Of the current 47 PhD students, approximately 8% are from the UK, 26% are from the EU and 66% are other overseas. The School provides full funding to its Doctoral students, through the Business School Graduate Teaching Assistant scholarship, but there are other scholarship opportunities available. Among the current students: three are fully funded through the EPSRC Doctoral Training Partnership; two receive funding through the London Interdisciplinary Social Science Doctoral

Training Partnership, which is in collaboration with King's College London and Queen Mary University of London; seven have been awarded the College's highly competitive President's Scholarship; one has a full scholarship through the Brevan Howard Centre; and one has their own funding.

The MRes students are evaluated during the programme and most proceed to the PhD. In the five years of entry from 2015-2019, out of 60 students, two left for industry, one transferred to Mathematics, and one to another institution, with the remaining 56 going on to the PhD. Students in this phase have structured annual reviews to make sure satisfactory progress is being made in their research. Departments require every student to participate in a PhD seminar series. Each student needs to present their research at least once a year. The programme also provides an annual research fund ranging from £1,000 to £1,800. The faculty community is highly involved in support and supervision to the students during their PhD and help in their placement. In addition, students also benefit from the strong pastoral care that the business school offers, aiming to support their wellbeing alongside their academic success.

Our aim in the MRes/PhD programme is to place our students at top universities and we expect them to take a similar amount of time to complete as students at leading international schools. As a result, business PhDs often take longer than 4 years to complete their programs, which is a more common length in STEM disciplines (hence a 57% completion rate in 4 years reported in the data). Among the people we hired as Assistant Professors in 2018 and 2019, 6 completed their PhDs in 5 years and 1 took 6 years. The most recent cohort that has been largely unaffected by Covid, entered in 2014 and has completions consistent with this pattern. Of the 14 students who entered, 2 withdrew, 3 submitted in 4 years, 5 more in 5 years, 2 in 6 years, and 1 in 7 years. The remaining student has not submitted yet due to interruption of study.

The improvement in quality in the programme is visible, among other ways, in the placement of the graduates. Out of 9 graduates in 2019, 4 had faculty placements at UCL, Sussex, Tsinghua and Renmin, and another was placed at the Bank of England. Other notable placements in recent years include assistant professors at University of Alberta, Université Laval, Queen's University (Canada), and post-doctoral fellowships at ETH, the LSE and Mannheim. Most others had senior placements in finance and consulting or became entrepreneurs.

Pre- and Post-Doctoral Research Staff

These staff are on research-only contracts. Research assistant is a pre-doctoral training grade for staff with a first degree who are registered and studying for a higher degree within the College or at another institution. There are currently 5 such assistants. Research associate is the most junior post-doctoral position and there are 21 of these employed. The College career structure for fellows has four grades: Research Fellow, Advanced Research Fellow, Senior Research Fellow and Principal Research Fellow. Currently, there are 6 such fellows, mostly integrated and contributing to the various research centres of the School and primarily funded through research grants. We aim to support our research staff and provide continuous appointment and career progression at the School and elsewhere. Out of the 82 researchers employed by the School during 2014-20 who have left, 56 are in academia, 7 in policy/research, 11 in business, and 8 are unknown. The universities include Cambridge, Erasmus, ETH, Goethe University Frankfurt, IESE, Imperial, Oxford, Shanghai Jiao Tong, and Trinity College Dublin. The policy/research category includes the Bank of England and OECD.

Equality, Diversity and Inclusion (EDI)

The School aspires to provide an inclusive working environment that empowers all staff to reach their full potential. To meet this aspiration, the School Diversity Committee (DC) was established in 2014 (initially as the Gender Equity Committee). The purpose of the DC is to provide direction, challenge and advice to the Dean and the Management Board in relation to all aspects of equality, diversity and inclusion. The remit includes diversity-related matters including, but not limited to, issues and challenges for individuals who fall under any of the protected characteristics, i.e. gender and gender identity, religion, sexual orientation, race, age, and disability. It is currently composed of 5 faculty and 4 professional staff. The DC reports to the Dean and the School's Management Board via the Chair of the Committee, who sits on the Management Board. The core strategic priority related to diversity and inclusion has been developed by the DC. The Chairs of this committee, **Miraldo** and **Kosova**, were given Julia Higgins Awards in 2019 in recognition of their work. These awards are given annually to recognise people who have significantly contributed to the support of academic women at Imperial.

The School's aspiration to sustain a vibrant inclusive research culture is reflected in a range of policies. All faculty are asked at the beginning of each academic session if there are any considerations such as childcare that they wish to be considered during the construction of teaching timetables. **Consideration is given to those with caring responsibilities and part-time staff by ensuring School meetings and social gatherings typically fall within a 10am – 4pm window. The College will reimburse a member of staff for additional child-care expenses when attending work-related events outside the normal place of work.**

Another important benefit offered through central College is access to an outstanding nursery, in which many research and professional staff enrol their children.

In addition to the standard 16 weeks paid parental leave all staff and research students are eligible for, faculty can apply for the Elsie Widdowson Fellowship Award, which is described in the Institutional Environmental Statement. **Overall, 17 Elsie Widdowson Fellowships were granted to Business School faculty during the REF period.**

The School offers Unconscious Bias and Active Bystander training sessions for all staff. This training is strongly recommended for all staff and is required for staff in managerial positions or who have responsibilities or make decisions in the areas of hiring, supervision, performance evaluation or promotion.

The School also monitors the membership of all School committees and advisory boards, including recruitment panels, to try to ensure a minimum of 30% representation of both males and females, without overloading certain people who have heavy committee loads. It also carefully monitors recruitment shortlists to make sure that they include appropriate diversity across protected characteristics.

The College has a Conference Organisation Policy to ensure diversity of participants in conferences organised by Imperial staff or students, or conferences held on College premises. The School has also drafted a set of good practice guidelines for chairing and asking questions in research seminars to ensure equity of treatment for female speakers and participants.

Gender and Ethnicity

The Athena SWAN Charter was established in 2005 to encourage and recognise commitment to

advancing the careers of women in science, technology, engineering, maths and medicine employment in higher education and research. In 2015, Athena SWAN was **expanded** to recognise work undertaken in arts, humanities, social sciences, business and law. Building on its work to support gender equity, the School successfully applied for Bronze in 2016. It was the first business school to formally receive an award under this scheme. Since then, the School has been implementing its 41-point action plan and remains committed to the Athena SWAN Charter principles and will be applying for Bronze renewal in 2021.

The School and its DC have been working on a more comprehensive set of policies to support race equality at the level of the School and College. There are specific aims and practices being adopted with the goal of achieving tangible results and a School staff member is co-chairing the College work group that has been preparing application to join the Race Equality Charter.

Despite its efforts, the progress of the School in terms of attracting and securing a diverse community has been uneven, with some areas progressing more than others. Although we have worked hard to attract female faculty, the overall share has not improved, with 27% of the of staff in 2019-20 being female. The highest share is among the associate professors (33% female) and the greatest progress has been among full professors, with 15% females, doubling from 2015. The PhD programme is quite balanced with 49% female students.

The School also wishes to have a diverse staff in terms of Black, Asian and Minority Ethnic (BAME) staff. Limited progress has been made within this category: Asian staff increased between 2014-15 to 2019-20, from 11% to 13%, while White staff fell from 79% to 70%.

The School will continue to work very hard to foster a more inclusive culture by increasing the diversity of its staff, including those in more senior roles. As noted above, changing culture and a set of actions to support this commitment is one of the strategic priorities for the next five years.

Outputs and Quality

The School aims for the highest level of quality and impact for its research initiatives. With College being a signatory to DORA, the School accordingly assessed research excellence in terms of the intrinsic quality and significance of individual outputs. As measures of overall quality from an external viewpoint, we can refer to journal reference points that are relevant in a business school context. For example, the British Chartered Association of Business Schools publishes a journal guide with assessments of journal quality, and international business school rankings specify research output metrics based on selected journals (e.g. the FT 50 Ranking, as noted in Section 1). Taken alongside journal ratings, output citations data for individual outputs are also a frequently used to generate comparative quality metrics.

Clarivate InCites (<https://clarivate.com/webofsciencegroup/solutions/incites/>) shows that, between 2014 and 2020, the Web of Science (WoS) recorded 1,001 outputs from the School's staff, in journals that it has assigned to UoA 17. Of these, 38 papers were in the top 1% of papers in the WoS UoA 17 based on citations, and 213 (21% of all our outputs) were in the top 10%.

REF Eligible Staff Output Journal Profile and Citations

Following the College REF Code of Practice, staff were asked to nominate their choice of up to 7 outputs for assessment and potential inclusion in the final portfolio. As a result of this exercise, the School reviewed 504 unique nominated outputs from 98 (92.15 FTE) staff for potential inclusion in

our required portfolio of 228 outputs.

In terms of gender, 24% of attributed outputs were by female faculty and 76% by male. Asian and Chinese faculty members generated 15% of the outputs, with 8% coming from Others (including undisclosed) and 77% from White faculty. These are broadly in line with the faculty distribution of males and females as well as Asians and Chinese, albeit with a slight over-representation of Whites. The distributions are affected by seniority and age profiles, which vary across the gender and BAME groupings.

Quality indicators relating to the attributed outputs are set out Tables 1 and 2.

Table 1 Top Journals by Number of Attributed Outputs and Journal Rating

Journal Name	No. Attributed Outputs	AJG Rating	FT50
ACADEMY OF MANAGEMENT JOURNAL	19	4*	✓
JOURNAL OF FINANCIAL ECONOMICS	13	4*	✓
MANAGEMENT SCIENCE	13	4*	✓
REVIEW OF FINANCIAL STUDIES	10	4*	✓
STRATEGIC MANAGEMENT JOURNAL	10	4*	✓
AMERICAN ECONOMIC REVIEW	9	4*	✓
JOURNAL OF FINANCE	9	4*	✓
OPERATIONS RESEARCH	9	4*	✓
ORGANIZATION SCIENCE	9	4*	✓
RESEARCH POLICY	9	4*	✓
ADMINISTRATIVE SCIENCE QUARTERLY	6	4*	✓
MARKETING SCIENCE	5	4*	✓
REVIEW OF ECONOMIC STUDIES	4	4*	✓
ACADEMY OF MANAGEMENT REVIEW	3	4*	✓
ECONOMETRICA	3	4*	✓
JOURNAL OF MARKETING	3	4*	✓
JOURNAL OF POLITICAL ECONOMY	3	4*	✓
JOURNAL OF APPLIED PSYCHOLOGY	2	4*	✓
JOURNAL OF CONSUMER PSYCHOLOGY	2	4*	✓
JOURNAL OF MARKETING RESEARCH	2	4*	✓
QUARTERLY JOURNAL OF ECONOMICS	2	4*	✓
JOURNAL OF INTERNATIONAL BUSINESS STUDIES	1	4*	✓
JOURNAL OF OPERATIONS MANAGEMENT	1	4*	✓

Note* AJG: <https://charteredabs.org/academic-journal-guide-2018/>

Table 1 lists 23 journals in which our faculty publish. They are all in the group of highest 4* rated journals in the Academic Journal Guide (AJG) and on the separate list of key research journals used in the research element of the Financial Times (FT50) global rankings of business schools. These 23 journals account for 147 (64%) of the 228 attributed papers.

The attributed outputs produced by faculty are also widely cited.

Table 2. Attributed Outputs Cited over 400 Times by Citation Source and AJG Rating

Author	Journal	Google Scholar	WoS	AJG*	FT 50
Peydro	ECONOMETRICA doi.org/10.3982/ECTA10104	1347	255	4*	✓
Gawer	RESEARCH POLICY doi.org/10.1016/j.respol.2014.03.006	1068	333	4*	✓
Kirilenko	JOURNAL OF FINANCE doi.org/10.1111/jofi.12498	1057	115	4*	✓
Autio	RESEARCH POLICY doi.org/10.1016/j.respol.2013.08.016	1050	359	4*	✓
Peydro	JOURNAL OF POLITICAL ECONOMY doi.org/10.1086/694289	584	58	4*	✓
Propper & Seiler	REVIEW OF ECONOMIC STUDIES doi.org/10.1093/restud/rdu045	543	112	4*	✓
Wiesemann	OPERATIONS RESEARCH doi.org/10.1287/opre.2014.1314	506	225	4*	✓
Peydro & Iyer	REVIEW OF FINANCIAL STUDIES doi.org/10.1093/rfs/hht056	497	120	4*	✓
Nanda	MANAGEMENT SCIENCE doi.org/10.1287/mnsc.2015.2207	434	128	4*	✓
Kacperczyk	ECONOMETRICA doi.org/10.3982/ECTA11412	402	67	4*	✓

Note* See note for Table 1.

Table 2 shows 10 of the attributed papers published in the assessment period have over 400 Google Scholar citations. The table also shows 8 of these 10 have over 100 WoS citations. Two of the authors are women and another two are Asian.

3. Income, infrastructure and facilities

The Pattern of Research Funding over the Assessment Period

Over the REF period, the School had total research income of £22.0M: £8.2M from UK Research Councils, £5.4M from EU sources, £4.2M from UK industry partners, £1.2M from UK charities, £1.6M from the UK Government, and £1.4M from other sources.

In addition to this external funding, over the REF assessment period, the School committed significant internal funds to strengthen our research endeavour. For example, the total amount spent by the School to fund personal research allowances was around £1.7M over the REF period while the total cost to the School of providing funding for doctoral studentships rose from £375K in 2014-15 to £1.3M in 2019-20, and stood at £5M for the total period. New School research centres that were yet to receive significant external funding were also provided with £1.5M in seed funding to underwrite staff costs until they were self-sufficient. Finally, the School was awarded five prestigious Imperial College Research Fellowships at a value of £0.6M. During this period, research at the School also benefitted substantially from the £20M Brevan Howard donation

covering the period 2012-20.

The School's external grant portfolio has changed considerably over the assessment period. We have seen a reorientation away from UK research council grants and towards a greater reliance on industrial and European funding. In the first year of the assessment period, research councils accounted for 56% of our research income, but this figure fell consistently from 2015-16 and in 2019-20 stood at 15%. Council grants, nevertheless, represented a total of £8.2M over the period and were the biggest single source.

The trend in UK research council funding is partly attributable to the end of a cycle of a set of very significant grants. In the assessment period, four research council centre or large grants ended. These had contributed to our previous high volume with a combined total value to the School of around £12.5M.

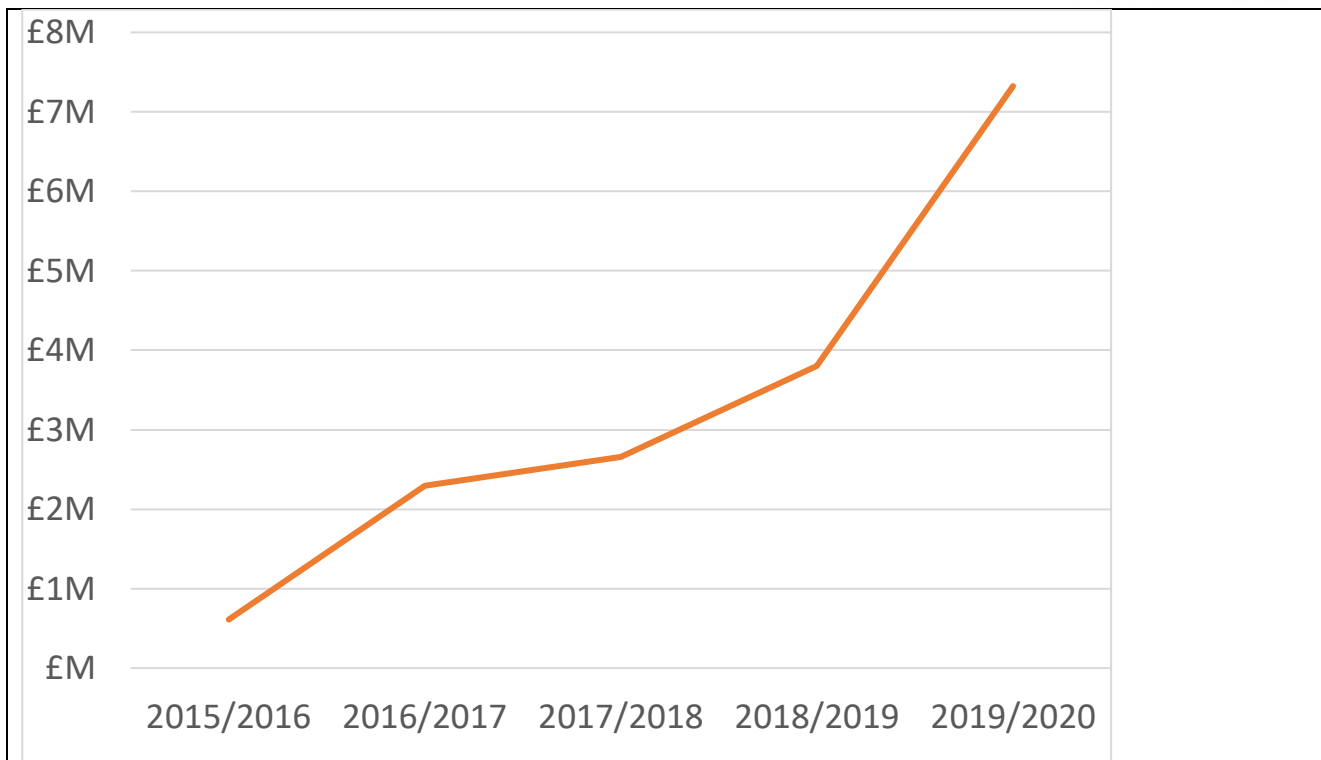
Another important driver has been the growing proportion of foreign faculty and the recent recruitment of overseas senior faculty with international funding horizons. Our European Commission grant income has, as a result, risen year-on-year in absolute and percentage terms, from 8% in the first year of the period to 60% in the last. This is mainly due to winning seven recent prestigious European Research Council investigator awards, two at starting level (**ter Wal** €1.33M 2017-22, **Custodio** €1.36M 2019-24), three at consolidator (**Hansen** €1.65M 2020-25; **Kacperczyk** €1.59M 2016-20; **Nanda** €1.59M 2020-25; and two at advanced (**Propper** €1.49M 2018-22; **Bolton** €1.74M 2020-25). Four of these are led by PIs who have joined us during the period. Four are reflected in our income figures for this period, and three more, awarded in 2020, will be evident in future spending.

In addition to these, we have won large collaborative grants as co-ordinator from the Horizon 2020 and Climate KIC programmes: the STOP consortium (on policy responses to childhood obesity) brings together 24 participating organisations and has a total value of €10.5M (**Sassi** H2020; €2.1M to Imperial), while the Climate KIC-funded ARISE programme (on risk management in agriculture) has a total value of €5.48M (**Biffis** Climate-KIC €3.83M to Imperial).

Industry funding has not shown such consistent growth but has accounted for 21% of our research income over the period, and this will rise when recently awarded grants (including four separate grants for research centre funding signed in 2020 with a combined value of around £5.75M) start to be reflected in our spending.

The changing levels of grant awards are shown in Figure 1. This is not spending against grants but the total value of new awards each year without reference to spending. This overall profile makes clear the recent significant upturn in grants awarded and the resulting positive implications for the vitality and sustainability of our research environment.

Figure 1 Grant Awards to the Business School 2015-2020



Infrastructure: Management, Bid Processes and Research Support

The School's Research Committee is chaired by the Vice-Dean for Research and Faculty and includes representatives from each of the School's departments. The Research Committee advises the School's Management Board on research resource and infrastructure policy and acts as the main conduit between the Management Board, staff and the wider College on research issues. This includes overseeing research integrity, working with the researchers to address any ethical, legal and professional dimensions of their work. It also helps promote and support open research, including open data and open access whenever possible. The Vice-Dean and Head of Research Support both sit on the College's main research committee, the Vice-Provost's Advisory Group for Research.

The management of the grant application process is the joint responsibility of the individual academics and the School's Research Support Team. Usually, the Head of Research Support liaises with the faculty member drafting the proposal and provides support on the costings, offers additional useful guidance on the nature of the proposal, and fits the proposal to funder priorities and the kinds of bids being funded.

Imperial College Library manages a data budget of £387K (2019-20) for the School. This is mainly used for long-term subscriptions to data sets with wide usage across the School and is not intended to be spent on resources with more limited use. The Library and School have a joint working group to manage this budget, and the School Research Committee receives annual reports on its expenditure. In addition to this, the Department of Finance has its own data budget of £80K per year for the purchase of smaller and lower-cost resources for the use of smaller groups of academics.

Research Centres

As described in Section 1, the School's research centres play an important role in the vitality and sustainability of research in general through their role as sources of attracting funding for, and intellectual locations for PhD students and post-doctoral researchers. They also embody and sustain the development of our strategic research and engagement themes, with each of them connected to one or several of the centres described below.

Centre for Health Economics & Policy Innovation (CHEPI)

CHEPI was established in 2017 and is led by **Sassi**. It performs cutting-edge research on incentives and environments that encourage individuals and organisations to make health-enhancing decisions. CHEPI supports the development of business and government policies that embed those incentives and create those environments. As of June 2020, CHEPI was leading 8 and participating in over 14 large scale funded research projects involving faculty across Imperial College London and other leading academic institutions totalling £13.5M, with an annual research income of over £1.3M.

Brevan Howard Centre

This is led by **Allen** and was founded in 2012-13 with a £20M donation from the hedge fund Brevan Howard. It has world-leading expertise in financial economics. Its main contributions span three broad streams of research: financial stability and financial regulation, the design of financial structures for countries, and "Finance for Good" projects such as financing development, environmental protection and medicines. The impact case by **Miles and Ramadorai** (Household Finance and Mortgage Market Regulation in UK and India) exemplifies the reach and significance of this work. Interdisciplinary links span engineering, computing and mathematics and includes collaboration with the Imperial College Centre for Cryptocurrency Research and Engineering in the Faculty of Engineering. There is extensive international cross-disciplinary collaborative research through the ARISE project spanning the Department of Physical Geography at Utrecht, École Polytechnique (Paris) and CIRAD, the French Agricultural Research Centre for International Development. This work is summarised in the impact case by **Biffis** and **Chavez** (Financial Inclusion – Supporting Africa's Poorest Farmers). Vibrant long- and short-term visitor programmes have added to the vitality and quality of the research environment and helped us in recruitment. Distinguished long-term visitors included **Lubos Pastor** (Chicago), **Pietro Veronesi** (Chicago), **Haresh Sapra** (Chicago), **Harrison Hong** (Columbia), **Antoinette Schoar** (MIT) and **Paul Asquith** (MIT), as well as **Bolton** and **Röell**, who were subsequently recruited.

Centre for Climate Finance and Investment (CCFI)

The CCFI, directed by **Donovan** (Professor of Practice) and with **Bolton** as academic director, was established in 2017 with a donation of £525K over three years from Quinbrook Infrastructure Partners, renewed in 2020. This has been supplemented with a grant of £1.4M from Standard Chartered Bank covering the period 2020-24, enabling the Centre to expand its activities considerably. The Centre's principal contributions are around investigating the investment opportunities in renewable energy, clean technologies, and climate-resilient infrastructure. The Centre works in close collaboration with the College's Grantham Institute for Climate Change and the Environment, jointly running research activities and an MSc, as well as with a variety of partners such as CityUK, the International Energy Agency and UN Environment.

Centre for Financial Technology

This was founded in 2016 by **Kirilenko**, with a grant from Citibank of \$1.2M (US). Since then, he has moved to the University of Cambridge, and the Centre is now jointly directed by **Chana** (Professor of Practice) and **Chemla**. Citibank renewed their funding for a further \$1.2M in 2020. Financial technology, or fintech, is developing at a rapid rate, disrupting sectors as diverse as corporates, banking, trading and investment, personal finance, accounting, and insurance. The Centre acts as a hub for the interdisciplinary research needed to develop innovations, reveal insights and answer questions in this space; bringing together the activities of academics, start-up companies, established industry and governmental organisations. The case study by **Buraschi, Distaso and Kosowski** (Risk Measurement and Portfolio Construction) exemplifies the significant impact of this approach.

Imperial Business Analytics (IBA)

The IBA was formed in 2014 in partnership with KPMG. Led by **Kennedy**, it is an explicitly interdisciplinary research laboratory which spans departments within Imperial College Business School and across the College through the Data Science Institute. IBA is at the forefront of data science and business analytics, using cutting-edge technology such as the KPMG Data Observatory, one of the world's most advanced data visualisation spaces. The Centre's research is focussed on how business analytics, data and artificial intelligence will change business, and society more generally. Funded by its corporate stakeholders KPMG and DLA Piper, the Centre has brought in direct funding totalling £3.1M over the REF period.

The Leonardo Centre

This centre, directed by **Zollo**, is concerned with developing a sustainable society, where companies pursue profit for societal impact. The Centre is pursuing several research programmes to investigate how this vision can be implemented, collaborating with several other centres and units across Imperial on this implementation. These include ones on purpose and governance, leadership and culture, business model innovation, corporate and functional strategies, and control and incentive systems. Its initial funding was provided by a grant from Huawei of £2.5M over five years.

The Centre for Responsible Leadership

This is among the newest research centres and is directed by **Moore**, who joined the School in 2019. It is funded by Citibank for \$1.4M (US) over three years from 2020. Drawing on academic theory and business practice, it will focus on generating meaningful change in businesses and organisations through evidence-based research that addresses the key ethical, economic, social, environmental and technological challenges facing organisations today. It will help businesses and organisations to identify practices that will improve their approach to leadership and boost overall performance.

The Centre for Management Buy-Out Research (CMBOR)

CMBOR was launched at Nottingham University Business School by **Wright** in 1986 and moved with him to Imperial College Business School in 2011. It operated throughout the REF period until Professor Wright's untimely death in 2019. With core funding from Investec and Equistone throughout the REF period, CMBOR collected and aggregated quantitative international data on buyouts by management teams and private equity institutions. The impact of this work is captured in the **Wright** impact case (Impacts on the Early-Stage Business Financing Eco-System of the

UK).

The Gandhi Centre

This multi-disciplinary centre led by **Chaturvedi** has a focus on “innovation for inclusive growth,” as the main theme for research and applied policy contribution to energy, infrastructure, health and digital platforms. It provides research and executive education, and forms partnerships with global companies to develop best practice in innovation and entrepreneurship. With extensive national and international collaboration, the Centre has had a particular role facilitating interaction between British and Indian executives to build business relationships and support local development. Among other projects, it has been key in supporting the development of a very successful new university in India.

The Deep Tech Initiative

Many of the world’s most pressing problems depend on the successful commercialisation of fundamental science and engineering innovations or “Deep Tech.” Building on Imperial’s strong research foundation in science, engineering and medicine, as well as our entrepreneurial culture embodied in the Translation and Innovation Hub (I-HUB) in White City, this cross-College strategic initiative is led by **Nanda**. It will support and reshape our understanding of what is required to shape a thriving Deep Tech ecosystem across the UK and beyond, based on co-located cross-disciplinary research and translational support.

Advancement: Donations and Philanthropy

The mobilisation of philanthropic support for research is of strategic importance to the School. Advancement is a centralised activity at Imperial, with two advancement staff assigned full time to the School; they are devoted to encouraging and mobilising philanthropy to support School activities. The Head of Development for the School works closely with the Dean and the senior leadership of the School to develop the School’s advancement strategy, identify fundraising priorities, and to liaise with central fundraisers.

Philanthropic giving supports many different activities at the School but is particularly important for new centres. The Head of Development spends a significant portion of time supporting fundraising for them as well as for funding for supporting PhD students and hiring post-doctoral researchers. Past donations have been transformative for research in several areas. For example, the Brevan Howard Centre was made possible through a £20M donation for the period 2012-20. A gift of £525K for a fellowship at the Centre for Climate Finance and Investment was secured in 2017 and renewed in early 2020 from Quinbrook Infrastructure Partners. The activity of Advancement in supporting research is being facilitated by the establishment of new programmes and additional staff positions to support a culture of philanthropy in the School and to reach out more consistently to our alumni network in our fundraising.

Industry Partnerships

The External Relations team also supports research through the development of corporate partnerships. These enable companies to co-develop and support research in areas of mutual interest to them and School staff and help maximise the potential impact of the research undertaken. To facilitate these partnerships, the School is supported by a director of industry partnerships and commercialisation. This person reports to the College’s Enterprise Division,

working across multiple faculties, but spends most of his time working to support research in the School.

The recent £2.5M 5-year funding of the new Leonardo Centre by Huawei is a good example of a corporate partnership that existed at the College level and was developed by the School's Director, resulting in significant funding for the School. Other partners include Alibaba Group; Barclays; BDO; BP; Cisco; Citigroup, DRAX, EDF Energy; Facebook; Fideuram; Google; Hero Group; HSBC; IBM; KPMG; Microsoft; Munich Re; National Grid; the NHS; Omnicom Media Group; Ping An; Royal Bank of Canada (RBC); Standard Chartered; Swisscom; Unigestion; and Withings.

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

Engagement and Communication

It is critically important to engage with and communicate the results of our research to key stakeholders. The School's Institutional Marketing and Communications function was established in 2014 to support the internal and external communication of the School's research mission. This work includes developing content (articles, videos, podcasts), and sharing it in the School's communications channels (such as its website, magazine and social media channels), and coverage in external channels, including traditional and digital/social media.

Some examples that illustrate the reach of our communications over the period since 2014 are the following. Our research translation hub, Imperial Business Knowledge, had 1.5 million page views. Articles include **Hansen** on how CEO leader styles vary across types of business, which was covered in Forbes, Irish Times, Start Up Magazine, Real Business, Executive Grapevine, CEO Review and Relocate Magazine. Forbes also covered **Propper and Phillips** on decentralisation and centralisation in managing public health COVID policy, **Yip** on COVID and globalisation, and **Moore** on whether ethical leaders are good for business. The annual School magazine is mailed to 13.5K alumni, and corporate contacts. The School website contained research news and had 1.24M pageviews. There were 604 pieces of traditional media coverage.

Pathways to Contact and Engagement

Conferences and Collaborative Events

The School's extensive programme of conferences serve two core objectives: they are a key part of our contribution to the advancement of research across the global academic community of which we are a part; and they serve as a key pathway to collaboration and impact through knowledge exchange with the public and private sector user communities.

One very high-profile event is the Annual Business School Flagship Conference Series. It combines contributions from School faculty with leaders of external organisations to address issues of global significance. Inaugurated in 2016, successive conferences have focused on our key strategic themes and priorities. They have covered: Acting on Climate Change; Acting on Future Health; the Future of Finance; Digital Transformation; and Beyond Sustainability. To maximise the reach of the conference, full proceedings are filmed and made available through the School website along with a written summary and links to relevant School research. Speakers have included distinct personalities of business and society, including the CEOs of Lloyds Bank, MAN Group and Sainsbury's, the Editor of Glamour, and M. Yunus, a Nobel laureate. The 2020 Sustainability Conference, held virtually, included as speakers and panel members senior

executives from Microsoft, Google, McKinsey, Blackrock, BP and Citigroup. It attracted 102 senior executive attendees, and generated over 4K page views, 4K social media engagements and 857 livestream views.

The School hosts multiple conferences and events across its research fields. For example, the **Brevan Howard Centre Series** places special emphasis on high-profile conferences to allow the School's research community to interact with and access the latest academic, practitioner and policy views. They are often hosted in conjunction with other universities and some take place overseas. Examples of keynote speakers include **Blanchard** (Former Chief Economist, International Monetary Fund), **Rogoff** (Harvard University), **Buiter** (Citigroup), **Carney** (Former Governor of the Bank of England), **Bernanke** (Former Chair of the Board of Governors of the US Federal Reserve) **Lew** (Columbia SIPA, US Secretary of the Treasury 2013-2017), **Szabo** (Global Finance Access) and **Jun** (China Green Finance Committee).

Research based on cross-disciplinary collaboration are exemplified by two **Digital City Exchange (DCE) Conferences** based on an EPSRC funded five-year multidisciplinary research programme with researchers drawn from the Faculty of Engineering and Business School. The conferences in 2014 and 2016 explored ways to digitally link utilities and services within a city, enabling new technical and business opportunities.

We also aim to reflect the School's commitment to fostering a diverse and inclusive environment in our very public profile events. For example, in 2018, we hosted the world's first live holographic university lecture with the theme **Women in Tech: The Inside Story**. Guest speakers were beamed into the College from Los Angeles, New York and London to give their accounts of the challenges and opportunities they had experienced in their careers. This event generated very significant media coverage and visibility. The path-breaking use of holography was also exploited by the **Centre for Climate Finance and Investment**. In 2019, speakers in London and Toronto discussed sustainable finance, renewables, infrastructure and long-term investing. Similarly, **Imperial Business Analytics** held a very high-profile hologram event in SIBOS 19, a leading global banking conference.

In the area of health, **CHEPI** had a variety of highly visible events, many of them collaborative. This started with its launch, which was celebrated with a one-day conference, *New Frontiers in Health Policy: Innovation and Incentives in Public Health and Health Care*, in 2017. **Sassi** also hosted the second annual meeting of his Science and Technology in Childhood Obesity Policy (STOP) project in Paris in 2018. Finally, a conference reflecting the interdisciplinary links of the School across the College in the area of health research was held in 2020. It was hosted by CHEPI and the Centre for Mathematics of Precision Healthcare and held within the Mathematics Department.

Conference Organisation

In addition to the above, School faculty organised, co-organised or were members of the scientific committees of 30 academic conferences in the US, Italy, UK, Germany, Spain, Poland, Canada and Greece for organisations including the World Bank, Academy of Management, European Group for Organisational Science and the British Institute of Energy Economics.

Visiting Speakers

The School attracts numerous distinguished visiting speakers to its departmental seminars. For

example, in the academic year 2019-2020 the School hosted 83 speakers from universities across the globe, including Princeton, Stanford, Harvard, MIT, Toronto, Bocconi, Columbia, Duke, London Business School, Cambridge, UCLA, Cornell, NYU, KU Leuven, Chicago, Pennsylvania, Illinois, Warwick, Sao Paolo, Texas at Austin, Michigan, Zürich, Berkeley, Northwestern and Wharton.

Research Partners and Impact

Through its faculty connections, the School sustains a wide range of partners listed in Section 3. They have contributed to impacts of major international reach and significance of which we list a few examples below. The first two are drawn from our REF Impact Case Portfolio, the remainder exemplify the wider context from which they are drawn.

Ramadorai's 2017 Report on Household Finance for the Reserve Bank of India led *inter alia* to the mandatory benchmarking of interest charges on the home loans market, informing the choices of 50 million mortgage applicants annually.

Research collaboration by **Biffis** and **Chavez** with Munich Re, the World Bank and Tanzanian banks led to an innovative loan-insurance product that resulted in \$13M of additional loans to 50,000 small-scale Tanzanian farmers, benefitting 400,000 household members and workers.

In collaboration with the Portuguese Ministry of Health, **Miraldo** and colleagues at CHEPI assessed the effects of taxation on sugar sweetened beverages in Portugal. They showed that the tax reduced sugar consumption and the decline was greater than for educational policies and industry self-regulation. They advised the government to create an additional tax tier for the products with higher sugar content. A team member joined the government task force to consider the change and the evidence produced led the government to include the additional tier.

Research by **Merlo** on consumer transparency and participation had a major impact on the marketing strategies and performance of a multinational manufacturing business (Velcro) and a consulting services agency (D. Labs). Velcro's eight years of collaboration led to the revenue of the company doubling alongside expanded customer diversity. "I commend Prof. Merlo's work as having had a significant and instrumental impact on the strategic development of Velcro" said **Dr Fraser Cameron**, then CEO, Velcro.

Haskel's work on the measurement of investment in intangible assets has had a major impact on the activity, behaviour and capacity of the UK Office of National Statistics (ONS) in this area. "... Jonathan's work on intangible assets has been extremely useful for the ONS, and we will continue to engage with Jonathan and his co-authors into the future, to ensure we continue to stay at the international frontier on this important agenda," said **Jonathan Athow**, Deputy National Statistician and Director General, Economic Statistics, ONS.

Collaborative research by **Gann** with Laing O'Rourke, Arup and Mace on innovation in major infrastructure development led to the CEO of Crossrail (Europe's largest civil engineering project, with a budget of circa £14.8BN), to call on expertise from the School. Crossrail launched its innovation programme Innovate18 in 2013 to support ideas from the project. By 2016, this had led to over 450 recognised innovations, 60 funded trials, and over £750,000 of investment. "As Crossrail's Programme Director, I worked with Prof. Gann and his team to develop our world-leading innovation process and system.... I am now Co-Chair of the Construction Leadership Council, which has supported the roll-out of innovation processes originating from our work together on Crossrail. These processes are leading to systematic approaches to innovation in what

is often seen to be an uncoordinated and traditional industry,” said **Andy Mitchell**, CEO, Tideway.

Entrepreneurship and Commercialisation

Given the School’s distinctive location at Imperial, it is an essential feature of our impact that we work towards the College’s vision for an innovation ecosystem based on the White City Campus (see Institutional Environment Statement). The White City Campus already has a Translation and Innovation Hub (I-HUB), dedicated to fostering technology transfer and translation and the nurturing of small, high-growth, technology-based start-ups. To complement the I-HUB, Imperial and digital business builder Blenheim Chalcot have created a new building called **Scale Space** aimed at providing a highly supportive environment for technology-led businesses which are “scaling up”. The School has taken around 1,100 square metres of space in Scale Space to occupy from March 2021.

The objective is to enhance and exploit the School’s research leadership in innovation and entrepreneurship, particularly as it relates to digital businesses. It will also help foster linkage with other parts of Imperial to strengthen understanding of the crucial interplay between technology and business. This objective is being addressed through two main mechanisms.

The first is to locate research centres at Scale Space including: (1) the new Initiative on Deep Tech Entrepreneurship, (2) the Centre for Financial Technology and (3) Imperial Business Analytics. The first, explained in Section 3, seeks to understand and address the key barriers to the successful commercialisation of deep tech ventures, while the second will develop productive relationships with the many Blenheim Chalcot companies active in fintech. The third will bring to White City and expand a variety of analytics project engagements with start-ups and larger corporates.

The second mechanism is to support and enhance the emerging Scale Space community, which includes all resident companies, the School and interested external (business) entities. Scale Space LLP is organising speaker-centric networking events which will be supported by School faculty. As part of this engagement, three of our entrepreneurship researchers (**Rogan, ter Wal** and **Nanda**) are also working on using Scale Space as a pioneering living research lab, exploring, among other topics, how entrepreneurs form networks and connectivity when they establish themselves in new locations.

Professional Contributions and Indicators of Esteem

Journal Editorships

In the REF period, 51 members of the School’s faculty held 114 editorial positions. These included for the main editor: **Allen**, Managing Editor, Review of Finance; **Perkmann** and **Phillips**, Editor in Chief, Innovation, Organisation and Management; and **Zollo**, Editor in Chief, Organisation and Environment. For editors and equivalent: **Kacperczyk**, Editor, Review of Finance; **Phillips**, Co-Editor, Innovation and Organisation; **Propper**, Deputy Editor, VOXEU; **Ramadorai**, Editor, Review of Financial Studies; **Talluri** Department Editor, Management Science and Senior Editor, Productions and Operations; **Valletti**, Editor, Journal of Competition, Law and Economics; and **Wiesemann**, Area Editor, Operations Research Letters. In addition, the faculty held 26 associate editorships, had positions on 34 editorial boards, 6 editorial review boards, and 3 advisory editorships.

Esteem: Prizes, Awards, Professional and Advisory Contributions

The outstanding overall contribution made by the School through its impact on research scholarship by the multiple pathways described above is reflected in the prizes and awards won and the senior advisory positions to which our faculty are appointed. They reflect the complementarity between academic distinction and impact activity.

School faculty have won multiple academic and industry awards and prizes for their research. These include the Tjalling C. Koopmans Prize 2014 (**Gann**), Lloyd's Science of Risk 2015 Prize (**Chavez**), Arrow Award for best paper published worldwide in economics of health in 2016 (**Propper**), American Economic Association 2016 award for the best paper published in the American Economic Journal: Economic Policy in the previous three years (**Propper**), António Arnaut Prize for the best contribution to health systems research 2016 (**Miraldo**), Jürgen Hauschildt Award for the best research publication in innovation management 2016 (**Criscuolo**), FIRS Lifetime Achievement Award 2016 (**Allen**), the Indigo Prize for research on measuring economic activity for the 21st century 2017 (**Haskel**), Casualty and Actuarial Society's Charles A. Hachemeister Prize 2018 (**Biffis**), INFORMS Society for Marketing Science Gary L. Lillen Practice Prize for 2018 (**Gokhan**), Oliver Williamson Award for Best Paper, Society of Institutional and Organizational Economics 2018 (**Hansman**), Paper of the Year, China International Forum on Finance and Policy 2018 (**Hansman**), Joanne Martin Trailblazer Award of the OMT Division of the Academy of Management to recognise opening a new line of inquiry in organisation theory 2018 (**Phillips**), and Best Crypto Economics Paper Award at the 2nd Toronto Fintech Conference 2019 (**Pagnotta**). In 2018 and 2020, three of the School's academics were named in the annual Poets&Quants competition as among the top 40 business academics under 40 in the world (**Stigliani** in 2018 and **Eisingerich** and **Noval** in 2020).

Faculty hold senior positions in professional academic bodies and have other appointments marking their distinction. For example, **Propper** (2014), **Gale** (2016), **Wright** (2016), **Allen** (2017) and **Autio** (2020) were made Fellows of the British Academy. **Haskel** was awarded a CBE in 2018 for his public services to economics. **Kacperczyk** was President of the European Finance Association in 2020, while **Propper** was President of the Royal Economic Society in 2020, elected as an International Fellow of the US National Academy of Medicine and was made a Dame in 2021. **Ramadorai** is a Senior Non-Resident Fellow, National Council for Applied Economic Research, New Delhi, and a member of the Governing Council, Society of Financial Studies. **Bolton** acted as an International Advisor to the China Finance 40 Forum, **Hughes** served as a member of the EPSRC Strategic Advisory Network. **Phillips** is a member of the Board of Governors for the Academy of Management and serves as a Representative at Large. **Yip** was inducted into the Academy of International Business Thinkers50 Hall of Fame.

School faculty have also served in multiple senior advisory and leadership roles in the public and private sectors. For example, **Gann** was Chairman of the Smart London Board from 2012-2017 and is currently Chairman of the UK Atomic Energy Authority. **Green** became a council member for the British Institute for Energy Economics. **Hughes** and **Haskel** were members of the BEIS Committee to Review UK Manufacturing Metrics. **Hughes** is a member of the Independent Strategic Advisory Panel of the UK Ministry of Defence. **Haskel** serves as a Non-Executive Director of the UK Statistics Authority and as a member of the Monetary Policy Committee of the Bank of England. **Propper** is a member of President Macron's Expert Commission on major post-coronavirus economic challenges. **Sassi** is a member of the Public Health England Alcohol Advisory Group and the WHO Nutrition Guidance Expert Advisory Group – Subgroup on Policy Actions and is also a member of the WHO Regional Director's Advisory Council on Innovation for

Unit-level environment template (REF5b)

NCDs. **Miles** was a member of Monetary Policy Committee from 2009-15, was awarded a CBE in 2016 for services to monetary policy, is Chair of the Trustees of the Institute for Fiscal Studies, a Board Member of the CEPR, and a member of the Commission of the Central Bank of Ireland. **Valletti** was Chief Competition Economist, DG COMP, European Commission, Brussels 2016-2019, is a member of the board of the UK's Financial Conduct Authority (FCA) and of the academic advisory board of the Open Markets Institute. He is also a Non-Executive Director on the Board of Payment Systems Regulator (UK). **Chana** chairs the NATO Advisory Group to the Secretary General on Emerging and Disruptive Technologies. **Hansen** is a member of the Scientific Advisory Board of the Information and Forschung Institute, one of Germany's largest economic think-tanks.