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Institution: Imperial College London
Unit of Assessment: 19 (Business and management studies)
a. Overview

The Business School at Imperial College London has four groups: Finance; Innovation and Entrepreneurship; Health Management; and Organisation and Management. The first three reflect our Imperial personality; the fourth - strategy, marketing, economics, organizational behaviour, decision science, management information and accounting - ensures a rounded business school.

The School plays an integrated role in furthering the mission of Imperial College. Our high-level strategy is:

- To pursue a distinctive niche, and achieve recognised excellence, in areas aligned with Imperial’s strengths;
- To collaborate with other College faculties and departments to produce significant research and foster the College’s reputation for research excellence;
- To embark on research with a view to translating research outcomes to achieve wide-ranging impact for the benefit of economy and society.

Since our last submission in RAE2008, we have:

- Increased our annual research income from £2.7M (2006-07) to £4.6M (2012-13);
- Increased the number of publications in top journals (impact factor > 2.5) by 300 per cent;
- Hired a number of professors from elite US universities (Harvard, NYU, Princeton);
- Launched a new £20m research centre in finance.

Our 2014 submission comprises 57.95 FTE (63 headcount, 94% of staff eligible for submission).

In August 2013, the School’s new Dean, Professor G. “Anand” Anandalingam (former Dean of the Robert H. Smith School of Business at the University of Maryland) took up appointment, and he and his senior management team are formulating their strategy for the School: this process, in consultation with colleagues and external stakeholders, will continue into 2014. We continue to build capability not only in general management but particularly in finance, innovation and entrepreneurship, the digital economy, and in health management, and details of recent hires and initiatives follow below. Our core aims persist: to win significant research funding; to conduct excellent research and publish in journals of high academic impact; to translate research into material business and societal impact; and to sustain a vibrant PhD community. Underpinning all this will be the achievement of even stronger partnerships with the other faculties and departments of Imperial College.

b. Research Strategy

Strategy formulation: Consistently ranked among the world’s top universities, Imperial College specialises in science, technology and medicine, and their application to business and society. Its mission emphasises not merely discovery but also effective translation. Increasingly, this requires interdisciplinary research to address pressing problems, from climate change to patient care.

The research strategy of Imperial’s Business School plays a core role to this mission, and its research strategy is therefore threefold:

- To pursue a distinctive niche and achieve recognised excellence in areas aligned with Imperial’s strengths, particularly in entrepreneurship, innovation, finance and healthcare; areas such as marketing or organisation are usually approached from a technology management and strategy standpoint;
- To collaborate with other College faculties and departments, particularly in Imperial’s priority areas of health, energy, environment, and the digital economy;
- To translate research outcomes to achieve wide-ranging impact for the benefit of economy and society by engaging potential end users in research design and execution.

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Strategy Review: Our Deputy Dean (Faculty & Research), Professor Gerry George, has responsibility for research and reports monthly on execution of current strategy, both to our Management Board and to Imperial's Vice-Provost's Advisory Group for Research. Strategy revisions are considered annually, at an away-day, and in discussion with the School's Advisory Board, chaired by Iain Conn, a Main Board Director of BP. Each year, these discussions are distilled into a three-year plan approved by Imperial's Provost's Board.

Evaluation of research strategy in RAE 2008: In RAE 2008 we committed to the following targets. The table below shows what we achieved.

Table 1 Previous research targets, now met

	2007 baseline	RAE08 target : 2013	Achieved 2013
Research income (£M)	£2.0M	£3.5M (+75%)	£4.9M (+146%)
No of articles in journals with impact factor > 2.5	25	37.5 (+50%)	105 (+320%)
Submitted FTEs, REF/RAE	48	62 (+30%)	58 (+21%)

Research income figures compare three-year averages 2004-07 and 2010-13

The first two targets were surpassed by some margin. However, we did not anticipate how much competition would bid up salaries of top-flight academics in our international peer group. This made recruitment harder and, as a result, we slightly undershot our target for extra academics and research fellows to be submitted to REF 2014.

Research, our core value, is supported by:

Setting challenging and transparent standards: We rank the top journals, nationally and internationally, and benchmark against evaluations by the *Financial Times* and London Business School. Top journals have low acceptance rates. Staff members are encouraged to publish in the best journals and, are continually supported in doing so, for example through mentoring by those who have recently achieved this, and through group workshops. Performance evaluation of staff is by cumulative assessment over several years. Success is directly rewarded by bonuses and salary enhancements.

Creating appropriate structures: Our research strategy has high-level direction regarding the School's broad priorities, but allows considerable individual initiative. This interaction is brokered both within Groups and by our Research Committee, which takes a strongly developmental role, monitoring both research strategy and progress in its realisation.

Individual research performance is a key aspect of academic hiring and subsequent promotion. Since our contract research staff, on whom many large grants depend, are also vital, we also have a clear career structure for contract researchers – Research Associate, Research Fellow, Senior Research Fellow – subject to the same scrutiny as promotion of tenured academics. Several contract research staff have subsequently successfully become tenured academics. Since RAE2008, we have introduced a mentoring scheme for postdoctoral researchers.

Its effectiveness is confirmed by the fact that, during 2007-13, two Senior Research Fellows became Readers (now Associate Professor); and six Research Fellows became Lecturers (now Assistant Professor). Our transparent career ladder serves to motivate young research staff and enhances our ability to attract the very best to such posts. The Imperial College Staff Development Unit provides a comprehensive range of workshops and training programmes, which are mandatory for probationary academic staff. Annual performance review and development meetings provide mechanisms for staff to receive additional mentoring from a more senior staff member; training in grant writing, research delivery, and publication strategy; or incorporation into a strong flourishing research team.

We provide academic staff with appropriate teaching and administrative loads to enable sufficient time for their research endeavours. Teaching programmes are designed to allow individual faculty large blocks of uninterrupted research time. Our faculty work with their international co-authors in order to deliver excellent research; and we design the balance of teaching and research to enable

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such overseas research visits, and the reciprocal, to occur. Our seminars and conferences have predominantly international participation, and are often supported by major grant funding.

Adopting suitable attitudes: We have created a culture in which people take a keen and supportive interest in the success of their peers, with a collective commitment to research excellence. Ongoing quality improvement entails encouraging staff to continue to aim high and to welcome the arrival of new faculty members with even stronger research networks and proven track records at the highest level.

Celebrating success: Our annual Research Celebration, a major event in our calendar, provides an opportunity for faculty to display their work both to Business School colleagues, to members of other Imperial faculties, and to external collaborators and guests, often sparking new interdisciplinary collaborations. Both Design London and the Digital City Exchange grew out of such interactions.

Providing excellent facilities: In 2004, we moved into a new £27M building providing state-of-the-art facilities for staff and students. The College has continued to invest in the Business School in the REF period, increasing its space and providing a further 17 offices, a new PhD suite with space for over 50 doctoral students, and support staff space (see p.6 below).

We briefly highlight below the implications for research in our major areas of focus:

Finance: Our Finance Group, led by Professor Paolo Zaffaroni, was given a huge boost in 2013 by the creation of the Brevan Howard Centre for Financial Analysis supported by an initial donation of £20m. During 2013-2019, this will fund £3m a year of finance research, with the explicit goal of creating a world-class centre comparable with the leading US Schools. The Founding Executive Director is Professor Franklin Allen, formerly of the Wharton School, University of Pennsylvania, and a past President of the American Finance Association. It will hire 3-5 new academics, including, as Research Director, Professor Douglas Gale, of New York University (Economics; its former Department Chair); create a bespoke PhD programme (at least 10 funded students); and develop a visitor programme, providing a platform for the continued development of the rest of our finance group, which anyway continues to progress: Professors Rustam Ibragimov and Marcin Kacperczyk joined us from the faculties of Harvard University (Economics) and New York University (Stern School of Business) respectively during 2011-13.

Innovation and Entrepreneurship: During 2003-12, the £8.5M EPSRC programme funding for the Innovation Studies Centre underpinned our research and was a springboard for further funding (this comprised the original Built Environment Innovation Centre (£3.1M, 2003-08) and the renewed and renamed ISC (£5.4M, 2008-13)): research funded through the ISC and co-developed with our industrial partners at IBM, Laing O'Rourke and Crossrail forms the basis of our impact case studies on 'Transforming the project-based firm' and 'Reorganising IBM staff and capabilities to promote customer-focussed innovation'. Innovation remains a key theme, including our establishment and leadership of the Digital Economy Lab (a cross-College consortium bringing together research in the digital economy, led through the Business School and the Faculty of Engineering), and our design collaboration with the Royal College of Art and Imperial's Faculty of Engineering. Professor David Gann moved from the Business School to become Imperial College's Vice-President (Development and Innovation) in 2013, and the I&E group is now led by Professor Mike Wright who, with 25,500 Google Scholar citations, is one of the top cited entrepreneurship scholars in the world. His Centre for Management Buyout Research, founded in 1986 and the pre-eminent source of analysis on private equity and buy-outs, moved from Nottingham to Imperial in 2011. Professor Gerry George won an ESRC Professorial Fellowship in 2011 for his work on resource-constrained innovation. Under his leadership, the Rajiv Gandhi Centre for Innovation and Entrepreneurship raised over £2M for research. The ESRC / BBA / BIS / TSB-funded Enterprise Research Centre will further strengthen entrepreneurship, as will Erkkio Autio's work on a global entrepreneurship index (GEDI).

Health management: Professor Carol Propper (returned 0.5 FTE by both Imperial and Bristol) ESRC Professorial Fellow and ex-Chair of the ESRC Research Grants Board, continues her influential research on incentives within healthcare. Her successor as Group Head, Professor Rifat

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Atun, recently completed a three-year secondment to run HIV research at the Global Fund in Geneva. Professor James Barlow's group continues to attract substantial funding to investigate healthcare innovation issues, including work on remote care, and organisational change in healthcare (further details are given in section (e) below): his team's work forms the basis of our impact case study on 'Promoting remote care'. Professor Peter Smith (ex-Head of the Centre for Health Economics at York) leads our research on international health systems, and co-directs the Centre for Health Policy in Imperial's Institute for Global Health Innovation.

Organisation and Management: We added to our economics capacity through two routes: work on sustainable energy, supported by a donation-funded chair held by Professor Richard Green, Group Head and former Director of the Institute for Energy Research and Policy at Birmingham; and a general increase in economics research capability supported by a new MSc in Economics and Business Strategy. Our established economics faculty members continue to publish at a high level, particularly in the areas of competition, regulation and the knowledge economy, and attract competitive research grants: Professor Tommaso Valletti, whose work provides our impact case study on 'Regulating the telecommunications market' held an ESRC responsive mode grant of £146K for work on competition and vertical supply chains (2009-11), while Professor Jonathan Haskel (also the author of one of our impact case studies, on 'Defending government investment in science') has received grants as PI from the EC and NESTA with a total value of over £1.4M over the REF period.

Professor Nelson Phillips continues to provide intellectual leadership of research in organisational behaviour and strategy, where more general expansion of student numbers due to the launch of an MSc in Strategic Marketing allowed us to make excellent new appointments: Drs Mark Kennedy and Mirjam Tuk (previously on the faculties at University Southern California and Groningen, respectively) and Maria Farkas and Claudia Jasmand (recent PhDs from the universities of Michigan and Maastricht, respectively).

The Business School's measurable research targets for the next 6 years:

- Achieve another 50% increase in research income from grants and donations;
- Increase by 30% the number of Category A FTE staff to be submitted to REF 2020
- Increase PhD intake by 33%;
- Increase by 20% the number of articles in elite academic journals (impact factor >2.5).

New initiatives of strategic importance

- **The Brevan Howard Centre for Financial Analysis** (see section on Finance Group above)

This provides the opportunity to create a 'best in Europe' finance group in its chosen niche, raise our research profile, attract yet better staff in other fields, and create a transformational fully-funded PhD programme.

- **Digital City Exchange (£5.9M, of which £2.5M for Business School, EPSRC grant 2011-16)**

An interdisciplinary Imperial platform (Business, Engineering, IT, Medicine) to model radical changes in behaviour as the smarter planet evolves; led by the Business School; linking behaviour across previously disparate sectors, to create new business models and influence policy.

- **The Enterprise Research Centre (£2.9M, of which £511K for Business School funded by ESRC, BIS, TSB, BBA)**

An inter-university consortium (with Warwick, Aston, Strathclyde: total grant value £2.9M), helping to create transformational influence on policy to meet the challenges of growing SMEs, linking micro and macro entrepreneurship research.

Priority areas: Our recruitment strategy is to hire people of excellence who fit our prioritised themes (see p.1). Our research standards are clear: we aim for at least one excellent publication per person per year, and we reward those who sustain this level year after year. We create

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research centres to support individual researchers, creating effective and well-funded thematic clusters and facilitating research across group and departmental boundaries.

Prioritisation is ultimately the responsibility of the Dean, advised by the School's Management Board, and supported by the Research Committee. The Dean is annually accountable to Imperial when presenting a rolling three-year business plan for the School as a whole. Heads of funded research centres are then accountable, at regular intervals, to this Management Board.

Funding streams: At end October 2013, we had 62 staff on academic contracts and 38 contract researchers. Total research income in 2012-13 was £4.6M, almost £80k pa per FTE submitted. Past and future success reflects a strategy to win the research income needed for excellent research with material impact, by:

1. Using the science focus of Imperial and its excellence and reputation, and consequently of its business school, vigorously to pursue EPSRC funding collaboratively with other departments (financial opportunities being substantially larger than at ESRC, and the College's research priorities closely aligned with those of the EPSRC);
2. Pursuing programmes solely for the Business School (e.g. Innovation Studies Centre) and leadership of collaborative programmes (e.g. Digital City Exchange, with four other Imperial departments, of which £2.5M for us); or £11M Health and Care Infrastructure Research and Innovation Centre (HaCIRIC), (with three other universities, £3M for us);
3. Similarly, pursuing grants from ESRC (e.g. £1M UK Innovation Research Centre, joint with Cambridge; co-funded by NESTA, TSB, BIS; also our share of Enterprise Research Centre (see above) co-funded by BBA, BIS, TSB);
4. Seeking fellowships for our best academic staff (Gerry George and Carol Propper won ESRC Professorial Fellowships); half a dozen of our staff also had various AIM fellowships;
5. Stepping up our pursuit of funding from the European Commission's FP7 and Horizon 2020 programmes. Our funding from the EC has increased from c. £54K in 2008-09 to c. £384K in 2012-13, with current and recent projects including a Marie Curie Initial Training Network in design management and co-ordination of the CO-INVEST consortium on innovation and intangible investment;
6. Pursuing donations and contracts to finance research and impact: Rajiv Gandhi Centre for Innovation and Entrepreneurship (£0.8M initially from BP, Kusumu Trust); Hero Trust India, (£1M, research on Indian Business); Alan and Sabine Howard (£1M, research on sustainable energy business); Brevan Howard (£20M, research on finance); Ernst and Young and Equistone Partners Europe, (£1M, the Centre for Management Buyout Research);
7. Building on our relationships with corporate partners as an opportunity to co-create and fund research projects which derive impact later (relationships with IBM, Laing O'Rourke and Crossrail are examples);
8. Building lasting relationships with actual or potential donors. Success of the Gandhi Centre helped win the Hero donation; relationship build with Alan Howard over seven years (hedge fund centre, then sustainable energy chair) led to the £20M finance donation;
9. Creating 69 Adjunct Professors to engage successful business leaders who not only give masterclasses; some also finance seminars, or advise on grants.

Facilities: Our space increased by 230% during 2003-12, reflecting strong growth in research and programmes. Space will increase by a further 15% by 2019. Researchers are typically co-located with academic faculty. Every PhD student has computer and library provision, and access to funds for conference attendance, for example.

Research administration and management: Accountable via the Research Committee to our Management Board, research administration is supervised by the Deputy Dean (Faculty & Research) and executed by a Strategic Research Manager who identifies broad trends in research, detects opportunities, supports the writing of grants, and leads grant administration. The SRM is supported both by a team of research managers (some grant-funded) and by our administrative finance team. Collectively, this team helped support an increase in annual research income from £2.7M to £4.6M during 2007-12. At College level, we are supported by a team of Research Services administrators, who handle final checks and submissions of bids, and grant set-up and invoicing, a central Research Office with oversight of policy and procedure, and a European funding office expert to support grants from the European Commission. Advisory Boards, both at

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School level and for our major funded research centres (e.g. the UK-IRC and Digital City Exchange) provide a valuable role in guiding research and facilitating impact.

c. People, including:

I. Staffing strategy and staff development

We have three career structures – research, teaching, and academic. Academic staff, who excel in both research and teaching, are hired only if they have proven ability to publish in top journals. We offer fixed-term two-year contracts to young academics, to enable their potential and capability to be developed. Of the 63 people submitted in REF 2013, 13 are early career researchers. Our research ambitions, and supportive environment, make Imperial an attractive home for the next generation of research leaders.

Staffing: The table below shows staff headcount at 31 October 2013. Our three-year plan, approved by Imperial College, envisages a further 20% increase in academic headcount by 2016.

Table 2 Staff headcount at 31 October 2013

	Age	< 30	30-9	40-9	50-9	60 +	Total	Grand total
Academic	Fixed term		2				2	
	Asst prof	1	15	8			24	
	Assoc prof		8	3			11	
	Professor		2	12	7	4	25	62
Research only	Junior	7	17	4	1		29	
	Senior		3	4	1	1	9	38
Teaching only			2	6	2	3	13	13
Admin		21	64	18	11	5	119	119

Table 2 above confirms a healthy and sustainable staffing distribution. We attract young staff (both from outside and from our contract research staff); support them in achieving promotion effectively and in a timely manner; develop senior professors as leaders, both through internal promotion and by external recruitment, and, as individuals and in teams; win substantial research funding; publish in influential international journals; and then achieve and demonstrate considerable impact. Research opportunities are not limited by current staffing. Winning greater research resources, from whatever source (donations, grants, corporate support, staff appointments financed through teaching income) creates further opportunities.

With regard to our ability to attract academics from all over the world, of our full Professors, 10 were from the UK and 15 from outside the UK.

Since RAE 2008, some staff have departed for prestigious positions elsewhere, notably Professors Jaideep Prabhu (to Cambridge), Laurent Calvet (to HEC Paris), Robert MacCulloch (to his native Auckland), and Ammon Salter (to Bath). Conversely, we have welcomed Professors Rustam Ibragimov (from Harvard), Marcin Kacperczyk (from NYU Stern) and four prominent UK professors: Jonathan Haskel (from QMUL), Mike Wright (ex-Nottingham), Richard Green (ex-Birmingham), and Peter Smith (ex-York). The Business School will be joined in 2014 by Professors Franklin Allen (Wharton School, University of Pennsylvania) and Douglas Gale (Economics, NYU).

We make joint appointments (in collaboration with other Imperial faculties) where appropriate to our research endeavours (e.g. Professors Rifat Atun and Peter Smith, with Medicine).

Our system of annual appraisals – Personal Review and Development Plans – offers a formal opportunity to discuss individual needs, mechanisms for constructive support and to agree objectives and expectations. We celebrate the successes of our staff, but there is occasional disappointment. If this persists, we provide a supportive performance management environment that leads either to improvement or departure. We have required only two minor restructurings during this REF period, but we remain vigilant.

Prestige competitive personal research fellowships: Gerry George won a highly competitive ESRC professorial fellowship (2011-14; one of only 4 awarded in 2011); a feat repeated by Carol

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Propper in 2012. We believe that we are the only business school in the UK to host two ESRC Professorial Fellows. Several staff have held fellowships of the Advanced Institute of Management (AIM), including Gerry George (innovation fellow), Dr Markus Perkmann (management practice fellow) and Professor Ammon Salter (Ghoshal mid-career fellowship). Professor Erkko Autio held the EPSRC / Qinetiq chair in technology transfer from 2006 until 2011. Professor Walter Distaso and Dr Robert Kosowski won British Academy mid-career fellowships; fewer than 50 were awarded nationally in all subjects. We also had notable successes with early career fellowships from research councils, EU Commission, and other funders, and several recipients of these have gone on to faculty positions at Imperial and elsewhere. Dr Riccardo Fini held an EU Marie Curie intra-European fellowship; Dr Adriana Cornea, who held a British Academy postdoctoral fellowship, now has a lectureship at Exeter; Dr Stephanie von Hinke Kessler Scholder, who held an ESRC postdoctoral fellowship with us, now holds an MRC Research Fellowship at York.

Evidence of equality of opportunity: Teaching is organised in blocks in order to provide long periods for research. All academics are encouraged to work with co-authors around the world. For such staff, teaching loads are low to support research opportunities. Elsie Widdowson Fellowships provide one-year teaching and administrative buyouts for women returning from maternity leave. The College's flexible working policy is applicable to all staff.

Imperial fully espouses the principles of the Concordat to Support the Career Development of Researchers, and has achieved an HR Excellence in Research Badge from the European Commission. As noted above, every year each member of staff is required to undertake a Personal Review and Development Plan, a two-way discussion between staff member and line manager. Our practice emphasises clarity and transparency in what we expect of researchers; mentoring and regular discussion of developmental needs, a clear research career progression (defined grades, promotion criteria, evidence of researchers being so promoted, including to senior levels); possible conversion to the academic stream if such standards are attained; and full inclusion in the intellectual and social life of the School.

The College's Learning and Development Centre provides management and leadership programmes for all staff and additional tailored development support for the academic community. This includes the Academic Development Centre (support for all aspects of academic achievement), the Female Academic Development Centre and the Senior Academic Leadership Programme.

The College is committed to supporting equality-related activities, and resources a dedicated Equalities Unit, and support networks including Imperial as ONE (race), Imperial 600 (LGBT), and Disability Staff and Student Forums. Equality-related issues are championed by a senior member of College staff: during 2008-12, this was Professor Begg, then Principal of the Business School.

Ethics and accountability: The School's research is governed by Imperial College's research ethics policy, which takes account of the requirements of the ESRC's framework for research ethics. Research projects with human participation are subject to a relatively light-touch review and signed off by the School's Dean, who can refer more complex ethical issues to the College-level research ethics committee. All applications for ethical approval were accepted in this REF period.

c. II. Research students

Postgraduates: We are fully committed to developing the next generation of academics, and we aim to expand our postgraduate programme and to build our financial support to achieve this. Our annual PGR intake has evolved, from 20 in 2007 to 22 in 2013, and is projected to be 27+ by 2019. We have a good record of converting contract researchers into tenure-tracked academics: of 62 academics in 2013, eight had formerly been contract researchers in the School.

In 2008, our Finance PhD stream was well established, with structured course provision and an annual intake of 4-5 high-calibre students. In contrast, the Management PhD stream was loosely structured. Together, the overall 2008 intake of the PhD Programme was 16 students. Since 2008, we have consolidated the management stream, introduced new taught PhD courses for methods and content, and a formal structure for the first 18 months; offered PhD students pedagogical training to enhance their subsequent job prospects; and increased fully funded scholarships. Our

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aim is to increase our recent intake of 19-20 per annum to at least 24 per annum, most with fully-funded studentships. Of our current 97 PhD students, 25% are from the UK, 34% from elsewhere in the EU and 41% non-EU. 21 PhDs are funded by the UK Research Councils (predominantly via the EPSRC Doctoral Training Partnership) and 25 by fully-funded Business School or Imperial College studentships. A further 11 students are fully-funded by their home governments or by industrial sponsors. The School's four-year PhD submission rate is excellent, standing at 92% for 2011-12, eight percentage points higher than that for Imperial College as a whole.

The College aims to attain recognition through the ESRC's doctoral training centre scheme in 2016, in collaboration with some of the institutions with whom we already collaborate in providing research student training (including London Business School, King's College, Birkbeck and UCL).

We hold structured annual reviews of all students, including the PhD/MPhil transfer decision. We encourage and sponsor participation by second- and third- year students in research conferences. At least one conference presentation per year is expected.

We regard the integration and mentoring of doctoral students as a key responsibility. The School has invested resources in a portfolio of doctoral level courses: empirical methods in economics, topics in advanced financial engineering, topics in empirical finance, and techniques in management research. Students are required to attend Imperial College Graduate School training provision, which has twice won the *Times Higher Education* Award for Outstanding Support for Early Career Researchers. Recent initiatives include residential weekends for first year and final year students ('Research skills development course' and 'Finish up and move on'). There are rolling programmes: students can take options as the need arises, and training is progressive. Our graduate teaching assistantships enable those who wish to become academics to develop useful teaching and tutoring experience. As well as those former fellows listed on p. 6, former PhD students and research associates in the School have gone on to positions in Technische Universität München (Dr Oliver Alexy), European School of Management and Technology (Dr Linus Dahlander), Nottingham University Business School (Dr Cher Li) and EM Lyon Business School (Dr Brice Dattee).

d. Income, infrastructure and facilities

Research income: Annual research volume rose from £2.7M in 2006-07 to almost £4.6M in 2012-13 and is projected to exceed £7m by 2019. Two thirds of our research funding has been from UK research councils, principally from major programme and centre grants, including the EPSRC Innovation Studies Centre (wholly within the Business School, £5.4M 2008-13), ESRC UK Innovation Research Centre (in partnership with Cambridge, £1M 2009-13), EPSRC Health and Care Infrastructure Research and Innovation Centre (led by us, with Loughborough, Reading and Salford, our share £3.65m 2006-13); the EPSRC Digital City Exchange (the bid led by us, with participation from four Imperial departments in Imperial's Faculty of Engineering, our share £2.5m for five years from September 2011); and the ESRC / BBA / BIS / TSB Enterprise Research Centre (with Warwick, Aston, Strathclyde, £2.9M 2013-15; our share £511K).

We also receive other research council and British Academy grants through responsive-mode and directed schemes.

We have successfully diversified our funding to reduce our dependence on research council funding and to fulfil our growth projections. Funding comes from a wide portfolio of sources including the EU, philanthropic donations, and corporate funding, as detailed on pp.4-5 above: although donations such as those from BP and Brevan Howard are outwith the REF definition of research income, they play an important and increasing role in advancing our research strategy, and in directly funding key aspects of the School's research activity.

Research Support through corporate partnerships: Since RAE 2008 the School has appointed a dedicated Corporate Partnerships Manager, located in the Business School but also forming part of a centrally managed team across Imperial, with counterparts embedded in all the other faculties. Our Corporate Partnerships activity aims to professionalise engagement with industry by horizon scanning; determination of Imperial's value proposition; opportunity evaluation and "Stage-gating" opportunity management; co-ordination and bid management of major complex opportunities; and

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conducting relationship management of key partners across Imperial to deepen links with key companies (e.g. IBM, BP).

Corporate partners enhance the School's research capability in two different ways

- *By direct support of activities solely within the Business School*

BP support for the Rajiv Gandhi Centre for Innovation and Entrepreneurship (£0.5M); Alan and Sabine Howard support for research in Sustainable Energy Business (£1M); IBM support for research on client focus and career development of engineers (£0.3M); Arup support for research on network analysis (£ 0.3M); NHS support for telecare and remote medicine (£1.0M); Laing O'Rourke support for research on innovation (£0.5M); Brevan Howard support for research in Finance (£0.2M historically, £20M going forward); Ernst and Young and Equistone Partners Europe for research on Private Equity (£1M).

- *By supporting research across Imperial faculties, including the Business School*

IBM support for the multi-faculty Digital City Exchange (led by the Business School); Transport for London support for transport analysis (Business School share £0.2M); Crossrail support for research on network infrastructure and innovation (Business School share £0.45M).

Research support from Imperial College: The College provided significant direct support to enhance our research infrastructure and capability during the REF period. For example, it has provided and refurbished the space to keep pace with our very rapid growth over the last 10 years, and remains committed to do so in the future (see section on facilities, p.4). This space is both for centres and projects, for the concomitant expansion of our PhD programmes and additional offices for some staff.

e. Collaboration and contribution to the discipline or research base

Collaborations. We collaborate extensively both within the wider College community, the UK and globally. Examples include:

- *Within Imperial College*

With the Faculty of Engineering: RCUK Digital City Exchange; ICT Knowledge and Innovation Community (KIC) of the European Institute of Innovation and Technology (EIT): further details of these collaborations follow in the 'Interdisciplinary research' section below.

With the Faculty of Medicine: the National Centre for Infection Prevention and Management (Professor Rifat Atun); NIHR Collaboration for Leadership in Applied Health Research and Care for north-west London (Professor James Barlow); Institute for Global Health Innovation (Professor Peter Smith).

With multiple faculties: Grantham Institute for Climate Change (with Natural Sciences, Engineering and Medicine); Energy Futures Lab (with Engineering and Natural Sciences); Climate Change KIC of the EIT (with Engineering, Natural Sciences and Medicine).

- *With Imperial and other UK academics*

Professor James Barlow led for Imperial the EPSRC Health and Care Infrastructure Research and Innovation Centre (with Reading, Loughborough and Salford), designed to fulfil the EPSRC's aspirations for multi-institutional, cross-disciplinary work which built UK research capacity in the key strategic area of healthcare infrastructure. He also led for Imperial the Whole System Demonstrator, the largest UK randomised control trial of telecare and remote medicine (with Nuffield Trust, LSE, Oxford, Manchester and City universities) and the Department of Health funded Policy Innovation Research Unit (PIRU), with the London School of Hygiene and Tropical Medicine: Professor Barlow's team's contributions to the first two of these form the basis for our impact case study on 'Promoting remote care to achieve effective healthcare at affordable cost'.

As described above, we are major contributors to the ESRC UK Innovation Research Centre (with Cambridge) and Enterprise Research Centre (with Warwick, Aston and Strathclyde). Design London (with the Faculty of Engineering and the Royal College of Art), a four-year collaboration funded by HEFCE and NESTA, came to an end in 2011.

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- **With international academics**

Our national and international collaborations are extensive. To take some examples: Erko Autio co-directs the project that created a Global Entrepreneurship and Development Index (GEDI), and this forms the basis for our impact case study 'Identifying and eliminating bottlenecks to entrepreneurship and development'. Our participation in the London node of the Information and Communications Technologies KIC of the EIT is described in more detail in the 'Interdisciplinary research' section below.

As well as working with international academics, we also successful at winning research funding from overseas thereby augmenting our research capability. As noted above in the 'Funding streams' section, we have substantially increased our grant income from the European Commission. To give some notable examples: Jonathan Haskel co-ordinated the EU FP7 CO-INVEST programme on the knowledge economy (£693K, 2008-10); Bart Clarysse leads for Imperial an EU FP7 initial training network in design management with the Universities of Gothenburg and Aalto and the Polytechnic University of Milan (£210K, 2012-15). Professor Peter Smith is a participant in two FP7 projects in healthcare systems performance measurement as well as the US National Institutes of Health-funded PopArt study in HIV prevention (£225K, 2011-15, with collaborators in Zambia and South Africa as well as the London School of Hygiene and Tropical Medicine). A fuller list of our international funding is as follows:

PI	Project	Funder	£ k
Haskel	ICT-NET	EU FP7	62
Haskel	Co-Invest	EU FP7	693
Clarysse	DESMa Training network	Marie Curie	210
Smith	Health systems	US NIH	225
Smith	Health policy	EU FP7	100
Miraldo	Prescription decisions	National Institutes for Health and Welfare (Finland)	110
Eisingerich	Pre-exposure HIV prophylaxis & Marketing	Gates Foundation	137
Sismeiro	Marketing	Peugeot Citroen	210
Cox	ETHICAL & RADICAL	EU FP7	148
Martin	ENTRACTE & SIMPATIC	EU FP7	98
Fini	TRACK	EU FP7 Marie Curie	107
<i>Total overseas research income (incl. other small grants not listed)</i>			£2.3M

- **Research underpinning public service and public policy (a few of many examples)**

David Gann was a member of the 2009 Royal Society panel which produced the report *Hidden Wealth – the contribution of science to service sector research*; and a member of the Hargreaves commission, whose independent report *Digital Opportunity: A review of Intellectual Property and Growth* was commissioned by Prime Minister, David Cameron; Rifat Atun acted as an advisor to the World Bank, WHO and DfID, and recently completed a three-year post as chair of the World Health Organization Task Force on Health Systems and Tuberculosis (2009-2012); James Barlow provided advice on telecare and innovation in health care systems to the Department of Health; Carol Propper's work on competition in the NHS was widely cited during debates on NHS reforms; Jonathan Haskel's work on how science research boosts economic growth was explicitly cited by David Willetts and is credited for defending the science research budget from cuts; Jonathan Haskel and Tommaso Valletti were members of the UK Competition Commission, in which role their particular research expertise was frequently used, and Professor Valletti has recently been appointed to the EU's Economic Advisory Group on Competition Policy; Mike Wright has provided private equity advice and input to both the British and the European Venture Capital Associations, to the Bank of England, BIS, US Government Accountability Office, and the Institute of Chartered

Environment template (REF5)

Accountants in England and Wales. Professors David Gann and Carol Propper were both awarded the CBE in this REF period for contributions to research and its impact on public policy.

Contribution to the discipline and research base:

Interdisciplinary research and contributions to the wider research base

Imperial's Digital Economy Lab was set up by the Business School as an embryonic grand challenge institute, with joint Directors from Business School and Engineering, and including Medicine and Natural Sciences. The Lab won a £5.9M, five-year RCUK programme grant (the Digital City Exchange). Further initiatives include the Cisco-funded *Future Cities Centre* with UCL and the *Intel Collaborative Research Institute for Sustainable Connected Cities*. The Lab also houses the London node of the European Institute for Innovation and Technology (EIT) ICT Knowledge and Innovation Community (KIC), recently upgraded to full partner status in collaboration with UCL, Hewlett Packard, BT and IBM. The Digital Economy Lab analyses how data captured in one use (e.g. energy) may then be reused in another (e.g. healthcare, transport, retail) to create new business models and enhance efficiency by optimising systemically rather than piecemeal.

Imperial's Grantham Institute for Climate Change, funded by a £14M donation, harnesses interdisciplinary research to explore how behavioural changes and technical innovations can mitigate effects of climate change. Our contribution includes analysis of risk (Distaso, Biffis), and econometric modelling of behavioural change (Martin). We also helped to win additional research funding (TSB, IBM, Met Office) to create an Open Platform for the re-use of related data.

Imperial's Energy Futures Lab, led by the Faculty of Engineering, addresses major energy challenges. Gerry George, Director of the Business School's Gandhi Centre, is a member of its strategy board, and leads energy projects in India and Africa. Erkkko Autio, Director of the School's Energy Business Research Lab, leads research on business models in relation to new energy opportunities. Richard Green, Professor of Sustainable Energy Business, leads research on infrastructure pricing.

Clusters, external partners, enrichment of our research capability

Many of our larger strategic partnerships encompass other Imperial faculties. IBM's partnership in the RCUK-funded Digital City Exchange project is one facet of a wider relationship with Imperial that extends to the Departments of Computing, Electrical Engineering and Mathematics. The Business School leads for Imperial on IBM; Engineering leads on relations with BP, and Medicine on relations with pharmaceutical companies, though the Business School is extensively involved.

Operational partnerships form a significant base of research collaboration and are usually managed individually by academics. The School has senior engagement and numerous research projects with Nokia that span research on IP frameworks and technology transfer approaches. The School also has a number of external advisory boards which help to ensure industry and user engagement with our research. Our main advisory board meets every four months, providing industry and practitioner input to our research strategy. Each of our main research centres and large grants has its own advisory board that fulfils a similar function.

Journal Editorships

Members of the School have acted as the lead editors for four major international journals during the REF period:

<i>Academy of Management Journal</i>	Gerry George (<i>first non-US school to host editor</i>)
<i>Strategic Entrepreneurship</i>	Mike Wright (<i>until 2009, also edited J. Mgt. Studies</i>)
<i>Accounting, Organisations, and Society</i>	Chris Chapman
<i>Journal of Management Inquiry</i>	Nelson Phillips

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Service on Editorial Boards (a partial selection, concentrating on the top international journals)

<i>Academy of Management Journal</i>	Autio, George, Kennedy, Mishina, Phillips, Wright
<i>Academy of Management Review</i>	Mishina
<i>Entrepreneurship Theory and Practice</i>	Autio, Wright
<i>Journal of Business Venturing</i>	Autio, George
<i>Journal of Management Studies</i>	Autio, George, Wright
<i>Econometric Theory</i>	Abadir
<i>Econometric Reviews</i>	Abadir
<i>Strategic Entrepreneurship Journal</i>	Autio, George, Wright
<i>Strategic Management Journal</i>	Mishina
<i>Strategic Organization</i>	Phillips
<i>Journal of Business Fin. and Accounting</i>	Wright
<i>Academy of Mgt Learning and Education</i>	Wright
<i>Lancet Global Health</i>	Atun
<i>Health Policy and Planning</i>	Atun
<i>Int'l Journal of Healthcare Technology and Management</i>	Barlow
<i>Int'l Journal of Healthcare Information Systems and Informatics</i>	Barlow
<i>Innovation and Entrepreneurship in Health</i>	Barlow

Conferences

The School regularly holds international conferences of distinction. Examples include:

- DRUID, Europe's leading innovation conference, held at Imperial in 2010 (the first time the conference had been held outside Denmark), with around 300 attendees from 30 different countries;
- Brevan Howard Hedge Fund conference series (annually since 2006) – with leading academics from Princeton, MIT, Columbia, NYU;
- Fourth Global Entrepreneurship Monitor Conference, 2011 (c. 60 attendees) and Global Entrepreneurship and Development Index conferences (2011, 2012), each around 100 attendees;
- Theories of Family Enterprise Conference, May, 2013 (linked to a special issue of *Entrepreneurship Theory and Practice*), usually held in the US or Canada;
- First international conference in platforms, markets and innovation, organised by Annabelle Gawer in June 2008 with over 70 participants including academics from Harvard, MIT and Tokyo: described by Professor Carliss Baldwin of Harvard as “a milestone in the development of a new interdisciplinary field”;
- International Conference on Universal Health Coverage co-organised in June 2013 by Imperial (Atun) with the Lancet, Turkish Ministry of Health, OECD, WHO, the World Bank, and attended by 500 delegates including ministers/deputy ministers of health from 40 countries.