

EXPLORING PREFERENCES FOR IMPACT VERSUS PUBLICATIONS AMONG UK BUSINESS AND MANAGEMENT ACADEMICS

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Abstract - Academics are under increasing pressure to demonstrate the impact of their research with external actors. Some national research assessment systems have mandated academics to document their impact on non-academic actors, and linked research funding to assessments of these impacts. Although there has been considerable debate around the design of these systems, little is known about how academics perceive the value of impact against more conventional academic outputs, such as publications. Using multisource data, including a large-scale survey of UK business and management academics, this paper explores the individual and institutional factors that explain an individual's preference for impact versus publication. The results show that academics display a preference for impact over publications, even when that impact is *not* associated with requirements of the assessment system in terms of rigour of the underpinning research. The preference for impact over publications is heightened by organization tenure, non-academic work experience, intrinsic career motivations and research-intensive contexts, while it is weakened by academic influence, extrinsic career motives and academic rank. We explore the implications of these findings for the design of research assessment systems and academics' reactions to them.

Keywords: impact, publications, research assessment systems, Research Excellence Framework, academic engagement

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Introduction

Governments have increasingly required academic faculty to explain their contribution to economic and social wellbeing and have accordingly set up research assessment systems to ensure that academics account for the impact of their research on non-academics (Bornmann, 2013; Geuna and Martin, 2003; 2012). This focus is partly related to the perception among many policy-makers that academic research tends to produce less social and economic impact than would be socially desirable (Martin, 2011). Such a view is often couched in the notion that academics operate in ‘ivory towers’, undertaking research with little relevance or impact on the rest of the society and it is partly reinforced by the idea, promulgated by scientists themselves, that effective research operates in a ‘republic of science’, removed from commercial and social pressures that dominate in other parts of society (Polanyi, 2000). The increased focus on impact is also linked to changing expectations about the importance of academic research in terms of economic and social development, a view that often equates research and universities as ‘engines of growth’, providing the ideas and skills to stimulate economic development (Etzkowitz et al., 2000). This suggests that efforts to spur academics to engage more with non-academics would be effective in encouraging greater social and economic development, therefore helping to raise the social and economic rate of return of publicly funded research (Cohen et al., 2002; Link et al., 2007; Perkmann et al., 2013).

The development of research assessment systems to incorporate social and economic impact has been led by the UK experience with the institutionalization of an ‘impact agenda’ (Martin, 2011; RCUK, 2015; Smith et al., 2011). The notion of ‘impact’ underpinning the UK research assessment and funding system is a broad one, including a wide range of social and economic outcomes arising from research

(Penfield et al., 2014). The first institutionalization of this ‘impact agenda’ was the requirement for publicly funded research projects from 2007 onwards to develop ‘pathways to impact’, a plan describing how the funded research would make a demonstrable contribution to *academic impact*, such as significant advances within and across academic disciplines, and *economic and societal impact*, through creating research and knowledge that benefit individuals, organizations and nations by supporting economic development, the delivery of public services or by enhancing the quality of life. The second leg of the agenda was based on the 2014 Research Excellence Framework (REF), which required units of submission to report a number of impact case studies, based on the faculty submitted to the research exercise (REF2014, 2011).¹ Impact in the REF was defined as “an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environmental or quality of life, beyond academia”. REF impact case studies could be based on research performed over the previous 15 years that led to a behavioural change or benefit to external actors. Each case study was then graded in terms of ‘reach’ and ‘significance’ by REF panel members and specialist advisers (Power, 2015; Smith et al., 2011). The third leg of this agenda has been a stream of funding towards universities’ knowledge exchange activities.²

The precise course of the institutionalization of this ‘impact agenda’ into the national research assessment system remains unclear. In particular, the impact

¹ Specifically, two impact case studies were required for every staff member up to 14.99 FTE (Full Time Equivalent), three case studies for 15 to 24.99, four cases for 25 to 34.99, five for 35 to 44.99, six cases for 45 or more and a further case study per 10 FTE.

² In England, the Higher Education Funding Council for England (HEFCE) provides public research funding in the form of a ‘block grant’, and the Research Councils provide funding for specific projects. The majority of HEFCE’ funding is distributed on the basis of research quality. This quality-related funding accounted for £1,070 million of HEFCE’s 2016 research grant. HEFCE also provides funding for knowledge exchange (Higher Education Innovation Funding (HEIF)) “to support and develop a broad range of knowledge-based interactions between universities and the wider world, which result in economic and social benefit to the UK” (<http://www.hefce.ac.uk/ke/heif/>). This ‘third stream’ of funding, separate from the two established streams for teaching and research, began in 2001. Eligible institutions were allocated £160 million for the 2016-17 academic year.

prerequisites of the REF were new to the UK research assessment system and they required universities to develop new practices for drafting impact case studies, generating a new accounting mechanism to shape and direct academic effort (Power, 2015). Still, the rules concerning what would be judged ‘impact’ for the purposes of the REF were somewhat arcane to non-experts and there remains a degree of uncertainty about the evaluation of impact – see for example Samuel and Derrick (2015).

Although it is useful to examine the design and conduct of national attempts to assess research impact through policy instruments, such as the REF, and probe the implications of these exercises (Hicks, 2012; Rebora and Turri, 2013), such an approach says little about individual academics’ attitudes to these changes, and how their perceptions of the ‘impact agenda’ in research assessment systems alter or change professional practices.

Specifically, it is still unclear how impact may be valued relative to other more conventional academic outcomes, such as teaching or research, in career progression and professional practice (Penfield et al., 2014) and we lack an understanding of how academics weigh the value of ‘impact’ in relation to other parts of their job role, including more traditional requirements such as publications. This is particularly important considering that whilst impact is viewed by some among the academic community as an opportunity to adjust some misdirected academic priorities (e.g., excessive focus in publication), publishing is still considered as a key means to document the rigour of the research underpinning impact – see for example (Watermeyer, 2014).

This paper seeks to bring to the surface the preferences of academics when they face competing options on their time and attention. An underpinning assumption is

that academics will try to allocate their time and effort on the activities that will enable them to best achieve their professional goals (Jacobs and Winslow, 2004). In doing so, they have to find a balance between the different, and possibly inconsistent, requirements in their professional role. For instance, looking at a sample of higher education institutions to understand their experience with the process of submitting REF impact case studies, RAND Europe (2015) found that among surveyed academics there were concerns that the new requirements for impact would promote applied research over ‘blue skies’ research. They also found that complying with the impact component was considered to be burdensome, with academics responsible for impact reporting to be overworked, having to spend a lot of time in both understanding the new guidance and finalizing the impact cases.

To help unpack academics’ preferences with respect to impact projects, we consider their choices with regard to different levels of project outcomes for publications and impact. We then seek to explain these choices by examining the factors that lead academics to prefer impact to more conventional outputs, such as publications, paying close attention to the role that the context in which individuals work and their own personal experience have on these preferences. Although we are aware that developing impact does not necessarily imply a fixed trade-off with a publication, by using a choice set we try to avoid the social desirability bias associated with the ‘impact agenda’, which may lead individuals to seek to “have their cake and eat it too”. The idea is to bring to the surface under what conditions academics will favour impact over publications, exploring how these choices are related to an academic’s personal characteristics and their institutional context.

Although our study is informed by the literature on academic engagement with industry, which has typically focused on science and engineering subjects (Cohen et

al., 2002; Link et al., 2007; Perkmann et al., 2013), in our analysis we consider academics working at business schools in the UK (Butler et al., 2015). We focus on this population for the following reasons. First, business and management academics often face tensions between their academic role and their engagement with practice. Indeed, there is a long-standing debate within business and management about how impact, or what is often referred to in this debate as ‘relevance’, can be reconciled with more traditional academic activities, such as writing papers for academic journals. As a result, academics working in this domain are often highly aware of the competing requirements on their time and attention from these different efforts. In this sense, business and management schools/departments may be seen as an ‘extreme case’, where individuals may be particularly receptive to impact demands due to the applied orientation of their subject matter. In this respect, by exploring the attitudes of business and management academics towards impact and publications, we can gain insight into preferences of academics most ‘at risk of infection’ from national assessment systems. Second, business and management schools/departments are extremely heterogeneous groupings, drawing faculty from many different domains of social sciences, humanities, and engineering-based disciplines, such as operations research, and therefore by focusing on this population we can observe a broad range of academic fields. Third, business and management academics in the UK are increasingly expected to publish in a prescribed set of journals, the Academic Journal Guide (AJG Guide, formerly known as the ABS list). This list of journals has become institutionalized as part of the way business schools in the UK prepare for the national research assessment. As such, it acts as a common reference point among a diverse set of respondents about the perceived value of different academic publications. Also, business and management academics receive modest levels of direct research support

through grants from the UK's main research councils³ and therefore they are liable to be primarily influenced by the REF in shaping their attitudes to impact. Moreover, REF scores are incorporated into a range of national teaching rankings, and widely used in the marketing efforts of these schools. Finally, the UK has been leading the way in terms of making the impact of higher education institutions more accountable and in raising the profile of impact as an increasingly important issue.

To explore preferences for impact over publication in this context, we draw upon four different sources of data, including a large-scale survey of academics working at UK business schools. The survey was conducted in 2015, and received 1,945 responses. Linking these data to information on websites, the REF, and individuals' publication records in Scopus, we explore the predictors of individuals' preference for projects with impact versus publications. The analysis is based on both a descriptive account and several decision-based logistic models.

The results show that business and management academics have a strong preference for impact, with a majority choosing a project with significant impact and no publications over a publication with high academic status. We find that the preference for impact over publication is weakened by academic influence and academic rank, while it is strengthened by organizational tenure and non-academic work experience. We also find that while intrinsic career motivations strengthen the predilection for impact over publications, extrinsic motivations weaken the preference for impact. Finally, we find that the preference for impact is raised in contexts with a strong focus on research. We explore the implications of these findings for the design

³ From 2010 to 2014, research active faculty (i.e. those submitted to the REF assessment) in management received on average around £10k per FTE in direct research council funding, as compared to engineering and science, where research active faculty received on average more than £100k per FTE over the same period (www.ref.ac.uk).

of national research assessment systems and for individual academics' perception of the role of impact in their job role.

Research context and setting

Engagement with practice has long been an important challenge for business and management academics. As Pettigrew (2011) notes “interest in the impact of social science and management knowledge is as old as the fields of study themselves”. Traditionally, business schools drew upon formerly practicing managers, reflecting a strong applied orientation and as such, many institutions did limited research. However, over time, we have seen the rise of the ‘modern’ business school, staffed by a range of research oriented faculty complemented by a broad array of teaching fellows and former practitioners (Thomas and Wilson, 2011). For some, this turn towards research disengaged from end-users has steered business schools away from concerns of practitioners, leading to calls for a more engaged model of research (Bennis and O’Toole, 2005). In this debate, the challenge of enabling rigour and relevant research, considering the uncertainty about the appropriate roles and values of academic faculty in working with external actors, clearly remains a strongly contested topic (Butler et al., 2015; Hodgkinson and Starkey, 2011; Learmonth et al., 2012; Pettigrew, 2011; Thomas and Wilson, 2011). Research has shown that business and management academics often feel tensions between their engagement with practice and their scholarly efforts. These tensions relate to the different expectations of these engagement efforts relative to conventional academic practice, as well as to the academics’ sense of identity and objectivity as scholars. These conflicts also relate to the different timescale of projects, raising questions such as “how is the kind of research [promoted by the impact agenda, e.g., long-term complex interdisciplinary management research projects] to be nurtured and valued in a context where the short

term and the quickly publishable tends to dominate?” (Pettigrew and Starkey, 2016). As Pettigrew and Starkey (2016) suggests, these tensions also arise from the fact that rewards and promotion systems at UK universities still tend to favour academic outputs relative to impact and engagement in terms of career progression.

In the UK national research assessment system, business and management academics were judged to generate relatively high impact, with over 400 cases attesting this impact graded by the REF panels (Mason, 2015; Pidd and Broadbent, 2015). From the results of the REF, it was clear that there was no distinct one-to-one matching between research status and ability to demonstrate impact among business and management departments, as some of the departments rated highly for research received relatively modest ratings for their impact. The REF approach to assessing impact was developed relatively late in the national assessment cycle, as the rules for the evaluation were only released three years prior to the assessment itself. The release of these rules led to a major effort by universities to track back in time to document their faculty’s impact. The additional requirement was that the research associated with the impact would have been performed at the university. This created a challenge to evidence the impact retrospectively, usually requiring considerable time and effort from academic faculty themselves, as well as from impact officers and impact managers, to claim the impact for their institution (Power, 2015). Where an academic had moved to another institution, there was relatively little incentive to provide this evidence to their previous employer as the impact would remain with their past employer rather than their current one. This meant that in departments with significant churn in terms of faculty, impact tended to be low. In business and management, this pattern was observed, for example, at University College London

and Warwick Business School, which received high relative scores for research outputs, but low scores for impact.

The effect of the ‘impact agenda’ on UK academics and in particular on business and management academics is, as yet, hard to discern. Prior work on the effect of research assessment systems, such as the REF, tends to focus on systemic, organizational or department-level effects (Bornmann, 2013; Geuna and Martin, 2003; Hicks, 2012). This approach could miss out the experiences and attitudes of individual faculty, whose professional roles are re-shaped by these systems. As such, we lack insights into how individuals’ preferences may differ from the requirements of the national assessment system in important ways, and how these differences may shape the way these national assessment systems are translated into practice on the ‘shop-floor’ of the academic profession, especially in fields that may be most receptive to such demands.

A recent survey of a sample of UK academics indicated relatively modest changes in patterns of academic engagement with non-academics between 2006-2008 and 2012-2014, with some evidence for a slight decline in levels of engagement. The authors suggest that this reflects the weakening macro-economic situation, but also a shift in academic engagement efforts to more focused patterns of engagement (Hughes et al., 2016). However, this analysis does not frame the choice of impact against other types of academic outputs. This is important considering that academics reportedly face a range of issues with regard to the implementation of impact such as issues of academic prioritization, capacity and compatibility, dissemination, hierarchy, time, ownership, and tracking (Watermeyer, 2014). In particular, researchers are faced with trade-offs in terms of where to allocate efforts and resources (e.g., finding the time to develop interactions with research users), as well

in terms of where their priorities should lie. This is complicated by the observation that the “academic preoccupation with publishing research findings in internationally renowned journals...is difficult for academics to shake and seems to fog the distinction between excellence in research and the impact(s) of this excellence” (Watermeyer, 2014).

Data and method

The context for our study is the population of academics working at UK business schools. These business schools represent a significant portion of the wider academic system, accounting for over 7 per cent of all academics working in the UK.⁴ These schools have seen rapid growth over the past 20 years, with the formation of many new institutions and large increases in numbers of students, faculty and professional staff. Moreover, UK business schools are both highly diverse among themselves, as some have a strong research orientation whereas others focus on more local needs, and within themselves, as they draw upon faculty from a wide range of disciplines.

Our research approach involved bringing together information from four independent sources: (1) business schools’ websites, (2) the REF census, (3) publication data, and (4) a large-scale survey. The first stage of the data collection required collating information on the faculty employed in business schools in the UK. The data were hand collected from the *universities’ websites* and included gender and rank. These details were gathered at three points in time. The initial collection was made directly prior to the 2014 REF census in late 2013; the second round was conducted the following year where email addresses were also captured. These data were finally updated in 2015, when all researchers’ names and contact details were

⁴ 14,810 out of 201,380 academic staff at UK higher education providers allocated to Business & Management studies cost centre, according to the 2015/16 HESA Staff record (<https://www.hesa.ac.uk>).

double-checked on the web to ensure they were as accurate and current as possible. The second source was the *REF census and results* released in December 2014. These data include the REF scores, as well as individual research outputs, directly taken from the Higher Education Funding Council of England (HEFCE) REF results website.⁵ Third, to capture information on publications, we matched our data on faculty with individual-level publication information from *Elsevier's Scopus*. The searches of authors' records and downloading their publications were performed in July 2014 using the 'author preview' in Scopus. We then manually checked these data, using information from websites and other sources. We also utilised ranking data from the Academic Journal Guide (ABS List) which was developed by the Chartered Association of UK Business Schools and provides an assessment of the quality of different journals in business and management (ABS, 2015).

The fourth and most important element of our study was a *large-scale survey of academics*, which was conducted in 2015 and therefore after the completion of the REF. The survey data used in this study come from a larger research project pertaining to business academics' views of journal lists as means of research assessment. As part of this study, we administered an online questionnaire to all academics working in business schools that had participated in the Research Assessment Exercise 2008 with the addition of University College London. In order to ensure clean records for the survey, we attempted to remove individuals who were not expected to be potentially research active. Thus, the survey participants' list included Senior Teaching fellows but excluded Visiting, Honorary, Emeritus and Teaching Associates/Teaching fellows. The final population investigated was composed of 8,002 academics, affiliated to 90 UK business and management schools.

⁵ HEFCE REF 2014, <http://results.ref.ac.uk>, accessed June 2016.

The survey was designed using an iterative approach. We began by assembling various questions from prior research and then developed our own bespoke questions. Once we had an initial draft of the survey, we piloted it with more than 20 business and management academics, most of whom were based outside the UK but had recently worked at UK universities. Based on the results of the pilot, we adjusted the text of the questions and then re-ran the pilots with a smaller group of faculty. The survey was open for one month, and non-respondents were asked to participate three times. In total, we received responses from 1,945 participants, leaving us with a response rate of just over 24%.

In order to check the reliability of our response pool, we undertook some tests of the response population, looking for sources of bias in our final sample. First, we analysed if there was any difference in the respondents' institutions REF ranking using their overall Grade Point Average (GPA) compared to the rest of the sample: we performed a non-parametric test and found no significant difference. Second, we compared the academic rank of those completing the survey against the rank of those who were included in the overall sample. Given the exclusion of Teaching fellows from the population and the itinerant nature of junior faculty, our sample included a slightly higher proportion of professors. Finally, we checked the primary expertise of survey participants in order to assess a broad correspondence between participants and those who were submitted to REF 2014. To do so, REF outputs were compared to the expertise of participants who completed the survey using the subject classifications provided in the AJG Guide. Overall, the sample was consistent with the broad section of papers submitted to the REF. After excluding responses for non-item response and completing matching across the various sources of data, we were left with a sample of 1,246 individuals for the analysis.

Measures

Dependent variable

Preference for publication. Since the issue of how academics perceive the value of impact versus publications has not been addressed in the previous literature, it was necessary to develop a new question. Given the increasing institutionalisation of the ‘impact agenda’ among UK universities, we were concerned about the danger of social desirability bias if we simply asked a question about how individuals perceive the value of impact to their work. Moreover, this approach would have not indicated an individual’s preference for impact versus more conventional academic outcomes. To bring this information to light, we developed a choice set question. Our question design was inspired by studies of managerial choice in innovation studies (Fischer and Henkel, 2012, 2013; Schillebeeckx et al., 2016) as well as research on risk preferences in behavioural economics (Cohen and Einav, 2007; Santos-Pinto et al., 2015). In these risk preference studies, individuals are offered a staged set of choices between two groups of outcomes with different degrees of risk. The choice sets fix the value of one part of the choice and then incrementally increase the reward for the second option. The idea is to determine at what point individuals will shift their preference from one outcome to another. Building upon this logic, we designed a question in a similar format. To pose our question as neutrally as possible, we indicated that the question related to a personal preference and that there was no right or wrong answer. The exact wording of the question is described in Figure 1.

<INSERT FIGURE 1 ABOUT HERE>

Our dependent variable was therefore the option set, indicating when individuals shifted their preference for impact associated with increasingly high

quality output against a high quality academic output (i.e. a Journal of Distinction (4-star) paper) with no impact.

It must be acknowledged that this choice set is partly ‘artificial’, as it is possible for a research project to be impactful on non-academics and be published in a leading journal. However, since it might be expected that an academic would likely prefer to have both outcomes, the use of the choice set formulation allows us to bring to the surface underlying preferences that might not be expressed using a more conventional question format.

Key independent variables

To better understand the factors that shape preferences for impact, we explored a range of personal and professional characteristics, many of which have been subject to prior research in academic engagement with industry (Perkmann et al., 2013). Our goal was to better understand the factors that are associated with different choices between impact and publication.

Academic influence. There are considerable differences between individual researchers in terms of their academic influence. Academic influence tends to have a high skew, with a small number of faculty accounting for the majority share of published papers and citations (Seglen, 1992), especially in business and management (Baum, 2011, 2012). To capture differences across individual researchers’ academic influence, we considered the total number of citations, as indicated in their Scopus record. Citations were then adjusted based on the researchers’ academic age, quantified as the number of years since the year of their first publication. Given the highly skewed nature of citations we split the variable into quartiles for the analysis.

Academic rank. Since rank is liable to strongly influence attitudes to engagement with non-academics and to the value of publications, we created a

measure of professional rank. For this information, we relied on a survey question that asked respondents “What is your current position?”. We then created three dummy variables *lecturer*, *associate professor*, and *professor* (baseline category, removed).

Organizational tenure. Research on organizational tenure suggests that the length of time a person stays in an organization can have an important effect on their responses to external pressures. In particular, long-term employees are liable to build deep knowledge of the organization’s ways of working and also help with the socialization of new members of the organization. In addition, they may display a higher degree of organizational commitment (Allen and Meyer, 1993; Mathieu and Zajac, 1990) and be more likely to take up pro-social job roles even when not asked to do so (Rollag, 2004). To capture the length of time individuals had been employed in their current institutions, we asked them “How long have you been employed in your present organisation?” The options ranged from “Less than 1 year” to “10 years or more”.

Non-academic work experience. Many academics working in universities, and especially in business schools, draw upon professional experience working in industry, government or non-governmental organizations. These individuals may have been recruited to a business school in order to strengthen the delivery of teaching or to help others draw upon their experiences to further their research. In addition, many practitioners undertake academic training and then shift towards academic careers. In this sense, business and management academics often have had hybrid careers, working both inside and outside academe (Clarysse et al., 2011; Lin and Bozeman, 2006). To assess the extent to which academics draw upon non-academic work experience, we relied on a survey question asking the participants to indicate roughly

how many years they had worked outside academia, such as for the government or the private sector (Clarysse et al., 2011).

Career motivations. Research has shown that academics differ in their career motivations (Sauermann and Stephan, 2013). In particular, research has indicated that scientists ‘pay’ by foregoing income and other benefits to remain active in the academic system (Stern, 2004). This reflects a strong affinity among academics to some aspects of their job, including autonomy and academic freedom. Academics also display a strong preference for the pro-social aspects of their job role in contributing to wider society through education and research (Sauermann and Cohen, 2010). These intrinsic aspects of academic job roles reflect the enjoyment that individuals derive from their job (Deci and Ryan, 1985, 2000). At the same time, it is also the case that a significant share of academics similarly appear to appreciate the salary and benefits associated with the role, which have traditionally included opportunities for promotion, long-term stable employment and generous pension benefits (Sauermann and Stephan, 2013).

To explore how these career motivations may shape preferences towards impact, we drew upon a question used by Sauermann and Cohen (2010), which in turn is based on a question included in the National Science Foundation’s survey of doctorate holders (see also Tartari et al., 2014). The question asks ‘When thinking about your job as an academic, how important is each of the following factors to you?’, and provides a range of items. We then categorized items into two summarized variables *intrinsic* motivations, including ‘Contribution to society’, ‘Degree of independence’ and ‘Intellectual challenge’ and *extrinsic* motivations comprising ‘Benefits (pension, holidays, etc.)’, ‘Job security’, ‘Level of responsibility’, ‘Opportunities for career advancement’ and ‘Salary’.

Research status. There is considerable organizational variety among the 90 plus business and management schools operating in the UK. Some of these organizations have a strong orientation towards research, such as London Business School or Imperial College Business School, whereas others are more directly concerned with servicing local industry and educational roles, such as Sheffield Hallam or the University of the West of England. To address the institutions' orientation towards research, we considered their Grade Point Average (GPA) calculated from the REF Summary for Unit of Assessment 19 - Business and Management (*overall rank of institution in REF 2014*).

Importance of impact for promotion. Different institutions may value engagement with practice and impact more (or less) highly in their promotion criteria. Notably, several UK universities have responded to the 'impact agenda' by giving greater attention to engagement and impact in promotion decisions. To capture the salience of engagement with practice and impact in the institutions' promotion criteria, we included a variable that was derived from one of the survey questions. Specifically, we asked individuals: 'From the list of items below please rank the importance of the three most important activities for promotion in your work context'. There were seven options capturing different aspects of the job role, such as 'taking up administrative roles', 'publishing in leading journals', 'developing new taught courses and programmes' and 'generating research that leads to substantial impact on policy and practice'. We then created a variable *promotion at institutional level*, taking the average proportion of survey respondents in the focal institution that rated

impact related aspects as being one of the three most important reasons for promotion in their organization.⁶

Additional variables

At the level of the individual researchers, to get a better understanding of the sample and to account for possible training effects, we included in the model three additional demographic variables (*gender*, *academic age* and *obtained PhD in the UK*). Based on information gathered from the business schools' websites, we created a dummy variable equal to 1 for male and 0 for female academics. To calculate academic age, we relied on the information reported in Scopus and calculated the number of years since the researcher's first publication. It is plausible that individuals that are embedded in the UK will be more aware of, and potentially socialized by, a research evaluation environment where impact has grown in prominence. Thus, with respect to the PhD institution, we created a binary variable equal to 1 if the individuals had earned their PhD from a UK university, and 0 otherwise.

We also included a binary variable *involved in impact case study* set to 1 if the individual had submitted a case study for the REF 2014 for Business and Management (Unit of Assessment 19), and 0 otherwise. We focused on the individual level here, as individual researchers lead the vast majority of impact cases. An analysis of the Business and Management Impact Case Studies submitted in the 2014 REF showed that of the 410 impact statements 54% had only a single contributor highlighted, 29% had two contributors highlighted, 12% had three contributors and 5% had four or more contributors. A review of a subset of the 29% submissions with two contributors suggests that in many cases there was one clear dominant contributor (identified by the outputs being predominantly by that author, or where the project

⁶ As an alternative to this perceptual question, we attempted to obtain the promotion requirements at various universities, but it was extremely difficult as this information was not publicly available.

related to a research grant that contributor was the Principal Investigator (PI)). In addition, of the 17% that had three or more contributors, again there was a clear and dominant project lead (indicated by the outputs being predominantly by that author, where the project related to a research grant that contributor was the PI).

At the level of the institution, we included in the model a variable *size of the institution* corresponding to the organizations' head count as indicated in the business schools' websites.

Finally, we included *area of expertise* dummies to consider any field-specific heterogeneity. This information was based on a survey question where we asked respondents to indicate their primary area of expertise using the subject classifications used in the Academic Journal Guide 2015. This includes 24 discipline areas.

Data analysis

In analysing the data, we took two approaches. First, we examined the decision between 'No publication outputs, but outstanding impact' (coded 0), as opposed to 'Journal of Distinction (4-star) paper, but little or no impact' (coded 1), using a binary logit model. By taking this estimation strategy, we effectively assumed that respondents were answering the question individually as a binary choice.

However, the binary logic does not explicitly capture the sequential nature of the decision making process in choice set. While it is plausible to argue that the initial choice will be taken as a binary process, this will not be the case for later decisions where the outcome considered is contingent on all earlier outcomes. This type of ordered choice is perhaps more aptly termed sequential choice since higher categories of outcomes can only be reached by proceeding through each lower category of outcomes and the decision maker cannot reverse former choices. Thus, in order to

accommodate these sequential decisions of nested alternatives, we also utilised a sequential logit model (Buis (2013) details the applied estimator).

Results

Descriptive statistics of the main and control variables are given in Table 1. As Table 1 shows, the majority of the respondents (66%) were male and a plurality (36%) were Associate Professors. Respondents reported having worked an average of five years outside academia (*non-academic work experience*). Pairwise correlations between the dependent variable *preference for publication* (sequential), the binary *preference for publication* and explanatory variables are also included. As evident from the table, correlations between the two dependent variables are very high (approaching 0.85), whereas correlations between *preference for publication* (sequential) and the explanatory variables are not distinctly high. The full set of correlations is available upon request.

Table 2 reports the means of variables across the different options chosen, i.e., different levels of publication associated to the impact project. The results show that business and management academics have a strong preference for impact. This is somewhat surprising, as impact for the REF could have been claimed if it was associated to a project with a publication *and* this publication was at least of a national level of quality (2*). However, over half of our sample (624 out of 1,246 respondents) had a preference for impact even in the case that such impact would not be ‘claimable’ in terms of a REF impact case in the national research assessment. One explanation for these results is that there was a lack of knowledge among the respondents about the nature of impact for the REF and the requirements for an underpinning publication. This explanation is broadly consistent with research that has shown that only a minority of academic researchers are aware of existence of the

Technology Transfer Office (TTO) at their own institution (Huyghe et al., 2016). However, this potential lack of awareness did not translate into the REF submission process itself, given that for only a very small proportion of impact cases assessed in the REF the underpinning research cited in the submission was not judged to reach an international standard of excellence (Pidd and Broadbent, 2015). Regardless of the specific features of the REF, it is clear that a large share of business and management academics would see significant value in a project with impact, whether or not it is useful in the national research assessment system.

<INSERT RESULTS TABLE 1 ABOUT HERE>

<INSERT RESULTS TABLE 2 ABOUT HERE>

Table 3 reports the results of the logit analysis (Model 1) and of the sequential logit analysis (Model 2). Model 1 predicts respondents' *preference for publication at the first transition*, i.e. preference for a "Journal of Distinction (4-star) paper, but little or no impact" (coded 1) against a project leading to "no publication outputs, but outstanding impact" (coded 0). The results table reports the odds-ratios (OR) of preference for publication against an impactful project. $OR > 1$ and $OR < 1$ indicate that a unit change in the predictors respectively *increases* or *lowers* the odds of choosing a project leading to a highly ranked output (Journal of Distinction (4-star) paper) as opposed to an impactful one (i.e. one with no publications but "outstanding impact").

We then examine the effects of different personal characteristics, starting with academic influence. Overall, we find that there is a positive and statistically significant association between researchers' academic influence and their preference for a high-end publication as opposed to impact ($OR > 1$). These results are consistent with the argument that highly influential academics have a greater 'taste for publishing' in general, and will be unwilling to trade-off impact for a high status

publication. The odds-ratio for scholars published in the upper quartile is substantial with those scholars being above 1 (1.796). Thus, although differences in academics' past research influence appear to play a statistically significant role in shaping researchers' willingness to trade publication outputs for impact, if individuals receive additional age-adjusted citations, the odds that they will chose publications do noticeably change.

Model 1 also shows that researchers at various stages of their career display a different set of preferences for more conventional academic outputs relative to impact. Holding all the other variables at a fixed value, the odds of preferring publications are lower for Associate Professors (*associate professor* = 1) and Lecturers (*lecturer* = 1) compared to the baseline category (*professor*). In terms of percentage change, the odds of preferring publication for Associate Professors are $(1 - 0.626) * 100\% = 37.4\%$ lower than the odds for Professors. The results for Lecturers are similar in term of magnitude. These results suggest that both junior (Lecturers) and mid-career (Associate Professors) faculty have higher preference for documenting and claiming impact than senior faculty (Professors). This might be explained by the fact that for senior staff, there is a greater degree of detachment from national assessment systems, due to security of employment. In contrast, early and mid-career faculty may seek to engage in outreach with non-academic audiences, helping them to make a broader and stronger case for academic promotion.

<INSERT RESULTS TABLE 3 ABOUT HERE>

Model 1 demonstrates that the longer researchers have tenure within their current organizations, and the greater their experience working outside academe, the higher the chances that they will prefer impact versus publications (OR<1).⁷

⁷ We note that the time that a person has worked in their current institution, and the time working

Specifically, the odds-ratio for a one-unit increase in organizational tenure and professional experience are 0.940 and 0.954 indicating that for each additional year individuals have been employed in their current institutions and have worked outside academia the odds of choosing high-end publication decrease by $(1-0.940)*100%=6.0\%$ and $(1-0.954)*100%=4.6\%$ respectively. In the first case, the particular administrative features of the UK's national research assessment system may help to explain the finding. In the REF, impact case studies needed to be based on research undertaken in the home organization and thus were an immobile resource. The evidential requirements of the REF have also favoured individuals with a long tenure within the organization, as an impact case study was based upon research and impact developed in the previous 15 years (REF2014, 2011). In the latter case, professional experience outside academe may reflect that these individuals have greater awareness of industrial problems and conditions than individuals who have worked largely within the academic system. Moreover, individuals with high levels of professional experience will have a richer network of external contacts upon which to draw in order to both develop impactful research projects than individuals without such experience (Lam, 2007). As such, they can draw upon these contacts to not only generate impact from their research, but also to help evidence their impact by securing written testimonials. This idea is consistent with past research in management (Hodgkinson et al., 2001), indicating that considerable barriers that impede the adoption of management research with high practical relevance include the limited availability of researchers who possess the socio-political skills to engage successfully with the wider community of stakeholders.

outside academia have a pairwise correlation 0.078 (significant at the 1% level).

Model 1 also suggests that while intrinsic motivations reduced the preference for publication over impact ($OR < 1$), extrinsic career motivations appear to increase the preference for publication over impact ($OR > 1$). These results suggest that researchers may perceive a publication could enhance their material circumstances compared to impactful work, as publications may be a more effective ‘currency’ for career advancement.

Additionally, Model 1 shows that the preference for impact over publications is enhanced by institutional research status. Specifically, the odds-ratio for a one-unit increase in the Institution Grade Point Average (GPA) calculated from REF is less than 1 (0.995) indicating that the odds of choosing publication decrease as the institution’s research status increases. Further, we examine a variable capturing promotion using the institutional average of two measures related to impact (‘Generating research that leads to substantial impact on policy and practice’ and ‘Building links with practice or policy’). However, we do not find that the institutional promotional criteria have significant effect on an individual’s preference for impact. This result may be due to the fact that other criteria, such as leadership and management roles may be more important criteria for promotion.

Turning to the other variables, we find that women have a higher preference for impact compared with men. We also find that individuals who had obtained a PhD in the UK have a greater taste for impact. Interestingly, participants who had been involved in the submission of impact case studies did not show a strong preference for either outputs or impacts as implied by the insignificant coefficient. We also find that the coefficient on academic age does not affect preferences. Finally, subject area expertise fixed effects (not reported) were insignificant for all binary logit models and the majority of those expertise fixed effects were also insignificant in the sequential

logit model at the at conventional 5% level (with 5 of the 96 possibilities being significant).

Model 2 presents the results of the sequential logit, where we estimate a separate logistic regression for each decision stage and we model the probabilities of choosing publication over impact at each transition. The findings from Table 3 highlight that the critical decision point is at the first stage and that the binomial logit model provides a close first approximation of this choice despite the sequential nature of the data. Following the second transition, the effects of all main variables are not statistically significant indicating that later stages of the choice set are difficult to discern with the information available to the study.

Additional analysis

To explore the findings in greater detail, we ran a range of additional analyses. First, we explored whether our results are sensitive to our operationalization of two of the key variables, *academic influence* and institutional *research status* (see Table 4). In order to examine whether or not our findings are robust to different measures of *academic influence*, we examined a set of alternative measures focusing on Scopus's journal impact ranking, the Source Normalised Impact Factor (SNIP) measure and the Academic Journal Guide 2015 list (Moed, 2010).⁸ In Model 1 (Table 4), we consider the individual's SNIP Journal weighted outputs derived from data from 2008-2012, the last data available prior to the REF process. To obtain an alternative measure of academic influence, in Model 2, we classify the individual outputs based on the journals rating as indicated by the AJG Guide. The journal ratings are provided on a REF 4-point scale with an additional category Journal of Distinction, which is derived from "listed with the highest rating in three of the five non-university based listings"

⁸ Although Scopus provides a number of journal metrics, our preference was to use SNIP as it normalises citations across subject areas and that it does so without relying on classifications of subject areas (Moed, 2010).

(ABS, 2015: 7). We operationalize the measure by adding the Journal of Distinction category as a fifth element to the AJG Guide scale. Overall, the results are qualitatively consistent with our initial measure of academic influence (OR>1).

Second, we examine the sensitivity of the findings to our definition of institutional *research status* using variables derived from the REF. Specifically, in Models 3 and 4 (Table 4), we use the rank of the institutions using the GPA of their impact scores and the GPA derived using the research outputs data. However, in neither case did these variables have an impact on the participant choices. We also explore interactions between the *academic rank* and three identifier variables distinguishing between institutions' ranking in REF 2014 using the overall GPA (Model 5). Specifically, we consider three groups: the 'Top 20' ranked institutions, the institutions in the '21 to 50', and those with GPAs 'Greater than 50'. We take survey participants who were professors in the Top 20 institutions as the reference group. While Associate Professors and Lecturers do not exhibit a statistical difference from Professors within Top 20 institutions, Associate Professors and Lecturers in lower ranked institution have a higher preference for impact (OR<1) compared to the reference category *Professor (Top 20)*.

<INSERT RESULTS TABLE 4 ABOUT HERE>

Third, we examine whether the orientation of researchers or their engagement with non-academics may shape our results. It may be that the choice of impact over publications is driven primarily by an academic's research orientation.⁹ Since we did not include a question about the research orientation or engagement with non-academics on our original survey, we accessed a recent survey of academic engagement undertaken out by Centre for Business Research (CBR) (Hughes et al.,

⁹ We thank one of the reviewers for this suggestion and extension to the paper.

2016).¹⁰ The CBR survey targeted all academics at UK universities and received a 14% response rate. We were able to successfully link 358 individuals across the two surveys, where we had complete responses for both surveys. From the CBR survey, we draw from two questions. The first concerns an individual's research orientation, which was captured by a question on the CBR survey about a respondent's primary research orientation between basic, applied, and basic applied research. The CBR survey also provides a detailed list of engagement channels between the individual and non-academics, covering some 27 different channels (Hughes et al., 2016). To measure breadth of academic engagement with non-academics, we simply count the number of channels of academic engagement reported by the individual. Model 6 reports the results of the analysis with inclusion of these new variables. Overall, as might be expected, the results show that individuals with an applied research orientation are more likely to prefer impact versus publication compared to individuals with a basic research orientation, and that the breadth of academic engagement is associated with a higher likelihood to choose impact over publications. Despite the introduction of these new variables, our initial findings remain reasonably consistent, albeit with lower explanatory power. For example, academic influence, extrinsic motivations and tenure retain their statistical significance and signs. However, we find that the academic rank and institutional status are no longer significant when research orientation and engagement are included in the analysis, indicating that our original results are sensitive to inclusion of control variables for research orientation and engagement. To further probe these, we tried a number of dummy variables for different ranks and institutional status, but found little evidence that rank or status shaped the preference for impact versus publication once research

¹⁰ We are grateful to Cornelia Lawson for making this link possible. During the linking process, we followed our established data protocol, where tokens were used for the linking and then the data were re-incorporated on a file without any personal identifier.

orientation and/or engagement is controlled for within the analysis (available upon request). These non-findings are difficult to interpret, but they are possibly due to the significant reduction in the sample size as a result of the linking, leaving us with few observations for some of these institutional and rank categories.

Discussion and conclusions

The development of the ‘impact agenda’ by the UK government was intended to encourage academics to proactively seek to engage with non-academics to maximize the contribution of their research to society. How academics have responded to the impact agenda, however, remains poorly understood. To help try to shed light on this question, this paper examined the preferences of UK business and management academics towards impact as compared to more conventional academic outcomes. This research was intended to better understand how the preferences of individuals for impact versus publications are shaped by their individual circumstances and institutional contexts.

Overall, it was clear that for most business and management academics, impact was considered more valuable than any level of publication that we offered, indicating a strong preference for impact among our population. One implication of this finding is that impact is highly valued by business and management academics and that they will forgo a significant publication output in order to secure it, if forced to choose. Fundamentally, when the choice of impact is framed against more conventional academic outputs, impact clearly comes out trumps.

Our results show that the preference for impact is lowest among the most influential, extrinsically motivated and senior faculty regardless of whether they were direct contributors of REF impact statements. The highest preference for impact was associated with longer organizational tenure, non-academic work experience and

intrinsic career motivations. The finding that those with greater institutional tenure had a higher relative preference for impact may reflect the administrative features of the REF, with its focus on impact generated over the previous 15 years. It may also arise from shifts in universities' appreciation of the value of impact (Martin, 2011). Furthermore, in general, we found little evidence that the institutional context shaped the preference for impact, although more research-intensive business school faculty had a slightly higher preference for impact. We also found no evidence that the salience of impact in promotion criteria in the local context increased the level of preference for impact. However, the results show some evidence of the penetration of a preference for impact even to junior staff members, suggesting that the impact agenda may have had a socializing effect. Such effects are also consistent with the finding that individuals who obtained their PhD training in the UK, where impact has taken an increasingly prominent role, were likely to value impact more highly than those who have not.

Our research has some implications for the design of national research assessment systems. First, one of the goals of the development of the 'impact agenda' in the UK was to encourage academics to give more attention to external engagement in the design and conduct of their research. Although our study does not directly assess the effectiveness of these policy instruments to shift academic attitudes and behaviours, it does suggest that individual academics are receptive to the call for impact in the sense that they will trade off a significant academic output to achieve it. Indeed, national assessment systems may be 'pushing at an open door', as many academics already have a strong preference for impact over academic outputs. However, among the most influential academics the desire for publications over impact remains, indicating that the 'impact agenda' is more potent for those with

modest publication profiles. Moreover, the highest preference for impact is also among those individuals with high tenure in their organization. This suggests that the rules of the UK's national assessment, with its strong bias towards individuals who remain at their organization during the assessment period, might influence perceptions of the value of impact against other academic outputs.

Second, we found that those academics with the strongest preference for impact over academic outputs are a quite different group than to those who actually submitted impact in the national assessment exercise. In fact, among our sample, we found that those individuals associated to an impact case study in the assessment appear to be fairly indifferent to choosing between impact versus publications. This might suggest that these 'impactful' individuals might have developed the impact without high-powered incentives associated with the national assessment systems, as it emerged as a part of their wider job role. However, this result is preliminary and greater research is required to understand how faculty that were named in REF case studies differ from other faculty in terms of their attitudes and behaviours.

Third, this study opens up the question about whether the current approach to assessing impact in the REF and other national assessment systems could be improved. The Stern Review (2016) has outlined a more expansive notion of impact for the future REF exercises, encompassing a greater domain of activities, such as teaching and social engagement. Although our results do not directly address this issue, it may be that the administrative features of the national assessment may confuse academics about the value and attribution of impact (Penfield et al., 2014). In some cases, individuals may disassociate impact from the research itself, assuming that impact is now a substitute for research outputs, even though the current assessment system is geared to rewarding the societal and economic impact of

research outputs. In other cases, individuals may wish to avoid being entangled in the accounting exercises associated with the REF impact, as this activity is only mandated for at most one in eight faculty and still not considered a primary driver of career success in academic life. Greater research is required to understand how changes in the notions and definitions of impact may shape academic behaviour and attitudes towards the wider ‘pathways to impact’ agenda.

Limitations and future research

There are several limitations to our research approach. First, our initial choice set focuses on the trade-off between a single publication and significant impact. It might have been more productive to frame this question differently, presenting a greater ‘offer’ for publications versus impact. For example, we could have asked individuals about their preferences for a basket of papers against different levels of impact. Future research could seek to develop more refined choice sets, with a wider range of potential options – for both impact and publications – to help better uncover individual preferences.

Second, our analysis is premised on the idea of a trade-off between impact and publications. This idea is consistent with research showing that business and management academics often see engagement as imposing tensions to their identity (Butler et al., 2015). However, it is clear from the wider literature that both impact and publications often go hand-in-hand, as scientific breakthroughs are associated with bursts of industrial applications, such as patents (Azoulay et al., 2009). There is also a long tradition in business and management of ensuring that research is impactful (Starkey and Madan, 2001). In addition, several of our respondents commented that they considered this choice set was too stark. However, we were careful to frame our question in a way that allowed people to express their personal

preferences, and we avoided suggesting that there was a hierarchy between the choices. In our defense, presenting the question as a trade-off may reveal preferences of academics that may be hidden or partially exposed by a question allowing them to have both impact and publications. In particular, given the prevalence of the ‘impact agenda’ in the UK context, there is a danger of social desirability bias if academics are simply asked about the value of impact on its own. Other research designs, which give greater scope for individuals to discuss the tensions and challenges they face when seeking to combine impact and publishing, would be useful. In particular, interviews, ethnographies and case studies might yield many fruitful insights about how these choices unfold in the daily working lives of academics (Butler et al., 2015).

Third, by focusing on the partial trade-off between impact and publications, our set up does not allow us to investigate the concurrence of impact and (high-quality) publications. This may be significant considering the importance that the research assessment system itself placed on publications in its assessment of impact. Although the 2014 REF required that impact cases had to be underpinned by research that was graded as of international standing (or 2*), for a significant share of our respondents impact without a publication was preferable to a leading publication without impact. The consequence of this choice would mean that their impact would not be usable in research assessments like the previous REF, and therefore may have limited immediate utility for themselves and/or their institutions. This suggests that many academics have a strong preference for impact regardless of the particular features of the national research assessment system. The proposed revisions to the definition of impact in a future REF may open up the possibility for inclusion of this type of impact (e.g., without the requirement of underpinning high-quality research), helping align academics’ preferences with the national assessment system. An alternative

interpretation is that many respondents were simply unaware of the previous national assessment rules, and made a misinformed choice. Future research could probe the awareness of the individuals about national research assessment rules to ascertain whether the preference of impact without the potential reward of an impact case study remains high under these circumstances.

Fourth, this study focuses on individual level characteristics, and so it does not consider team-based approaches. In accordance with Stern's recommendation (Stern, 2016: 23) that "(i)nstitutions should be given more flexibility to showcase their interdisciplinary and collaborative impacts by submitting 'institutional' level impact case studies" prospective research could also take into account the characteristics of the team involved in the research and impact. For example, the existence of mixed skills within the academic team, including combining those with experience of work in industry with those with purely academic careers, may help to overcome the trade-offs we have assessed in this paper.

Fifth, since our work is partly based on a cross-sectional survey, we are not able to rule out potential sources of endogeneity. In particular, an individual's attitudes about the value of impact over publications may influence their research pathway, leading to their current publication and employment profile. In addition, since our sample is based on academics in employment at UK business and management departments, it may reflect the hiring preferences of these organizations towards impact-oriented individuals or even the desires of impact-oriented academics to choose to work in this context.

Sixth, our study drew from the concept of impact currently in use in the UK research assessment system. Although this approach helps to ensure a degree of face validity of our choice set for respondents, it is also a limiting factor in our analysis.

There are a broad range of activities that may lead to impact, such as applied research, commercial engagement, advisory roles, consulting etc. and these are not easy to sweep up in an all encompassing term for 'impact'. Future research could seek to disentangle different activities of engagement with external actors and see how academics' value these different efforts against their more traditional academic outputs. In particular, a detailed conjoint analysis of academic preferences with regards to different 'pathways to impact' and publications might yield richer insights into the perceived trade-offs between these aspects of academic job roles.

Finally, our study is based on a survey of academics in a single country and those active in business and management, and this is an important limitation to the generalizability of our findings. It must be said that the UK has been in the forefront of developing research assessment systems, and it has sought to institutionalize their assessment on a recurring cycle, and incorporating impact in its latest round (Hicks 2012). In addition, business and management schools are rife with concerns about the balance between engaging practice and academic contributions. As such, business and management faculty at UK institutions are perhaps 'canaries in the mine' for academics in other contexts where such assessment systems are put in place. However, it is also possible that in other disciplines one would find a different set of factors that shape a preference for impact over publications. Indeed, future research could explore whether the preference for impact is weaker in basic-oriented research fields, such as mathematics, humanities or physics, or stronger in applied ones, such as chemical engineering or health.

Despite its limitations, we hope our study has brought a fresh perspective on the 'bottom-up' perceptions of individual academics about the value of impact against more conventional academic outputs, furthering our understanding of the implications

of national research assessment systems on academic behaviour, and in turn of the implications of academic behaviour on assessment systems. In doing so, we have sought to contribute to a greater understanding of how academics assess the value of impact in their professional practice, and how personal and institutional circumstances may shape this assessment.

References

ABS, 2015. Academic Journal Guide. Chartered Association of Business Schools, London.

Allen, N.J., Meyer, J.P., 1993. Organizational commitment: evidence of career stage effects? *Journal of business research* 26, 49-61.

Azoulay, P., Ding, W., Stuart, T., 2009. The Impact of Academic Patenting on the Rate, Quality and Direction of (Public) Research Output. *The Journal of Industrial Economics* 57, 637-676.

Baum, J.A., 2011. Free-riding on power laws: questioning the validity of the impact factor as a measure of research quality in organization studies. *Organization* 18, 449-466.

Baum, J.A., 2012. The Skewed Few Does “Skew” Signal Quality Among Journals, Articles, and Academics? *Journal of Management Inquiry* 21, 349-354.

Bennis, W.G., O’Toole, J., 2005. How business schools lost their way. *Harvard business review* 83, 96-104.

Bornmann, L., 2013. What is societal impact of research and how can it be assessed? A literature survey. *Journal of the American Society for Information Science and Technology* 64, 217-233.

Buis, M., 2013. SEQLOGIT: Stata module to fit a sequential logit model.

Butler, N., Delaney, H., Spoelstra, S., 2015. Problematizing ‘Relevance’ in the Business School: The Case of Leadership Studies. *British Journal of Management* 26, 731-744.

Clarysse, B., Tartari, V., Salter, A., 2011. The impact of entrepreneurial capacity, experience and organizational support on academic entrepreneurship. *Research Policy* 40, 1084-1093.

Cohen, A., Einav, L., 2007. Estimating Risk Preferences from Deductible Choice. *The American Economic Review* 97, 745-788.

Cohen, W.M., Nelson, R.R., Walsh, J., 2002. Links and Impacts: The Influence of Public Research on Industrial R&D. *Management science* 48, 1-23.

Deci, E.L., Ryan, R.M., 1985. *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.

Deci, E.L., Ryan, R.M., 2000. The " what" and " why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry* 11, 227-268.

Etzkowitz, H., Webster, A., Gebhardt, C., Terra, B., 2000. The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. *Research Policy* 29, 313-330.

Fischer, T., Henkel, J., 2012. Capturing value from innovation—diverging views of R&D and marketing managers. *IEEE Transactions in Engineering Management* 59, 572-584.

Fischer, T., Henkel, J., 2013. Complements and substitutes in profiting from innovation—A choice experimental approach. *Research Policy* 42, 326-339.

Geuna, A., Martin, B.R., 2003. University Research Evaluation and Funding: An International Comparison. *Minerva* 41, 277-304.

Hicks, D., 2012. Performance-based university research funding systems. *Research Policy* 41, 251-261.

Hodgkinson, G.P., Herriot, P., Anderson, N., 2001. Re - aligning the stakeholders in management research: lessons from industrial, work and organizational psychology. *British Journal of Management* 12, S41-S48.

Hodgkinson, G.P., Starkey, K., 2011. Not Simply Returning to the Same Answer Over and Over Again: Reframing Relevance. *British Journal of Management* 22, 355-369.

Hughes, A., Lawson, C., Salter, A., Kitson, M., Bullock, A., Hughes, R.B., 2016. *The Changing State of Knowledge Exchange: UK Academic Interactions with External Organisations 2005 -2015*. NCUB, London.

Huyghe, A., Knockaert, M., Piva, E., Wright, M., 2016. Are researchers deliberately bypassing the technology transfer office? An analysis of TTO awareness. *Small Business Economics* 47, 589-607.

Jacobs, J.A., Winslow, S.E., 2004. Overworked faculty: Job stresses and family demands. *The Annals of the American Academy of Political and Social Science* 596, 104-129.

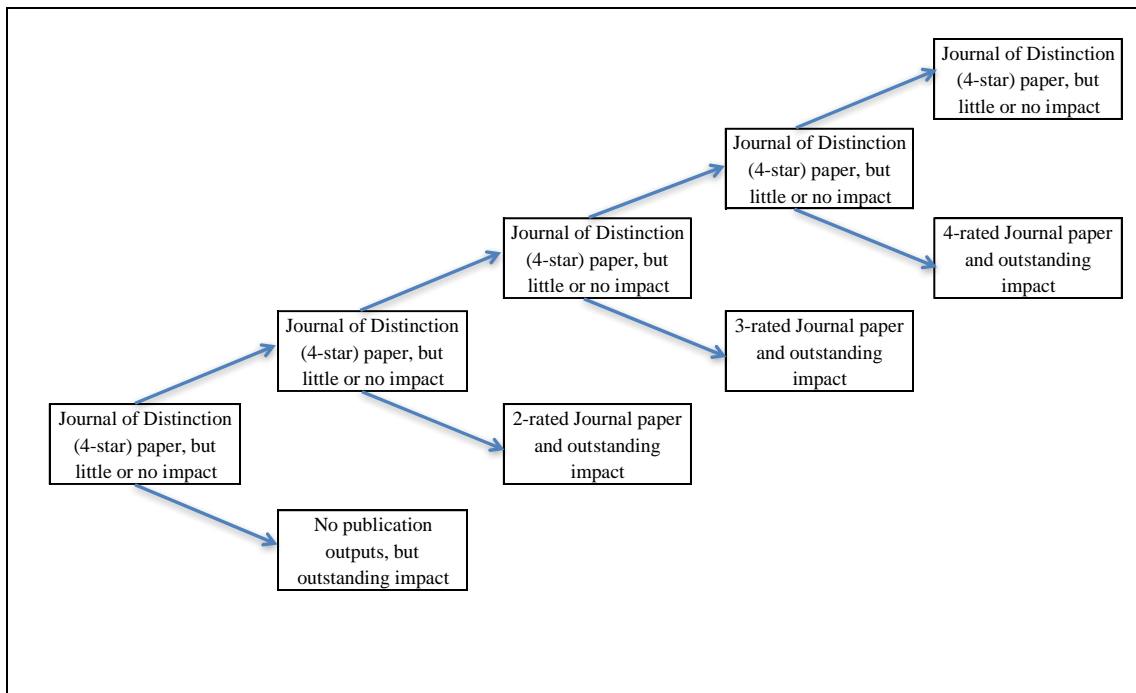
Lam, A., 2007. Knowledge networks and careers: Academic scientists in industry—university links. *Journal of management studies* 44, 993-1016.

Learmonth, M., Lockett, A., Dowd, K., 2012. Promoting Scholarship that Matters: The Uselessness of Useful Research and the Usefulness of Useless Research. *British Journal of Management* 23, 35-44.

- Lin, M.-W., Bozeman, B., 2006. Researchers' industry experience and productivity in university–industry research centers: A “scientific and technical human capital” explanation. *The Journal of Technology Transfer* 31, 269-290.
- Link, A.N., Siegel, D.S., Bozeman, B., 2007. An empirical analysis of the propensity of academics to engage in informal university technology transfer. *Industrial and corporate change* 16, 641-655.
- Martin, B.R., 2011. The Research Excellence Framework and the ‘impact agenda’: are we creating a Frankenstein monster? *Research Evaluation* 20, 247-254.
- Mason, R., 2015. *The Impact of Business School Research: Economic and Social Benefits*. Chartered Association of Business Schools, London.
- Mathieu, J.E., Zajac, D.M., 1990. A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological bulletin* 108, 171.
- Moed, H.F., 2010. Measuring contextual citation impact of scientific journals. *Journal of Informetrics* 4, 265-277.
- Penfield, T., Baker, M., Scobl, R., Wykes, M., 2014. Assessment, evaluations, and definitions of research impact: A review. *Research Evaluation* 23, 21-32.
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D’Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., 2013. Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research Policy* 42, 423-442.
- Pettigrew, A., Starkey, K., 2016. The Legitimacy and Impact of Business Schools—Key Issues and a Research Agenda. *Academy of Management Learning & Education* 15, 649-664.
- Pettigrew, A.M., 2011. Scholarship with impact. *British Journal of Management* 22, 347-354.
- Pidd, M., Broadbent, J., 2015. Business and Management Studies in the 2014 Research Excellence Framework. *British Journal of Management* 26, 569-581.
- Polanyi, M., 2000. The republic of science: Its political and economic theory. *Minerva* 38, 1-21.
- Power, M., 2015. How accounting begins: Object formation and the accretion of infrastructure. *Accounting, Organizations and Society* 47, 43-55.
- RAND, 2015. *Preparing impact submissions for REF 2014: An evaluation: Findings and observations*. RAND Corporation, Santa Monica, CA.
- RCUK, 2015. *Pathways to Impact*. Research Councils UK, Swindon.
- Rebora, G., Turri, M., 2013. The UK and Italian research assessment exercises face to face. *Research Policy* 42, 1657-1666.

- REF2014, 2011. Assessment framework and guidance on submissions.
- Rollag, K., 2004. The impact of relative tenure on newcomer socialization dynamics. *Journal of Organizational Behavior* 25, 853-872.
- Samuel, G.N., Derrick, G.E., 2015. Societal impact evaluation: Exploring evaluator perceptions of the characterization of impact under the REF2014. *Research Evaluation* 24, 229-241.
- Santos-Pinto, L., Bruhin, A., Mata, J., Åstebro, T., 2015. Detecting heterogeneous risk attitudes with mixed gambles. *Theory and Decision* 79, 573-600.
- Sauermann, H., Cohen, W.M., 2010. What makes them tick? Employee motives and firm innovation. *Management science* 56, 2134-2153.
- Sauermann, H., Stephan, P., 2013. Conflicting logics? A multidimensional view of industrial and academic science. *Organization Science* 24, 889-909.
- Schillebeeckx, S., Chaturvedi, S., George, G., King, Z., 2016. What do i want? The effects of individual aspiration and relational capability on collaboration preferences. *Strategic Management Journal* 37, 1493-1506.
- Seglen, P.O., 1992. The skewness of science. *Journal of the American Society for Information Science* 43, 628-638.
- Smith, S., Ward, V., House, A., 2011. 'Impact' in the proposals for the UK's Research Excellence Framework: Shifting the boundaries of academic autonomy. *Research Policy* 40, 1369-1379.
- Starkey, K., Madan, P., 2001. Bridging the relevance gap: Aligning stakeholders in the future of management research. *British Journal of Management* 12, S3-S26.
- Stern, L., 2016. Building on Success and Learning from Experience: An Independent Review of the Research Excellence Framework, in: Department for Business, E.I.S. (Ed.). HMO, London.
- Stern, S., 2004. Do scientists pay to be scientists? *Management science* 50, 835-853.
- Tartari, V., Perkmann, M., Salter, A., 2014. In good company: The influence of peers on industry engagement by academic scientists. *Research Policy* 43, 1189-1203.
- Thomas, H., Wilson, A.D., 2011. 'Physics Envy', Cognitive Legitimacy or Practical Relevance: Dilemmas in the Evolution of Management Research in the UK. *British Journal of Management* 22, 443-456.
- Watermeyer, R., 2014. Issues in the articulation of 'impact': the responses of UK academics to 'impact' as a new measure of research assessment. *Studies in Higher Education*, 39, 359-377.

Figure 1: Decision Sequence across Impact-Journal Trade-off Categories



Note: This information was based on the following survey question:

“The recent Research Excellence Framework (REF) included an assessment of the economic and social impact of research. In this question, we would like to understand your perception of the value of 'impact' against more traditional academic outputs. The question asks you to indicate your personal preference between two projects with different levels of impact and academic outputs.

There is no right or wrong answer. Your choice is simply a statement of your personal preference between the options offered. In assessing 'impact' we draw your attention to the REF definition of impact as "an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia", which was assessed in terms of its 'reach' and 'significance'.

Journal of Distinction (4-star) paper, but little or no impact OR No publication outputs, but outstanding impact
 Journal of Distinction (4-star) paper, but little or no impact OR 2-rated Journal paper and outstanding impact
 Journal of Distinction (4-star) paper, but little or no impact OR 3-rated Journal paper and outstanding impact
 Journal of Distinction (4-star) paper, but little or no impact OR 4-rated Journal paper and outstanding impact”

Table 1. Summary Statistics including pairwise correlations with the Dependent**Variable**

	Mean	Standard Deviation	Min	Max	Pairwise Correlations (Dependent Variable)
Preference for publication (DV - sequential)	2.14	1.35	1	5.00	1.00
Preference for publication (DV - binary)	0.51	0.50	0	1	0.84*
Citations (age adjusted)	2.37	27.38	0	514.30	0.10*
Citations (age adjusted) - Quartile 1	0.09	0.26	0	1.25	-0.05
Citations (age adjusted) - Quartile 2	0.71	1.34	1.25	4.88	-0.04
Citations (age adjusted) - Quartile 3	2.17	4.01	4.88	14.42	0.02
Citations (age adjusted) - Quartile 4	10.45	28.20	14.4	514.30	0.10*
SNIP weighted outputs over REF period (age adjusted)	0.56	0.78	0	17.23	0.16*
SNIP weighted outputs over REF period (age adjusted) - Quartile 1	0.02	0.07	0	0.32	-0.07*
SNIP weighted outputs over REF period (age adjusted) - Quartile 2	0.14	0.25	0.32	0.80	-0.07*
SNIP weighted outputs over REF period (age adjusted) - Quartile 3	0.27	0.49	0.80	1.46	0.01
SNIP weighted outputs over REF period (age adjusted) - Quartile 4	0.66	1.51	1.46	28.87	0.15*
Academic Journal Guide Classification (age adjusted)	2.32	2.75	0	57.20	0.16*
Academic Journal Guide Classification (age adjusted) - Quartile 1	0.06	0.16	0	0.75	-0.19*
Academic Journal Guide Classification (age adjusted) - Quartile 2	0.31	0.57	0.75	1.75	-0.10*
Academic Journal Guide Classification (age adjusted) - Quartile 3	0.59	1.05	1.75	3.11	0.62*
Academic Journal Guide Classification (age adjusted) - Quartile 4	1.35	3.03	3.11	57.20	*-0.15
Professor	0.34	0.47	0	1	0.10*
Associate Professor	0.36	0.48	0	1	-0.11*
Lecturer	0.30	0.46	0	1	0.01
Organisational tenure	6.09	3.49	0	10	-0.13*
Non-academic work experience	4.98	6.44	0	35	-0.18*
Career Motivations (Intrinsic)	4.49	0.55	1	5	-0.13*
Career Motivations (Extrinsic)	3.83	0.71	1	5	0.03
Gender (Male=1)	0.66	0.47	0	1	0.15*
Academic age	12.54	8.82	0	45	0.01
Obtained PhD in the UK	0.71	0.45	0	1	-0.10*
Author of Impact Case in REF 2014	0.07	0.25	0	1	-0.05
Basic research	0.26	0.44	0	1	-0.14*
User-applied basic research	0.40	0.48	0	1	0.10
Applied	0.34	0.34	0	1	0.01
Engagement	7.71	5.40	0	27	-0.10*
Overall Rank of Institution in REF 2014	34.93	24.39	1	101	-0.15*
Impact Rank of Institution in REF 2014	35.37	23.66	1	101	-0.16*
Output Rank of Institution in REF 2014	33.17	24.98	1	101	-0.13*
Size of the institution (Head count)	118.52	58.99	1	323	0.01
Promotion at institutional level	0.04	0.05	0	1	-0.07*
Accounting	0.07	0.25	0	1	0.03
Business History and Economic History	0.01	0.11	0	1	-0.02
Economics, Econometrics and Statistics	0.12	0.32	0	1	-0.02
Entrepreneurship and Small Business Management	0.04	0.19	0	1	0.11*
Finance	0.08	0.28	0	1	-0.01
General Management, Ethics and Social Responsibility	0.03	0.16	0	1	0.10*
Human Resource Management and Employment Studies	0.09	0.29	0	1	-0.01
Information Management	0.04	0.20	0	1	-0.09*
Innovation	0.03	0.17	0	1	-0.05
International Business and Area Studies	0.03	0.18	0	1	-0.04
Management Development and Education	0.01	0.11	0	1	0.03
Marketing	0.11	0.31	0	1	-0.06*
Operations and Technology	0.04	0.20	0	1	-0.01
Operations Research and Management Science	0.04	0.20	0	1	0.01
Organisation Studies	0.07	0.25	0	1	-0.02
Psychology (General)	0.01	0.12	0	1	-0.02
Psychology (Organisational)	0.04	0.19	0	1	0.00
Public Sector and Health Care	0.02	0.13	0	1	0.03
Regional Studies, Planning, Environment	0.01	0.09	0	1	-0.05
Sector Studies (includes Leisure and Tourism)	0.02	0.13	0	1	0.00
Social Sciences (e.g. sociology, political science, etc.)	0.04	0.19	0	1	-0.06*
Strategy	0.04	0.20	0	1	0.02
Other	0.01	0.12	0	1	0.07*
None	0.01	0.07	0	1	-0.04

Note: * indicates significant at the 5% level of significance

Table 2: Means of variables across Impact-Journal Trade-off Categories

	1	2	3	4	5
	No publication outputs, but outstanding impact	2-rated Journal paper & outstanding impact	3-rated Journal paper & outstanding impact	4-rated Journal paper & outstanding impact	Journal of Distinction (4-star) paper, but little or no impact
Citations (age adjusted)	10.65	15.45	16.35	16.15	19.17
SNIP weighted outputs over REF period (age adjusted)	5.06	7.19	8.27	8.09	9.19
Academic Journal Guide Classification (age adjusted)	1.89	2.35	2.90	2.84	2.95
Professor	0.29	0.34	0.41	0.35	0.46
Associate Professor	0.41	0.38	0.27	0.30	0.29
Lecturer	0.30	0.28	0.32	0.35	0.25
Organisational tenure	6.55	6.03	5.48	5.38	5.70
Non-academic work experience	6.14	4.49	4.04	2.88	3.84
Career Motivations (Intrinsic)	4.55	4.48	4.45	4.42	4.32
Career Motivations (Extrinsic)	3.80	3.87	3.91	3.82	3.84
Gender (Male=1)	0.61	0.61	0.66	0.78	0.84
Academic age	12.58	12.06	12.73	11.90	13.81
Obtained PhD in the UK	0.75	0.71	0.69	0.62	0.65
Author of Impact Case in REF 2014	0.08	0.05	0.07	0.06	0.03
Overall Rank of Institution in REF 2014	37.52	39.48	31.45	28.04	29.19
Size of the institution (Head count)	118.42	120.00	114.00	124.43	116.15
Promotion at institutional level	0.06	0.06	0.06	0.05	0.06
N	624	163	205	163	91

Table 3: Logit and Sequential Logit Estimates (odds-ratios reported) – dependent variable: preference for publication

Variable Name	Measurement	1		2							
		Logit		Sequential Logit							
		No publication outputs, but outstanding impact		No publication outputs, but outstanding impact		2-rated Journal paper & outstanding impact		3-rated Journal paper & outstanding impact		4-rated Journal paper & outstanding impact	
		Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat
Academic Influence	Citations (age adjusted) - Quartile 2	1.252	(1.29)	1.246	(1.27)	1.161	(0.50)	1.504	(1.26)	1.504	(1.26)
(Ref. Quartile 1)	Citations (age adjusted) - Quartile 3	1.496 **	(2.12)	1.513 **	(2.18)	1.673 *	(1.64)	0.701	(1.07)	0.701	(1.07)
	Citations (age adjusted) - Quartile 4	1.796 **	(2.62)	1.793 **	(2.63)	2.247 **	(2.28)	1.238	(0.58)	1.238	(0.58)
Academic Rank	Associate Professor	0.635 ***	(2.58)	0.628 ***	(2.67)	0.864	(0.53)	1.069	(0.22)	1.069	(0.22)
(Ref. Professor)	Lecturer	0.670 **	(1.97)	0.697 **	(1.70)	1.486	(1.09)	0.853	(0.42)	0.853	(0.42)
Organisational Tenure	Organisational tenure	0.937 ***	(3.35)	0.937 ***	(3.31)	0.966	(1.11)	1.008	(0.24)	1.008	(0.24)
Non-Academic Work Experience	Non-academic work experience	0.955 ***	(4.11)	0.955 ***	(4.09)	0.995	(0.27)	0.985	(0.79)	0.985	(0.79)
Career Motivations	Intrinsic	0.610 ***	(3.98)	0.611 ***	(3.99)	0.745	(1.50)	0.888	(0.59)	0.888	(0.59)
(Intrinsic and Extrinsic)	Extrinsic	1.331 ***	(3.09)	1.339 ***	(3.17)	1.162	(0.99)	0.916	(0.54)	0.916	(0.54)
Gender	Gender (Male=1)	1.343 ***	(2.22)	1.343 ***	(2.22)	1.566 **	(2.05)	1.965 ***	(2.80)	1.965	(2.80)
Academic age	Date from first publication	0.986	(1.57)	0.986	(1.58)	1.003	(0.20)	0.996	(0.24)	0.996	(0.24)
Obtained PhD in the UK	UK	0.756 **	(1.93)	0.754 **	(1.96)	0.789	(1.05)	0.732	(1.31)	0.732	(1.31)
Impact Case	Involved in an Impact study in REF 2014	0.634	(1.74)	0.622 *	(1.84)	1.174	(0.35)	0.754	(0.62)	0.754	(0.62)
Institutional Environment	Overall Rank of Institution in REF 2014	0.996 *	(1.38)	0.996 **	(1.52)	0.987 ***	(2.87)	0.998	(0.42)	0.998	(0.42)
	Promotion at institutional level	0.396	(0.63)	0.420	(0.59)	0.087	(1.00)	0.009	(1.60)	0.009	(1.60)
	Size of the institution (Head count)	1.000	(0.41)	0.999	(0.53)	0.996 **	(2.04)	1.000	(0.08)	1.000	(0.08)
	Constant	8.624 ***	(2.96)	7.187 ***	(2.74)	6.770 ***	(1.71)	6.770	(0.85)	0.582	(0.32)
Area		YES		YES		YES		YES		YES	
N		1,246		1,246							
Pseudo R ²		0.092									
Log likelihood		-783.9		-1547.6							

Notes: z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1. OR>1 indicate preference for publication.

Table 4: Logit Estimates (odds ratios reported) – dependent variable: preference for publication

Variable Name	Measurement	1		2		3		4		5		6				
		Academic Productivity		Academic Productivity		Impact Rank		Output Rank		Interactions of Academic & Institutional Rank		Research Orientation & Engagement				
		(SNIP)		(AJG)		in REF 2014		in REF 2014								
		Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat			
Academic Influence (Ref. Quartile 1)	Citations (age adjusted) - Quartile 2											1.860	*	(1.71)		
	Citations (age adjusted) - Quartile 3											2.211	**	(1.97)		
	Citations (age adjusted) - Quartile 4											3.294	**	(2.49)		
	SNIP weighted outputs over REF period (age adjusted) - Quartile 2	0.920		(0.93)												
SNIP weighted outputs over REF period (age adjusted) - Quartile 3	1.740	*	(1.71)													
SNIP weighted outputs over REF period (age adjusted) - Quartile 4	4.020	***	(3.94)													
Academic Journal Guide (age adjusted) - Quartile 2				1.224		(1.14)		1.249		(1.25)	1.222		(1.13)	1.207		(1.05)
Academic Journal Guide (age adjusted) - Quartile 3				1.611	***	(2.58)		1.648	***	(2.69)	1.599	***	(2.54)	1.605	***	(2.52)
Academic Journal Guide (age adjusted) - Quartile 4				2.324	***	(4.04)		2.422	***	(4.24)	2.299	***	(4.01)	2.300	***	(4.00)
Academic Rank (Ref. Professor)	Associate Professor	0.674	**	(2.28)	0.678	**	(2.24)	0.680	**	(2.22)	0.678	**	(2.23)			
	Lecturer	0.740	**	(1.98)	0.750	*	(1.91)	0.763	**	(1.93)	0.747	*	(1.93)			
Academic/ Institutional Rank (Ref. Professor Top 20)	Professor (20-50)										0.635		(1.50)	0.778		(0.54)
	Professor (50>)										0.503		(1.43)	0.709		(0.53)
	Associate Professor (Top 20)										0.659		(1.63)	0.882		(0.19)
	Associate Professor (20-50)										0.461	**	(2.46)	0.504		(1.11)
	Associate Professor (50>)										0.335	**	(2.29)	0.456		(0.87)
	Lecturer (Top 20)										0.769		(0.98)	0.593		(0.81)
	Lecturer (20-50)										0.465	**	(2.21)	0.466		(0.61)
	Lecturer (50-)										0.374	**	(1.99)	0.669		(0.22)
Research Orientation (Ref. Basic Research)	User-applied basic research													0.933	**	(2.14)
	Applied													0.502	**	(2.97)
Engagement	Engagement													0.435	**	(2.51)
Organisational tenure	Organisational tenure	0.948	***	(2.71)	0.945	***	(2.87)	0.947	***	(2.78)	0.948	***	(2.73)	0.946	***	(2.79)
Non-academic work experience	Non-academic work experience	0.959	***	(3.67)	0.957	***	(3.91)	0.959	***	(3.74)	0.960	***	(3.65)	0.959	***	(3.69)
Career Motivations (Intrinsic and Extrinsic)	Intrinsic	0.621	***	(3.80)	0.620	***	(3.87)	0.629	***	(3.72)	0.621	***	(3.79)	0.634	***	(3.65)
	Extrinsic	1.317	***	(2.96)	1.313	***	(2.95)	1.300	***	(2.84)	1.312	***	(2.91)	1.304	***	(2.84)
Gender	Gender (Male=1)	1.323	***	(2.09)	1.332	**	(2.16)	1.306	**	(1.99)	1.306	**	(1.99)	1.323	**	(2.05)
Academic age	Date from first publication	0.988		(1.41)	0.988		(1.36)	0.989		(1.29)	0.988		(1.40)	0.988		(1.34)
Obtained PhD in the UK	UK	0.766	*	(1.83)	0.735	**	(2.13)	0.754	*	(1.94)	0.767	*	(1.82)	0.770	*	(1.78)
Impact Case	Involved in an Impact study in REF 2014	0.607	*	(1.92)	0.654	*	(1.66)	0.605	*	(1.93)	0.604	*	(1.95)	0.611	*	(1.90)
Institutional Environment	Output Rank of Institution in REF 2014	0.997		(1.03)	0.996		(1.38)						1.008		(1.05)	0.999
	Impact Rank of Institution in REF 2014							0.999		(0.28)						
	Research Output Rank of Institution in REF 2014										0.996		(1.32)			
	Institutional Promotion criteria	0.331		(0.77)	0.196		(1.12)	0.214		(1.04)	0.304		(0.83)	0.212		(1.07)
	Size of the institution (Head count)	0.999		(0.53)	0.999		(1.19)	0.999		(0.43)	0.999		(0.49)	0.999		(1.05)
	Constant	7.435	***	(2.74)	6.885	***	(2.64)	6.184	***	(2.48)	7.068	***	(2.68)	6.825	**	(2.58)
Area	Fixed effects for primary area of expertise	YES			YES			YES			YES			YES		
N		1,246			1,246			1,246			1,246			358		
Pseudo R ²		0.099			0.096			0.099			0.100			0.150		
Log likelihood		-777.9			-778.0			-778.5			-777.7			-776.1		

Notes: z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1. OR>1 indicate preference for publication