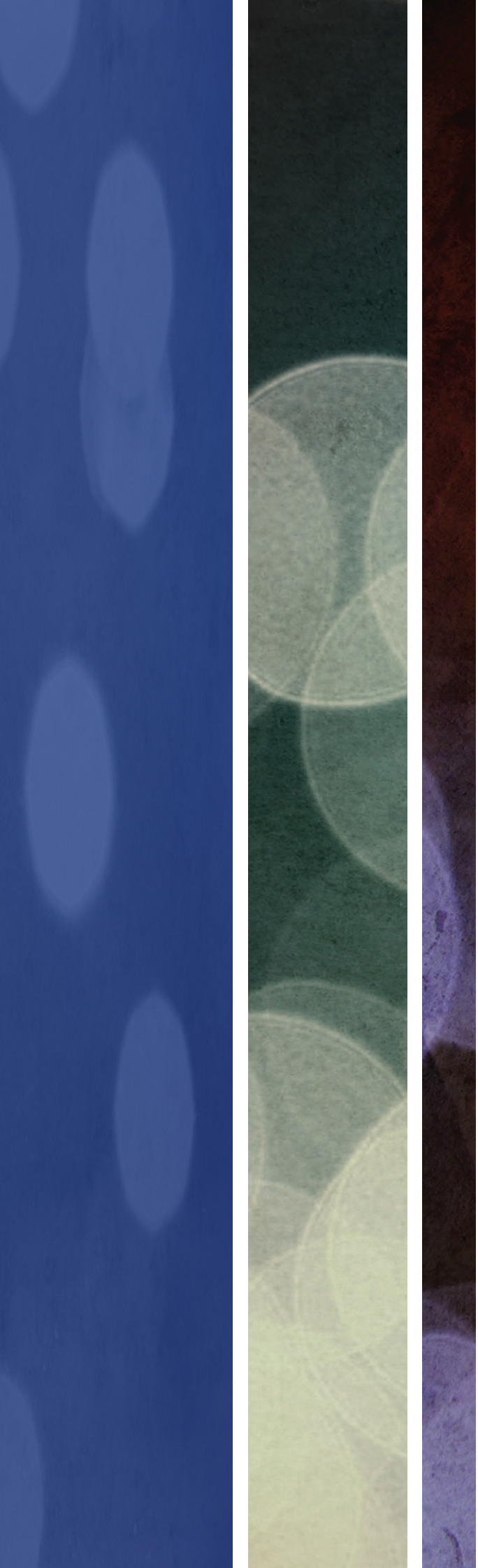

Australian and New Zealand
Academy of Management

Australian and New Zealand Academy of Management Research Productivity Survey Report 2008–2010

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Australian and New Zealand Academy of Management (ANZAM)
Research Productivity Survey Report 2008–2010

Peter J. Jordan, Ross L. Chapman, Martin Grimmer, & Anne M. H. Christie

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Foreword from the President of ANZAM

The Australian and New Zealand Academy of Management (ANZAM) has a long history of providing service to its members through its support of research in Australia and New Zealand. While many associate ANZAM with the Annual Conference, there are a range of initiatives that ANZAM funds on an annual basis including special interest groups, a number of doctoral consortiums each year and providing awards for research. ANZAM also sponsored the start of the Business Academic Research Directors Network (BARDsNET), which is now under the auspices of the Australian Business Deans Council (ABDC). This report is part of the continuing tradition of ANZAM providing support for and rewarding excellence in Management research.

ANZAM has been at the forefront of assisting Management academics in understanding research in Australia and New Zealand. Indeed, the current Journal Rankings exercise by the Australian Business Deans Council was initially started by ANZAM in 2005 when Professor Geoffrey Soutar, Professor Liz Fulop and Professor John Brocklesby produced a report on senior Management academics' perceptions of Management journals.

The ANZAM Research Productivity Report 2008–2010 continues a practice which ANZAM commenced in 2002 with the publication of Professor Geoffrey Soutar's report on research productivity across the Management disciplines in Australia and New Zealand covering the years 1997–1999. This first foray into examining research in the field comprised just 11 pages and, while based on a relatively small sample, was a starting point for ANZAM to provide this information to its members. The success of this first report was followed in 2005 by a further publication by Professor Geoffrey Soutar covering the years 2000–2002. That report, while only 13 pages, was used broadly in Management schools and departments for a range of purposes, from supporting promotion applications to establishing standards for research output.

In putting this current report together, I wish to thank first the heads of schools/departments of Management for the service they have provided to the discipline by providing the data for this report. Clearly, this was an additional task that busy heads could easily have ignored, but we have been delighted with their response to this initiative. I would also like to thank the ANZAM Board for supporting this initiative and Professor Peter Jordan, Professor Ross Chapman, Associate Professor Martin Grimmer and Dr Anne Christie for the work they have put into collecting and analysing the data and preparing this report.

I commend this report to the membership of ANZAM and I look forward to seeing you all at future ANZAM conferences and events.

Associate Professor Bruce Gurd
ANZAM President, 2013

Introduction

The research productivity of academics has been the focus of much attention in recent years, and has resulted in governments developing schemes to assess this, from the Performance-Based Research Fund (PBRF) in New Zealand, to the Excellence in Research for Australia (ERA) Initiative in Australia, and the Research Assessment Exercise (RAE) in the UK. The central concern of each of these measurement schemes has been to understand academic research productivity, to encourage a focus on quality in academic publishing, and to provide governments with a measure of their return on investment. Each of these programs has also enabled some benchmarking between institutions and countries in the sector. While these studies have provided a unique insight into the publication output of individual researchers or groups of researchers within institutions, each has been developed with a different focus (e.g., individuals under the RAE and disciplines within a university under ERA) and each has used different procedures to collect the data (individual submissions to university submissions). This makes direct comparisons from these data problematic.

The aim of this report is to examine the research productivity of Australian academics working within Managements schools/departments between 2008 and 2010. This report differs from other reports on research productivity because it focuses at a discipline level (broader than the 1503 Field of Research Code used by the Australian federal government) across the sector, rather than at the institutional level. The report is more detailed than collections like ERA or the PBRF as it combines a number of issues such as total research output, journal quality, research supervision, specific grant activity and workload allocations.

Previous Research into Academic Research Productivity

Concern over research productivity has been the subject of numerous research studies, beginning as far back as the early 1950s. These early studies tended to focus on the natural sciences and were limited to U.S. universities. Fox (1985) contains a very good review of these early studies. Several studies have been undertaken to compare academic research productivity between disciplines and between countries; however, differences in time allocations, reward and recognition structures and in the adopted measures of research productivity themselves have made such comparisons very difficult. Teodorescu (2000) summarised the issues and outcomes of many of these studies in his attempt to analyse cross-national research productivity variations. His study examined randomly selected samples of academics from research-intensive universities in 10 countries. In total, around 11,500 full-time academics provided self-reported publication data over a three-year period and answered a range of questions based on previously examined research productivity factors. Teodorescu's (2000) article reported on the power of a range of individual and institutional variables to explain the variation in publication productivity. Relevant findings of this study included the following:

- wide variances exist between the variables that affect publication productivity between the different countries studied;
- academic rank correlated positively with publication productivity only among British and Australian scholars;
- time spent on teaching does not negatively affect publication productivity (only Japan deviated from this pattern);
- weekly time spent on administration also did not seem to negatively affect publication productivity (in fact, in Hong Kong, higher administration loads were positively correlated with higher article productivity); and
- staying connected to a "mother discipline" either through professional association membership or attendance at annual meetings emerged as an important correlate of article productivity in each of the 10 countries considered.

More recent studies have focused on motivational aspects of research productivity, and a number of these studies have examined the intrinsic and extrinsic motivational factors for academic research productivity in business schools. In contrast to Teodorescu's (2000) findings, Chen, Gupta, and Hoshower (2006) summarised a number of research productivity studies between 1990 and 2006 as identifying the following factors that affect publication productivity: (i) tenure status; (ii) the allocation of working time to research activities; (iii) length of the tenure probationary period; (iv) teaching loads; and (v) financial research support. Their study of 320 U.S. business academics in 10 mid-Western universities found on average that academics spent 29% of their time on research, and found average annual research outputs (based on unweighted participation in a publication) as follows:

- Books 0.12
- Book chapters of cases 0.23
- Journal articles 1.43
- Grants USD$9,310

Using expectancy theory analysis, Chen et al. (2006) found research productivity was: (i) positively related to tenure status; (ii) negatively related to years in academe; and (iii) positively related to the percentage of working time an academic allocates to research activities.

In a study of U.S. Business schools that compared Management academics with those working in the field of Management Information Systems (MIS), Hotard et al. (2004) found average annual publication outputs of 1.26 and 0.90 peer-reviewed journal articles for Management and MIS academics respectively. The study also found differences between the disciplines in terms of average teaching load and motivations to achieve publication output.

A recent cross-disciplinary research productivity study (Hardré, Beesley, Miller, & Pace, 2011) of 721 academics in 28 U.S. universities used the following measure of productivity: the total of authored or

co-authored peer-reviewed research publications plus national or international conference presentations over the last three years. Their study found mean outputs for the various academic ranks (across the three-year period) as follows: Full Professor, 18.2 outputs; Associate Professor, 15.0 outputs; and Assistant Professor, 15.1 outputs. This study used structural equation modelling to examine the impact of various factors on research productivity and concluded that research effort and institutional valuing and rewarding of research correlated positively with improved productivity, while teaching load related negatively to research productivity.

In summary, while there has been considerable investigation of academic research productivity, much of this has focused on U.S. universities and only a handful of these studies have focused on Business schools. Most studies have used self-reported outputs collected through surveys sent directly to individual academics. Because of the differing output measures included and the variation in both university classification and individual academics surveyed, the research that has been conducted is difficult to compare. There are some broad observations that can be made on these studies and the first is the variability between countries. Clearly, context has an impact on how academics produce research, and on how much research they produce. Very few studies have examined any quality measures concerning the research outputs, with most U.S. studies incorporating journal publications and conference presentations.

Given the increasing attention being directed at research productivity generally in universities, and in particular the issues of quality research output in Business schools as highlighted in the recent ERA outcomes in Australia and the PBRF outcomes in New Zealand, it is timely to undertake an analysis of research productivity within the Management academy. Previous investigations into academic research productivity suggested such a study should focus on a single region, and would need to consider both issues of quality and issues of workload allocation in relation to academic research output.

The ANZAM Research Productivity Survey

The foundations for the 2008–2010 ANZAM Research Productivity Survey came from ANZAM's first foray into examining research productivity, the 2002 research productivity report (Soutar, 2002), which covered the years 1997–1999. Interest in that report resulted in a follow-up report on research productivity, which was also funded by ANZAM. Professor Soutar's 2005 report covered the years 2000–2002 (Soutar, 2005) and has been used in Management schools across Australia and New Zealand for a range of activities from benchmarking to assisting academics in applications for promotion. The original 2002 survey was based on 226 academics (Soutar, 2002). The 2005 report was based on a sample of 428 academics (Soutar, 2005), while our current study is based on a maximum of 599 academics in 2010 (and 1624 data points over three years).

The data used in this report is based on the Australian Government's Higher Education Research Data Collection (HERDC), which is provided annually by universities to the Australian federal government. Heads of schools/departments of Management or their equivalent within Business schools were asked

to provide the data on de-identified individual Management academics. Thus, the survey is different to many previously reported studies that used self-reported publication data. The data were de-identified when collected and were aggregated into a single data file upon receipt to maintain the privacy of individual respondents. The research was conducted under an approved research protocol obtained from Griffith University (EHR/23/12/HREC).

The ANZAM Research Productivity Survey and Excellence in Research Australia

The ANZAM Research Productivity Survey is not intended to replace, but rather to complement, other data collection exercises such as the ERA or the PBRF, by providing a greater depth of information within a specific discipline. For instance, while ERA is focused on assessment of research outputs against a world standard, the ANZAM collection examines total research output across academic levels. The ANZAM survey also captures other data that is important to academic managers and Business schools, but which may not be relevant to policy makers, such as research workloads and Higher Degree by Research (HDR) supervisory load.

We also want to recognise that this report does not capture activity in the sector. We know that A*-rated journals on average are accepting less than 10% of submissions, with the acceptance rate raising slightly in A, B and C-rated journals. We also acknowledge that the data we report in relation to research grants does not capture activity in the sector. Examining Australian Research Council (ARC) grants, we know the average success rate for discovery grants is around 22% and for linkage grants is around 45%. Finally in supervisions, we are clear that no research supervision is the same and that some HDR students require massive amounts of work for the supervising academics, while others are relatively easy to supervise. In this report we do not capture these data and we do not seek to quantify activity in the sector. Our focus is on productivity and therefore we only focus on successful outcomes in each of these fields of activity.

Recommendations on Use of the ANZAM Research Productivity Report

We note that this report is based on a representative sample of the sector, and on this basis we do not provide a detailed analysis at lower units of analysis (school, department, university type). Although this report may be used for broad comparisons for individual academics and Management schools/departments, it should not be used for fine-level policy development in relation to expectations and workloads. Variations we have noticed that may affect how these data can be interpreted include:

- differences in research workload allocation between universities;
- differences in professional experience within academic levels;
- differences between academic levels;
- differences in grant activity between universities and between academic levels;
- differences in supervision loads between universities and between academic levels;

- differences in the quality of papers between individual academics;
- trends between the years 2008 and 2010, and changes between this report and previous research productivity reports produced by ANZAM, which mean that output is constantly changing;
- research-related output/contributions that are not counted in this collection including editorships, editorial board membership, and ad hoc reviewing;
- impact across the sector including consultancies and broader reports (which are noted in this report in the "other publications" category, but not recorded as contributing to a HERDC point); and
- anecdotal evidence that the HERDC allocation of equal authorship to papers is not the way in which the sector works and that generally in most publications there is differential contribution to outputs.

On this basis, we recommend that this report not be used to establish a one-size-fits-all policy on research output across Australian universities. What this report does provide, however, is a good snapshot of academic research output during the period 2008–2010 and an indication of how research output within the sector is changing.

The ANZAM Research Productivity Survey

The Survey

The ANZAM Research Productivity Survey was developed in 2011 (Appendix A). The survey mirrors information reported in the 2002 and 2005 ANZAM research productivity reports (Soutar, 2002, 2005), but includes additional information that was seen as being useful to Management school/department administrators today. The survey was developed as a spreadsheet to enable the majority of the data collected to be cut and pasted from existing reports and collections held within Management schools/departments for both university reporting and Australian federal government reporting. In developing this survey, we received advice from current heads of schools/departments of Management and Business schools regarding useful information to assist in making decisions. The survey was discussed at both Institutional Member meetings of ANZAM and the new Heads of Schools of Management Network that commenced in 2010 as an ANZAM initiative. The survey covers the years 2008–2010 and focuses on the broader Management discipline.

Procedure

The initial survey (Appendix A) was emailed to approximately 40 Business schools / heads of schools / Institutional Member representatives on 7 December 2011. The first survey was returned in February 2012 and the last survey was received in April 2013. In completing the surveys, academic managers were asked to incorporate all academic staff, whether teaching, service or research focused. Where schools included disciplines other than Management, respondents were asked to report only Management academics and identify their main area of Management using the listing of continuing ANZAM Conference Tracks (Appendix B).

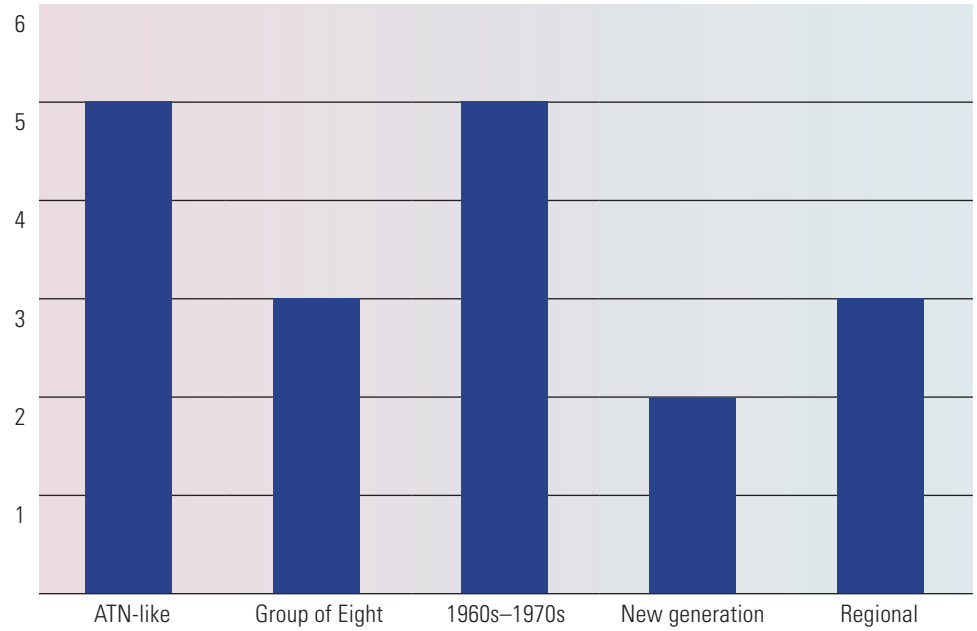
In determining the sample for this data collection, the research team decided not to survey New Zealand institutions. We were informed that at the time we were collecting data, New Zealand universities were in the process of their research quality exercise, the Performance Based Research Framework (PBRF). The advice the research team was given from deans of Business schools and heads of Management schools/departments in New Zealand was that sending this survey would add more stress to our trans-Tasman colleagues. We also note that the New Zealand PBRF collects data in a very different way and that the effort in data discovery to produce this report would put additional strain on heads of schools/departments in New Zealand. Based on this advice, we decided not to include New Zealand institutions for this report.

Sample

In total, we received returns from 18 separate schools or departments in universities ranging from large metropolitan to smaller and regionally focused . Figure 1 outlines the range of universities that provided the data for this report. To provide a picture of our sample we have used Moodie's (2012)

categorisation of the Australian university sector (see Appendix C). In our sample, we received responses from 3 out of 8 Go8 universities, 5 of the 6 ATN-like universities, 5 of the 1960s–1970s universities, 2 of the new generation universities, and 3 of the 10 regional universities. On this basis, we see the data in this report as broadly representative of the university sector.

Figure 1 Submissions by University Type



In total, we received data for 490 academics in 2008, 535 in 2009 and 599 in 2010. We removed 7 cases from each of the years in which the data on academic level were not correctly entered, leaving a sample of 483 in 2008, 528 in 2009 and 592 in 2010.

In Table 1 we provide the highest qualification in line with the Australian Qualifications Framework (AQF) achieved by our sample. The data provided covers each of the 2008, 2009 and 2010 returns. When examining averages over the three-year sample period for research output we provide both the number of data points (total sample over the three years) and the sample for each year. Based on our 2010 sample, we found 84.3% of academic staff as PhD qualified. This contrasts with the previous ANZAM Research Productivity Report 2000–2002, where only 63% of academic staff had a PhD (Soutar, 2005), and the 1997–1999 report, where only 59% of faculty held a PhD (Soutar, 2002).

In contrast to our current study, where 10.9% of our sample reported a Masters degree as their highest qualification, approximately 35% of faculty reported a Masters degree as their highest qualification between 1997 and 1999 (Soutar, 2002), and 29% of faculty in the 2000–2002 report (Soutar, 2005). Based on these data, the increasing requirement within Business schools to employ academically qualified faculty to address professional performance standards is clear.

Table 1 Highest Academic Qualification 2008, 2009, 2010

Qualifications	2008	%	2009	%	2010	%
Not provided	9	1.9	10	1.9	2	0.3
AQF Level 6 (Adv Diploma)	4	0.8	4	0.8	4	0.7
AQF Level 7 (Bachelors)	4	0.8	4	0.8	4	0.7
AQF Level 8 (Hons / Grad Dip)	13	2.7	17	3.2	20	3.4
AQF Level 9 (Masters)	51	10.6	65	12.3	63	10.9
AQF Level 10 (PhD)	402	83.2	428	81.1	499	84.3
Total	**483**	**100.0**	**528**	**100.0**	**592**	**100.0**

Table 2 lists the sample for each academic level for 2008, 2009 and 2010. The spread of the sample broadly replicates the distribution of academics in the sector, suggesting that we have a representative sample based on the levels within Management schools/departments.

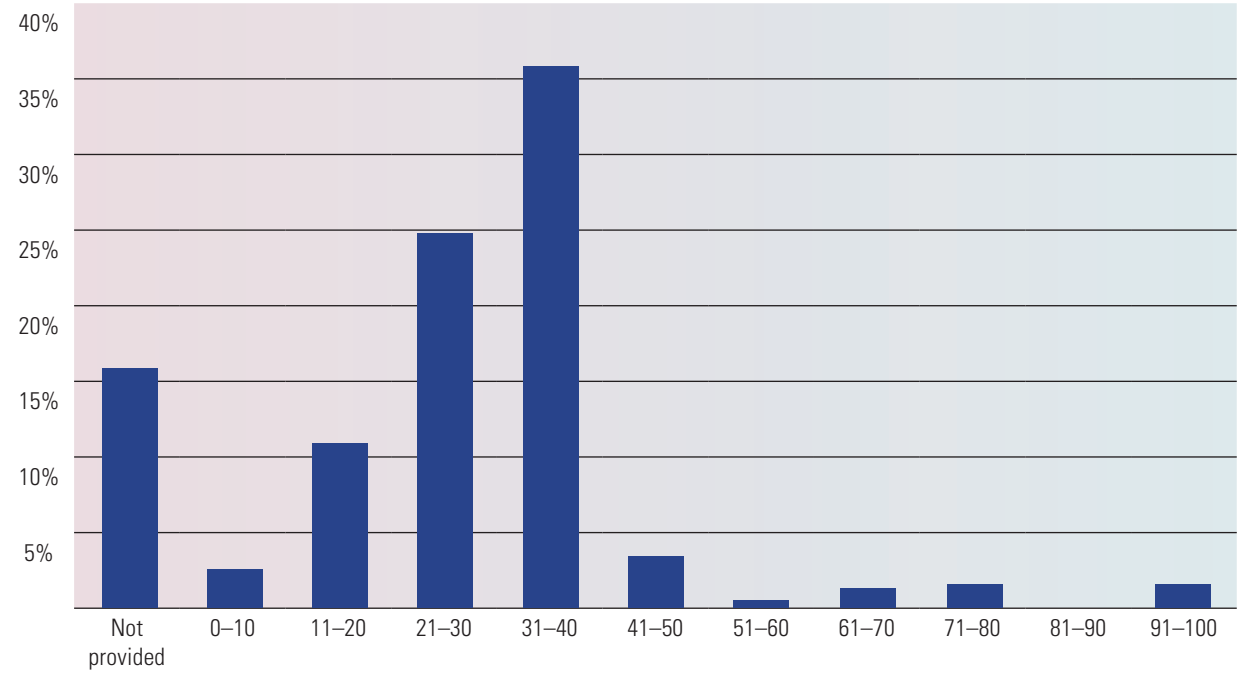
Table 2 Academic Level 2008, 2009, 2010

Academic level	2008	%	2009	%	2010	%
Not provided	14	2.9	14	2.7	9	1.5
Associate Lecturer (A)	17	3.5	20	3.8	22	3.7
Lecturer (B)	161	33.3	174	33.0	185	31.3
Senior Lecturer (C)	129	26.7	148	28.0	177	29.9
Associate Professor (D)	70	14.5	73	13.8	83	14.0
Professor (E)	72	14.9	79	15.0	99	16.7
RF & SRF*	20	4.1	20	3.8	17	2.9
Total	**483**	**100.0**	**528**	**100.0**	**592**	**100.0**

* Research Fellow and Senior Research Fellow

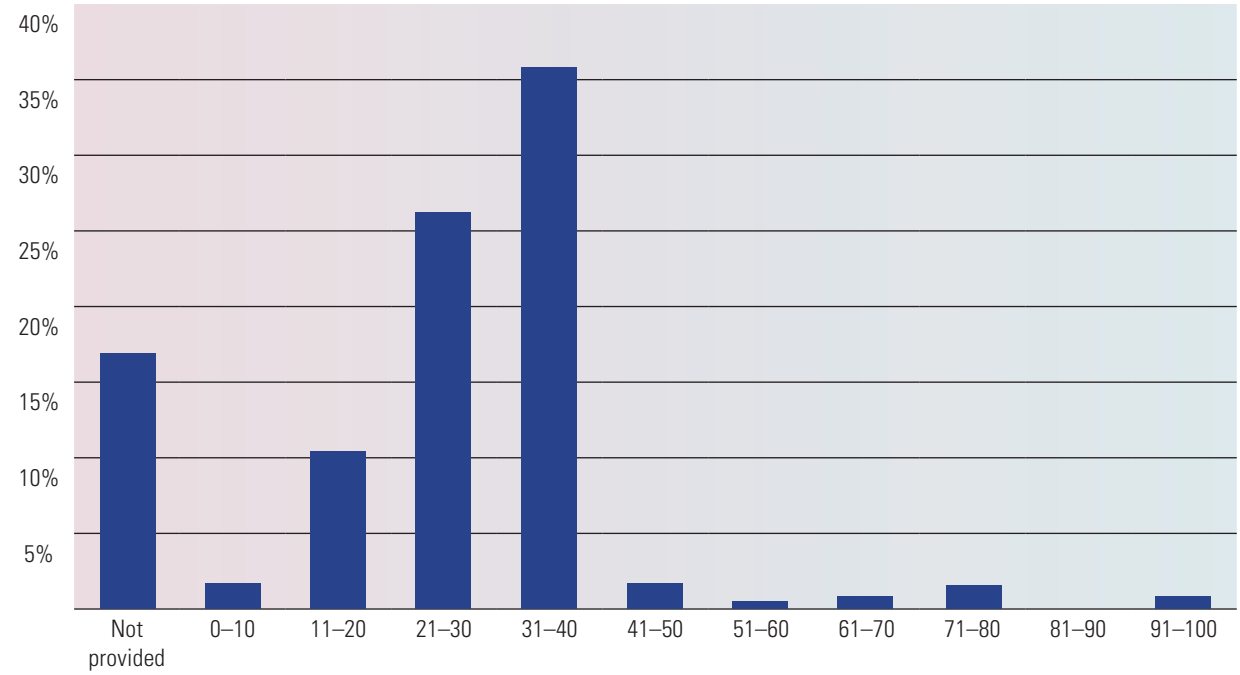
As indicated in our literature review, prior research suggests that there are a number of factors that underpin research productivity including experience, qualifications and academic appointment level. An overriding issue, however, is the amount of time academics devote to research according to their workload. This varies across schools/departments and universities. In Figures 2, 3 and 4, we outline workloads of the participating academics for 2008, 2009 and 2010.

Figure 2 Research Workload Allocation 2008



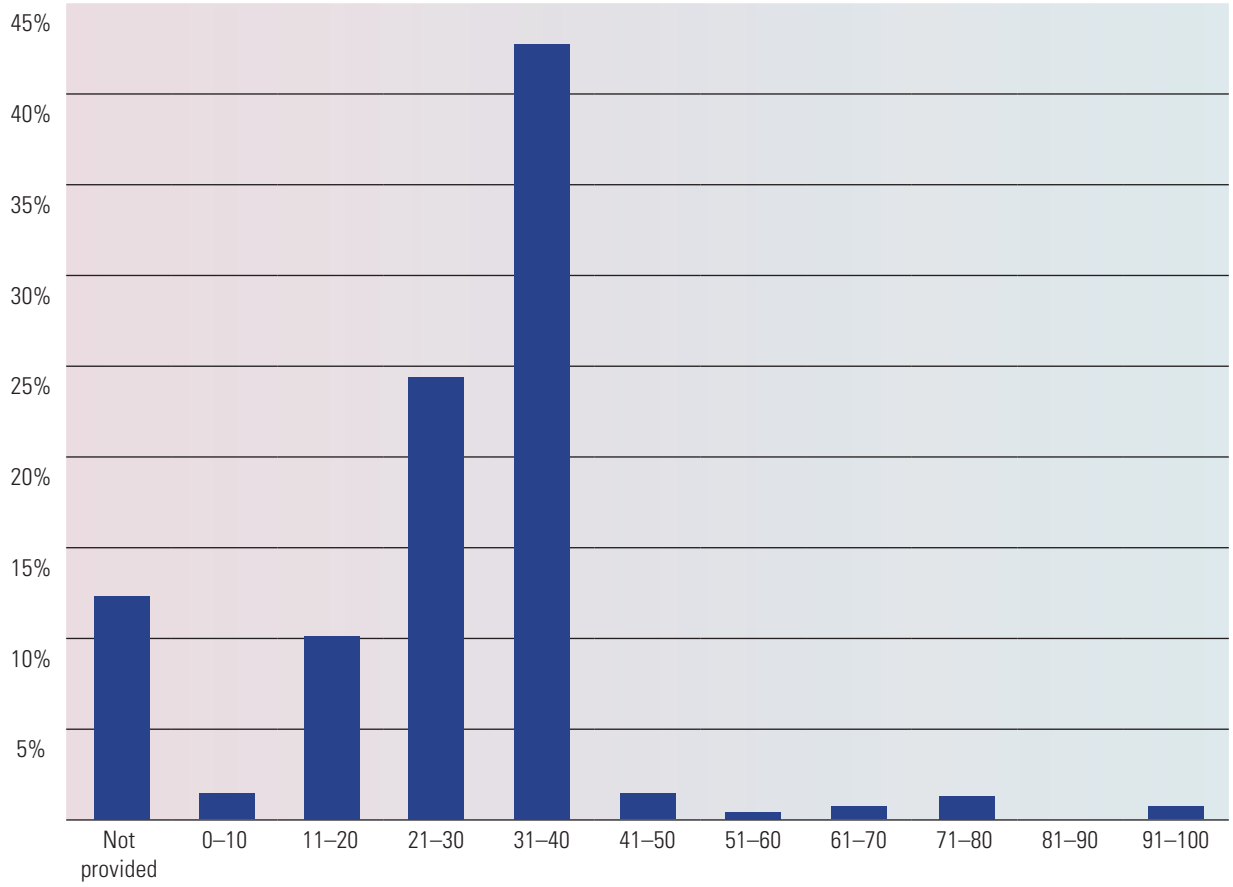
n = 483

Figure 3 Research Workload Allocation 2009



n = 528

Figure 4 Research Workload Allocation 2010



n = 592

In the 1997–1999 survey, Soutar (2002) reports the workload of his sample as comprising 44% teaching, 33% research and 23% service. In the 2000–2002 survey, the average workload of Management academics was listed as 49% teaching, 30% research and 21% service (Soutar, 2005). The average workload has changed in the period 2008–2010 with the data revealing more of a focus on research. As reported in Figures 2, 3 and 4, the most common workload was between 31% and 40% across the three collection periods. Averaging across the three time periods, approximately 38.3% reported a 40% research workload and 22.3% reported a 30% research workload. There were, however, a significant amount of missing data from the survey, with no data for 78 academics in 2008 (16.1%), 96 in 2009 (17.4%) and 75 in 2010 (12.7%).

Finally, Table 3 outlines the sample by discipline across the years 2008, 2009 and 2010. The categories for this table were drawn from ANZAM streams for the 2011 conference.

Table 3 Academics by Discipline 2008–2010

Research area	2008	2009	2010	Total	%
Critical Management	13	17	17	47	2.93%
Entrepreneurship, Small Business & Family Enterprise	22	25	27	74	4.62%
Gender and Diversity	8	8	9	25	1.56%
HRM and Development & Change	65	69	89	223	13.91%
International Management	26	26	32	84	5.24%
Leadership	15	16	20	51	3.18%
Management Education and Development	21	19	21	61	3.81%
Marketing and Communication	40	45	42	127	7.92%
Organisational Behaviour	33	34	46	113	7.05%
Public Sector and Not-for-Profit	21	21	21	63	3.93%
Research Methods	4	5	4	13	0.81%
Strategic Management	31	29	31	91	5.68%
Sustainability and Social Issues in Management	37	39	42	118	7.36%
Technology, Innovation and Supply Chain	40	50	54	144	8.98%
Not specified	107	125	137	369	23.02%
Total	**483**	**528**	**592**	**1603**	**100.00%**

We note significant missing data (23%) in this table as each academic had to be individually coded by heads of school/department. On balance, however, Table 3 shows a meaningful spread of the sample across disciplines. In interpreting these data, we acknowledge that Management academics work across disciplines so that research in Organisational Behaviour may also be in the field of Gender and Diversity and Human Resource Management, and that academics working in Sustainability may be using other disciplines to publish this research. We asked for the primary discipline of each academic, and as we were asking heads of school/department to make this judgement, we acknowledge that these data may not always be accurate. Table 3 does show, however, that the data captured in this report are not isolated to one field in the Management discipline.

Research Output 2008–2010

Understanding the Data

This report is based on data provided to us by Management schools/departments. While we have taken every care to make sure the data provided were accurate on a prima facie basis, we take no responsibility for any errors in the data as supplied. The tables prepared, however, accurately reflect the data collected. Academic publishing in the Management disciplines is a long-term process and there are often long lead times to papers being published. For instance, in a review of 20 years of publications in the Strategic Management Journal, Phelan, Ferreira, and Salvador (2002) note that the average time between initial submission and eventual publication was 720 days (S.D. 332 days). Phelan et al. (2002) note the median number of authors on manuscripts in this field as 2.0. This contrasts with figures in the sciences (e.g., Biology), where Eysenbach (2006) cites an average time from submission to publication as 104 days in non-open access journals, and an average number of authors per paper as 5.7. Similarly, in examining 28 biomedical journals, the time between submission and publication was 270 days (S.D. 63 days). In terms of a comparison between the physical sciences and the social sciences, Franceschet and Costantini (2010) note that average collaboration in the social sciences is much lower, being around two authors per paper, whereas in the physical sciences, the average is around four authors per paper with some disciplines such as Physics having an average of 55 authors per paper (median five authors per paper). While the average of 55 authors per paper seems inaccurate, Franceschet and Costantini (2010) note the largest number of authors on a Physics manuscript was 1412. On this basis, it is difficult to compare across disciplines.

The data provided in this section gives an overview of publications achieved during the three-year period 2008–2010. We acknowledge that data collections of this type often use a five- or six-year period when examining research productivity to allow the ebb and flow of academic publishing. We have chosen a three-year span for this research to provide a comparison with previous ANZAM collections.

An important issue is that our reporting is based on the Higher Education Research Data Collection (HERDC) process in which output is calculated based on the relative contributions of authors to publications. This is important to remember, as most previous studies have reported on unweighted points, which would clearly lead to higher apparent research outputs.

What is a HERDC point?

To allow the data in this report to be consistently compared between academics we have adopted a standard measure for publication output based on the HERDC process. Quoting from the documents issued by the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education:

"... where there are multiple authors the count must be apportioned according to the number of authors. For example, if there are three authors of a publication, one third should be counted for each author who was a staff member or student." (DIICCSRTE, 2013, p. 33)

The Results

Table 4 reveals the average output per academic across all Management disciplines in the years 2008–2010. As noted already, the nature of academic publishing in the Management discipline and any Social Science discipline, which involves long lead times in the review process and to eventual publication, means that looking for trends across a three-year period is difficult. One trend which may be drawn from these data is the overall reduction in refereed conference papers that are recorded in the HERDC return.

Table 4 Combined Average Research HERDC Point per Academic 2008 to 2010

Output	2008	2009	2010
Research books (A1)	0.15	0.10	0.07
Research book chapters (B1)	0.26	0.19	0.16
Journal articles (C1)	0.56	0.57	0.57
Refereed conference papers (E1)	0.56	0.53	0.36
Other journals or ranking not found	0.01	0.01	0.02

2008 n = 483, 2009 n = 528, 2010 n = 592

These trends can be compared with the data reported in the 2000–2002 survey (Soutar, 2005), which revealed a steady publication rate for journals and book chapters, and a statistically significant increase in the number of refereed conference papers during that period (0.56 per academic in 2000 and 1.10 per academic in 2002). The trend towards reduced conference publications over the 2008–2010 period may be as a result of movement in Australian academia generally, as the impact of the Research Quality Framework (RQF) and the ERA programs influenced publishing preferences. We note that academics at several institutions during 2008–2010 were encouraged not to report conference papers within the HERDC return, as these would eventually become full journal articles. While there are no New Zealand data in this report, we also suspect in the New Zealand context a similar trend, with academics being encouraged towards journal and book chapter outputs in order to raise their profiles under the PBRF.

Table 5 provides more detailed descriptive statistics for each type of publication output.

Table 5 Average Annual HERDC Points x Academic x Publication Type 2008–2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.10	0.20	0.57	0.48	1.04	0.01
Median	0.00	0.00	0.00	0.00	0.50	0.00
Variance	0.33	0.37	0.94	0.75	2.06	0.02
Skewness	7.32	7.87	3.75	2.98	2.79	11.80
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	5.00	10.33	10.80	8.33	14.30	2.00
Bottom 25%	0.00	0.00	0.00	0.00	0.00	0.00
Bottom 50%	0.00	0.00	0.00	0.00	0.50	0.00
Top 25%	0.00	0.00	0.99	0.80	1.50	0.00
Top 10%	0.00	0.80	1.60	1.50	2.80	0.00
Top 5%	0.40	1.00	2.40	2.00	3.89	0.00
Top 1%	5.00	2.40	4.56	4.00	6.33	0.50

Total data points = 1603, 2008 n = 483, 2009 n = 528, 2010 n = 592

After examining the dataset, we observed that a significant number of academics in the Management disciplines were reported as having no research output at all. On a yearly basis, this number across all academic levels was 151 in 2008 (31.2% of the sample), 179 in 2009, (33.9% of the sample) and 207 in 2010 (35.3% of the sample). To examine this in greater detail we have analysed non-output by academic level, as shown in Table 6. In the 2002 report, Soutar notes that the number of non-publishing academics was 20%, with a further 20% only producing conference papers. In the 2005 report, Soutar reports these figures as being 23% non-publishing academics and 14% who published conference papers only during the 2000–2002 period. The data in Table 6 reveals the number of academics who did not publish in 2008, 2009 and 2010.

Table 6 Non-Publishing Academics x Academic Level 2008, 2009, 2010

Academic level	2008	%	2009	%	2010	%
Not provided	3	21.4	7	50.0	6	66.7
Associate Lecturer (A)	13	76.5	15	75.0	17	77.3
Lecturer (B)	70	43.5	79	45.4	86	46.5
Senior Lecturer (C)	34	26.4	51	34.5	58	32.8
Associate Professor (D)	17	24.3	10	13.7	21	25.3
Professor (E)	10	13.9	15	19.0	17	17.2
RF & SRF	4	20.0	2	10.0	4	23.5
Total non-producing	**151**	**31.2**	**179**	**33.9**	**209**	**35.3**

2008 n = 483, 2009 n = 528, 2010 n = 592

We also analysed the number of academics who did not publish across the three-year period. These turned out to be far fewer. In analysing these data, we adopted a conservative approach and identified all respondents who had no publications over the three-year survey period based on the data collected for 2008. In total, 58 (12%; n = 483 for 2008) academics produced no published outputs over the period 2008–2010. We note this is a much lower level than previously reported by Soutar (2002, 2005). We did note a group who did not publish over a two-year period; however, it was not clear if these individuals had moved university, retired or resigned. To ensure a conservative estimate, we only examined cases where there were no publications for a three-year period. In Table 7, we outline the academic level of the group who did not publish across the three-year period.

Table 7 Non-Publishing Academics x Academic Level 2008–2010

Academic level	No. with no publications	Total no. of academics	% with no outputs	Average workload*
Associate Lecturer	7	17	41.2%	16.0%
Lecturer	35	161	21.7%	26.1%
Senior Lecturer	9	129	7.0%	25.1%
Associate Professor	4	70	5.7%	22.5%
Professor	2	72	2.8%	40.0%
RF & SRF	1	20	5.0%	40.0%
Total non-producing	**58**	**483**	**12.0%**	**25.2%**

2008 n = 483; *average workload of non-publishing group

It is important to note that these data cannot be judged without referring to Figures 2, 3 and 4, which outline the research workload within the sector. At Level A (Associate Lecturer), many of these academics are still studying towards their doctorate degrees and their focus during this time is understandably on producing their dissertation. At the other end of the spectrum, at Level D (Associate Professor) and Level E (Professor), we also note that academics working at these levels often take on significant administrative loads that can have a direct effect on the flow of research. We also note that the number not publishing at Levels D and E drops significantly in Table 7.

Of more concern is the proportion of Level B (Lecturer) and Level C (Senior Lecturer) academics who do not appear to produce yearly research outputs (Table 6), and in particular the number of academics at Level B who have not produced any publications over a three-year period (Table 7). Explanations for this may range from being new to academia and not being able to balance the requirements of service teaching and research, or being overloaded with teaching that may restrict research. We also acknowledge anecdotal evidence of some Management faculties encouraging junior academics to publish only in A*, A and B-ranked journals. We have noted earlier in this report the low acceptance rate for these journals. It may be the case that asking junior academics to publish at these levels without experience may result in no publications for a specific period.

We have also observed that financial restrictions during this period have resulted in some institutions minimising or withdrawing money for conference attendance, which may result in academics at these levels not being able to get publications out through this avenue. More research needs to be undertaken within Management schools/departments to determine why these academics, who will be dependent on a research profile for professional standing and career progression, are not producing research outputs.

Finally of interest is the lack of publications for an individual in the Research Fellow / Senior Research Fellow category. We anticipate that this category of appointment should have a significant workload allocated to research. Still within this category, there are a small number of academics not producing research when this should be their main focus. We acknowledge in making this statement that we have an extremely small sample size for this group.

Details of research output by academic level

Table 8 presents publication output across each of the academic levels. Analysis reveals that there are statistically significant differences (all statements regarding significant difference in this report were checked for statistical validity using ANOVA analysis) between the overall output at each level of academe within Management schools/departments.

Table 8 Average Annual HERDC Points x Publication Type x Academic Rank 2008–2010

Academic level	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Not provided	0.14	0.12	0.38	0.34	0.73	0.12
Associate Lecturer	0.01	0.05	0.14	0.18	0.32	0.00
Lecturer	0.08	0.09	0.30	0.35	0.65	0.00
Senior Lecturer	0.13	0.13	0.54	0.46	1.00	0.01
Associate Professor	0.11	0.28	0.65	0.66	1.31	0.01
Professor	0.14	0.53	1.08	0.69	1.77	0.03
RF & SRF	0.01	0.26	1.21	0.52	1.73	0.00

Total data points = 1603, 2008 n = 483, 2009 n = 528, 2010 n = 592

The overall output of Research Fellows and Senior Research Fellows falls between Level D (Associate Professor) and Level E (Professor) and is significantly different from each of those levels. This is to be expected as Research Fellows have work profiles that generally vary between 80% and 100% research, and therefore have much more of their workload in research.

Overall, there are significant differences between journal output and conference output at all academic levels except for Level D (Associate Professor) for which the difference is not significant.

Table 9 reveals the research output for Level A or Associate Lecturer level academics. The data are based on relatively low number of returns. Within Business schools generally, and Management schools/departments specifically, this is not a large employment category.

Staff employed at Level A would not normally yet have doctorates but, rather, be working towards completion. On this basis, the research output for this group is commensurately low. Analysing the data for Level A faculty, there is a significant difference between conference output and journal output, with academics at this level relying to a greater degree on conferences.

Table 9 Average Annual HERDC Points – Level A (Associate Lecturer) 2008–2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.01	0.05	0.14	0.18	0.32	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.40	2.00	2.00	2.00	4.00	0.00
Bottom 25%	0.00	0.00	0.00	0.00	0.00	0.00
Bottom 50%	0.00	0.00	0.00	0.00	0.00	0.00
Top 25%	0.00	0.00	0.00	0.00	0.00	0.00
Top 10%	0.00	0.00	0.91	1.00	1.00	0.00
Top 5%	0.00	0.00	1.00	1.00	2.00	0.00
Top 1%	0.00	–	–	–	–	0.00

Data points = 59, 2008 n = 17, 2009 n = 20, 2010 n = 22

The data in Table 10 shows the average output for Level B or Lecturer level academics, statistically the largest group in this report.

Table 10 Average Annual HERDC Points – Level B (Lecturer) 2008–2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.08	0.09	0.30	0.35	0.65	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	5.00	1.50	4.00	5.70	6.00	0.50
Bottom 25%	0.00	0.00	0.00	0.00	0.00	0.00
Bottom 50%	0.00	0.00	0.00	0.00	0.33	0.00
Top 25%	0.00	0.00	0.40	0.40	1.00	0.00
Top 10%	0.00	0.40	1.00	1.00	2.00	0.00
Top 5%	0.00	1.00	1.49	2.00	3.00	0.00
Top 1%	5.00	1.16	2.90	3.79	4.00	0.00

Data points = 520, 2008 n = 161, 2009 n = 174, 2010 n = 185

The data in Table 9 reveal a significant difference in outputs, with this group producing more conference papers per year than journal articles during this period. This trend was also evident in the 2000–2002 collection, with Level B academics in the Management disciplines during that period also producing more conference papers than journal articles.

In making these comments for subsequent tables, we note that a direct comparison of total output between previous research collections and the current study is difficult due to the change in the way the 2002 and 2005 reports were prepared using total publication count, and this report, which uses HERDC points that result in a weighted publication count by number of authors. We can, however, examine trends and relativities with more confidence.

Academics who are very active in research at Level B (the top 10% of the group) produce on average 2.00 HERDC points per year with at least 1.00 of those HERDC points being from a journal article.

In Table 11 the average output for Level C or Senior Lecturer level academics is reported. The data in Table 11 reveal a significant difference between conference and journal output, with this group producing more journal articles per year than conference papers during this period. This trend was also evident in the 2000–2002 collection for Level C academics, who produced more journal articles than conference papers during that period. The direction in Australian universities to upgrade the quality of their research and the various quality research assessment exercises run in Australia seems to have been reflected in the outcome for this group.

Table 11 Average Annual HERDC Points – Level C (Senior Lecturer) 2008–2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.13	0.13	0.54	0.46	1.00	0.01
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	5.00	2.33	6.06	5.83	8.33	2.00
Bottom 25%	0.00	0.00	0.00	0.00	0.00	0.00
Bottom 50%	0.00	0.00	0.00	0.00	0.66	0.00
Top 25%	0.00	0.00	1.00	0.80	1.43	0.00
Top 10%	0.00	0.50	1.50	1.20	2.40	0.00
Top 5%	0.40	1.00	2.27	2.00	3.37	0.00
Top 1%	5.00	1.29	4.43	4.00	6.14	0.57

Data points = 454, 2008 n = 129, 2009 n = 148, 2010 n = 177

Academics who are very active in research at Level C (the top 10% of this group) produce on average 2.40 HERDC points per year with at least 1.50 of those points being from journal articles.

The average output for Level D or Associate Professor level academics is reported in Table 12.

Table 12 Average Annual HERDC Points – Level D (Associate Professor) 2008 to 2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.11	0.28	0.65	0.66	1.31	0.01
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	5.00	9.00	4.33	5.00	6.33	1.00
Bottom 25%	0.00	0.00	0.00	0.00	0.33	0.00
Bottom 50%	0.00	0.00	0.40	0.33	1.00	0.00
Top 25%	0.00	0.40	1.00	1.00	2.00	0.00
Top 10%	0.00	0.88	2.00	2.00	3.20	0.00
Top 5%	0.83	1.16	2.66	2.94	4.14	0.00
Top 1%	2.50	2.95	3.50	4.00	5.87	0.68

Data points = 226, 2008 n = 70, 2009 n = 73, 2010 n = 83

In Table 12, the data reveal that this group was producing around the same number of journal articles and conference papers per year during this period. This trend was similar in the 2000–2002 collection for Level D academics. In both surveys, the average number of journal articles produced was greater than academics at Level C. Academics who are very active in research at Level D (the top 10% of this group) achieve on average 3.20 HERDC points per year with at least 2.00 of those points being from journal articles.

Table 13 contains the average research output for Level E or Professor level academics across the period 2008–2010:

Table 13 Average Annual HERDC Points – Level E (Professor) 2008 to 2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.14	0.53	1.08	0.69	1.77	0.03
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	5.00	10.33	10.80	8.33	14.30	2.00
Bottom 25%	0.00	0.00	0.17	0.00	0.40	0.00
Bottom 50%	0.00	0.00	0.80	0.00	1.20	0.00
Top 25%	0.00	0.52	1.49	1.00	2.06	0.00
Top 10%	0.33	1.97	2.40	2.00	4.00	0.00
Top 5%	1.00	2.36	3.42	3.25	5.55	0.00
Top 1%	3.98	6.16	8.25	6.25	10.59	1.16

Data points = 250, 2008 n = 72, 2009 n = 79, 2010 n = 99

The data reveals that this group was producing a significantly greater number of journal articles than conference papers per year during this period. This trend was similar in the 2000–2002 collection for Level E academics. In both surveys, the average number of journal articles produced was greater than academics at Level D. Academics who are very active in research at Level E (the top 10% of this group) produce on average 4.00 HERDC points per year with at least 2.40 of those points being from journal articles.

The average output for Research Fellow and Senior Research Fellow academics is reported in Table 14.

Table 14 Average Annual HERDC points – Senior and Research Fellows 2008–2010

	Books (A1)	Book chapters (B1)	Journal articles (C1)	Refereed conference papers (E1)	Total output (A1–E1)	Other publications
Mean	0.01	0.26	1.21	0.52	1.73	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.40	3.50	10.36	3.00	10.36	0.00
Bottom 25%	0.00	0.00	0.00	0.00	0.40	0.00
Bottom 50%	0.00	0.00	0.40	0.00	1.16	0.00
Top 25%	0.00	0.29	1.85	0.94	2.55	0.00
Top 10%	0.00	1.00	2.99	1.76	4.74	0.00
Top 5%	0.00	1.51	4.26	2.00	5.17	0.00
Top 1%	–	–	–	–	–	–

Data points = 57, 2008 n = 20, 2009 n = 20, 2010 n = 17

We have combined these two groups so as to increase the level of reliability in the data, as the datasets for each category were small. The data reveal that these academics were producing significantly more journal articles than conference papers per year during this period. The report for 2000–2002 did not collect data for these academic levels.

Academics who are very active in research in these groups (the top 10% of the group) produce on average 4.74 HERDC points per year with at least 2.99 of those HERDC points being from journal articles. This output needs to be considered in the light of Research Fellows typically having a much higher proportion of their workload allocated to research.

Research productivity and workload

As indicated earlier, the amount of time that a Management academic can dedicate to research will have a large impact on their research output. As a result, the data received on research workload were analysed so as to determine the effect on research productivity. As the workload data were not normally distributed, but were instead multimodal (i.e., very 'lumpy'), we decided to allocate academics into four relatively meaningful workload groups, according to the percentage of time allocated to research.

- **Group 1:** Up to and including 25% (N = 256)
- **Group 2:** Around 30% (i.e., +/– 1%) (N = 351)
- **Group 3:** 35–40% (N = 627)
- **Group 4:** Over 40% (N = 121)

Analysis reveals a significant difference in overall research output between Group 1 and groups 2, 3 and 4, and between Group 4 and groups 1, 2, and 3 (see Figure 5). In other words, those Management academics whose research workload is lowest produce the least research output, and those whose research workload is highest produce the most research output. The 30% and 35–40% research workload groups did not differ.

Further analysis of research book chapter (B1) and journal (C1) output shows a similar pattern (see Figures 6 and 7). However, the picture changes for conference paper (E1) output (see Figure 8). While the trend linking more research time to more outputs is evident for journal outputs and book chapter outputs, the data for conference papers is less conclusive. The apparently random nature of these data may be attributed to the vagaries of claiming conference publications under the HERDC process, as conference papers are seen as less valuable. It may also be that those who have less research time focus on the quick returns a conference submission can give. At this point, further research would be required to be able to make any definitive conclusion.

Figure 5 Comparison between Research Workload Groups by Total Research Output (Average Annual HERDC Points)

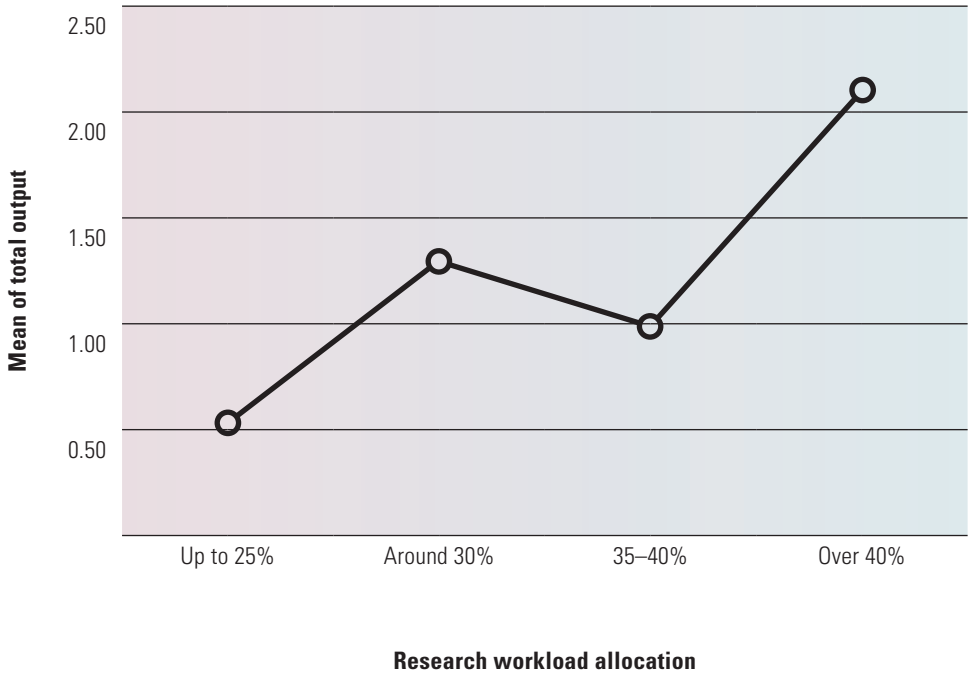


Figure 6 Comparison between Research Workload Groups by Research Book Chapter (B1) Output (Average Annual HERDC Points)

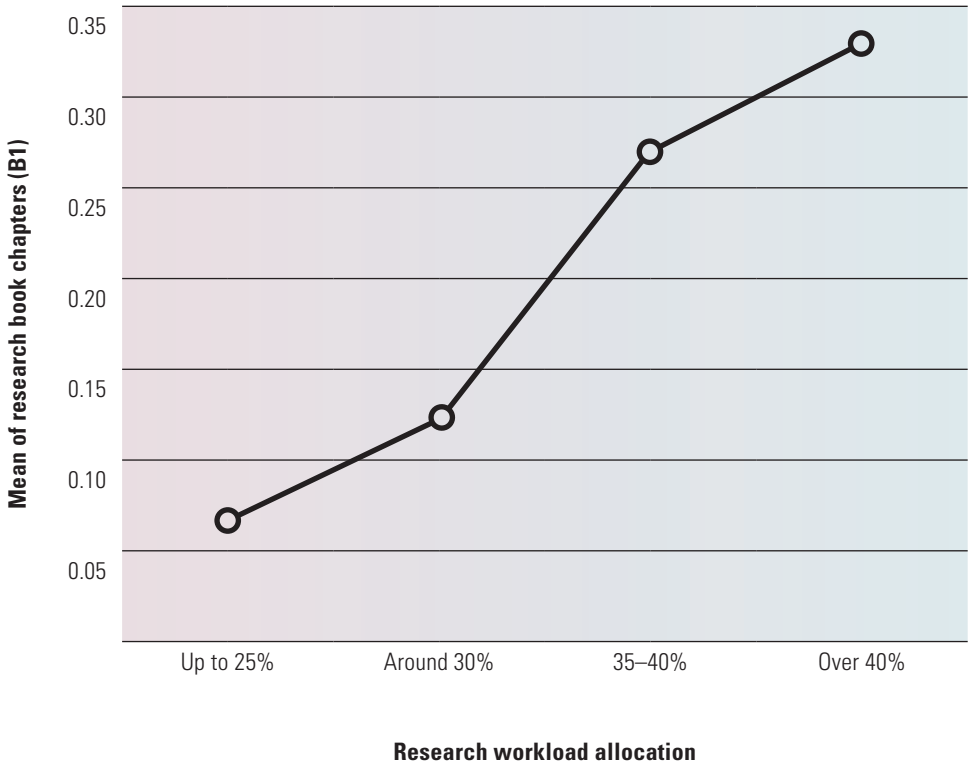


Figure 7 Comparison between Research Workload Groups by Journal (C1) Output (Average Annual HERDC Points)

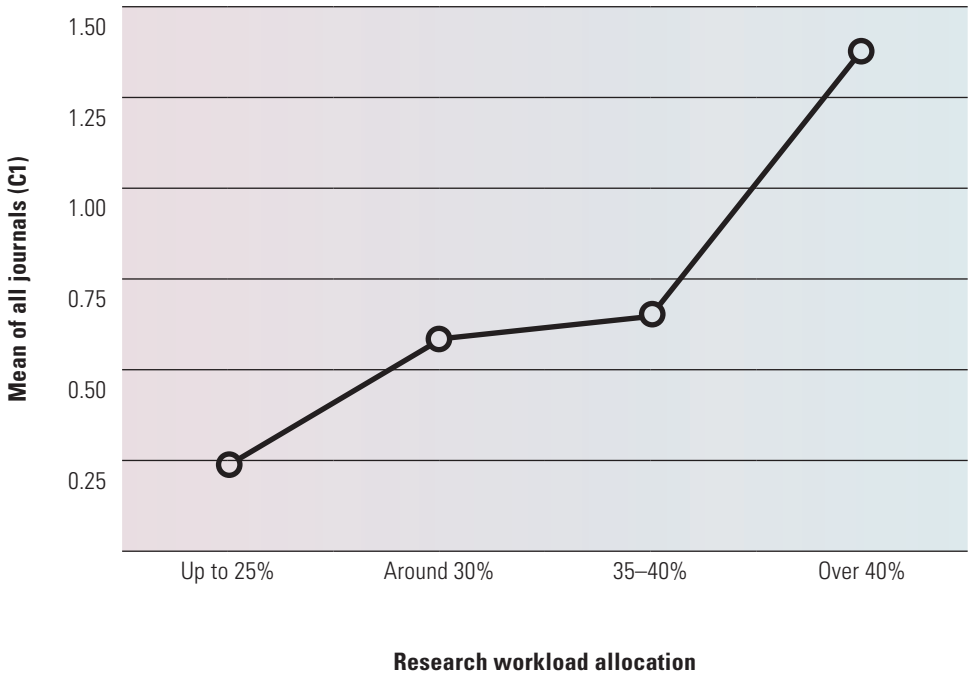
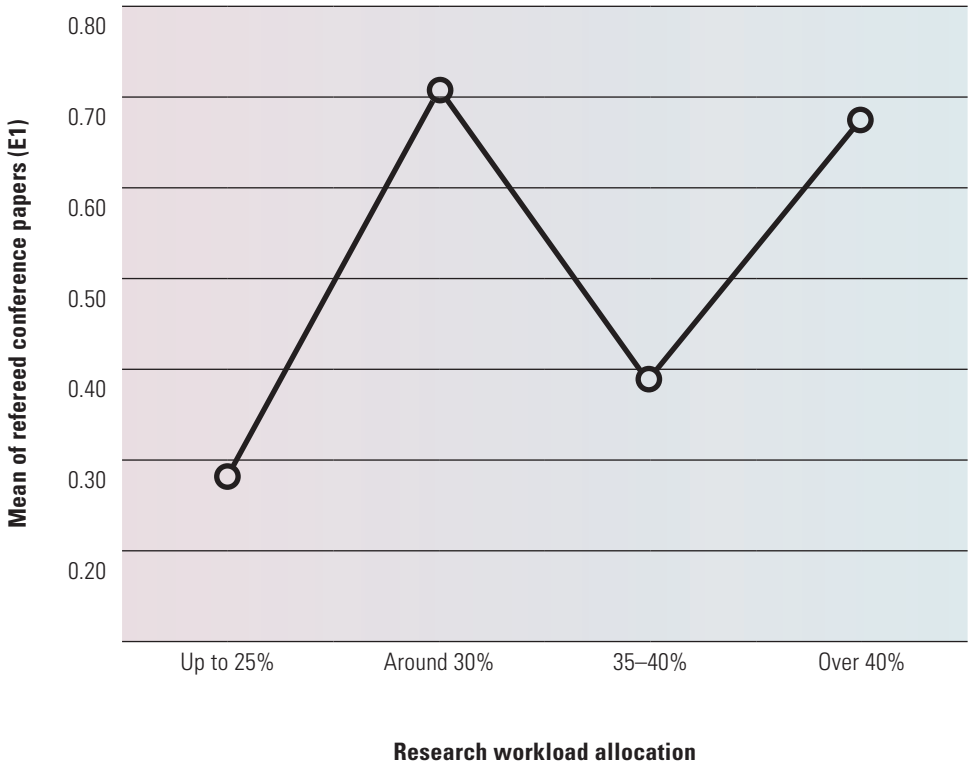


Figure 8 Comparison between Research Workload Groups by Conference Paper (E1) Output (Average Annual HERDC Points)



While total output is important, the emphasis in Australia and New Zealand on increasing the quality of academic research has been a focus for governments and universities. To examine this, we now move to analysing journal output by quality of journal.

Details of research output by ABDC Journal Rating

Analysing the quantity of research output provides an important picture of the amount of research activity carried out by Management academics in Australia. However, the question of quality of output is not specifically addressed (beyond, for example, the need for journal outputs to be refereed). One of the improvements to the current ANZAM Research Productivity Survey over the previous two is that participating Management schools/departments were asked to not only list the overall number of journal (C1) outputs for their academic staff, but also provide information about the quality of journal outputs, using the Australian Business Deans Council (ABDC) Journal Rating List. Thus, it is possible in this report to examine the proportion of journal outputs across the Council's A*, A, B and C-rated journal publications.

In the following section, we provide data for average output per academic for the A*, A, B and C journal classifications. Overall, journal output is provided first, and then output by academic level.

Note: It is important to recognise that these tables only include data from those academics who produced journal outputs in the three-year sample period across the four ABDC rating categories. This

was done to provide a clearer picture of where journal outputs were placed, and one that was not clouded by the proportion of academics with no journal output. Of those sampled, in 2008, there were 229 academics who produced journal outputs; in 2009, there were 254; and in 2010, there were 304.

Table 15 shows the average output per academic across the four ABDC rating categories for 2008–2010. As can be seen, the mean output increases from A* through to C-rated journals, doubtless reflecting the relative difficulty or ease of placing papers in these journals. For example, it is only the top 13% of academics, approximately, who score HERDC points in A* journals (specifically, those above the 87th percentile), with the highest performing academic producing an annual average of 3.00 HERDC outputs in A*-rated journals. The picture gradually changes across A to C-rated journals, with increasingly greater proportions of academics publishing in these outlets, as expected; the median output only rises above zero (i.e., 0.33 HERDC points) for C-rated journal outputs. Mean HERDC points for A-rated journal outputs increased over the three-year sample period; specifically, the mean A-rated journal output was significantly higher for 2010 (0.27) than for 2008 (0.18) and 2009 (0.19). No differences over the three years of the sample period were found for the other journal classifications.

Table 15 Average Annual HERDC Points per Academic by ABDC Journal Rating 2008–2010 (only academics with journal outputs)

	A* Journal articles (C1)	A Journal articles (C1)	B Journal articles (C1)	C Journal articles (C1)	Total journal articles (C1)
Mean	0.08	0.22	0.37	0.50	1.16
Median	0.00	0.00	0.00	0.33	1.00
Variance	0.06	0.19	0.32	0.66	1.24
Skewness	4.99	2.91	2.95	3.85	3.47
Minimum	0.00	0.00	0.00	0.00	0.02
Maximum	3.00	3.70	6.40	8.00	10.80
Bottom 25%	0.00	0.00	0.00	0.00	0.50
Bottom 50%	0.00	0.00	0.00	0.33	1.00
Top 25%	0.00	0.33	0.50	0.75	1.41
Top 10%	0.25	0.83	1.00	1.20	2.40
Top 5%	0.55	1.00	1.33	2.00	3.00
Top 1%	1.00	2.00	2.28	3.77	5.85

Total data points = 787, 2008 n = 229, 2009 n = 254, 2010 n = 304

Tables 16–20 show the average output per academic across the four ABDC rating categories at each academic level within Management schools/departments. We omitted Level A (Associate Lecturer) academics from this analysis as only seven respondents produced a journal output during the sample period (out of a possible 59 Level A academic survey returns across 2008–2010). One of these seven had produced some A*-rated journal output during the sample period (i.e., 0.33 HERDC points).

Table 16 shows the average output per academic across the four ABDC rating categories for 2008–2010 for Level B (Lecturer) academics. There were 50 Level B academics in 2008, 60 in 2009, and 70 in 2010 who produced journal output (compared with the total number of Level B academics sampled of 161 in 2008, 174 in 2009, and 185 in 2010). As expected, mean output increases from A* through to C-rated journals. The median output only rises above zero (i.e., 0.33 HERDC points) for C-rated journal outputs.

Additional analysis reveals that only the top 6% of Level B academics, approximately, published in A*-rated journals (specifically, those above the 94th percentile). The top 22% published in A-rated journals, the top 40% in B-rated journals and the top 60% in C-rated journals.

Table 16 Average Annual HERDC Points per Level B by ABDC Journal Rating 2008–2010 (only academics with journal outputs)

	A* Journal articles (C1)	A Journal articles (C1)	B Journal articles (C1)	C Journal articles (C1)	Total journal articles (C1)
Mean	0.02	0.14	0.26	0.45	0.87
Median	0.00	0.00	0.00	0.33	0.66
Variance	0.01	0.10	0.18	0.34	0.44
Skewness	5.76	2.98	2.57	2.00	1.84
Minimum	0.00	0.00	0.00	0.00	0.02
Maximum	1.00	2.00	3.00	3.00	4.00
Bottom 25%	0.00	0.00	0.00	0.00	0.40
Bottom 50%	0.00	0.00	0.00	0.33	0.66
Top 25%	0.00	0.00	0.50	0.50	1.00
Top 10%	0.00	0.50	1.00	1.00	2.00
Top 5%	0.25	1.00	1.00	2.00	2.19
Top 1%	0.60	1.60	2.19	3.00	3.19

Data points = 180

Table 17 shows the average output per academic across the four ABDC rating categories for 2008–2010 for Level C (Senior Lecturer) academics. There were 63 Level C academics in 2008, 67 in 2009, and 92 in 2010 who produced journal output (compared with the total number of Level C academics sampled of 129 in 2008, 148 in 2009, and 177 in 2010). Again, mean output increases from A* through to C-rated journals. The median output only rises above zero (i.e., 0.33 HERDC points) for C-rated journal outputs. Overall journal output was significantly higher for Level C versus Level B academics, though not for any of the individual ABDC journal categories.

In further analysis we found that only the top 8% of Level C academics published in A*-rated journals (specifically, those above the 92nd percentile). The top 25% published in A-rated journals, the top 46% in B-rated journals and the top 53% in C-rated journals.

Table 17 Average Annual HERDC Points per Level C by ABDC Journal Rating 2008–2010 (only academics with journal outputs)

	A* Journal articles (C1)	A Journal articles (C1)	B Journal articles (C1)	C Journal articles (C1)	Total journal articles (C1)
Mean	0.05	0.16	0.35	0.54	1.11
Median	0.00	0.00	0.00	0.33	1.00
Variance	0.04	0.10	0.24	0.61	0.91
Skewness	4.01	2.24	1.57	2.04	2.32
Minimum	0.00	0.00	0.00	0.00	0.17
Maximum	1.00	2.00	2.25	3.86	6.06
Bottom 25%	0.00	0.00	0.00	0.00	0.45
Bottom 50%	0.00	0.00	0.00	0.33	1.00
Top 25%	0.00	0.33	0.50	0.87	1.33
Top 10%	0.00	0.50	1.00	1.50	2.31
Top 5%	0.50	1.00	1.31	2.50	2.97
Top 1%	1.00	1.00	2.00	3.66	5.39

Data points = 222

Table 18 shows the average output per academic across the four ABDC rating categories for 2008–2010 for Level D (Associate Professor) academics. There were 41 Level D academics in 2008, 45 in 2009, and 50 in 2010 who produced journal output (compared with the total number of Level D academics sampled of 70 in 2008, 73 in 2009, and 83 in 2010). Again, mean output increases from A* through to C-rated journals. The median output only rises above zero (i.e., 0.33 HERDC points) for C-rated journal outputs. Overall, journal output for Level D academics did not differ significantly from

that for Level C academics; nor did output for any of the individual ABDC journal categories. Level D academics did, however, perform significantly higher than Level B academics for A* and A-rated journal output. This pattern may reflect a greater focus by Level D academics on publishing in higher quality journals.

Following further analysis we found that the top 15% of Level D academics published in A*-rated journals (specifically, those above the 85th percentile). The top 32% published in A-rated journals, the top 37% in B-rated journals and the top 53% in C-rated journals.

Table 18 Average Annual HERDC Points per Level D by ABDC Journal Rating 2008–2010 (only academics with journal outputs)

	A* Journal articles (C1)	A Journal articles (C1)	B Journal articles (C1)	C Journal articles (C1)	Total journal articles (C1)
Mean	0.10	0.25	0.32	0.42	1.08
Median	0.00	0.00	0.00	0.29	1.00
Variance	0.11	0.22	0.29	0.28	0.75
Skewness	5.91	2.74	2.01	1.38	1.44
Minimum	0.00	0.00	0.00	0.00	0.07
Maximum	3.00	3.00	2.50	2.33	4.33
Bottom 25%	0.00	0.00	0.00	0.00	0.40
Bottom 50%	0.00	0.00	0.00	0.29	1.00
Top 25%	0.00	0.40	0.50	0.78	1.31
Top 10%	0.40	1.00	1.00	1.06	2.50
Top 5%	0.62	1.04	1.36	1.50	3.02
Top 1%	2.26	2.63	2.50	2.21	4.02

Data points = 136

Table 19 shows the average output per academic across the four ABDC rating categories for 2008–2010 for Level E (Professor) academics. There were 55 Level E academics in 2008, 58 in 2009, and 77 in 2010 who produced journal output (compared with the total number of Level E academics sampled of 72 in 2008, 79 in 2009, and 99 in 2010). Again, mean output increases from A* through to C-rated journals. For the first time, the median output rises above zero (i.e., 0.20 HERDC points) for B-rated journal outputs; the median for C-rated journal outputs is 0.17 HERDC points. Overall journal output was significantly higher for Level E than for Level D academics, as well as for B-rated journal output, but not for the other three ABDC journal categories. Level E academics perform significantly higher than Level B and C academics, except for C-rated journal output. Indeed, the mean is lower for C-rated

journal output than that for Level C academics, perhaps again reflecting a greater focus on publishing in higher quality journals.

Based on further analysis of these data we note that the top 20% of Level E academics published in A*-rated journals (specifically, those above the 80th percentile). The top 40% published in A-rated journals, the top 53% in B-rated journals and the top 52% in C-rated journals.

Table 19 Average Annual HERDC Points per Level E by ABDC Journal Rating 2008–2010 (only academics with journal outputs)

	A* Journal articles (C1)	A Journal articles (C1)	B Journal articles (C1)	C Journal articles (C1)	Total journal articles (C1)
Mean	0.13	0.33	0.47	0.48	1.41
Median	0.00	0.00	0.20	0.17	1.00
Variance	0.10	0.32	0.53	0.92	2.14
Skewness	3.28	2.50	3.58	4.67	3.31
Minimum	0.00	0.00	0.00	0.00	0.17
Maximum	2.20	3.70	6.40	7.40	10.80
Bottom 25%	0.00	0.00	0.00	0.00	0.56
Bottom 50%	0.00	0.00	0.20	0.17	1.00
Top 25%	0.00	0.50	0.80	0.66	1.60
Top 10%	0.50	1.00	1.33	1.18	2.64
Top 5%	0.87	1.50	1.81	1.60	4.58
Top 1%	1.56	2.70	3.00	6.35	9.48

Data points = 190

Table 20 shows the average output per academic across the four ABDC rating categories for 2008–2010 for Research Fellow and Senior Research Fellow (RF/SRF) academics. There were 11 RF/SRF academics in 2008, 16 in 2009, and 10 in 2010 who produced journal output (compared with the total number of RF/SRF academics sampled of 20 in 2008, 20 in 2009, and 17 in 2010). Again, mean output increases from A* through to C-rated journals. As with Level E academics, the median output for B-rated and C-rated journals is above zero (i.e., 0.40 and 0.33 HERDC points respectively). Overall journal output was significantly higher for RF/SRF academics versus Level E academics, as well as for C-rated journal output, but not for the other three ABDC journal categories. This probably reflects the higher research workload for RF/SRF academics, who have more time to produce research output.

A more in-depth analysis of the data reveals that the top 18% of RF/SRF academics published in A*-rated journals (specifically, those above the 82nd percentile). The top 35% published in A-rated journals, the top 65% in B-rated journals and the top 56% in C-rated journals.

Table 20 Average Annual HERDC Points per Research Fellow / Senior Research Fellow by ABDC Journal Rating 2008–2010 (only academics with journal outputs)

	A* Journal articles (C1)	A Journal articles (C1)	B Journal articles (C1)	C Journal articles (C1)	Total journal articles (C1)
Mean	0.13	0.25	0.60	0.89	1.86
Median	0.00	0.00	0.40	0.33	1.50
Variance	0.09	0.22	0.50	2.65	3.65
Skewness	2.12	2.39	1.60	2.94	2.81
Minimum	0.00	0.00	0.00	0.00	0.20
Maximum	1.00	1.90	3.00	8.00	10.36
Bottom 25%	0.00	0.00	0.00	0.00	0.45
Bottom 50%	0.00	0.00	0.40	0.33	1.50
Top 25%	0.00	0.32	1.00	1.00	2.22
Top 10%	0.72	1.00	1.68	2.86	4.02
Top 5%	1.00	1.72	2.13	5.15	6.28
Top 1%	–	–	–	–	–

Data points = 37

Summary of comparison between academic levels for research quality

Figures 9–12 contain the mean plots for each of the four ABDC rating categories across each academic level. For significance, the mean difference required between academic levels is 0.07 for A*-rated journals, 0.11 for A-rated journals, 0.12 for B-rated journals, and 0.35 for C-rated journals. The picture is one of increased quality of journal output as academic level rises, as would be expected. What is noteworthy as well is the apparently lower interest among Level D and Level E academics in publishing in B and especially C-rated journals, relative to A* and A-rated journal output. Output in B and C-rated journals is evidently a route to research performance for early and perhaps middle career researchers, but less so for mature researchers. The exception is for RF/SRF academics, who still publish in B and C-rated journals at a higher rate than Level D and Level E academics; this is doubtless a function of the higher research workload allocation for these academics.

Figure 9 Comparison between Academic Levels Publishing in A*-rated Journals by HERDC Output

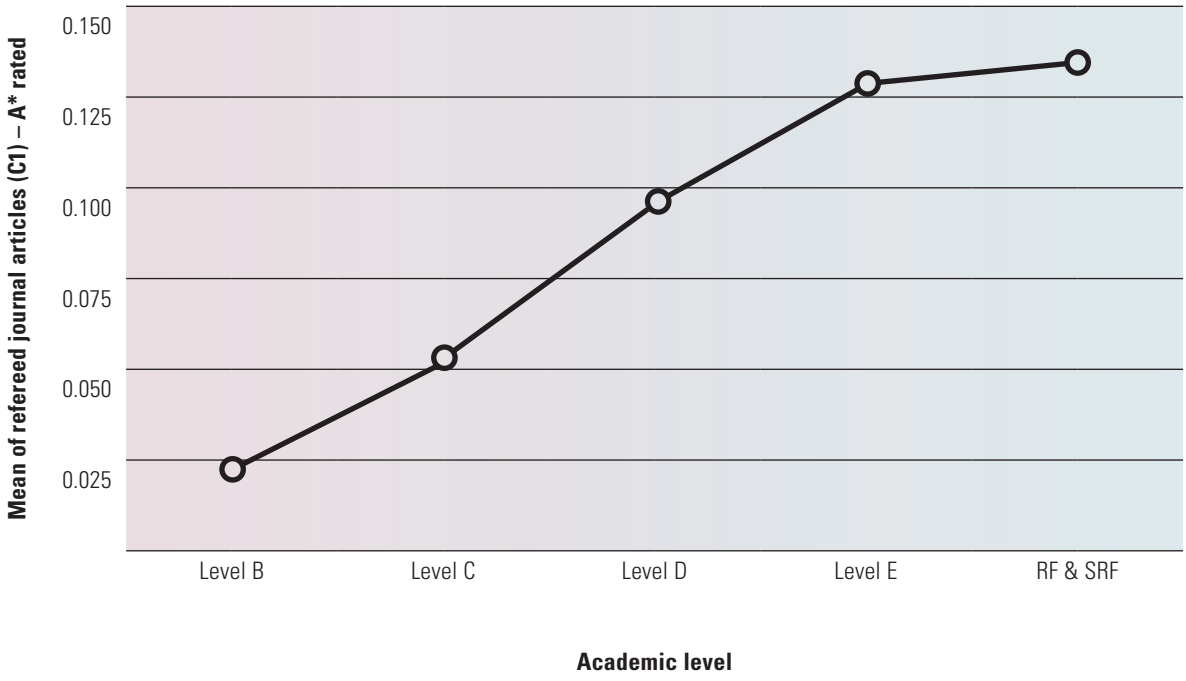


Figure 10 Comparison between Academic Levels Publishing in A-rated Journals by HERDC Output

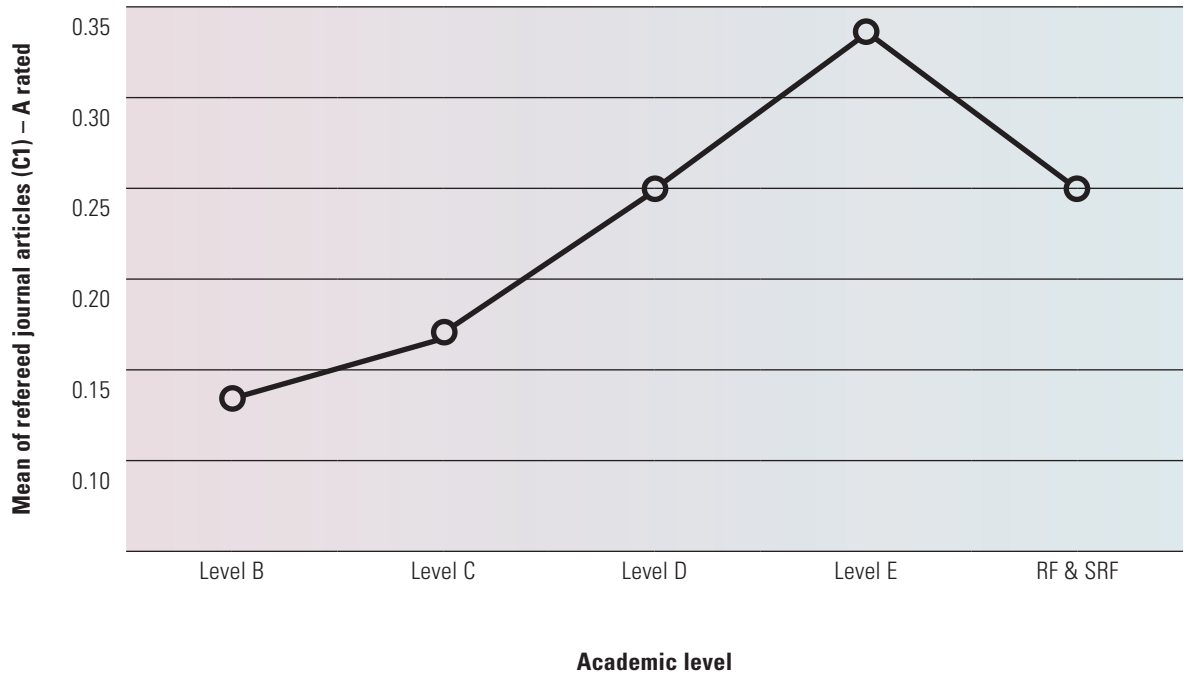


Figure 11 Comparison between Academic Levels Publishing in B-rated Journals by HERDC Output

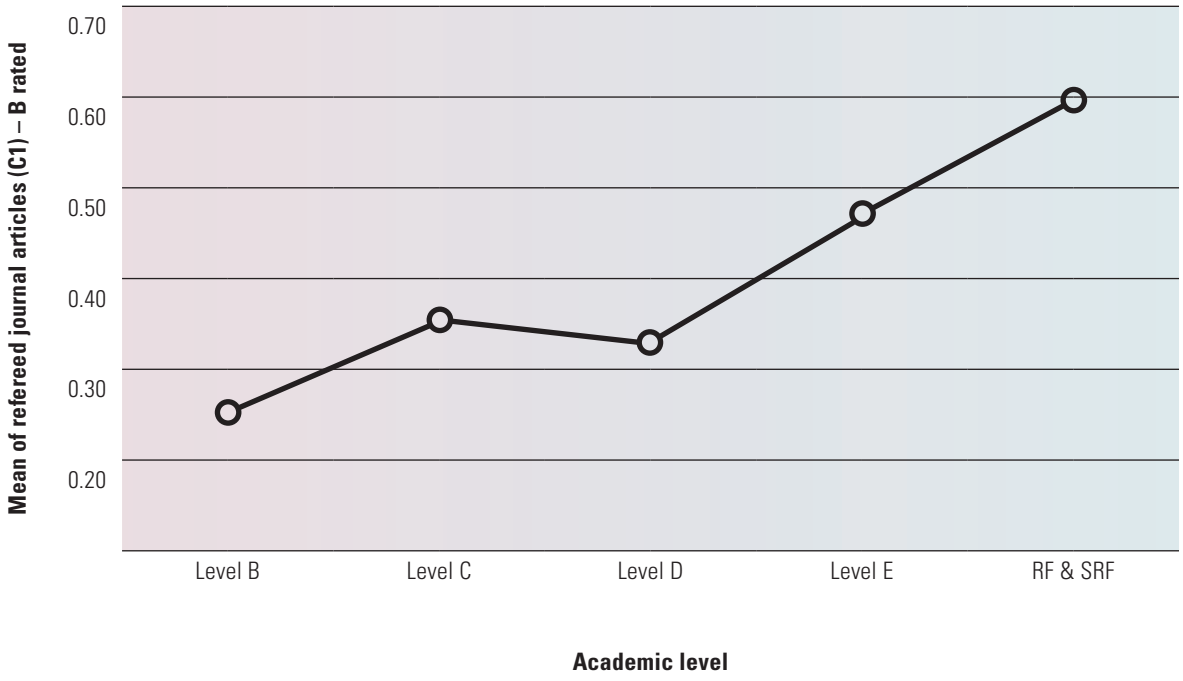
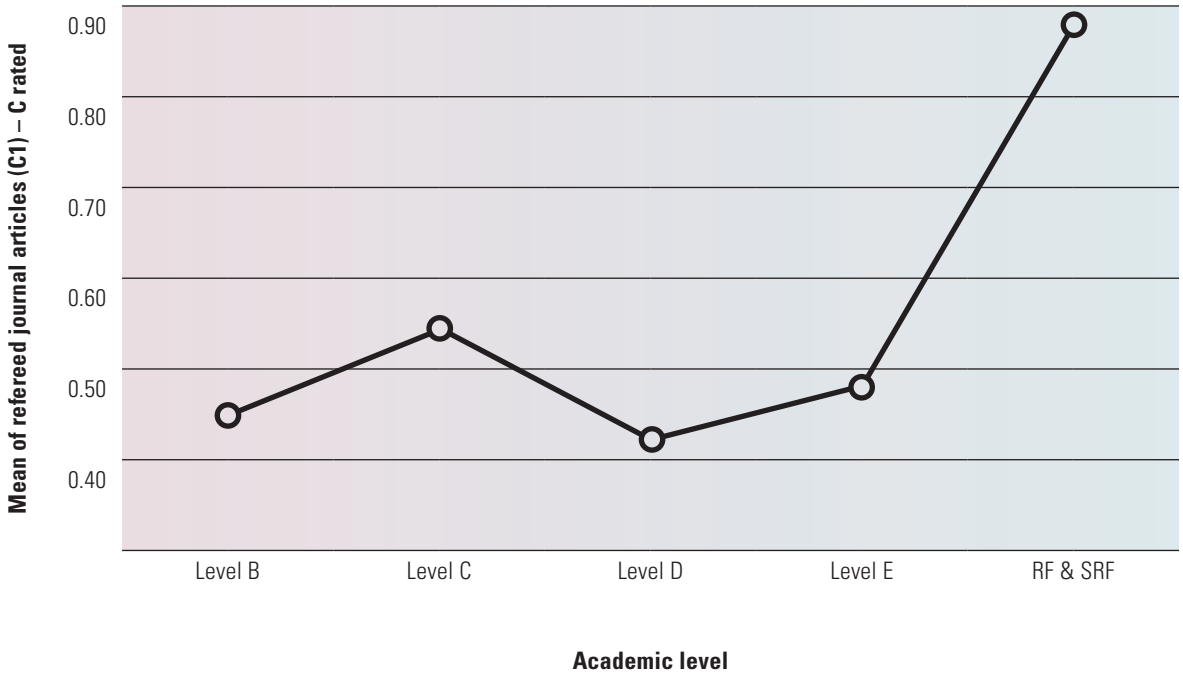


Figure 12 Comparison between Academic Levels Publishing in C-rated Journals by HERDC Output



Higher Degree by Research (HDR) Enrolment and Supervision 2008–2010

The first table in the 2002 ANZAM Research Productivity Report (Soutar, 2002) reported on doctoral programs at participating universities. The trends in terms of mean enrolment in doctoral programs at that time was encouraging, with the 2002 report stating that the average size of doctoral programs within universities was increasing, peaking at an average of 19.58 students per program in 1997. This position seemed to improve in Soutar's (2005) next report, with the average number of doctoral students enrolled in programs in 2002 being 47.33 students.

We note that since that time, the focus in Australia for federal government funding on doctoral programs has moved from paying for enrolments to paying for completions. This has reduced the emphasis for some institutions to enrol a large number of PhD students, regardless of whether the student progresses or not.

Again, our reporting basis is different in this survey. In our survey, we asked heads of schools/departments to report equivalent full-time student load (EFTSL) supervisions, rather than total number of students enrolled. In developing the survey, the research team formed the opinion that if we were looking at research productivity, we were going to gain a more accurate view by collecting data on student load, rather than total number of students enrolled. So while this report appears to reveal a dramatic drop in the number of students enrolling in research programs, this needs to be viewed in the light of a different method of counting. In Table 21, our data reveal a mean of 9.75 EFTSL per program in 2008, building to 10.67 EFTSL per program in 2010 (see Table 20).

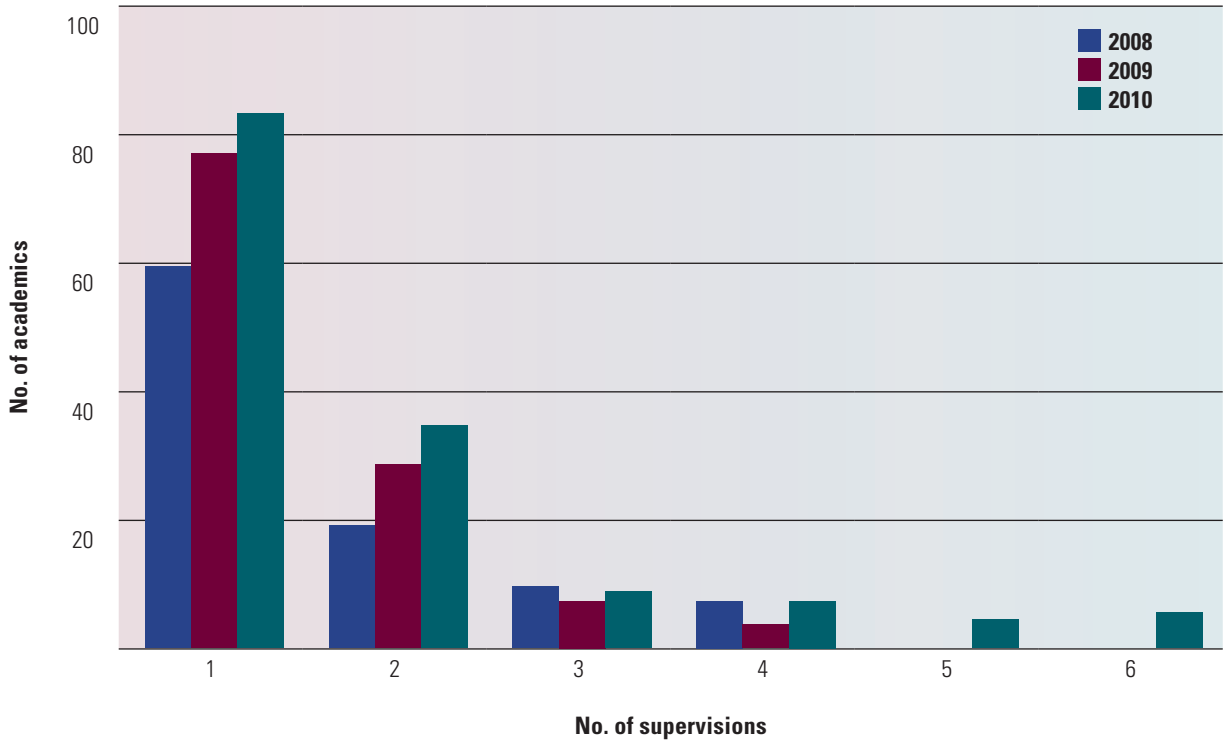
Table 21 Average HDR EFTSL Supervisions per Unit 2008–2010

	2008	2009	2010
Total enrolments	156	168	192
Number of universities	16	17	18
Mean enrolments	9.75	9.88	10.67

In order to examine the research supervision issue in greater detail, in Figure 13 we examine the average supervision load of academics across the period 2008–2010. This table reveals that there are a large number of academics not supervising HDR students. There are also very few academics that are supervising more than one EFTSL research student. In our opinion, the 2008 and 2009 results may

suffer from a lack of available historical data. The 2010 data is more likely to be accurate, as enrolment of these students would be more recent. We did note a significant variation in the way these data were held and reported across the sample.

Figure 13 Number of EFTSL Supervisions per Academic (excluding those not supervising)



To provide a more in-depth understanding of the spread of research supervision, in Tables 22–24 we outline research supervision by discipline for each year. Again, we see these data as indicative, as the number of survey returns in which the discipline was not reported, or was reported as "other", is significant.

Table 22 Number of EFTSL Supervisions by Discipline 2008

	No. of Faculty	EFTSL	Faculty Not Supervising	Supervisors	% Supervision
Critical Management	13	6.8	8	5	38.46%
Entrepreneurship, Small Business & Family Enterprise	22	2.0	20	2	9.09%
Gender and Diversity	8	0.8	6	2	25.00%
HRM and Development & Change	65	8.0	60	5	7.69%
International Management	26	7.6	21	5	19.23%
Leadership	15	2.0	13	2	13.33%
Management Education and Development	21	2.0	19	2	9.52%
Marketing and Communication	40	18.0	32	8	20.00%
Organisational Behaviour	33	15.0	25	8	24.24%
Public Sector and Not-for-Profit	21	5.5	19	2	9.52%
Research Methods	4	4.0	1	3	75.00%
Strategic Management	31	7.6	26	5	16.13%
Sustainability and Social Issues in Management	37	14.9	26	11	29.73%
Technology, Innovation and Supply Chain	40	22.8	28	12	30.00%
Not specified	107	38.7	71	36	33.64%
Total	**483**	**155.7**	**375**	**108**	**22.36%**

Table 23 Number of EFTSL Supervisions by Discipline 2009

	No. of Faculty	EFTSL	Faculty Not Supervising	Supervisors	% Supervision
Critical Management	17	9.6	9	8	47.06%
Entrepreneurship, Small Business & Family Enterprise	25	10.0	21	4	16.00%
Gender and Diversity	8	0.0	8	0	0.00%
HRM and Development & Change	69	8.9	61	8	11.59%
International Management	26	5.4	22	4	15.38%
Leadership	16	3.1	13	3	18.75%
Management Education and Development	19	4.4	15	4	21.05%
Marketing and Communication	45	11.0	37	8	17.78%
Organisational Behaviour	34	16.1	25	9	26.47%
Public Sector and Not-for-Profit	21	8.0	17	4	19.05%
Research Methods	5	2.0	4	1	20.00%
Strategic Management	29	6.0	23	6	20.69%
Sustainability and Social Issues in Management	39	21.7	24	15	38.46%
Technology, Innovation and Supply Chain	50	21.7	35	15	30.00%
Not specified	125	40.4	84	34	27.20%
Total	**528**	**168.3**	**398**	**130**	**24.62%**

Table 24 Number of EFTSL Supervisions by Discipline 2010

	No. of Faculty	EFTSL	Faculty Not Supervising	Supervisors	% Supervision
Critical Management	17	9.3	12	5	29.41%
Entrepreneurship, Small Business & Family Enterprise	27	8.5	21	6	22.22%
Gender and Diversity	9	3.0	7	2	22.22%
HRM and Development & Change	89	15.0	78	11	12.36%
International Management	32	11.7	23	9	28.13%
Leadership	20	4.1	15	5	25.00%
Management Education and Development	21	10.3	16	5	23.81%
Marketing and Communication	42	15.0	31	11	26.19%
Organisational Behaviour	46	13.0	36	10	21.74%
Public Sector and Not-for-Profit	21	10.0	16	5	23.81%
Research Methods	4	8.0	2	2	50.00%
Strategic Management	31	12.0	24	7	22.58%
Sustainability and Social Issues in Management	42	11.4	33	9	21.43%
Technology, Innovation and Supply Chain	54	13.7	40	14	25.93%
Not specified	137	47.3	90	47	34.31%
Total	**592**	**192.1**	**444**	**148**	**25.00%**

The observation that can be made based on Figure 13 and Tables 22–24 is that there are a number of Management academics who are not involved in research supervision. Some of this may be because they are not academically qualified to supervise. We note that different universities have different requirements for academics to qualify to be able to undertake research supervision, including being research active (usually based on a specific number of research publications over a specific period), a lack of research output and a lack of prior co-supervisions or supervisory experience. We also note that a low number of enrolments, and the general model of two supervisors per student, may also contribute to this outcome.

Examining the data in relation to research degree completions suggests an unusual data pattern. While Soutar (2002) reports the number of HDR completions per university between 1997 and 1990 as an average of 7 graduates per program, the 2005 report states that the average completions was 38 graduates per program (Soutar, 2005). Clearly, the unexpected growth in the number of completions over such a short period is a discrepancy in the data. The completion rates are much lower in our report (Table 25). We believe that these data may have been affected by a lack of information available to heads of schools/departments on HDR completions per academic. While some students in some universities are enrolled under schools or departments, others may be enrolled under an associated research centre or a centralised entity within the university such as a graduate school.

While we have questions over these data, we have provided the information so as to maintain common measurements as established in the previous Soutar reports.

Table 25 Average Research Degree Completions per Academic Unit 2008–2010

Completions	2008	2009	2010
PhD	1.69	1.76	1.61
Masters	0.44	1.18	1.17
Total	**2.13**	**2.94**	**2.78**

2008 n = 16, 2009 n = 17, 2010 n = 18

Research Grant Income 2008–2010

There has been an increasing emphasis across all universities for academics to apply for funding for their research. Indeed, rather than an input to research, grant funding is often counted by universities and government as an outcome of research. The direct relationship in the Management discipline between obtaining research funding and increased research output is not clear. Internationally, there are many successful Management researchers who produce quality research without funding. At the same time, the nature of the competitive process of gaining grants means that already successful researchers are more likely to also get grants to support further research.

As grant income is seen as an important aspect of research productivity in the Australian as well as the New Zealand context, in this section we report on broad grant income across the sector.

Australian Research Council Grants

Australian academics are encouraged to apply for Australian Research Council (ARC) funding, which is seen as an indication of esteem and quality when comparing between universities. Universities have also been clear in their instructions that academics need to increase the amount of funds and the number of grants sought from the ARC. This situation is similar in New Zealand, where academics are encouraged to apply for grants from the Marsden Fund and other granting bodies.

In Tables 26 and 27, we outline the number of grants and the overall income across the Management discipline, from discovery and linkage grant outcome reports where funding was provided in the years 2008, 2009 and 2010 (based on reports provided by the ARC). These data were aggregated from ARC reports within the 1503 Field of Research (FoR) code and the 3502 Research Fields, Courses and Disciplines (RFCD) classification code. Funding outcomes are provided for discovery grants (Table 26) and linkage grants (Table 27).

Table 26 ARC Discovery Funds Allocated in Management (FoR 1503 or equivalent) 2008–2010*

	2008	2009	2010
Number of grants	23	24	26
Number of universities	11	11	14
Number of academics listed	63	68	77
Total grants allocation	**$1,615,128**	**$1,820,621**	**$2,204,709**

* Data compiled from ARC funding outcome reports

Analysis of Table 26 shows a relatively narrow spread of discovery grants across the sector, with a maximum of 14 universities in 2010 attracting grants in the 1503 FoR code. In analysing these data, it is important to note that we apportioned the grant to the administering institution even though we observed that there were grants where academics from a number of institutions participated. We also did not try to examine research grants outside of the 1503 category and so did not collect Management research conducted elsewhere (for instance under Psychology). Even so, a maximum of 77 academics from across the sector is not a large group obtaining discovery grants.

Table 27 ARC Linkage Funds Allocated in Management (FoR 1503 or Equivalent) 2008–2010*

	2008	2009	2010
Number of grants	39	45	41
Number of universities	15	16	16
Number of academics listed	135	186	209
Total grants allocation	**$2,538,391**	**$3,422,646**	**$3,423,942**

* Data compiled from ARC funding outcome reports

Table 27 outlines the allocation of ARC linkage funds across the years 2008–2010. This table again confirms a relatively narrower spread of these types of grants across universities. The number of grants awarded and the number of academics involved in those grants, however, was much greater for linkage than discovery grants. There was also a greater distribution of funds under the linkage program.

What the data from Tables 26 and 27 do not reveal is the number of submissions sent to the ARC for the 1503 FoR code or by Management academics generally. The ARC reveals that the success rates for ARC discovery grants was 21.4% in 2008, 20.4% in 2009 and 22.7% in 2010; for linkage grants the success rate generally was 45.2% in 2008, 45.8% in 2009 and 44.9% in 2010. This means a massive amount of work is being undertaken in the discipline in submitting unsuccessful grants. Again, this effort is not captured in quantifying the research output of academics, but it is activity being encouraged by universities. There remains a question as to whether this workload on grant submission is being recognised in university workload allocations.

Again, in examining the spread of linkage grants, we acknowledge that not all Management-related research appears in the 1503 FoR code. For instance, there are projects submitted under Industrial and Organisational Psychology, Health, Engineering or Tourism which could be seen as "Management" projects. On this basis, we see Tables 26 and 27 as being conservative estimates of the grants being awarded to the Management disciplines from the ARC.

Research Grant Income from the Survey

In Tables 28–30 we move back to analysing research data collected in the survey. We asked that heads of schools/departments provide data on Category 1, 2 and 3 research grants in order to gain a greater understanding of the broader grant funding being obtained in the sector.

Table 28 Survey Reported Research Income Category 1 Grants 2008–2010

	2008	2009	2010
Number of academics involved	44	52	68
Number of grants	28	38	47
Number of universities reporting grant income	10	10	11
Maximum allocation	$609,404	$511,701	$809,266
Total of grants	**$3,326,414**	**$4,411,104**	**$4,838,825**

2008 n = 16, 2009 n = 17, 2010 n = 18

HERDC Category 1 grants are broadly described as Australian Competitive Grants Research Income, which includes ARC discovery and linkage grants, and other national competitive grant income (e.g., National Health and Medical Research Council grants). This broader description of the source of funding accounts for the fact that the totals reported in Table 28 are greater than the sum of ARC discovery and linkage grants reported in Tables 26 and 27. This may also be a result of the data capturing Management academics participating in grants that were outside of the 1503 FoR code.

Table 29 reports HERDC Category 2 grant income, which includes other public sector research income; for example, grant income from state and federal governments. These can be state-based grants or non-competitive grants provided by government.

Table 29 Survey Reported Research Income Category 2 Grants 2008–2010

	2008	2009	2010
Number of academics involved	37	37	45
Number of universities reporting grant income	9	9	10
Maximum allocation	$490,000	$241,885	$184,975
Total of grants	**$1,684,172**	**$1,379,323**	**$1,915,898**

2008 n = 16, 2009 n = 17, 2010 n = 18

Finally, Table 30 reports on HERDC Category 3 grants, which include industry and other research income. In this category, we identify grants provided by industry and other international organisations. While this is the largest category in the number of academics involved in gaining grants, it is the smallest pool of money, with less institutions reporting income from this source.

Table 30 Survey Reported Research Income Category 3 Grants 2008–2010

	2008	2009	2010
Number of academics involved	59	96	95
Number of universities reporting grant income	6	8	10
Maximum allocation	$496,250	$493,750	$488,750
Total of grants	**$1,628,053**	**$2,326,424**	**$1,840,880**

2008 n = 16, 2009 n = 17, 2010 n = 18

Summary of Grant Income

From this snapshot of grant activity across the Management disciplines, we have shown that grant income is limited to a few institutions and a relatively small number of Management academics. Clearly, the data collected by this survey suggests that the Management academics covered by the survey, on average, fall significantly short of the USD$9,310 per academic found by the Chen et al. (2006) U.S. study, even if we correct for the unweighted data in that study. However, the definition of grant income can be interpreted in many ways, and it is clear that the heads of schools/departments providing data for the current study have used a very narrow definition of research income. For example, we have not captured any income derived from consultancy in these data, and this may be equally important to Management academics. Given the practice-based focus of many Management academics, consultancy income data may be of similar importance to research grants. Some connections to industry may be picked up in the linkage grant activity and the reporting of Category 3 grant income, as these grants require an industry partner, but clearly there are many more opportunities that may not fall under a strict definition of a research consultancy that still contribute to research output in the sector.

Conclusion

Discussion

Research output

A clear trend is emerging within the 2008–2010 survey, which replicates a movement in the overall university sector towards a focus on greater output and higher quality. While we have discussed the trend identified in earlier reports (Soutar, 2002, 2005) towards increasing conference paper submissions, in the 2008–2010 period this has been reversed, although we note that the reasons for this are not yet clear. We can say from our data that refereed conference paper submissions have reduced and journal submissions are increasing. However, one issue we noticed in putting this report together was the number of reporting units that did not claim conference papers under the HERDC system. While we are not condoning "double-dipping" of conference and journal papers, we are also concerned that this trend hides a substantial amount of output in the sector. Under the ERA research quality assessment exercise in Australia the trend not to count or to recognise conference publications may increase as universities try to minimise the number of conference paper publications, which are often seen as lower quality research outputs. This ignores the fact that, in the Management discipline, conference papers are often used by academics as a first step in developing quality journal papers. Prior research has demonstrated the importance of attending conferences for staying in touch with a discipline and its contribution to improving research output (Teodorescu, 2000).

In comparing results found in this survey to those discussed from previous U.S. and international studies, it would seem that Australian Management academics have slightly higher research workloads (around 35% of total workload compared with 29% on average from the 2006 U.S. study by Chen et al.), but seemingly lower publication outputs and research income levels on average. However, it needs to be remembered that these previous reports collected unweighted publication and income data. The journal article output data for business academics as reported by Chen et al. (2006) at 1.43 outputs per academic it seems much higher than the overall average of 0.57 outputs per academic found in this survey. However, if we assume an average number of authors per article of 2.50 (a reasonable estimation given findings from previous studies and the recent trend to increase author numbers in Management articles) in the Chen et al. study and create a weighted publication average for U.S. academics, the figure is much more comparable at 0.572. Similar calculations on average book and book chapter outputs yield figures of 0.05 and 0.09 respectively from the Chen et al. study, which are actually less that the average weighted outputs found from this study of 0.07 and 0.16 respectively. Using these assumptions, our data suggest reasonably similar overall average research productivity output to this business research study undertaken in the U.S.

Research supervision

A comparison between the 2008–2010 survey and earlier research collections is difficult. The data, however, suggests a reduction in the number of students enrolled in HDR programs. We also note within the sector that there are only a relatively small percentage of academics involved in supervision. If you take account of the number of junior academics and those who are research inactive (not published in the last three years) this level of activity appears to be more reasonable.

Research grants

The university sector as a whole has placed significant emphasis on grant income over the last five years. Certainly the data collected within the 2008–2010 survey demonstrates that Management academics are seeking grants from a broad range of areas.

Limitations

There are several limitations in this report that need to be acknowledged.

i. **Representativeness of the data set.** While we have given every school/department of Management the opportunity to respond to this survey, our final sample was 18 units. Although we have results from Go8 universities, Australian Technology Network universities, Innovative Research universities and rural universities, we do not consider that we have a truly representative sample from each grouping, with some groups having more responses than others. We do, however, contend that the data we collected is broadly indicative of trends in the sector.

ii. **Errors in data reporting.** Although clear instructions were given to universities to collect based on HERDC definitions, we are concerned that in a very small number of cases these definitions may not have been adhered to. To address this issue we normalised data that did not conform to HERDC specifications. In the context of the overall data set and the size of the sample, and our attempts to normalise these data, we consider this as acceptable error and do not believe that this would have dramatically affected our results.

Conclusions and Future Directions

Comparisons with previous studies on research productivity have shown similar overall levels of output for publications, but perhaps lower levels of research income generation, although this is difficult to assess because of the different inputs considered under the broad heading of research income. Overall, comparisons are difficult because of the different contexts of the surveys and the different measurement units employed.

Significantly, one aspect of this report mirrors previous reports provided by ANZAM on this topic – that there is a group of academics who do not publish, with the inference that they do not research. Despite active attempts by universities and governments to increase research output, there still remain a number of academics with a workload that indicates they should be spending between 20% and 40%

of their time on research. Yet they are not completing this part of their workload. This is an issue that needs to be addressed by Management schools/departments and by universities generally across disciplines.

In conclusion, examining Australian Management academics' research output overall, we are of the opinion that the quality and quantity of research has increased. As a group, Management academics are responding to broader pressures from society and universities to produce higher quality research outputs in an increasingly competitive global context.

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Glossary

ABDC	Australian Business Deans Council – a national council comprising deans, heads and directors of Australian university business faculties and schools
Academic level	Also known as Academic rank. Includes Associate Lecturer, Lecturer, Senior Lecturer, Associate Professor, Professor, and Research Fellow and Senior Research Fellow
Academic rank	See Academic level
Acceptance rate	The percentage of articles/books accepted for publication
Activity	Activity refers to the full range of writing effort including accepted and unaccepted work
ANOVA analysis	A one-way analysis of variance of group means
ANZAM	Australian and New Zealand Academy of Management
ANZAM Board	Board of Directors for ANZAM
ANZAM Conference Tracks	See Appendix B
ANZAM Research Productivity Survey	This is the current survey and collects data similar to that in the 2002 and 2005 ANZAM research productivity reports (Soutar, 2002, 2005)
ANZAM Streams	Also referred to as Tracks. See Appendix B
AQF	Australian Qualifications Framework – national policy for regulated qualifications in Australian Education and Training
ARC	Australian Research Council – a statutory body under DIICCSRTE which promotes Australian research and innovation globally; it manages the National Competitive Grants Program (NCGP) and administers ERA
Australian university sector	Includes Group of Eight universities (Go8), 1960s–1970s universities, Australian Technology Network universities (ATN), new generation universities, innovative research universities, and rural universities
BARDsNET	Business Academic Research Directors Network.
DIICCSRTE	Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education
Discovery grants	Part of the NCGP managed by the ARC
EFTSL	Equivalent full-time student load (i.e., one student studying full time)
ERA	Excellence in Research Australia
Ethics protocol	The ethics for this report was obtained from Griffith University under approval number EHR/23/12/HREC
Expectancy theory	(Vroom, 1964) Where the desire to satisfy a need is sufficient to ensure the effort required to achieve it is worthwhile
FoR code	Field of Research code
HDR	Higher Degree by Research
HDR supervisory load	EFTSL for supervision of HDR students
Heads of Schools of Management Network	Network of Heads of Schools of Management within ANZAM; commenced in 2010
HERDC	Higher Education Research Data Collection, in which publications are categorised: A1 = Research books B1 = Research book chapters C1 = Journal articles E1 = Refereed conference papers

HERDC Category 1 grant income	Australian Competitive Grants Research Income including ARC discovery and linkage grants
HERDC Category 2 grant income	Other public sector research income
HERDC Category 3 grant income	Industry and other research income
Institutional Member meeting	Meeting of representatives of the member institutions involved in ANZAM
Journal rankings	A variety of ranking methods can be used; in this document the ABDC standards are applied (A*, A, B, and C-level journal quality) as judged by an expert panel
Linkage grants	Part of the NCGP managed by the ARC
Management disciplines	See also ANZAM streams
Marsden Fund	The Marsden Fund supports research excellence in New Zealand in the areas of science, engineering and mathematics, social sciences and the humanities
Mother discipline	The main discipline in which an academic operates and through which they derive support; could be maintained through professional association membership or attendance at annual meetings
NCGP	National Competitive Grant Program – a range of competitive grant programs operated by the federal government
Not provided/specified	Data was provided however not appropriately categorised
Other publications	Publications which are not of A*, A, B, and C-level journal quality
PBRF	Performance Based Research Fund (NZ)
PhD	Doctor of Philosophy
Publication output	Volume of publication output which meets the relevant national standards; e.g., ERA or RAE
RAE	Research Assessment Exercise (UK) – a quinquennial evaluation of the quality of research in British higher education institutions
Relative contributions	Points for authorship of publications are weighted in accordance with the HERDC standards
Research productivity	Productivity based on the volume and standard of research publications
Research Quality Framework	The predecessor to the ERA program developed by the former federal government
RHD	Research Higher Degree – see HDR
Research supervision	Supervision of HDR students including PhD and Masters students
RF/SRF	Research Fellow / Senior Research Fellow
RFCD	Research fields, courses and disciplines classification codes (superseded in 2008 by the FoR codes)
SD	Standard deviation
Structural equation modelling	Statistical technique for testing and estimating simultaneous equations to determine a model of best fit
Unweighted points	Points for authorship of publications are not weighted and therefore each author receives credit for the whole publication instead of a proportion of it
Workload allocation	Expectation of effort across a range of activities; e.g., 40:40:20 would indicate 40% of time should be spent on research, 40% on teaching, and 20% on service or administration

Appendix A: Survey Items

- University Name
- Year
- Current Academic Level
- Highest Qualification
- Research Workload Allocation
- Primary Discipline Area
- HERDC Outputs A1
- HERDC Outputs B1
- HERDC Outputs C1
- HERDC Outputs C1_A* rating
- HERDC Outputs C1_A rating
- HERDC Outputs C1_B rating
- HERDC Outputs C1_C rating
- HERDC Outputs E1
- Other Journal Output
- Number of EFTSL HDR supervisions
- Number of HDR completions PhD
- Number of HDR completions Research Masters
- Category 1 Grants (Number)
- Category 1 Income (Amount)
- Category 2 Grants (Number)
- Category 2 Income (Amount)
- Category 3 Grants (Number)
- Category 3 Income (Amount)
- Other Income

Appendix B: ANZAM Streams 2011

The Management disciplines selected for this report were based on the ANZAM conference streams for the 2011 Conference. The streams are:

- Critical Management Studies
- Entrepreneurship, Small Business and Family Enterprise
- Gender and Diversity in Organisations
- Human Resource Management and Development & Change
- International Management
- Leadership
- Management Education and Development
- Marketing and Communication
- Organisational Behaviour
- Other Not Listed
- Public Sector and Not-for-Profit
- Research Methods
- Strategic Management
- Sustainability and Social Issues in Management
- Technology, Innovation and Supply Chain Management

Appendix C: University Types

One study of the Australian university sector (Moodie, 2012) has categorised its 40 universities as follows:

- **ATN-like:** institutions that were established early as technical institutes in a capital city and formally designated a university after 1987.
- **Group of Eight (Go8):** the oldest universities in their mainland capital cities with the biggest research budgets and the biggest accumulations of academic, cultural and socio-economic capital.
- **1960s–1970s:** universities that were established from the mid 1960s to the mid 1970s as distinctively different from the older capital city universities and which have medium-sized research budgets.
- **New generation:** institutions based on former colleges of advanced education that were designated as universities around 1987, for which research is still developing, and which have most of their student load in cities of more than 250,000 people.
- **Regional:** universities with most of their student load in centres with a population of less than 250,000 people. This is expected to include the University of the Sunshine Coast until about 2020 when, because of the Sunshine Coast's big increase in population, the university will become a metropolitan new generation university.

Table C1 Types of Australian Universities

ATN-like	Go8	1960s–1970s	New generation	Regional
Curtin	ANU	Deakin	Australian Catholic University	Ballarat
QUT	Monash	Flinders	Bond	Central Qld
RMIT	Uni of Adelaide	Griffith	Canberra	Charles Darwin
Swinburne	Uni of Melbourne	La Trobe	Edith Cowan	Charles Sturt
UniSA	UNSW	Macquarie	Notre Dame	James Cook
UTS	Uni of Qld	Murdoch	Victoria University	Sunshine Coast
	Uni of Sydney	Newcastle	Uni of Western Sydney	Southern Cross
	UWA	Wollongong		Tasmania
				Uni of New England
				Uni of Southern Qld

From: Gavin Moodie, *University Types*, www.academia.edu, October 2002, Revised January, 2012.