Business School Doctoral Programs and the Future of Business Research

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Abstract

We apply a neo-institutional theoretical lens to interpret the extent of any significant similarities or differences in doctoral programs across business schools in Australia and New Zealand (ANZ). Overall, we characterise the state of doctoral education in business as lacking adequate funding, primarily attracting students with limited professional or industrial experience but having diverse approaches to the role of formal training as part of the doctoral program. Although we view these findings as somewhat inevitable given institutional and isomorphic pressures, they are of concern if ANZ business schools are to produce research that is both rigorous and relevant beyond the academy. Comparisons across institutional groupings and discipline areas largely suggest relatively common approaches to doctoral program design and administration across and within institutions.

Keywords: Doctoral programs, neo-institutional theory, business schools, research training, research relevance.

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1. Introduction

The objective of this study is to survey the state of business school[1] doctoral programs in Australia and New Zealand (ANZ) and determine whether there are substantive differences between university groupings and disciplines. Historically doctoral programs in Australia and New Zealand have generally presented considerable diversity (Pearson et al., 2008; Usher, 2002) compared with those in the United States. However, there has been relatively little detailed analysis of how doctoral education in business is delivered in Australia and New Zealand and how it has evolved more recently. Indeed, there is only limited recent research of which we are aware on the state business school doctoral education worldwide (Corner and Pio, 2017; Grottke et al., 2013). Hence, it is possible programs have become increasingly homogeneous, a function of academic drift (Berdahl, 1985; Miller Jr, 1975; Tight, 2015).

Our motivation stems from the critical foundation doctoral studies have in graduates' careers, particularly if they pursue an academic career (Bedeian et al., 2010). For example, homogenisation of academic training can bring benefits, including more consistent research skills and expertise, thereby providing a basis for successful academic careers (Fairweather, 1993; Bedeian et al., 2010). However, homogenisation can also be associated with a disproportionate focus on high-ranking journals (Swanson et al., 2007), discouraging interdisciplinary research and research relevant to practice (Jackson, 2022). Consistent with the research preferences of business school leaders, this homogenisation can be an important determinant of who they hire and the opportunities they provide. More broadly, PhD studies

[1] We use the term "business school" as a catch-all for disciplines broadly captured within Field of Research (FoR) codes 14 (Economics) and 15 (Commerce and Management). The FoR codes are part of the Australian and New Zealand Research Classification (ANZSRC) system, used to measure research and development statistics in Australia and New Zealand. We recognise that some Australian and New Zealand business schools exclude economics while some also include information systems and legal studies. However, these differences are unlikely to impact on our overall conclusions about the preparation of future business school academics. Broadly speaking, when we refer to "business disciplines" or "business schools", we are including the following: Economics, Accounting, Management, Marketing and Finance.

can also play an important part in graduates' outcomes should they pursue non-academic career pathways (Sharmini and Spronken-Smith, 2020).

We apply a neo-institutional theoretical lens (DiMaggio and Powell, 1983; DiMaggio and Powell, 1991; Scott, 2001) to understand the reasons for any similarities or differences between attributes of doctoral programs. Our approach is consistent with prior studies using neo-institutional theory to explain similarities in university program characteristics and how these have evolved (Morphew and Huisman, 2002; Altbach, 2011; Taylor et al., 2013). The scope of doctoral programs is considerable, so exploring practices that predominate or otherwise, with reference to isomorphic pressures, is an appropriate means of understanding the current state of business doctoral programs in Australia and New Zealand (Donaldson and Petersen, 2007; Morphew and Huisman, 2002).

We obtain detailed data on multiple characteristics of ANZ business school doctoral programs using a survey developed in conjunction with input from the Business Academic Research Directors' Network (BARDsNet). ANZ doctoral programs in the region are typically three to four years full-time, focusing on research training via a substantial proportion of thesis completion and a smaller coursework proportion. We examine multiple characteristics in detail, providing insight into potential trends and challenges. We focus on three key areas. While selective, they reflect areas of identified concern (see section 2). First, we consider the program structure and assessment. This incorporates the role of coursework versus research and the extent formalised assessment occurs concerning coursework and the research component (i.e., thesis). Second, we consider the career objectives and prior experience of doctoral students. Third, we examine the funding of doctoral programs, including the provision of scholarships. At the same time, we test for differences between university groupings and across major discipline groups.

Our results suggest while these programs are subject to isomorphic pressures, to a minor extent coercive and a larger extent normative isomorphism, there has not been extensive academic drift towards substantial homogenisation. For example, while most programs surveyed have formal stages related to coercive funding considerations, they are not dominated by coercive coursework, leading to diverse research abilities. Normative pressure appears to drive characteristics related to best practice, including supervisory panels, funding for networking and the requirement for external examination. However, we find several areas of concern, including research-centric doctoral programs, which, through various isomorphic pressures, appears consistent with programs in the United States but inconsistent with the balanced (i.e., teaching/research) workload models in ANZ, where it is common for new doctoral graduates to carry significant teaching loads. On the other hand, normative pressures have not pushed ANZ business schools to consistently focus on quantitative skills, thereby reducing the extent to which doctoral graduates from ANZ business schools can be expected to publish in top-tier publications.

Our research makes several contributions. First, it extends prior studies of university programs (especially doctoral programs), viewed through a neo-institutional framework. We are unaware of prior evidence of this type focused on doctoral education in ANZ business schools. We also provide novel evidence regarding the research training processes within ANZ business schools, thereby providing business school academics and leaders with insights into challenges they may need to address[2]. This contribution is timely given an ageing academic workforce and the impact of COVID-19, whereby many senior business school academics may

[2] Of course, to the extent Australian and New Zealand business schools recruit doctoral graduates from overseas programs such as those in the US, Europe or Asia, the implications of our analysis of programs in Australia and New Zealand may be reduced. Nevertheless, we believe it is important to understand the design and operation of Australian and New Zealand doctoral programs, and the extent to which their similarities and differences can be explained through a neo-institutional lens.

elect to take attractive redundancy packages, thereby making the role of newly produced doctoral graduates more critical and their impact on business school practices more substantial.

In the following section, we review the major areas of concern identified regarding doctoral education in the business disciplines, globally and within Australia and New Zealand. These issues guide the design of our survey instrument, also described in section two. Section three presents the results and highlights identified differences between university groupings and/or discipline areas. Section four concludes with suggestions for developing doctoral education in Australian and New Zealand business schools.

2. Background and method

2.1 Background

There is evidence of sustained concerns about the structure and content of business school doctoral programs. For example, frequent calls for a better understanding of the general and ethical values applicable to academic research, with Mitchell (2007), Berry (1989), Krueger (1991) and Trapnell et al (2009) considering this issue across several business disciplines in the US. At the same time, there is a strong tendency in certain parts of the world to emulate the US, often characterised by their perceived prestigious institutions, with a strong component of formal research training, including the completion of core and field courses, as well as seminars and workshops (Krueger, 1991). Institutional theory predicts organisations duplicate what is perceived as "correct" practices so they are viewed both internally and externally as legitimate (Scott, 1987; Meyer and Rowan, 1977). The acquisition of normatively defined practices is argued to be critical for survival, compared with efficiency-related practices (Fligstein, 2001; Meyer, 1980), and isomorphic pressures result, leading to the homogenisation of activities (in this case, homogeneous doctoral programs). These isomorphic pressures reflect coercive, mimetic and normative pressures (DiMaggio and Powell, 1983).

As institutions seek legitimacy through the isomorphic pressures causing practice duplication, this can broadly cause concerns about the nature of doctoral program offerings. It has also been argued that the relatively "structured" and "formal" process increases the tendency towards relatively homogeneous research by doctoral students and early career researchers (Fraser, 2014). Schwartz et al. (2005) provide evidence that US accounting doctoral students generally have low familiarity with anything other than traditional "premier" journals. Whether a heavy focus on method and technique results in less than optimal development of broader critical thinking skills and ability to undertake independent and relevant research is subject to conflicting evidence (Hansen, 1991; Mckiernan and Tsui, 2019; Sandhu et al., 2019). What follows below is a general overview of the elements of doctoral programs, beyond structure and content considerations above, that have been suggested in prior evidence as most significant.

An important characteristic of doctoral programs is the availability and quality of supervision. Not surprisingly, prior studies identify supervisors' experience heavily influences supervisory style. Yet it is well understood supervisory style needs to vary contingent on students' needs relating to their personality, maturity, intellectual and emotional characteristics. Wright et al. (2007) highlight this issue, consistent with often diverse student cohorts in Australia. However, small supervisory pools limit flexibility. While the use of supervisory committees means there is likely to be more variability and adaptability in supervisory styles, the extent of supervisory committees in Australian and New Zealand doctoral programs is unclear.

Varied feedback and networking opportunities are important determinants of student success. Mitchell (2007) demonstrates the importance of attendance and engagement at events, allowing students in US programs to network, such as conferences and exchange programs.

Accordingly, we survey the extent to which students can access financial support to attend such events.

While our main focus is on the role of doctoral programs as a means of research training, we recognise the importance of teaching. Business school faculty are typically employed on a balanced teaching, research and service model. Focusing on the marketing discipline in Australia, Boddy (2007) argues focus on dissertation completion is inadequate preparation for teaching. This is consistent with Australian doctoral graduates' heavy teaching loads. Supporting evidence is provided by McCoy and Milkman (2010), who find only half of doctoral candidates who were teaching while completing an economics doctorate in the US and Canada completed teacher training. Johnston et al. (2014) found similar levels of training among marketing students in the US, and although 53 percent of marketing doctoral candidates had formal teacher training, only 11 percent had credit recognition for this training. We, therefore, explore teaching experience.

Changes to doctoral student funding, for example, by the Australian government, have emphasised the importance of more structured and directive programs and encouraged faster completion. In addition, doctoral programs compete for funding with coursework programs, which are seen as having significantly greater reputational effects (Bearden et al., 2000). Lengthy completion time is expected to be a concern in Australia and New Zealand, as government funding is tied to completion.

US-based evidence identifies direct and indirect financial support as among the most influential factors determining an individual’s choice to apply for doctoral program admission (Stewart et al., 2008; Fisher and Garrett, 1984). Compared to other forms of tertiary study, doctoral programs represent a long and sometimes uncertain pathway. Financial support through a mix of scholarship and university work (including teaching opportunities) improves

the prospect of attracting doctoral students and the likelihood of completion. Accordingly, we view the extent of financial support provided as an important dimension to survey.

Student characteristics are also an important dimension of doctoral education. Gender balance in academia has remained a long-running concern across disciplines, including those in Australia (Everett, 1994; Flynn et al., 2017). With significantly improved mentoring and networking opportunities directed at addressing gender imbalances (Sandhu et al., 2019), it is important to understand the gender balance in doctoral studies, as this represents the future academic pipeline. Likewise, it is important to understand the mix between local and international students, as implications arising from differences in writing norms and national cultures have been noted, including in New Zealand, where there is a large proportion of international students (Corner and Pio, 2017). The Australian and New Zealand tertiary sector has attracted large cohorts of international students, and our survey considers how extensive international student enrolment is across different business disciplines.

Prospective students' intrinsic interest in completing a doctoral degree is a key determinant of students' intention to apply for doctoral studies (Osei, 2013). Prior studies in the US show students who are ambitious, motivated, persistent, organised and intellectually curious are more likely to complete their doctoral studies and achieve better research outcomes (Stock et al., 2009; Podsakoff et al., 2018; Grottke et al., 2013; Smart and Conant, 1990). While measuring the extent students exhibit such characteristics is outside the scope of our study, the diversity of pathways students take before enrolling in a doctoral program may reflect intrinsic interest. We, therefore, attempt to elicit information on students' professional and educational backgrounds. Concerns about the broader relevance of doctoral research may also reflect doctoral students with a lack of prior industrial and/or professional experience and/or an inability to communicate research outcomes to non-academics.

2.2 Research questions

Our survey gathers relevant descriptive evidence on the program characteristics, funding, student attributes, student numbers and employment destinations across doctoral programs in Australian and New Zealand business schools. However, we are also interested in testing for significant differences across recognised university groupings. As previously discussed, there is a tendency for academic drift and homogenisation (Morphew and Huisman, 2002; Tight, 2015). Our difference testing allows us to examine the extent this is occurring in Australia and New Zealand. Examining the differences across the areas we survey is important, as isomorphic pressures may operate with varying effects (Oliver, 1988). As previously detailed, to make sense of any homogeneity observed, we apply a neo-institutional theoretical lens, in particular focusing on why any program isomorphism has occurred with reference to cohesive, mimetic and normative pressures.

We define observable university groupings based on the national location (Australia or New Zealand) and then by two well-recognised groupings of Australian universities – the Go8[3] and ATN[4]. There is a strong correlation between membership of one of these groupings and the assessment of research quality, as evidenced by successive Excellence for Research in Australia (ERA) assessments (Feng and Taylor, 2021), although even among these groups, there have been significant differences in the overall ranking of Business and Economics research quality. Nevertheless, Feng and Taylor (2021) identified the top six Australian business schools comprise five from Go8 institutions and one from the ATN. Accordingly, it is of interest to understand whether university groupings are related to the state of doctoral

[3] Go8 refers to the Group of Eight universities. There are eight universities that are members of the Go8 comprising "Australia's leading research-intensive universities" (see https://go8.edu.au/)
[4] ATN refers to the Australian Technology Network of Universities. There are six universities that are members of the ATN that are focused on "enterprise, impact and finding solutions to issues facing our economy and society" (see https://atn.edu.au/)

programs or if there is homogenisation of programs more broadly across the areas we examine. Hence, our first research question is:

RQ1: Are doctoral program characteristics, funding, student attributes, student numbers and employment destinations similar across observable university groupings?

We also recognise there may be discipline-specific differences, although isomorphic forces could be pervasive, resulting in little, if any, difference between disciplines (Scott, 2001). We define disciplinary groupings consistent with the primary Field of Research (FoR) codes used by the Australian Research Council (ARC), namely economics, accounting, finance, marketing and management. Based on our review of prior literature and personal observations of business school practices, we focus on testing for several differences across doctoral programs based on discipline areas[5]. First, consistent with concerns about the heavy focus on method and technique (Hansen, 1991; Mckiernan and Tsui, 2019; Sandhu et al., 2019), we examine whether this is specific to particular discipline areas. Second, consistent with documented differences in writing norms and national culture (Corner and Pio, 2017), it is important to understand if such challenges are more likely in certain discipline areas, in line with students' origination and language background. Third, the pathways students take before doctoral program enrolment may have implications for student interest and their doctoral research relevance (Perry and Zuber-Skerritt, 1994; Bearden et al., 2000). Different discipline areas may attract different proportions of students from certain pathways, and consistent with this, differing numbers of students. Lastly, the pathways doctoral graduates take post-completion may differ, in line with concerns associated with research relevance in some disciplines (Burgstahler, 2019; Kaplan, 2019). Hence, our second research question is:

[5] We are cognisant that while it would be ideal to survey respondents on all the possible differences across discipline areas, we already asked for detailed information across a number of areas and further data requested would likely lead to survey fatigue and a lower response rate.

RQ2: Are doctoral program characteristics, student attributes, student numbers and employment destinations similar across recognised business school disciplinary groupings?

2.3 Method

Our survey was structured consistent with the guidance from Dillman et al (2014). To maximise responses, we used simple and consistent question scales. We did not randomise question order, as the survey was structured based on a logical flow, aiding ease of completion, developed in consultation with members of the ABDC and, especially, from multiple discussions at BARDsNet meetings. This group comprised 46 university member institutions across Australia and New Zealand (essentially all business schools in both countries). Each of the 46 member institutions received the online survey.

There were three follow-up reminders for survey completion over almost 18 months[6]. The survey was not anonymous, allowing targeted reminders. We received 27 responses, providing a 58.70 percent response rate. It is noteworthy the participation rate was strong across different university groupings. The response rate was 55.26 and 75 percent for Australian and New Zealand universities, respectively. Among the Australian universities, the Go8 response rate was 62 percent, while all ATN institutions participated. As these two groups dominate the ERA ratings of business research, there is very strong coverage of institutions most likely to produce successful future researchers. The response rate for the Innovative Research Universities and Regional Universities Network groups was 50 and 40 percent, respectively. Although we would have liked all ANZ business schools to participate, the strong and generally representative response rate increases our confidence in making generalisations about the underlying process by which future business school academics are produced.

[6] The initial survey was sent in late 2017, with the last reminder in early 2019. Hence the responses pre-date any changes that would specifically reflect COVID-19 considerations.

To check for non-response bias, we compared responses received early and late, splitting the responses based on the mid-point according to the date each survey response was received. Our comparison of means using the Mann-Whitney U test indicates differences in the mean responses across the variables are almost all insignificant. We also test for common method bias using Harman's single-factor test, resulting in five factors with eigenvalues greater than one. The strongest factor explains 32.98 percent of the total variance, indicating common method bias is not present (Podsakoff et al., 2003).

To address research question one, are doctoral program characteristics, funding, student attributes, student numbers and employment destinations similar across observable university groupings (Go8/non-Go8 Australia institutions, ATN/non-ATN Australian institutions, and Australian and New Zealand institutions compared), we use the Wilcoxon *Z*-statistic, consistent with the non-parametric nature of our data. To address research question two, are doctoral program characteristics, student attributes, student numbers and employment destinations similar across recognised business school disciplinary groupings (economics, accounting, finance, marketing and management), we use the Friedman test. The Friedman test allows testing of differences across three or more related samples and is appropriate for non-parametric data. We report the Chi-square and associated asymptotic significance output from the Friedman test. All respondent institutions undertake research, to some degree, across all disciplinary groupings. Coupled with the descriptive statistics, we report the differences in section three below. A summary of the significant differences we find across university and disciplinary grouping is reported in Appendix 1 and 2, respectively[7].

3. Results and discussion

3.1 Program characteristics

[7] We summarise the significant differences in the tables reported in Appendix 1 and 2 to avoid excessive repetition of grouping tables across section 3. A full summary table of differences, including significant and insignificant differences, is available from the corresponding author upon request.

Table 1 summarises the program characteristics of surveyed doctoral programs. In Panel A, we summarise program structural characteristics. Almost all programs (92.6 percent) have formal stages, with no significant differences noted across university groupings. Government program funding, based on completion, appears to be a powerful source of influence, causing coercive isomorphism towards more closely monitoring student progression with a view to completion. However, while this might suggest a high degree of program formalisation and homogenisation, further analysis indicates this is not so, alleviating concerns about such homogenisation as noted in the US (Fraser, 2014). For example, among the respondent business schools, only half (48.1 percent) have mandatory coursework. When examining differences across university groupings, we identify 61.9 percent of Australian institutions require coursework, significantly higher than New Zealand institutions where no coursework is required. The maximum formal component is one-third of the program, likely reflecting government accreditation requirements in line with the Australian Qualifications Framework (AQF). On average, surveyed programs have a little less than 20 percent of the doctoral program directed to some form of formal coursework (17.7 percent). We do not find significant differences in the proportion of doctoral programs directed toward coursework across university groupings.

The less formalised nature of doctoral programs is also evident concerning examinations, with only 11.1 percent of programs having a mandatory PhD examination (for example, field and/or comprehensive), while only around one-third include some form of oral PhD examination. However, all New Zealand doctoral programs for which we received responses include oral examinations, a function of government requirements and therefore a form of coercive isomorphism, significantly more than the 19 percent of Australian institutions using such examinations. Otherwise, there are no other significant differences in examinations across the groupings. Collectively, outside the staged doctoral program approach and oral PhD

examinations in New Zealand, the structural characteristics of programs vary widely across institutions. This suggests institutions largely determine structural characteristics based on their own managerial and academic judgement, and structural homogenisation is only occurring via coercive isomorphism.

In Panel B of Table 1, we summarise the primary research method (i.e., quantitative versus qualitative) and provide a discipline breakdown. The percentage of students primarily using quantitative methods is on average 56.3 percent, while those primarily using qualitative methods is 43.8 percent, with no significant variation across university groupings. However, this percentage varies widely across disciplines, with economics and finance having the highest percentage of students primarily using quantitative methods at 72.1 and 68.7 percent on average, respectively. This is likely a reflection of the normative isomorphic pressures in economics and finance disciplines, where such methods are widely regarded as more acceptable based on the interaction between academics and as reflected in journal publications. The accounting, management and marketing disciplines are more balanced, with percentages of 57.8, 52.6 and 56.8, respectively. Among the discipline areas, the highest percentage of students who are primarily using qualitative research methods is in management, although accounting and marketing are both around 40 percent, not very different from management. The Friedman test confirms significant differences across discipline areas relating to the percentage of students employing both quantitative and qualitative methods.

We note the vast majority of papers published in accounting and marketing journals ranked as A* by the ABDC (i.e. journals ranked in the top tier) publish predominantly, or even exclusively, quantitative research, consistent with methods familiar to US doctoral program graduates (Schwartz et al., 2005). We would have expected such normalisation of the predominately acceptable method, quantitative, would have been reflected in the primary research method of doctoral students, however, this is not the case. It is possible such normative

forces have not had a notable impact, largely due to lower publication pressure in Australia and New Zealand compared with the US tenure system (Miller et al., 2011). Given the quantitative focus of A* journals, our survey results suggest many doctoral graduates from Australian and New Zealand business schools are unlikely to publish research in these outlets. However, the wider scope of methods used by doctoral students in the region means research more relevant to industry may follow.

We next consider the forms of supervision, namely capacity to supervise and the supervision form (individual supervisor or supervisory committee). The availability of suitably qualified supervisors means students are more likely to find supervision in their research area of interest and identify an appropriate fit concerning mentoring style and student motivation skills. The importance of supervisor characteristics in US management and economics programs is documented by Ford et al. (2006) and Stock (2009), and we note in passing thesis completion typically accounts for a smaller proportion of the doctoral program than in Australia and New Zealand. For the responding institutions, Panel C of Table 1 reports an average of 86.6 percent of faculty members hold doctoral degrees. However, the lowest percentage of faculty with doctoral qualifications among responding institutions is a little over half (58 percent). Panel C indicates the vast majority of business school doctoral programs require students to be supervised by some form of committee. Only around one-tenth of programs (11.1 percent) typically allow a single supervisor. This suggests any characterisation of doctoral study as a somewhat "feudal" servant-master arrangement is inconsistent with practice in Australia and New Zealand. Further, we do not observe any significant differences across university groupings based on faculty holding doctorates and using a committee supervision structure. The lack of significant differences in supervisory qualification and composition suggests such practice is an accepted professional norm in line with program quality expectations (Ford et al., 2006; Stock et al., 2009) and increases program attractiveness.

Further, the importance of accreditation in Australia and New Zealand has grown substantially and likely has led to some coercion concerning minimum supervisory expectations.

Panel D of Table 1 summarises financial support directed towards networking. Every respondent university indicated they provide some form of specific funding for doctoral students to attend conferences, workshops and doctoral colloquiums. Moreover, a substantial percentage of funding is effectively "guaranteed" to students, with a small portion competitively determined. Hence, it appears universal recognition and an accepted norm that doctoral students benefit from the opportunity to attend conferences, presenting their research and developing a network, consistent with the insignificant differences across university groupings based on networking support. This finding is encouraging in the context of supporting collective doctoral training continuation, including that offered by the Financial Research Network (FIRN) and the Accounting and Finance Australia and New Zealand (AFAANZ) doctoral courses. Such training also potentially fills a vital role given the absence of significant coursework in many individual programs.

Given doctoral programs are primarily directed at preparing students for a career in research and teaching, it is important to understand whether it is common for students to gain teaching experience. Panel E of Table 1 indicates, on average, a little less than half of doctoral students (41.8 percent) teach. Interestingly, a significantly higher proportion of students at Go8 institutions undertake teaching (66.8 percent) compared with non-Go8 Australian institutions (27.2 percent). No significant differences are found between ATN and non-ATN Australia institutions, and Australian and New Zealand institutions. The high proportion in some institutions, particularly Go8 institutions, of doctoral students engaged in teaching suggests it is important to consider the teaching-related training provided so they can build on their expertise during doctoral program completion. On the other hand, the low proportion in some institutions also teaching raises questions as to their preparedness to teach when commencing

academic careers and the extent their employer institutions need to consider the incentives for good teaching and relevant doctoral graduate teaching certifications (Doogar, 2003). Doctoral programs are an accepted means of preparing students for academic careers, however, through various isomorphic pressures, programs largely focus on research rather than teaching. While this may be appropriate in the US, where the early-career academic workload is research-focused, such a model is problematic in Australia and New Zealand, where early-career academics typically have more balanced workloads.

[INSERT TABLE 1 HERE]

3.2 Funding

Panel A and B of Table 2 summarises our exploration of funding. Using a strongly disagree to strongly agree (1 – 5) Likert scale, the average response to the statement "funding constrains our number of PhD students" is 3.96, varying from a score of 2 (disagree) to 5 (strongly agree) and a standard deviation of the 1.020. On a strongly disagree to strongly agree (1 – 5) Likert scale, the average response to "we have too many PhD students in our program" is 2.36, varying from 1 (strongly disagree) to 4 (agree) with a standard deviation of 0.70, indicating student numbers are not perceived as excessive in most institutions. The strong indication is funding constrains student numbers, with no significant differences across university groupings. With universities largely reliant on government funding, this appears to be acting as a coercive force limiting numbers. It appears universities would like to expand doctoral programs and thereby research output, suggesting institutions should pursue further industry-funded engagement. Industry-funded engagement would have the added benefit of encouraging industry-relevant research.

Consistent with the pressure of limited funding, responses indicate 64.4 percent of students complete their doctoral studies on time. Students at Australian institutions are significantly more likely to complete on time (68.4 percent) than their New Zealand

counterparts (49 percent). Higher rates of on-time completion in Australia are likely the result of coercive government pressures whereby universities receive funding based on student graduation. In our sample, we also observe a substantial number of doctoral students are completing their studies part-time. Panel A of Table 2 reports 70.8 percent of students are completing their PhD full-time, varying between 38.0 and 100.0 percent depending on the institution. From our university groupings, we find a significantly higher proportion of students completing their PhD full-time at New Zealand institutions (83 percent) compared with Australian students (67.6 percent). There is considerable variation across both countries and across university groupings, indicating study mode of students, whether full or part-time, is likely a function of individual institutional preferences, coupled with the students they attract.

Students who complete research studies before doctoral program enrolment may also complete at a faster rate. On average, 76.5 percent of doctoral students have completed a research masters and/or honours degree. Although this varies widely across responding institutions, this is not associated with identifiable university groupings. The higher risk of non-completion for doctoral students without prior research studies is recognised, including by Stock et al. (2011) in the US, where programs are more course intensive and thereby, students without prior research studies are at less risk compared with students in Australia and New Zealand, where students typically receive less coursework training. While the percentage of students who have completed prior research studies varies widely, the average is high and likely a function of both normative pressure, based on shared knowledge of applicants' chance of successfully completing doctoral studies, and coercive government forces, constraining funding if they students don't complete. Finally, Panel A of Table 2 reports common approaches to thesis examination. All surveyed institutions use external examiners, with common reliance on two or three examiners, and thereby no significant differences across university groupings. This indicates normative isomorphic pressure that external verification

is completely accepted by business school academics, and absence would indicate a disconnect from the academic community.

Panel C of Table 2 reports the methods by which students primarily fund their candidature. Given earlier evidence of institutional funding limitations, it is not surprising Panel C reveals only around half of enrolled students are typically funded by competitive scholarships, such as those provided by the university, government or industry. However, this percentage varies widely, ranging from 5 to 90 percent. We also find on average, an additional 14.9 percent of students are funded by internal scholarships related to teaching, research assistance or other activities. In general, it appears a large proportion of students do not receive explicit funding and are dependent on other forms of financial support such as external employment and/or family assistance. On average, we find about a quarter of doctoral students live on campus, although this varies widely across institutions. Despite the variation observed in scholarship funding, there are no significant differences across university groupings. This may reflect scholarship determination based on individual student merit at each institution, rather than systematic differences in scholarships awarded across different institutions, driven by government funding constraints and limited industry engagement.

[INSERT TABLE 2 HERE]

3.3 Student characteristics

Table 3 reports responses to questions regarding student characteristics. We find just over half (52.12 percent) of doctoral students are female. However, this varies widely across institutions, with a minimum to maximum female candidature of 25 to 78 percent and a standard deviation of 10.2 percent, although there are no significant differences across identifiable university groupings. These numbers are consistent with gender balance in the early career researcher pipeline, although some institutions' cohort of doctoral candidates is far

from gender-balanced. Given normative pressures within the sector and potential coercive regulatory pressures, the lack of gender balance in some institutions is surprising.

We also consider the extent to which doctoral students are sourced locally versus overseas. Panel B of Table 3 shows an average of 43.2 percent of doctoral students are local students, varying widely across institutions from 9 to 80 percent with a standard deviation of 19.4 percent, although there are no significant differences across university groupings. When we examine this question across specific disciplines, we observe only small insignificant variations. The high numbers of international students are not surprising given the fees charged, which reduces the coercive impacts of government funding. However, it also presents potential challenges associated with those from non-English speaking backgrounds. Panel C of Table 3 reports only 46.4 percent of PhD students come from English-speaking backgrounds, and once again, we observe no statistically significant variation across the disciplinary areas (confirmed by the Friedman test) or between identifiable university groupings. Such a high proportion of non-English background students has previously been recognised by Corner and Pio (2017) in the New Zealand context as a challenge for effectively delivering doctoral programs, given different writing norms and academia perceptions. Given the large number of international students in Australia and New Zealand, we expect this challenge to continue and could be made worse by pandemic-induced isolation.

Further evidence on the background of doctoral students is reported in Panels D and E of Table 3. On average, 43.3 percent of students have industry experience, varying from 10 to 96 percent, with a standard deviation of 24.8 percent. Students from industry comprise, on average, between 39.3 and 40.7 percent of candidates in accounting, economics, finance and marketing. However, industry candidates comprise 49.2 percent of candidates in management, which is significantly higher than other discipline groupings. This difference may reflect greater intrinsic interest of industry-based students in the management discipline, who are thus

prepared to come back to university. It may also reflect a preference among candidates from industry to undertake doctoral studies in a discipline where qualitative research methods are common. Regardless, higher proportions of students with an industry background would likely improve the research relevance. Thus, the low proportion of industry candidates, particularly in some institutions, and lower proportions across some disciplines is a concern. The high proportions of students not from industry is likely a function of the relatively high numbers of such students in the prospective student pool, coercive pressure to accept these students for funding and research output reasons, and limited funding in some cases to attract those with industry experience through scholarships.

Panel E of Table 3 indicates, on average, 38.1 percent of students have prior academic experience, varying widely from 10 to 94 percent. The extent to which students come from an academic background within their discipline varies, although not significantly, comprising 43.4 percent of students in marketing, 42.1 percent in management, 39.4 percent in accounting, 37.0 percent in economics and 34.2 percent among finance candidates. The lower proportion of candidates with an academic background is likely a function of the coercive pressures in business schools to hire full-time academics who have completed their PhD in line with accreditation requirements. Some candidates may have prior experience through casual research assistant and teaching positions, however, it is more common to undertake such positions while completing doctoral studies.

The average candidate age in our sample is 33.28, varying widely from 24 to 49 with a standard deviation of 6.05, as reported in Table 3 Panel F. This variation in age reflects a student cohort ranging from recent undergraduate coursework graduates to those with significant industry experience and doesn't vary significantly based on university groupings. Based on average age, doctoral candidates potentially have a little more than ten years of industry experience following undergraduate studies, although the extent this time period also

reflects other post-graduate study rather than non-academic career paths is not known. The higher proportion of candidates lacking industry experience suggests many candidates have completed other post-graduate studies, such as masters programs. Once again, the ability of such candidates with limited experience to identify research questions relevant to industry remains a concern.

We next consider acceptance rates. Acceptance rates provide a basic insight into the level of demand to undertake doctoral studies. Panel G of Table 3 reports these results. On average, 26.4 percent of applicants are accepted into doctoral programs, varying widely from 5 to 70 percent. Given the average acceptance rates are below 30 percent, there appears to be relatively rigorous selection processes. Based on our university groupings, Go8 institutions have significantly lower acceptance rates than non-Go8 Australian universities. This could be a function of normative pressures to identify as part of the Go8 group with agreement on a higher standard of potential applicants or simply a function of the larger volume of applicants due to perceived higher perceived quality programs.

[INSERT TABLE 3 HERE]

3.4 Student numbers

Doctoral candidate numbers are summarised in Table 4. The average number in each institution was 15.0 in accounting, 20.1 in economics, 14.2 in finance, 30.5 in management and 15.0 in marketing, with the Friedman test indicating significant differences across disciplines. The Wilcoxon test indicates management has significantly higher numbers than all other disciplines. This is unsurprising given the wide scope of research topics in management.

We find significantly higher numbers of students completing finance doctoral studies at Go8 compared with non-Go8 institutions. This possibly reflects the prestige and high-ranking publications in finance studies, aligned with normative pressure in Go8 institutions to maintain their identity as leading research institutions. In contrast, there are significantly higher

numbers of accounting and management students at ATN compared to non-ATN Australian institutions. This could reflect the more practice-based nature of accounting and management and, therefore, normative pressure on ATN institutions to maintain their identity as leaders in practice-related research and thereby engage with such practice, although this is difficult to say given the broad range of research topics these disciplines encompass. No other differences across university groupings are noted. When account is taken of the relatively large number of business schools, even allowing for the large number of students who do not take up employment in the university sector (see section 3.5 below), it would appear there is a relatively substantial pipeline of new academics.

[INSERT TABLE 4 HERE]

3.5 Employment destinations

To understand immediate graduate outcomes, we survey institutions concerning graduate pathways. On average, 53.1 percent of graduates go to academic employment destinations, varying widely from 15 to 90 percent with a standard deviation of 20.9 percent, as reported in Panel A of Table 5. The Friedman test confirms the proportion of students going to an academic employment destination varies significantly, however, no significant one-to-one differences are found using the Wilcoxon test. The discipline where the highest percentage of graduates go to an academic destination is accounting (62.0 percent), followed by marketing (55.7 percent), management (55.4 percent), economics (52.9 percent) and lastly finance (49.9), although again, these percentages vary widely across institutions. These percentages do not differ significantly across university groupings. Although we are reluctant to over-extrapolate, the fact accounting doctoral programs have the highest academic employment destination rate is also consistent with recent criticisms that accounting research is of little relevance to the profession, as shown by Burgstahler (2019) and Kaplan (2019) in the US. Of course, whether this reflects the way doctoral programs operate, the background of the doctoral students (e.g.,

lack of prior professional/industrial experience), succumbing to normative pressures to identify as part of an academic rather than practice-based discipline, or some other factor, is not clear.

[INSERT TABLE 5 HERE]

Given our findings that a large proportion of doctoral graduates do not go to academic positions, we further examine alternative employment destinations, with industry and government destinations reported in Tables 5, Panels B and C, respectively. Of course, as with all employment destination responses, these figures are dependent in several cases on estimations sourced by the respondents. On average, 32.8 and 11.0 percent of graduates go to industry and government employment destinations, respectively. The discipline where the highest percentage go to industry is finance (38.1 percent), followed by economics (35.6 percent), management (34.9 percent), marketing (32.7 percent) and lastly, accounting (28.1 percent), however, these differences are not significant based on the Friedman test. The discipline where the highest percentage of graduates go to government employment destinations is economics (13.9 percent), followed by finance (10.5 percent), management (9.4 percent), accounting (9.3 percent) and marketing (8.2 percent), however again, these differences are not significant. Interestingly, the proportion of management students at Go8 institutions going on to industry employment is less than half that of other institutions. In contrast, there is a significantly higher proportion of students going to industry employment across accounting, economics, finance and marketing at ATN compared to non-ATN Australian institutions. These differences appear in line with the normative pressures in both types of institutions and the stakeholders they interact with; Go8 institutions generally focus on high-ranking research, while ATN institutions are more concerned with work readiness outcomes. No other significant differences are found across the university groupings. Overall, these findings suggest that research relevance is more likely to be considered in ATN institutions than in that of Go8 institutions, given the difference in graduate pathways.

However, it also must be acknowledged that graduates from Go8 institutions are more likely to find opportunities to stay within academia.

4. Conclusion

Given concerns about future trends and challenges in Australian and New Zealand business schools, we conduct a detailed survey of Australian and New Zealand business school doctoral programs. We apply a neo-institutional theoretical lens to make sense of the underlying reasons for the state of these doctoral programs and the degree of observable homogeneity. In general, our survey of doctoral programs suggests institutional normative isomorphism largely explains similarities in the key characteristics observed across different university groups and discipline areas, going well beyond the superficial role of coercive pressures (Scott, 2008).

There are many positive aspects of business school doctoral programs in Australia and New Zealand. The combination of homogeneous and heterogeneous characteristics suggests Australian and New Zealand universities are subject to isomorphic pressures that have varying effects on doctor program attributes (Oliver, 1988) and which have not led to extensive academic drift and program replication throughout the region. While the majority of programs have formal stages, likely relating to coercive funding considerations, they are generally not dominated by coursework or one research method, thereby potentially contributing to heterogeneity in research output and abilities of graduates. Students appear to receive support via supervisory panels (rather than single supervisors), funding to develop their professional network, illustrating recognition of best practice and normative isomorphism in action. However, there appears only limited opportunity to receive scholarships and living support. Further, teaching opportunities vary widely while completing doctoral studies, and it is encouraging to see significantly higher numbers of students from Go8 institutions are provided with teaching opportunities. Limited teaching opportunities in some institutions is potentially

concerning, a reflection of the research-centred nature of doctoral programs and not the balanced workload models in Australia and New Zealand.

Not surprisingly, our survey reveals the majority of graduates take up academic positions upon completion, consistent with the lack of candidate industry experience, limited industry funding and the universal academic orientation of doctoral programs. However, with the decline in international student numbers and associated funding, the number of positions available for the foreseeable future may be greatly diminished. A higher proportion of graduates may need to find employment in industry and government, which could be problematic given concerns over research relevance and, consequently, the degree non-academic employers value doctoral graduates. We suggest pathways into doctoral programs need to change substantially, and greater encouragement is needed for those with industry experience to enter programs, thereby promoting industry-relevant research projects. Of course, the concerns associated with the ad-hoc nature of funding also need to be acknowledged. Attracting a higher proportion of candidates with greater industry experience will be difficult in the absence of a financial model supporting such students.

Although our results suggest some diversity in the extent to which Australian and New Zealand business schools prepare doctoral students to address the challenges in producing quality research seen as relevant beyond the academy, there is nevertheless a high degree of commonality around most of the issues. Funding constraints, limited pre-doctoral study experience, and pressure to gain teaching experience are relatively common problems in Australian and New Zealand business school doctoral programs. While there seems to be common acceptance of the need for external examination to verify satisfactory research achievement, we are surprised at the reluctance to adopt a more formalised training in research methods, despite an apparent enthusiasm for progressive assessment/stages. We are likewise concerned at the large proportion of doctoral students who see their future as being in

qualitative research, despite the high percentage of top-tier research journals in business disciplines having a quantitative focus. The absence of training in quantitative research methods likely limits the extent to which research will be publishable in many of the leading outlets. It seems normative isomorphic pressures concerning research method and focus on high-ranking publications have not taken hold in Australian and New Zealand business schools. This may also have negative implications for future assessments of research quality where quality is implicitly or explicitly linked to the most highly ranked journals.

It is also noteworthy that few doctoral students in business schools have substantive professional or industrial experience, although it should be noted that Go8 institutions appear more discerning in selecting applicants with lower acceptance rates. Hence, even where students receive sufficient research training, their ability to produce academically rigorous research may not be matched by an understanding of (or even an ability to recognise) important research questions relevant beyond the academy (Burgstahler, 2019; Kaplan, 2019). The importance of conducting research which is relevant to industry, the professions, and policy-making more broadly is likely becoming more important (Jackson, 2022). In addition, there is likely to be an increasing demand to incorporate relevant research into industry-focused curriculum (i.e. in teaching). The characteristics of a typical doctoral student, which we document, suggests caution is warranted in believing business research is of increasing relevance beyond the academy.

A potential limitation of this study is it reports on the state of doctoral programs pre-COVID-19. Changes in the operating models of business schools are likely, and this may, in turn, lead to significant changes in their doctoral programs. We suggest that understanding how such changes occur and their implications for teaching and research in the business disciplines will be crucial in predicting the quality and relevance of research (and teaching) in Australian and New Zealand business schools. We also suggest some broader evaluation of the quality of

doctoral education is warranted. In the manner of existing evaluation of research quality (i.e. ERA assessments), a potentially important starting point would be to have some record of the publication outcomes of doctoral program graduates.

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Appendix 1

Table A1: Summary of significant differences across university groupings

Panel A: Go8 and non-Go8 Australian institutions compared								
	Go8			Non-Go8			Wilcoxon *Z*-stat	*p*-value (two-tailed)
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
Teaching while completing PhD (percentage)	66.750	68.500	22.559	37.231	34.000	17.744	-2.102	0.032
Applicants accepted into PhD program (percentage)	13.200	10.000	8.871	31.375	27.500	20.656	-1.991	0.050
Number of finance PhD students	28.600	33.000	9.965	11.273	10.000	11.967	-2.211	0.027
Management students going to industry employment (percentage)	21.667	20.000	2.887	42.429	40.000	19.043	-2.300	0.017

(Table A1 continued next page)

Table A1: Summary of significant differences across university groupings (*continued*)

Panel B: ATN and non-ATN Australian institutions compared								
	ATN			Non-ATN			Wilcoxon *Z*-stat	*p*-value (two-tailed)
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
Number of accounting PhD students	32.000	30.000	9.165	11.500	9.500	11.002	-2.335	0.012
Number of management PhD students	51.667	42.000	18.502	26.071	29.500	20.033	-2.220	0.021
Students going to industry employment (percentage)	68.000	68.000	11.314	28.800	26.000	13.831	-1.940	0.061
Accounting students - industry employment (percentage)	68.000	68.000	11.314	20.750	25.000	14.048	-2.102	0.044
Economic students - industry employment (percentage)	68.000	68.000	11.314	24.375	25.000	8.400	-2.095	0.044
Finance students - industry employment (percentage)	68.000	68.000	11.314	30.750	28.000	9.721	-2.102	0.044
Management students - industry employment (percentage)	68.000	68.000	11.314	28.250	25.500	7.942	-2.108	0.044
Marketing students - industry employment (percentage)	68.000	68.000	11.314	27.625	25.500	5.927	-2.121	0.044

(Table A1 continued next page)

Table A1: Summary of significant differences across university groupings *(continued)*

Panel C: Australian and New Zealand institutions compared

	Australia			New Zealand			Wilcoxon *Z*-stat	*p*-value (two-tailed)
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
Oral PhD examination	0.190	0.000	.402	1.000	1.000	0.000	-3.554	0.002
Mandatory coursework	0.619	1.000	0.498	0.000	0.000	0.000	-2.626	0.022
Completing PhD full time	67.579	69.000	14.300	83.000	80.000	9.747	-2.140	0.030
Completed studies on time over the last five years	68.421	72.000	21.680	49.000	50.000	19.494	-2.032	0.044

Appendix 2

Table A2: Summary of significant differences across discipline areas

	Accounting			Economics			Finance			Management			Marketing		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Student numbers	15.000	10.500	12.344	20.091	15.000	23.191	14.238	10.000	12.864	30.455	30.000	20.423	15.048	16.000	9.997
Quantitative research method	57.813	60.000	19.790	72.063	77.500	22.089	68.688	67.500	25.848	52.563	51.000	17.780	56.750	55.500	19.591
Qualitative research method	39.500	39.500	19.0002	26.000	22.500	23.042	31.313	30.000	25.710	49.563	49.500	17.424	41.375	42.000	20.607
Academic employment destination	62.000	67.000	25.011	52.933	65.000	23.945	49.867	50.000	23.883	55.400	55.000	19.946	55.667	60.000	19.606

	Chi-Square	Asymp. Sig.
Student numbers	27.780	0.000
Quantitative research method	13.373	0.010
Qualitative research method	18.535	0.001
Academic employment destination	9.600	0.048

Tables

Table 1: Program characteristics

Panel A: Structure					
	Min.	Max.	Mean	Median	Std. Dev.
Formal stages (binary variable)	0.000	1.000	0.926	1.000	0.267
Mandatory coursework (binary variable)	0.000	1.000	0.481	0.000	0.509
Coursework in programs with mandatory coursework (percentage)	4.000	33.000	17.692	17.000	8.380
Mandatory PhD examination (binary variable)	0.000	1.000	0.111	0.000	0.320
Oral PhD examination (binary variable)	0.000	1.000	0.370	0.000	0.492
Panel B: Research method					
Quantitative methods					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All	15.000	78.000	56.300	55.500	16.547
Accounting	8.000	100.000	57.813	60.000	19.790
Economics	35.000	100.000	72.063	77.500	22.089
Finance	20.000	100.000	68.688	67.500	25.848
Management	5.000	80.000	52.563	51.000	17.780
Marketing	8.000	100.000	56.750	55.500	19.591
Other	2.000	75.000	48.533	50.000	16.668
Qualitative methods					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All	20.000	78.000	43.750	49.000	15.828
Accounting	0.000	66.000	39.500	39.500	19.002
Economics	0.000	65.000	26.000	22.500	23.042
Finance	0.000	80.000	31.313	30.000	25.710
Management	25.000	97.000	49.563	49.500	17.424
Marketing	0.000	92.000	41.375	42.000	20.607
Other	25.000	96.000	53.933	50.000	16.867

(Table 1 continued next page)

Table 1: Program characteristics *(continued)*

Panel C: Supervision					
	Min.	Max.	Mean	Median	Std. Dev.
Faculty holding doctoral degrees (percentage)	58.000	99.000	86.615	90.000	9.835
Supervised by a committee (binary variable)	0.000	1.000	0.889	1.000	0.320

Panel D: Networking support					
Percentage	Min.	Max.	Mean	Median	Std.Dev.
Funding for candidates to attend conferences/workshops/PhD colloquiums (binary variable)	0.000	1.000	1.000	1.000	0.000
Is the funding to attend conferences/workshops/PhD colloquiums guaranteed or competitively determined (1=guaranteed, 0=Competitively determined)	0.000	1.000	0.778	1.000	0.424

Panel E: Teaching opportunities					
Percentage	Min.	Max.	Mean	Median	Std.Dev.
Students who are teaching while completing their doctoral program	10.000	90.000	41.818	39.000	22.371

Table 2: Funding

Panel A: Descriptive statistics					
	Min.	Max.	Mean	Median	Std. Dev.
Funding constrains our number of PhD students (Likert scale 1 – 5)	2.000	5.000	3.960	4.000	1.020
We have too many PhD students in our program (Likert scale 1 – 5)	1.000	4.000	2.360	2.000	0.700
Students who complete their doctoral studies on time over the last five years (percentage)	11.000	94.000	64.375	70.500	22.335
Completing PhD full-time (percentage)	38.000	100.000	70.792	75.000	14.747
Students who have completed a research masters and/or honours degrees (percentage)	2.000	100.000	76.522	92.000	32.284
Minimum number of examiners on each dissertation	1.000	3.000	2.259	2.000	0.526

Panel B: Likert scale point percentage					
	Strongly disagree (1)	Disagree (2)	Agree nor disagree (3)	Agree (4)	Strongly agree (5)
Funding constrains our number of PhD students	0.000	16.000	4.000	48.000	32.000
We have too many PhD students in our program	8.000	52.000	36.000	4.000	0.000

Panel C: Financial position					
Percentage	Min.	Max.	Mean	Median	Std. Dev.
Funded by competitive scholarships (e.g. university, APA or industry)	5.000	90.000	53.750	56.500	23.981
Funded by internal scholarships (e.g. teaching, research assistance and PhD packages)	0.000	48.000	14.900	11.000	14.119

Table 3: Student Characteristics

Panel A: Gender					
Percentage	Min.	Max.	Mean	Median	Std. Dev.
Female students	25.000	78.000	52.125	50.500	10.182
Panel B: Origination (local students)					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All	9.000	80.000	43.238	44.000	19.421
Accounting	4.000	100.00	43.294	30.000	28.541
Economics	3.000	100.00	39.941	30.000	25.459
Finance	9.000	80.000	38.824	30.000	20.601
Management	9.000	80.000	41.765	30.000	24.242
Marketing	9.000	94.000	42.313	30.000	25.811
Other	1.000	100.000	43.942	30.000	40.356
Panel C: Language background (English)					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All	7.000	80.000	46.408	40.000	18.353
Accounting	3.000	100.000	47.000	45.000	21.051
Economics	0.000	75.000	41.000	40.000	21.172
Finance	0.000	100.000	45.118	40.000	23.648
Management	8.000	83.000	47.222	45.000	20.704
Marketing	11.000	85.000	45.706	40.000	19.880
Other	3.000	87.000	48.438	45.000	21.049
Panel D: Industry background					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All	10.000	96.000	43.316	43.000	24.806
Accounting	0.000	100.000	39.889	45.000	31.728
Economics	0.000	100.000	39.333	34.000	28.357
Finance	5.000	100.000	40.722	41.500	27.915
Management	10.000	100.000	49.167	49.500	27.045
Marketing	0.000	87.000	39.667	49.500	25.796
Other	0.000	100.000	47.313	49.500	28.535

(Table 3 continued next page)

Table 3: Student Characteristics *(continued)*

Panel E: Academic background					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All	10.000	94.000	38.100	33.500	22.110
Accounting	5.000	100.000	42.056	32.000	31.004
Economics	8.000	100.000	37.000	24.000	30.236
Finance	5.000	94.000	34.222	27.500	25.655
Management	0.000	94.000	39.389	31.000	26.951
Marketing	10.000	100.000	43.412	37.000	30.877
Other	10.000	94.000	39.438	30.000	24.787
Panel F: Age					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
Candidate age	24.000	49.000	33.280	32.000	6.045
Panel G: Acceptance rates					
Percentages	Min.	Max.	Mean	Median	Std. Dev.
All universities	5.000	70.000	26.346	20.000	20.363
Australian universities	5.000	70.000	27.048	20.000	19.996
Go8	5.000	25.000	13.200	10.000	8.871
Non-Go8 (Australian universities)	9.000	70.000	31.375	27.500	20.656
New Zealand universities	10.000	66.000	23.400	11.000	24.183

Table 4: Students numbers

Panel A: All universities					
Discipline	Min.	Max.	Mean	Median	Std. Dev.
All	6.000	366.000	113.870	120.000	80.864
Accounting	1.000	42.000	15.000	10.500	12.344
Economics	0.000	101.000	20.091	15.000	23.191
Finance	0.000	39.000	14.238	10.000	12.864
Management	1.000	82.000	30.454	30.000	20.423
Marketing	1.000	35.000	15.048	16.000	9.997
Other	1.000	150.000	31.222	14.500	36.480
Panel B: Australian universities					
Discipline	Min.	Max.	Mean	Median	Std. Dev.
All	6.000	366.000	119.333	127.000	89.640
Accounting	1.000	42.000	15.118	11.000	13.181
Economics	0.000	101.000	21.882	15.000	25.913
Finance	0.000	39.000	16.688	12.500	13.812
Management	1.000	82.000	30.588	30.000	21.680
Marketing	1.000	35.000	15.625	16.000	10.972
Other	1.000	150.000	34.429	14.500	40.574
Panel C: Go8					
Discipline	Min.	Max.	Mean	Median	Std. Dev.
All	91.000	249.000	161.600	151.00	56.787
Accounting	3.000	24.000	12.800	13.000	7.759
Economics	0.000	63.000	22.600	20.000	26.054
Finance	12.000	37.000	28.600	33.000	9.965
Management	29.000	82.000	40.800	30.000	23.080
Marketing	11.000	30.000	18.600	16.000	7.127
Other	16.000	81.000	47.750	47.000	28.593

(Table 4 continued next page)

Table 4: Students numbers *(continued)*

Panel D: Non-Go8 (Australian universities)					
Discipline	Min.	Max.	Mean	Median	Std. Dev.
All	6.000	366.000	103.077	79.000	93.321
Accounting	1.000	42.000	16.083	10.500	15.078
Economics	1.000	101.000	21.583	13.500	27.010
Finance	0.000	39.000	11.273	10.000	11.967
Management	1.000	73.000	26.333	25.000	20.562
Marketing	1.000	35.000	14.273	10.000	12.402
Other	1.000	150.000	29.100	11.000	44.665
Panel E: New Zealand universities					
Discipline	Min.	Max.	Mean	Median	Std. Dev.
All	43.000	122.000	94.200	112.000	34.586
Accounting	6.000	30.000	14.600	10.000	10.237
Economics	4.000	23.000	14.000	15.000	8.803
Finance	3.000	12.000	6.400	6.000	3.362
Management	15.000	60.000	30.000	23.000	17.593
Marketing	5.000	22.000	13.200	12.000	6.535
Other	4.000	33.000	20.000	21.500	13.832

Table 5: Employment destinations

Panel A: Academic					
Percentage	Min.	Max.	Mean	Median	Std. Dev.
All	15.000	90.000	53.111	54.000	20.942
Accounting	15.000	100.000	62.000	67.000	25.011
Economics	5.000	90.000	52.933	65.000	23.945
Finance	2.000	90.000	49.867	50.000	23.883
Management	15.000	90.000	55.400	55.000	19.946
Marketing	15.000	90.000	55.667	60.000	19.606
Other	15.000	90.000	50.875	50.000	21.685
Panel B: Industry					
Percentage	Min.	Max.	Mean	Median	Std. Dev.
All	8.000	76.000	32.765	26.000	19.344
Accounting	0.000	76.000	28.071	25.000	21.935
Economics	10.000	88.000	35.643	25.500	24.149
Finance	0.000	92.000	38.143	30.000	25.264
Management	10.000	76.000	34.857	28.000	17.999
Marketing	0.000	76.000	32.714	28.000	19.660
Other	10.000	76.000	39.267	30.000	20.130
Panel C: Government					
Percentage	Min.	Max.	Mean	Median	Std. Dev.
All	0.000	31.000	11.000	10.000	9.097
Accounting	0.000	30.000	9.308	10.000	8.807
Economics	0.000	50.000	13.929	10.000	13.499
Finance	0.000	30.000	10.538	10.000	8.743
Management	0.000	30.000	9.385	10.000	8.372
Marketing	0.000	30.000	8.231	6.000	9.038
Other	0.000	30.000	12.643	10.000	8.949