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The Market for Economics and Finance PhDs

by

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Abstract

This paper presents new information of the post-graduation activities of those with a PhD in economics and finance from an Australian university. Approximately 40% have an academic job, while the other 60% work elsewhere or engage in other activities. The analysis includes origin-destination networks for both the academic and non-academic markets, the determinants of earnings and measures of overqualification and underemployment. The findings of the paper can provide guidance to the future for those completing or contemplating PhD studies.

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1. Introduction

The training of PhD students is an important component of the work of universities. Much effort is devoted to selecting candidates for PhD programs, leading academics are typically involved with supervision, and emphasis is placed on the creation of high-quality theses that lead to publications. PhD students themselves are usually talented and motivated to succeed, and can be expected to excel in their subsequent careers. To a certain extent, universities can be judged by the achievements of their PhDs. The post-graduation activities of PhDs reflect on the workings of universities, their role in educating and nurturing future leaders, their efficiency and social value.

This paper investigates careers of economics and finance PhD graduates mostly from Australian universities. The paper deals with several related issues. Who are the major employers of PhDs in economics and finance? What jobs are available for them in academia, with government and in the private sector? What are the hiring practices of universities? What do they earn? Who feel overqualified for the jobs they do? Are they underemployed?

This paper is related to the literature on PhD graduate destinations. Seo et al. (2021) and Li and Horta (2021) analyse factors influencing PhD students' choice of careers inside or outside academia. Bryan (2019) investigates young "star" economists in the US, including their backgrounds, research fields, and the places where these top PhD graduates take jobs. He shows that a majority of stars work in top US economic programs, but governments (other than central banks and the World Bank) hire no stars and almost no stars go to the private sector. Siegfried and Stock (1999) and Stock and Siegfried (2014) document that the proportion of economist graduates going to the private sector was about 15-20 percent. Oyer (2006) provides evidence that the initial academic appointments of economics PhDs have a causal effect on long-term career development. Clements and Si (2019) analyse the careers of all economics PhDs from the University of Western Australia who graduated during the period 2001-2015 and find about 60 percent entered academia.

Studies on the destinations and employment outcomes of higher education graduates have been extensively performed in Australia and internationally. This reflects the increasing importance of employment outcomes to individuals interested in higher education and career prospects, and the public as both consumers and funders of higher education. These studies of graduate destinations tend to focus on bachelor's degree graduates, however, with studies looking at PhD graduates being the exception rather than the norm. Jackson and Michelson's (2015) national study of the determinants of employment for Australian PhD graduates, for example, was one of the few empirical studies of PhD graduate employment, finding that

prior work experience, study at a research-intensive institution and the use of certain job search strategies being associated with the chances of full-time employment.

Studies in this area also tend to have no particular focus on specific disciplines, with analyses of graduate outcomes usually being performed for the graduate cohort en masse, albeit with comparative analyses across fields of study and findings that field of study is one of the most important drivers of graduate outcomes (Li and Miller, 2013). Given the existence of large, national and rich datasets on graduate employment in Australia and elsewhere, such as the United Kingdom and New Zealand, this presents opportunities for the exploration of graduate outcomes for PhD degree holders in specific fields such as economics.

The next section provides a description of the first dataset we use, the post-graduation activities of those who presented at the PhD Conference in Economics and Business. Section 3 examines the workings of the academic job market via the flows of individuals from the PhD-awarding university to the university where they currently work. Section 4 discusses careers of the large number of PhDs now in government and business. The Graduate Outcomes Survey, a rich source of information, is used in Section 5 to analyse PhD graduates' earnings and occupations. Section 6 inquires about the extent to which PhDs perceive they are overqualified or underemployed for the jobs they do. Section 7 contains some concluding comments.

2. The Supply of PhDs

How big is the “PhD business”? Using data from the Department of Education, Skills and Employment, Figure 2.1 shows the number of completions of the PhD degree in economics and finance in Australia. Over the last 20 years, the production of PhDs approximately doubled (a growth rate of about 3.5 percent p. a.) and peaked recently around 150 p.a., while the fraction of females has risen modestly to about 40 percent.

Our first dataset starts with the 960 individuals who presented at the PhD Conferences in Economics and Business from 1987 to 2021.¹ Roughly speaking, these 960 represent about 25 percent of economics and finance PhDs produced by Australian universities. We obtained information on their current activities from the Trove website of the National Library of Australia, websites of overseas universities, Microsoft Academic, Google, Google Scholar and LinkedIn.² As shown in the upper branch of Figure 2.2, we located the current positions

¹ For details of the conferences, Clements and Gregory (2020).

² We encountered some problems with Google Scholar with unavailable profiles, missing and/or erroneous information. Microsoft Academic (MSA, <https://academic.microsoft.com/home>) has the advantage of using AI without relying on self-created profiles. For the majority of individuals, especially those with the same name but

of 700 of the 960 individuals, 404 of whom are academics, 247 are working in non-academic positions and 49 are still students. From Table 2.1, the unlocatable fraction has declined over time, but the academics' share of the total exhibits no noticeable trend (this share declines substantially in the last four years because many individuals are still students). As many of the unlocatables must be working in non-academic occupations, it is likely that more than one-half of the total are not in academia.

3. Those in Academia

The last row Table 3.1 shows that among the 404 in academia, 19 are at the level A, 100 are Bs, 101 are Cs, 80 Ds and 104 Es. That level E is the modal rank might come as a surprise. How can one-quarter now be full professors? One explanation is simply this reflects the composition of many economics and finance departments, where one-quarter or more of the staff are at the level E.³ The predominance of professors is also related to the academic career life cycle. In most cases, promotion to professor requires substantial experience in teaching and research, and importantly, a substantial publication record. These accomplishments take considerable time, perhaps 10 or more years, which would agree with the years in which many of the now-level Es presented at the conference – the earlier years. The second last column of Table 3.1 shows all the level Es presented before 2012 and there is a concentration in the 1990s. Several decades ago, it seemed that the career grade was senior lecturer (level C), but things have changed noticeably since then. More internal promotion opportunities, possibly associated with an expansion of the university system, coupled with less mobility across institutions, possibly means that the career aspiration of a representative academic is now associate professor (level D). Some of the changed academic environment may have been a consequence of the “Dawkins Revolution” of the late 1980s when a number of colleges of advanced education were accorded university status, resulting in an increase in the opportunity to become a professor. It is easy to see how these changes could lead to more Es in both absolute and relative terms.

Table 3.2 summaries the flow of individuals from PhD-awarding universities to where they are currently employed. There can be intermediate employers along the way, especially for those completing the PhD some time ago, but this table records just their current location. Thus, for example, the last entry of the first row indicates that 59 individuals obtained the

multiple MSA profiles, we first manually searched on LinkedIn or Google for the PhD-awarding university and/or affiliation, and then confirmed this with the Google Scholar profile.

³ For example, this is close to the structure of the UWA Economics Department, where 6 of the 22 regular academic staff are level Es (27 percent). Its sister department at UWA, Accounting and Finance, has relatively fewer professors with 6 out of 34 (18 percent). Is it more difficult to obtain promotion in A&F, or are they simply younger, leaner and less top-heavy?

PhD from ANU, 10 of whom are now employed at ANU, 1 is at Monash, and so on. The column for ANU shows that, in addition to the 10 of its own students, it hired 4 from Melbourne, 1 from UQ and 1 from a non-Go8, giving a total of 16. The 2 totals for ANU – 59 and 16 -- show that it sends out more PhDs than it hires, but bear in mind this refers to PhDs from (mostly) Australian universities who presented at the conference. A surplus on the PhD account also occurs for the other Go8 universities. Of course, there is no reason for the bi-lateral flows to be balanced -- by construction, the system as a whole is balanced with everyone hired by someone. Another feature of the flows is the predominance of the non-Go8 and overseas universities as employers, which account for $\frac{152+135}{404} = 71$ percent of all hiring.

The Table 3.2 network is quite sparse, but there is a hint of geographical influences with Monash-Melbourne and UNSW-Sydney links of moderate strength, probably reflecting lower transaction costs and agglomeration advantages. When large universities are located in the same city, there can be a deeper professional environment with more local knowledge, more professional interactions, more competitive stimulus and a higher propensity for individuals to move from one to another. Another aspect of the network is the lack of symmetry – the number of graduates from one university now at another does not even approximate the reciprocal flow from the second university to the first. Key parts of the network are summarised in Table 3.3. Column 2 gives the fraction of each university's PhDs now back on its staff. Thus, 16.9 percent of ANU's graduates have been hired by ANU, which is less than the mean for the Go8 of 18.8 percent. UWA and UQ are the largest in this regard, which may reflect their geographic isolation leading to a tendency to a “produce-your-own” approach.⁴ From column 4, all have a substantial overseas-placement share, especially ANU with almost one-half of their graduates now overseas academics.⁵

Before concluding this discussion it is appropriate to ask, how representative is the PhD Conference sample of the population of similar individuals? Do the results have general applicability? One way to address representivity is to compare those now in academia who presented at the conferences with those who did not. We can do this on a limited scale with the economics and finance PhDs from UNSW, UQ, USyd, and UWA awarded between 1991 and 2021.⁶ From the four universities, there are 117 individuals who presented and 200 who

⁴ A further explanation for the number of UWA PhDs on the staff at UWA is that among the 11 own-hires, 5 were already on the staff when they presented at the conference (some time ago), and they have remained at UWA ever since.

⁵ The Appendix contains further origin-and-destination information.

⁶ Surprisingly, not all universities have the online information regarding their PhD graduates. This information is available online for UNSW, UQ and USyd. A complete list of UWA PhDs between 2005-2019 was provided by

did not. Figure 3.1 presents four research-performance metrics and there seems to be only minor, if any, systemic differences in the outcomes of the two groups. On this limited basis, we can have some confidence in the generality of the results.

4. The Non-academics

Panel I of Table 4.1 shows the substantial variety of places of employment outside academia. It may seem odd that universities are a prominent non-academic employer. This is simply because those on a traditional academic career path in “teaching and research” positions are kept in the separate category of “academics”; the “non-academic” jobs at universities include post-doctoral fellows, research fellows, casual tutors, etc., not lecturers, senior lecturers, etc. With 54 PhDs, a major employer is government, as expected. The next largest employer is the consulting industry, followed by international agencies such as the World Bank, ADB and the IMF. Central banks (the RBA plus others) also play a substantial role in the market by hiring 15 individuals. According to panel II of the table, the Australian Treasury, ABS and the Productivity Commission have each hired three PhDs, as has CSIRO. The build-up of economic expertise in the state public sector is evident for Victoria and NSW, which employ 8 and 5 graduates, respectively. Also worth noting is that among the 247 individuals, 41 work overseas at public-sector agencies.⁷ The Appendix contains a word cloud of the roles performed by the non-academics.

The last row of Table 4.2 gives the percentage of each university’s PhDs who are now non-academics.⁸ Roughly speaking, this is about one-quarter for each, but this is likely to be an underestimate due to those unlocatables in a non-academic job. In any event, the share seems not too different across universities. ANU stands out in the number of its graduates now with international agencies and the Australian government, reflecting its Canberra location. The sources of employees for state governments are understandably quite diverse. There is a tendency for those in consulting to come from Monash, UNSW and Sydney, likely due to Melbourne and Sydney being the dominant business cities. Figure 4.1, showing the flows, highlights the diversity of both the origin and destination of the non-academics.

5. The Graduate Outcomes Survey

Data from the Graduate Outcomes Survey (GOS) was drawn on to provide further insights on labour market outcomes for PhD graduates. The GOS is a national survey of

Diana Soetjpto from UWA Student Services and Engagement; and for the period 1991-2004, we obtained the UWA data from its library website.

⁷ That is, 23 at international agencies, 2 at the Fed, 6 at other overseas central banks and 10 at other overseas public-sector agencies.

⁸ Warning! Like most of the other results in this and the previous section, Table 4.2 refers to those individuals who presented at a PhD Conference. As mentioned previously, however, there is some evidence to suggest this group is not unrepresentative.

graduates from all Australian universities, and is commissioned by the federal Department of Education, Skills and Employment (Quality Indicators for Learning and Teaching, 2021). All graduates who completed a degree are invited to participate in the GOS, around six months after graduation. The sample consists of graduates who completed a PhD qualification from any Australian university between 2016 and 2021 in the areas of economics ($n = 254$) and finance ($n = 119$), as defined by the Australian Standard Classification of Education. Table 5.1 presents the descriptive statistics of the GOS sample.

Table 5.1 shows that around 40% of PhD graduates in economics or finance are female, and have a mean age of around 36 years. Nearly half of the PhD graduates are domestic residents, and none of the graduates came from an Indigenous background. Graduates from a non-English speaking background are well-represented in the samples at 36% for economics and 48% for finance, but graduates with a disability and from low socioeconomic status (SES) are under-represented. Table 5.1 also presents data on employment for the graduates. At six months after graduation, the vast majority of graduates were employed, with 86% of economics PhDs and 80% of finance PhDs in employment. The unemployment rate for economics PhDs was 11% while the corresponding rate for finance PhDs was 17%. In addition, 6% and 9% of economics and finance PhD graduates were, respectively, engaged in further study. Two-thirds of the economics PhD graduates completed their qualification at a Go8 university, while just over a quarter of finance PhD graduates completed their qualification at a Go8 university.

Table 5.2 presents employment statistics for the graduates who were employed at six months. The vast majority of PhD graduates from economics and finance were employed full-time at six months, with 17% of economics PhDs and 23% of finance PhDs working part-time. There were 9% and 18% of economics and finance PhDs, respectively, indicating that they were underemployed.⁹

The majority of graduates from both fields were employed in the government sector. However, there was a markedly larger proportion of economics graduates working in government at 69%, relative to the 52% of finance graduates in government. This relative difference was reflected in the proportions in private industry, at 21% for economics and 38% for finance. The proportions working in the not-for-profit sector were similar at around 7-8%. Around 23% of economics and 14% of finance graduates were assessed as being

⁹ Underemployment was defined as those working part-time and who indicated they were seeking full-time employment.

overqualified.¹⁰ Economics graduates reported a mean annual salary of nearly \$90,000, while finance graduates earned more at \$99,000 per annum. Mean annual salary figures for those employed full-time were estimated at around \$100,000 for economics PhDs and \$110,000 for finance PhDs.

Table 5.3 presents the information on occupations. The occupations were reported at the four-digit level of the Australian and New Zealand Standard Classification of Occupations, and aggregated into the categories seen in Table 5.3. It can be generally observed that finance PhDs were more concentrated within the occupation of University Lecturers and Tutors compared to economics PhDs. For economics PhDs, the single largest occupation was University Lectures and Tutors, with 41% of the sample, followed by Economists (16%). A quarter of the economics PhD graduates worked as Professionals in other areas, with the remaining scattered across the occupational categories of Analysts (4%), Chief Executives or Managers (7%) and Other (4.5%). For finance PhDs, 62% were employed as University lecturers and tutors, 19% were employed as Professionals, 8% as Chief Executives or Managers, with very modest proportions in the categories of Analysts (3%), Other (3%) and Economists (1%).

We turn to an examination of the determinants of PhD graduate earnings next. Earnings are examined through a traditional Mincerian earnings regression model. The model is specified with the outcome of annual salary in natural logarithmic format, and the OLS estimates are presented in Table 5.4.¹¹ Economics PhDs were estimated to have earnings around 15% lower than finance PhDs. Female PhD graduates earned around 15% lower than male PhD graduates. There were no statistically significant effects estimated for citizens or permanent residents, or by age. Overqualification, however, has on average a 17% earnings disadvantage compared to graduates who reported being correctly matched to their jobs. Those who were assessed as being underemployed were also found to experience substantial earnings disadvantage at 40% lower than those who were satisfied with their hours of work. This underemployment earnings disadvantage was particularly pertinent as the model

¹⁰ Overqualification was assessed via self-report using the Scale of Perceived Overqualification. This scale consisted of eight Likert items ranging from strongly disagree = 1 to strongly agree = 5, with a neutral category of neither disagree or agree = 3. Graduates who have a mean score of 3.5 or above across the eight items are classed as overqualified, as per the approach of the Social Research Centre who conducted the GOS (QILT, 2021), and other published studies of overqualification using the GOS study (Li and Jackson, 2021).

¹¹ The model in Table 5.4 was estimated for a sample of 152 observations, which excluded observations with zero values for earnings and weekly hours worked, as well as trimming the top 1% values for these two variables. The results from the model of earnings for the full sample of 159 observations are qualitatively similar to the results in Table 5.4, with two minor exceptions. First, the coefficient for economics PhDs indicates an earnings advantage of 20% compared to finance PhDs, significant at the 5% level. Second, the earnings gap for the underemployed is much larger, at 54% lower than those who were satisfied with their hours of work.

included a control for the weekly hours worked, which was also significant and indicated an increase of earnings of around 1.5% for each additional weekly hour worked.

The Go8 graduates on average earned about 13% more than non-Go8 graduates. Those in the private sector had earnings earning statistically indistinguishable salaries in comparison to those in the public sector but those in the not-for-profit sector earned 22% more. The other demographic controls for NESB, disability and low SES were also statistically insignificant, although this could be due to the very modest number of individuals in these categories. Finally, those engaged in further study earned 31% lower than those who were not engaged in further study.

In summary, the earnings regression results in Table 5.4 show that the earnings are on average lower for economics PhD, or females, or overqualified or underemployed graduates. We further investigate whether there are statistically different earnings disadvantages of overqualification and underemployment in terms of (i) field of study, and (ii) gender. To do so, we interact the dummy variable of interest V_1 (overqualified, or underemployed) with the grouping dummy variable V_2 (Economics PhD or Female) and re-run the regression as in Table 5.4. Panel A of Table 5.5 reveals that lower earnings associated with overqualification are not statistically different across the economics and finance sub-groups.¹² However, underemployed economics PhDs experienced substantially lower earnings, -75%, compared to underemployed finance PhDs. The results in Panel B of Table 5.5 show that there are no gender differences in earning disadvantages associated with overqualification and underemployment.

6. Who is Overqualified and Underemployed?

The results of the earnings regression model from the previous section indicated that substantial earnings disadvantages were associated with overqualification and underemployment. Around 23% of economics PhD graduates and 14% of finance PhD graduates were found to be overqualified earlier. These proportions are lower than the 40% incidence of overqualification found for Australian bachelor's degree graduates by Jackson and Li (2021) but this finding is nevertheless rather substantial. Therefore, it is of interest to examine the PhD graduates' characteristics that are associated with these two employment outcomes. To explore these associations, binary logistic regression models for these two outcomes were estimated. Two sets of models were estimated for each outcome. The first set includes controls for demographic characteristics and employment characteristics. The second set includes all of the controls in the first, but also adds broad occupational categories.

¹² The full estimation results for Table 5.5 are contained in Table A3 of the Appendix.

As ‘economists’ and ‘university lecturers and tutors’ were prominent occupational categories for economics and finance PhD graduates, respectively, the second set of models included these specific occupational categories as control variables. Table 6.1 presents the results.

The results indicate that finance PhD graduates were less likely to be overqualified compared to economics PhD graduates by around 12% (Model 1) or 9% (Model 2). However, finance PhD graduates were more likely to be underemployed by 9% (Model 1) compared to economics PhD graduates, although there was no equivalent statistically significant effect in Model 2. Female graduates were 8% more likely to be overqualified based on results from Model 2, but there was no statistically significant effect in Model 1, and no gender difference for the outcome of underemployment. Domestic graduates were more likely to be overqualified compared to international graduates, but there was no statistically significant result for underemployment. No statistically significant result for both overqualification and underemployment was found by age.

PhD graduates in the private sector had increased likelihoods of overqualification by around 10% compared to those in the public sector, while no difference was observed for those in the not-for-profit sector. There were no statistically significant effects by sector of employment for the outcome of underemployment. The demographic characteristics of NESB, disability and low SES were also not found to be associated with either overqualification or underemployment.

Finally, we turn to the occupational variables used in the second set of models. Graduates in managerial occupations were found to be associated with a reduced likelihood of overqualification by around 20%, compared to those in professional occupations, while those working as university lecturers or tutors were associated with a 14% reduction in the likelihood of overqualification. There were no statistically significant effects on overqualification for the occupational categories of non-professionals or economists. For underemployment, none of the occupational categories were statistically associated but it also should be noted that the occupational categories of managers and economists were omitted from the model as there were no graduates in these categories who reported being underemployed, as is indicated by “(a)” in the table.

7. Concluding Comments

PhDs in economics and finance are talented individuals offering substantial promise of future contributions. Accordingly, universities typically devote substantial resources to training PhD students, including the important supervisory input from some of the most productive academics. The PhD business warrants careful attention. This paper has

investigated the careers of economics and finance PhD graduates from Australian universities, the types of jobs available to them (both academic and non-academic) and labour market outcomes including earnings, overqualification and underemployment. We used two datasets, (i) 700 of the 960 individuals who presented at the annual PhD Conference in Economics and Business over the last three decades; and (ii) the Graduate Outcomes Survey. A substantial proportion of these individuals are currently academics working at universities in Australia and elsewhere, while the others are involved in a wide variety of jobs in the public and private sectors. The findings of the paper can provide guidance to the future for those contemplating PhD studies, as well as current PhD students.

The results from our analysis of the Graduate Outcomes Survey data indicate strong employment outcomes for PhD graduates shortly after graduation. The vast majority of PhD graduates in economics and finance secure employment at six months after completing their doctoral study, and with most securing full-time employment. Further, their remuneration appears rather attractive especially at the relatively early stages of their careers. There were a number of graduates who reported being overqualified in their occupations, although the incidence of overqualification found here was lower than that found by Jackson and Li (2021) for bachelor's degree graduates in Australia. Reassuringly, the occupations of economist and university lecturer, where the majority of graduates are employed, were found not to be statistically associated with overqualification.

What might our findings mean for the future prospects of PhDs? While this is necessarily speculative, an obvious possibility is an academic career in a revitalised university sector. Universities are long-lived institutions that have been through many vicissitudes and despite all, have survived if not thrived. The long-term fundamental desire for individuals to improve themselves surely means a prominent ongoing role for institutions of higher learning. In addition to being flexible and fast learners, PhDs have valuable generic skills. Their training means they are usually good communicators, in both oral and written forms. Economics and finance PhDs are especially numerate, skilled in analysing large datasets with up-to-date methods. Importantly, they have a fundamental understanding of the basic economic forces that shape the prospects of business, government and society. Governments and business are now drowning in data (linked datasets, scanner data, real-time data, etc.) and could benefit from the expertise of PhDs to analyse it. Prospects seem rather good.

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Table 2.1 What are they doing now?

Years	Current occupation (Percentage of total; number of individuals in parentheses)				Total (Number)
	Academic	Non-Academic	Student	Not Identified	
1987-1992	35.5	24.7		39.8	93
1993-1997	44.7	18.9		36.4	132
1998-2002	44.1	24.3		31.6	152
2003-2007	51.4	22.9		25.7	144
2008-2012	50.0	26.3		23.8	160
2013-2017	43.8	34.0	1.4	20.8	144
2018-2021	20.7	28.2	34.8	16.3	135
Total	42.1 (404)	25.7 (247)	5.1 (49)	27.1 (260)	960

Notes: Years refers to the period in which individuals presented at conference. The total number of individuals in the last row correspond to those in the top branch on the left of Figure 1.1.

Table 3.1 Academic levels

(Number of individuals)

Period of conference	Level of current appointment					Total
	A	B	C	D	E	
1987-1992		1	2	4	26	33
1993-1997		5	10	12	32	59
1998-2002		2	17	23	25	67
2003-2007	2	17	22	18	15	74
2008-2012	4	19	37	14	6	80
2013-2017	6	35	13	9		63
2018-2021	7	21				28
Total	19	100	101	80	104	404

Table 3.2 Origin and destination of academics

(Number of individuals)

PhD from	Now at										Total
	ANU	Monash	UNSW	USyd	UWA	Melb	UQ	Adel	Non-Go8	Overseas	
ANU	10	1	1	3	2		3		10	29	59
Monash		8	1		1	4	1	1	14	14	44
UNSW		3	5	3		2			15	7	35
USyd			1	6			2	1	12	12	34
UWA		1			11				6	9	27
Melb	4	2				4	1		12	13	36
UQ	1	1		1	1		5		6	6	21
Adel					1			1	8	3	13
Non-Go8	1	3	2	2	2	5	2	3	67	38	125
Overseas		1		1		2			2	4	10
Total	16	20	10	16	18	17	14	6	152	135	404

Table 3.3 Major locations of academics

(Percentage of PhDs from awarding university)

PhD from	Current location		
	Former university	Non-Go8	Overseas
(1)	(2)	(3)	(4)
ANU	16.9	16.9	49.2
Monash	18.2	31.8	31.8
UNSW	14.3	42.9	20.0
USyd	17.6	35.3	35.3
UWA	40.7	22.2	33.3
Melb	11.1	33.3	36.1
UQ	23.8	28.6	28.6
Adel	7.7	61.5	23.1
Non-Go8	53.6	53.6	30.4
Overseas	40.0	20.0	40.0
Total	30.0	37.6	33.4
Go8 mean	18.8	34.1	32.2

Source: Derived from Table 3.2.

Table 4.1 Where are the non-academics?

(Number of individuals)

I. Sector	Number	II. Government Agency/Location	Number
Government	54	Australian Government	25
Australian	25	Treasury	3
State	19	Aust Bureau of Statistics	3
Overseas	10	Productivity Commission	3
Universities	52	CSIRO	3
Consulting	37	Aust Taxation Office	2
Big 4	8	Other	11
Other	29	Australian State Govts	19
International agencies	23	Victoria	8
World Bank	5	NSW	5
Asian Development Bank	5	Other	6
IMF	3	Overseas	10
UN	3	Azerbaijan	1
Other	7	Botswana	1
Central banks	15	Brazil	1
RBA	7	Canada	2
Fed	2	Mauritius	1
Overseas	6	NZ	1
Finance sector	12	Philippines	1
High schools, etc.	7	UK	1
Research institutions	9	Vietnam	1
Commercial banks	4		
Other	34		
Total	247	Total	54

Note: Panel II disaggregates the “Government” category of panel I. “Universities” refers to other than regular teaching and research positions.

Table 4.2 Origin and destination of non-academics

(Number of individuals)

Current location	PhD from										Total
	ANU	Monash	UNSW	USyd	UWA	Melb	UQ	Adel	Non-G o8	O'seas	
Universities	5	5	7	3	4	2	2	2	20	2	52
Aust Govt	10	1		2	1	3	2		6		25
Aust State Govts	2	3		4	2	1	3		4		19
Overseas Govts	1			1	1				6	1	10
Consulting	2	7	4	5	3	3	1	1	10	1	37
Other	4	3	2	2	4	2	3	1	12	1	34
International agencies	9	2	1	1	1	1	2		5	1	23
Central banks	2		2	2		1		1	4	3	15
Finance sector	1	1	1	3		1			4	1	12
High schools, etc.		1			1	1			4		7
Research institutions	2		2		1	3			1		9
Commercial banks			1						3		4
Total											
No. of individuals	38	23	20	23	18	18	13	5	79	10	247
% of awarding- university total	27.7	22.8	24.4	28.8	24.3	25.4	24.5	16.7	25.6	41.7	26.5

Note: Figures in last row are those in non-academic positions as a percentage of the total number of individuals from the PhD-awarding university who presented at a PhD Conferences.

Table 5.1 Descriptive statistics, GOS sample

Variable	Economic s	Finance
Female	0.417 (0.494)	0.403 (0.493)
Age in years	35.378 (8.798)	36.000 (8.551)
Citizen or PR	0.480 (0.501)	0.496 (0.502)
Indigenous	0.000 (0.000)	0.000 (0.000)
Studied part-time	0.154 (0.361)	0.252 (0.436)
Non-English Speaking Background	0.362 (0.482)	0.479 (0.502)
Disability	0.028 (0.164)	0.025 (0.157)
Low SES	0.016 (0.125)	0.017 (0.129)
Employed	0.858 (0.350)	0.798 (0.403)
Unemployed	0.106 (0.309)	0.168 (0.376)
Unavailable for work	0.035 (0.185)	0.034 (0.181)
Engaged in further study	0.055 (0.229)	0.092 (0.291)
Go8	0.665 (0.473)	0.261 (0.441)
Observations	254	119

Note: Standard deviations in parentheses.

**Table 5.2 Mean employment characteristics,
PhD graduates at six months**

Variable	Economics	Finance
Full-time work	0.835 (0.372)	0.768 (0.424)
Part-time work	0.165 (0.372)	0.232 (0.424)
Underemployed	0.087 (0.283)	0.179 (0.385)
Hours of work	37.167 (16.941)	37.378 (20.690)
Government sector	0.693 (0.463)	0.516 (0.502)
Private sector	0.206 (0.406)	0.379 (0.488)
Not-for-profit sector	0.087 (0.283)	0.074 (0.263)
Overqualified	0.225 (0.418)	0.137 (0.346)
Annual salary (AUD)	89,663 (40,878)	99,340 (54,407)
Annual salary (AUD) for full-time workers	100,249 (35,403)	109,584 (48,497)
Observations	218	95

Note: Standard deviations in parentheses.

**Table 5.3 Frequency of occupations,
economics and finance PhD graduates**

Occupations	Economics		Finance	
	Number	%	Number	%
University Lecturers and Tutors	90	41	59	62
Economists	34	16	1	1
Professionals	55	25	19	19
Analysts	10	4	3	3
Chief Executives and Managers	15	7	8	8
Other	10	4.5	3	3

Note: There were 2.5% and 4% of employed economics and finance graduates, respectively, who did not report their occupations and are hence not represented in this table.

Table 5.4 Results from OLS model of PhD graduate earnings

Variables	Coefficients
Economics PhD	-0.153* (-1.788)
Female	-0.150** (-2.239)
Citizen or permanent resident	0.023 (0.287)
Age	0.022 (0.842)
Age square/1000	-0.000 (-0.652)
Overqualified	-0.167** (-2.204)
Underemployed	-0.395*** (-3.064)
Group of Eight	0.127* (1.662)
Weekly hours of work	0.015*** (4.788)
Private sector	-0.033 (-0.417)
Not-for-profit	0.192* (1.701)
Part-time study	0.115 (1.289)
Non-English speaking background	0.004 (0.047)
Disability	0.122 (0.598)
Low SES	0.150 (0.660)
Further study	-0.295** (-2.085)
Constant	10.390*** (18.233)
Observations	152
Adjusted R-squared	0.450

Note: ***, ** and * indicate statistical significance at the one, five and ten percent levels, respectively. 't'-statistics are presented in parentheses.

Table 5.5 Selected results,
OLS models of PhD graduate earnings with interaction variables

	Dummy = Overqualification (1)	Dummy = Underemployment (2)
A. Field Interactions		
Dummy	-0.114 (-0.682)	0.016 (0.098)
Economics PhD	-0.143 (-1.567)	-0.007 (-0.083)
Dummy*Economics	-0.067 (-0.355)	-0.748*** (-3.940)
Controls	Yes	Yes
B. Gender Interactions		
Dummy	-0.142 (-1.406)	-0.403*** (-2.852)
Female	-0.134* (-1.703)	-0.153** (-2.156)
Dummy*Female	-0.055 (-0.366)	0.031 (0.144)
Controls	Yes	Yes

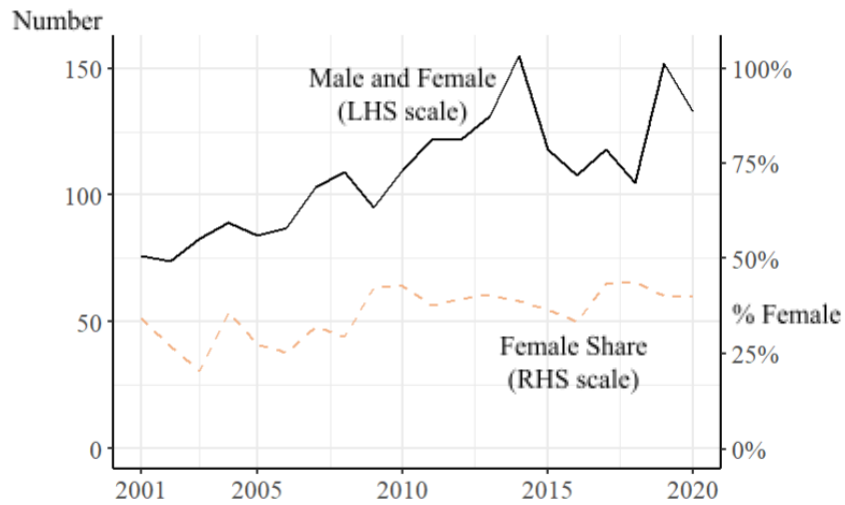
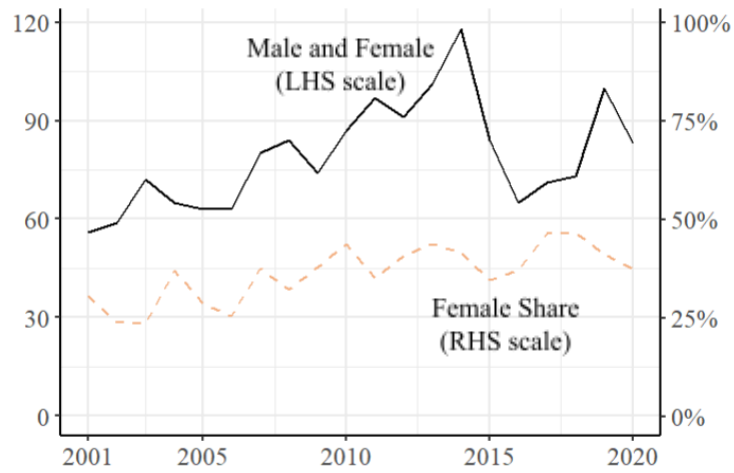
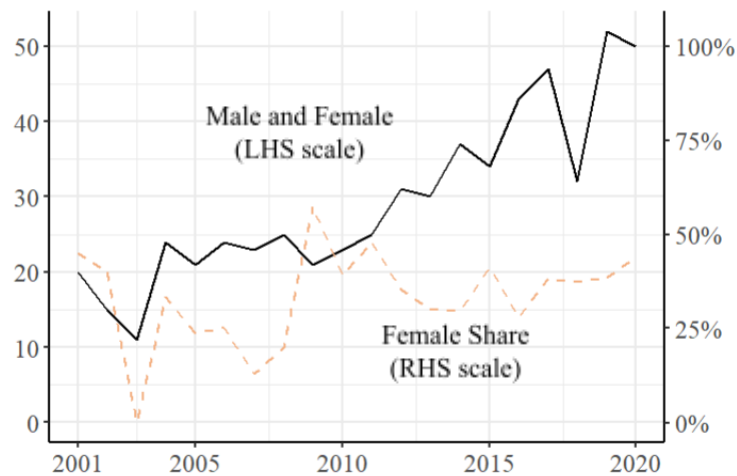
Note: ***, ** and * indicate statistical significance at the one, five and ten percent levels, respectively. 't'-statistics are presented in parentheses. See Table A3 in the Appendix for full results.

Table 6.1 Results from logistic regressions of overqualification and underemployment

Variables	Overqualified				Underemployment			
	Model 1		Model 2		Model 1		Model 2	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Finance PhD	-0.779** (-2.149)	-0.116** (-2.183)	-0.638* (-1.666)	-0.091* (-1.684)	0.868** (2.275)	0.086** (2.269)	0.632 (1.601)	0.073 (1.608)
Female	0.440 (1.453)	0.066 (1.464)	0.541* (1.725)	0.077* (1.746)	-0.282 (-0.730)	-0.028 (-0.730)	-0.335 (-0.854)	-0.039 (-0.855)
Citizen or PR	0.945*** (2.665)	0.141*** (2.732)	1.072*** (2.874)	0.153*** (2.972)	0.541 (1.267)	0.054 (1.266)	0.681 (1.554)	0.079 (1.560)
Age	0.087 (0.677)	0.013 (0.679)	0.116 (0.870)	0.017 (0.873)	0.098 (0.530)	0.010 (0.529)	0.081 (0.444)	0.009 (0.444)
Age sq/1000	-0.128 (-0.561)	-0.128 (-0.561)	-0.112 (-0.707)	-0.160 (-0.708)	-0.139 (-0.597)	-0.137 (-0.597)	-0.115 (-0.510)	-0.133 (-0.510)
Private sector	0.674** (1.971)	0.101** (2.000)	0.709** (1.979)	0.101** (2.011)	0.310 (0.745)	0.031 (0.745)	0.425 (1.000)	0.049 (1.002)
Not-for-profit	0.425 (0.798)	0.063 (0.800)	0.637 (1.168)	0.091 (1.174)	0.129 (0.187)	0.013 (0.187)	0.287 (0.403)	0.033 (0.403)
NESB	0.340 (0.943)	0.051 (0.946)	0.492 (1.313)	0.070 (1.321)	0.192 (0.442)	0.019 (0.442)	0.188 (0.421)	0.022 (0.421)
Disability	0.535 (0.611)	0.080 (0.612)	0.497 (0.537)	0.071 (0.538)	0.351 (0.316)	0.035 (0.316)	0.193 (0.174)	0.022 (0.174)
Low SES	-0.356 (-0.303)	-0.053 (-0.303)	-0.328 (-0.277)	-0.047 (-0.277)	(a) (a)	(a) (a)	(a) (a)	(a) (a)
Further study	-0.894	-0.134	-0.455	-0.065	-1.082	-0.107	-1.026	-0.119

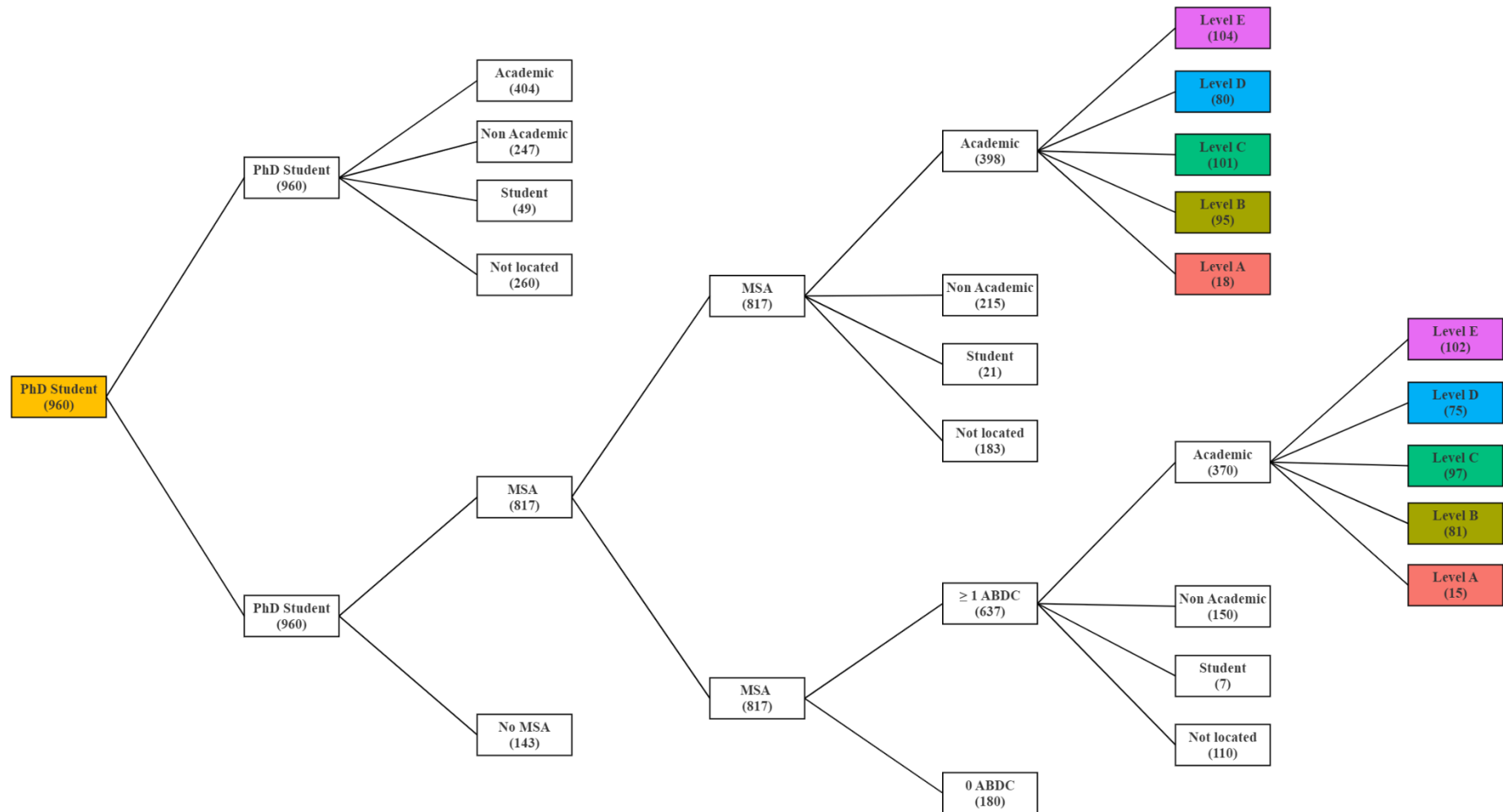
	(-1.148)	(-1.151)	(-0.572)	(-0.572)	(-1.031)	(-1.027)	(-0.965)	(-0.964)
Manager			-1.363*	-0.195*			(a)	(a)
			(-1.856)	(-1.885)			(a)	(a)
Non-professional			0.277	0.039			0.075	0.009
			(0.436)	(0.437)			(0.089)	(0.089)
Economist			0.051	0.007			(a)	(a)
			(0.107)	(0.107)			(a)	(a)
Lecturer			-1.006***	-0.144***			0.278	0.032
			(-2.723)	(-2.803)			(0.675)	(0.676)
Constant	-4.094		-4.603*		-4.217		-3.886	
	(-1.581)		(-1.717)		(-1.172)		(-1.092)	
Observations	313	313	313	313	308	308	255	255
Pseudo R-squared	0.0602		0.0999		0.0506		0.0500	

Notes: ***, ** and * indicate statistical significance at the one, five and ten percent levels, respectively. 't'-statistics are presented in parentheses.

Figure 2.1 PhD completions, Australia**I. Economics and Finance****II. Economics****III. Finance**

Notes: Data supplied on request by Department of Education, Skills and Employment. "Economics" includes econometrics, while "Finance" is the DESE category "Banking, Finance and Related Fields". For reasons unknown, Monash is not included in the DESE data.

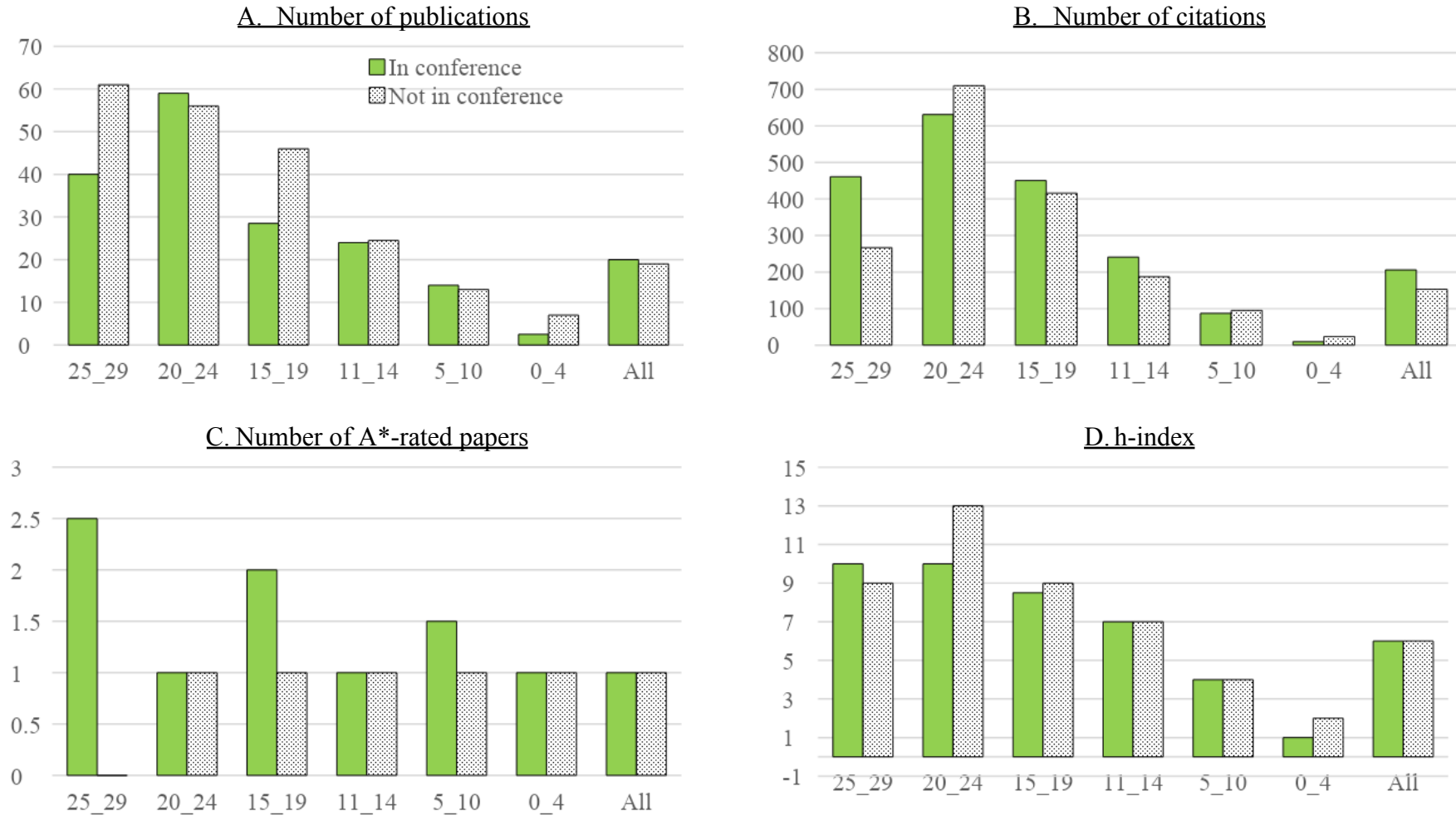
Figure 2.2 Structure of PhD Conference data



Notes:

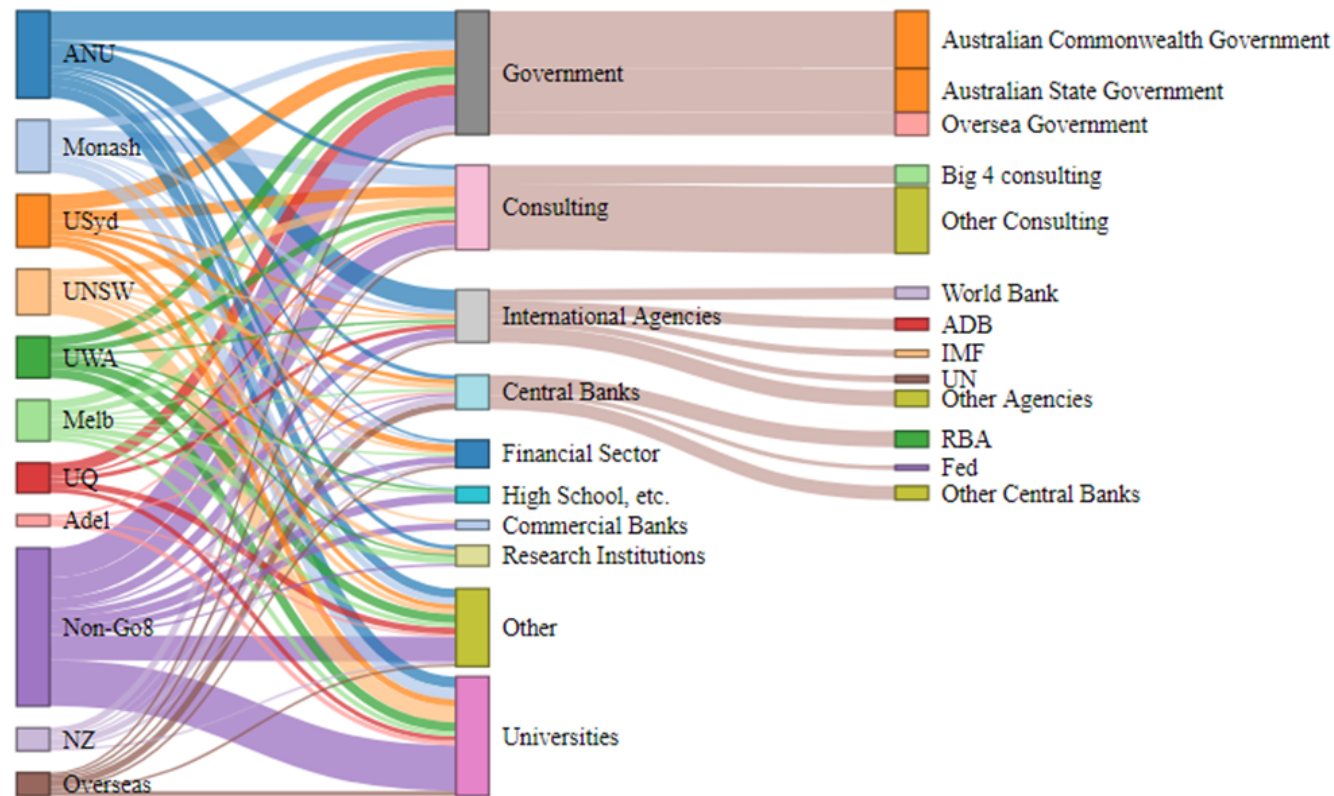
1. This chart shows the steps in going from the initial 960 PhD students (on the far left-hand side) to academics at 5 levels (E, D, C, B, A, on far right).
2. MSA represents those with a Microsoft Academic profile.
3. ≥ 1 ABDC refers to those with at least 1 publication in a journal rated by the Australian Business Deans Council.
4. The number of individuals at each step is given in parenthesis.

Figure 3.1 Research outcomes, conference and non-conference individuals



Notes: This figure refers to the medians of the 117 academics who presented at the PhD Conferences and the 200 academics who did not. The awarding universities of the PhDs were UNSW, UQ, USyd and UWA. The horizontal axis refers to the number of years since the PhD was awarded. Due to small numbers, bins for 30+ years are omitted. Data from Semantic Scholar.

Figure 4.1 Non-academic job network



APPENDIX

More Detailed Results

To provide a more consolidated formulation of the origin-destination information for academics, Table A1 categorises universities into three groups, Go8, non-Go8 (which include institutions in both Australia and NZ) and overseas, with flows split by level. Bearing in mind the qualification that fairly small numbers are involved, three features can be mentioned:

1. For levels A and E, in each row the diagonal entry is the largest, that is, individuals have a strong propensity to “return to/stay with the group”. This is easily understood for the A’s: A new PhD might find it convenient to stay where they studied for a couple of years and use that time to publish thesis research and look for a more permanent position. No such easy explanation can be made for the Es, however.
2. From the viewpoint of employer institutions (the column perspective), for the E’s, a “hire-your-own” practice is particularly noticeable for the Go8 where 80 percent of the hires are Go8-educated (29 out of a total of 35). This characteristic of the Go8 also applies for the other levels.
3. Overseas universities tend to hire mostly those with a PhD from the Go8. This applies to all levels.

As there is likely to be particular interest in the experience of level B’s and E’s, Table A2 gives the origin-destination flows at the individual-university level. The matrices are necessarily sparser than before, but two features stand out. First, a large majority of level B’s and E’s are now at non-Go8 and overseas universities. Second, ANU is by a large margin the major producer of level E’s; then comes UNSW and Melbourne.

Table 5.5 summarised the earnings results when interaction variables were included. Table A3 contains the full set of results.

Figure A1 is a word cloud of roles undertaken by those (from the PhD Conference sample) who are now not academics.

Table A1 Consolidated academic network
(Number of individuals)

PhD from	Currently working at			Total
	Go8	Non-Go8	Overseas	
I. Level A				
Go8	8	2	3	13
Non-Go8	1	4	1	6
Overseas				
Total	9	6	4	19
II. Level B				
Go8	17	12	38	67
Non-Go8	1	19	12	32
Overseas			1	1
Total	18	31	51	100
III. Level C				
Go8	26	31	7	64
Non-Go8	8	19	8	35
Overseas	2			2
Total	36	50	15	101
IV. Level D				
Go8	13	19	23	55
Non-Go8	5	9	7	21
Overseas	1	2	1	4
Total	19	30	31	80
V. Level E				
Go8	29	19	22	70
Non-Go8	5	16	10	31
Overseas	1		2	3
Total	35	35	34	104
VI. All Levels				
Go8	93	83	93	269
Non-Go8	20	67	38	125
Overseas	4	2	4	10
Total	117	152	135	404

Supplementary Material

29

Table A2 Flows for level Bs and Es
(Number of individuals)

PhD from	Currently working at										Total
	ANU	Mon	UNSW	USyd	UWA	Melb	UQ	Adel	Non-G o8	O’eas	
I. Level B											
ANU	3	1		1					1	9	15
Monash		2				1			4	8	15
UNSW			1							1	2
USyd									3	4	7
UWA		1			1				1	4	7
Melb	1					2	1		1	5	10
UQ							2		1	4	7
Adel									1	3	4
Non-Go8				1					19	12	32
O’s eas										1	1
Total	4	4	1	2	1	3	3	0	31	51	100
II. Level E											
ANU	6		1				1		4	11	23
Monash		3				1	1		1	1	7
UNSW			1	1		2			4	3	11
USyd				1			1		3	5	10
UWA					2				1		3
Melb	2	1				2			4	2	11
UQ	1						1				2
Adel					1				2		3
Non-Go8		1	1		1	1		1	16	10	31
O’s eas				1						2	3
Total	9	5	3	3	4	6	4	1	35	34	104

Table A3 Full results, OLS models of PhD graduate earnings with interactions

Variables	Economics interacted with		Female interacted with	
	Overqualified	Underemployed	Overqualified	Underemployed
Economics PhD	-0.143 (-1.567)	-0.007 (-0.083)	-0.155* (-1.800)	-0.154* (-1.787)
Economics*Overqualification	-0.067 (-0.355)			
Economics*Underemployment		-0.748*** (-3.940)		
Female*Overqualification			-0.055 (-0.366)	
Female*Underemployment			(a) (a)	0.031 (0.144)
Female	-0.152** (-2.255)	-0.126* (-1.971)	-0.134* (-1.703)	-0.153** (-2.156)
Citizen or permanent resident	0.025 (0.319)	0.029 (0.388)	0.022 (0.278)	0.022 (0.269)
Age	0.023 (0.861)	0.037 (1.458)	0.022 (0.812)	0.022 (0.823)
Age squared/1000	-0.212 (-0.679)	-0.354 (-1.193)	-0.195 (-0.626)	-0.199 (-0.636)
Overqualified	-0.114 (-0.682)	-0.180** (-2.507)	-0.142 (-1.406)	-0.166** (-2.194)
Underemployed	-0.393*** (-3.035)	0.016 (0.098)	-0.397*** (-3.065)	-0.403*** (-2.852)
Group of Eight	0.132* (1.693)	0.123* (1.693)	0.123 (1.598)	0.126 (1.646)
Weekly hours of work	0.015*** (4.783)	0.014*** (4.584)	0.015*** (4.726)	0.015*** (4.772)
Private sector	-0.034 (-0.426)	0.011 (0.142)	-0.034 (-0.426)	-0.033 (-0.415)
Not-for-profit	0.186 (1.621)	0.168 (1.561)	0.191* (1.681)	0.191* (1.684)
Part-time study	0.118 (1.315)	0.129 (1.517)	0.114 (1.268)	0.116 (1.291)
Non-English speaking background	0.001 (0.016)	-0.018 (-0.238)	-0.004 (-0.046)	0.003 (0.042)
Disability	0.129 (0.626)	0.181 (0.930)	0.119 (0.578)	0.125 (0.608)
Low SES	0.151 (0.663)	0.105 (0.486)	0.156 (0.683)	0.151 (0.664)
Further study	-0.294** (-2.064)	-0.235* (-1.734)	-0.291** (-2.044)	-0.295** (-2.074)
Constant	10.368*** (18.030)	9.988*** (18.127)	10.409*** (18.133)	10.399*** (18.061)
Observations	152	152	152	152
Adjusted R-squared	0.446	0.503	0.446	0.446

Note: ***, ** and * indicate statistical significance at the one, five and ten percent levels, respectively. 't'-statistics are presented in parentheses.

Figure A1 Non-academic roles



Note: Excludes “non-academic” positions at universities.