

Gender Differences in Academic Promotion and Mobility at a Major Australian University*

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This paper analyses gender differences in faculty promotion and mobility at the University of New South Wales (UNSW) using personnel records for 1999–2010. It finds female lecturers less likely than men to be promoted or to leave UNSW and female associate professors more likely to be promoted. These results are consistent with a flipping statistical discrimination model. Leave-taking did not account for gender differences. Instead, taking maternity leave indicates higher likelihood of staying at UNSW and being promoted. The paper finds that gender differences narrowed over time but not always as predicted by gender-related policy changes.

I Motivation and Background

In universities around the world, the ratio of women to men is lower at high academic ranks than at low ones. To some extent, this can be accounted for by the increasing numbers of women receiving PhDs and entering academic careers in recent decades. However, gender differences in academic promotion, perhaps due to discrimination, differential productivity or

different behaviours, could also contribute to these statistics. Compounding this, even if men and women are equally likely to be promoted, as long as men are more likely than women to switch universities when they fail to get promoted, women academics might end up being more concentrated at lower ranks.¹

This paper analyses gender differences in promotion and mobility at one of the eight major research universities in Australia during the first decade of this century, the University of New South Wales (UNSW), using personnel records on academic staff from January 1999

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¹ In this paper, the terms ‘level’ and ‘rank’ will be used interchangeably when discussing specific academic positions, and the terms ‘faculty’ and ‘academics’ will be used interchangeably as well. Capitalised, however, ‘Faculties’ are the major academic divisions in UNSW as in most Australian universities, whereas the next level of divisions are Schools.

through March 2010. It asks whether women were less likely than men from the same broad fields and of the same age to be hired at high ranks, to be promoted and/or to leave the university, and investigates whether maternity leave, unpaid leave or part-time work was associated with gender differences in promotion and mobility.

Other studies that have studied promotion rates and gender in Australian academia (e.g. Todd & Bird, 2000; Winchester *et al.*, 2006) have been based on cross-sectional data, often from surveys. This study is the first based on individual longitudinal personnel records, allowing identification of how individual careers within academia unfold and to capture information on those who leave the university as well as those who stay. The personnel data set does not include any productivity measures, so it cannot be known whether men and women were comparable along this dimension. The finding of gender differences, therefore, would not be *prima facie* evidence of discrimination, although the lack of such differences would heavily suggest its absence.

This research covers a period of changing university policies related to gender. During the early 2000s, the administration of UNSW, concerned with the low representation of women at the higher academic levels, adopted policies to encourage the promotion of women, the most substantive of which took effect in 2006. This paper studies whether these policies had a major impact on gender differences.

To preview the major findings, women are less likely than men to be promoted from the lecturer level. Gender differences in maternity leave, leave without pay (LWOP) and part-time work do not explain the gender difference in promotion from Lecturer. However, women Associate Professors are more likely than men to be promoted to Professor. The conclusion argues that this 'flipping' from less promotion of women at lower ranks to more promotion of women at higher ranks is predicted by Fryer's (2007) model of statistical discrimination.

Most of these gender differentials have narrowed over time, coinciding with the timing of policy changes. The gender differences in entry into and promotion from Lecturer jobs are absent in the last part of the decade. Yet the promotion *advantage* of female Associate Professors also disappeared by 2007, which is

surprising in light of the specific policy changes.

Regarding mobility from the university, women are somewhat less likely than men to leave UNSW from Lecturer jobs. This fact alone would boost the proportion of females at this lower level. This difference also disappeared by the decade's end. Finally, women who take maternity leave are less likely to leave the University and more likely to be promoted, and expanded maternity leave did not increase take-up rates.

The paper first reviews the literature on gender differences in academic careers (Section II) and describes general and gender-related employment policies at UNSW (Section III). Section IV describes the data and method used. The results on gender differences in first academic level and promotion are presented in Section V, followed by results on mobility (Section VI) and leave-taking and part-time work (Section VII). In the concluding section, possible explanations for the results are evaluated, including the extent to which the paper's empirical results can be attributed to changing gender policies.

II Literature Review: What is Known About Gender Differences in Academic Promotion?

Many authors document the paucity of women at higher academic levels in Australian universities and the prevalence of women in short-term or part-time jobs (see, e.g. Todd & Bird, 2000; White, 2001, 2003; Carrington & Pratt, 2003; Winchester *et al.*, 2006; Queensland University of Technology, 2011). Both Probert *et al.* (1998) and Todd and Bird (2000) note that women tended to be hired into Australian universities at lower ranks. Of those who *apply* for promotion, by the late 1990s, or early 2000s, success rates of females were similar or higher than those of men (Todd & Bird, 2000; Winchester *et al.*, 2006), although they had not been previously. Gender differences in men's and women's *application rates* for promotion narrowed considerably in the 1990s but women remained slightly less likely to apply for promotion in the early 2000s (Todd & Bird, 2000; Winchester *et al.*, 2006). In surveys, women academics in Australia on average reported less preference for, focus on and productivity in research (Poole *et al.*, 1997; Asmar, 1999). However, for Professorial levels, by the mid- to late 2000s, men and women expressed similar

preferences for research (Diezmann & Grieshaber, 2010).

During the past decade, two reports identified and analysed gender differences among academics at UNSW itself. An internal report on the UNSW workforce in 2001/2002 (Buttery *et al.*, 2003) highlighted the low number of women, particularly at higher levels, and the low success rates of applications for promotion, particularly women's applications. Lower women's applications rates received more prominence in a 2002 study by consultants (Probert *et al.*, 2002) that also emphasised the work/family concerns of female survey respondents.

The literature on gender differences in promotion in Australian academia has been descriptive and has not controlled for factors such as cohort or field. There *is* a limited literature for the USA and Europe that has included extensive controls. This literature is summarised briefly here. Of course, studies on gender differences in academic promotion in one country may not apply to others because systems of academic employment differ considerably.

Australia's academic levels and systems of promotion through those levels share many similarities with Western Europe's. Blackaby *et al.* (2005) studied academic rank in a cross-section of UK academics and found men more likely than women to hold higher ranks controlling for a variety of characteristics. They also found that women are approximately 9 per cent more likely than men to have fixed-term, temporary appointments. Van der Burg *et al.* (1998) in a small sample found no gender differences in promotion at Utrecht University in the Netherlands after accounting for beginning position and other covariates. Ward (2001) studied academics in five Scottish universities and, with quality controls, found a very significant gender difference in promotion from Researcher to Lecturer, but not in promotion at higher levels.

The US faculty system differs from Australia's in numerous ways. First, in the USA, there is stricter differentiation between jobs that can lead to tenure and jobs that cannot. Second, in jobs that can lead to tenure (tenure-track jobs), failure to achieve tenure typically requires the faculty member to permanently leave their university. Promotion to the second academic level (Associate Professor) either precedes or is coincident with receiving tenure rather than the Australian norm of tenure preceding promotion. Finally, full professorships are more prestigious

and exclusive in Australia. Moreover, cultural norms are different in all countries. Nevertheless, it may be relevant to know what gender differences have been identified in US academia, controlling for field, education and other individual characteristics.

Several studies find gender differences in obtaining a US entry-rank tenure-track academic job. Using longitudinal data and a variety of control variables, Ginther and Kahn (2009, 2011) find a 4 per cent gender difference in the likelihood of obtaining a tenure-track job in life sciences and social sciences but no significant gender difference in engineering or physical sciences. The National Science Foundation (2004) finds a 3–4 per cent difference in natural and social sciences combined. Using a cross-section with elaborate controls, Perna (2005) finds gender differences in obtaining a tenure-track job considerably larger than 4 per cent for all fields combined, including humanities.

Studies also find that women are less likely than men to receive tenure in the US *ceteris paribus*. Ginther and Kahn (2009) identify a gender gap of approximately 8 per cent in life sciences in the rate of receiving tenure but no gender gap in engineering or physical science. Ginther and Hayes (2003) find a gap of approximately 7–9 per cent in tenure receipt in the humanities. Among social sciences, economics has large gender gaps in promotion to tenure, as high as approximately 30 per cent (McDowell & Smith, 1992; Kahn, 1995; Ginther & Kahn, 2004). However, McDowell *et al.* (2001) believe that the gender differences had disappeared by the 1990s. Combining social and physical sciences, NSF (2004) and Long (2001) find insignificant gender differences in tenure rates for those on the tenure track. In the field of medicine in the USA, where tenure-track jobs are not necessary for long-term academic research jobs, Ash *et al.* (2004) found significant differences in promotion in academic medicine *ceteris paribus*.

Only a few of these studies explicitly study promotion to Full Professorship in the USA. For those who received tenure, Ginther and Kahn (2009) find a significantly slower promotion rate to Full Professorship for women than men in life sciences and no significant gender difference at all in physical sciences and engineering. Ash *et al.* (2004) found significant gender disadvantage in promotion to Full Professorship in academic medicine.

However, in the USA, *unmarried childless* female academics are either more likely than or equally likely as men to get a tenure-track job, be awarded tenure or be promoted to full professorship in all science and engineering fields (including social sciences; Ginther & Kahn, 2009, 2011; NSF, 2004).

As noted earlier, the present study adds to the literature on gender differences in Australian academia because it alone controls for other factors (e.g. cohort, field or age) and uses longitudinal data on individuals over time, allowing measurement of time to promotion of comparable academics. Also, compared with the existing literature, it also studies a later and longer period of time with changing policy regimes. This study also adds to the international literature on gender differences in academia in that it is one of the only studies to investigate the interaction between promotion and decisions to leave the university and also one of the only studies to link academic advancement and maternity leave.

III Academic Promotion Policies at UNSW

(i) Academic Promotion Policies at UNSW and Other Australian Research Universities

UNSW is one of the Group of Eight (Go8) universities in Australia, a group of large research-oriented Australian universities.² Policies related to academic employment in Australian universities are primarily determined by national agreements and legal decisions, and, consequently, employment policies adopted by UNSW are very similar to those at other Go8 universities.

There are five academic levels at UNSW: Associate Lecturer (level A), Lecturer (level B), Senior Lecturer (level C), Associate Professor (level D) and Professor (level E). The distribution across these levels by gender in January 2010 is given in Table 1. From discussion with administrators at UNSW, it is much less likely for academics entering UNSW at the lowest level of Associate Lecturer to be considered as potential permanent faculty colleagues. Many of

them do not yet have their PhDs. In our data, half (50 per cent) of those hired as Associate Lecturers are hired on fixed-term contracts compared with a third (33 per cent) of those hired at higher levels. Even of those hired on ongoing contracts, 54 per cent of those hired as an Associate Lecturer left UNSW within 3 years compared with 29 per cent hired at higher levels. Instead, recent PhDs considered as potential permanent faculty tend to be hired at the levels of Lecturer (B) or Senior Lecturer (C). In some but not all Schools and years, previous academic experience is required for Senior Lecturer hires. The term 'regular junior faculty' will be used in this paper for those hired as Lecturers or Senior Lecturers. In contrast to 'regular junior faculty', few of those hired as Associate Lecturers ever reach the level of Associate Professor.

Academic jobs at UNSW (and other Australian universities) are classified as 'continuing' (i.e. with no specified end date) or as 'fixed-term'.³ Many fixed-term contracts are given to truly temporary academic staff. Typically, these staff are hired for specific teaching or research assignments. At times, however, some fixed-term contracts are used for potentially permanent staff. Historically, in Australia as in many European countries, there was no tenure hurdle. In recent decades, many Faculties within Go8 universities have tried to encourage international recruitment of academics by hiring new 'regular junior faculty' on fixed-term contracts for a 3- to 5-year probationary period, mimicking the North American tenure process. In 1998, the national Higher Education Contract of Employment Award 1998 made this kind of fixed-term contract illegal. In response, some Go8 universities or their component Schools or Faculties chose to hire regular junior faculty on continuing contracts with a 1-, 2- or 3-year period of 'confirmation'.

At the end of 2005, major amendments to the Workplace Relations Act of 1996 dramatically limited the role of labour relations tribunals. As a result, some Go8 universities and, within UNSW, some Faculties and Schools began returning to official use of 3- to 5-year probationary periods for junior faculty, at the end of which they are the subject of a tenure-

² The other universities are Australian National University, Monash University, University of Adelaide, University of Melbourne, University of Queensland, University of Sydney and University of Western Australia.

³ A third mode of employment, casual workers employed by the hour, is not included in the data.

TABLE 1
Percentage of Academic Staff at Each Level

	January 2010 [†]				January 1999			
	Total	Females	Males	% Female	Total	Females	Males	% Female
Associate Lecturer	17.8	21.8	15.6	44.1	11.1	18.1	8.6	43.1
Lecturer	25.9	34.2	21.1	47.8	28.7	45.6	22.7	42.0
Senior Lecturer	28.8	27.7	29.4	34.7	32.4	26.5	34.5	21.6
Associate Professor	11.8	8.9	13.5	27.7	14.2	5.5	17.3	10.3
Professor	15.8	7.4	20.5	16.9	13.5	4.3	16.9	8.4
All	100.0	100.0	100.0	36.1	100.0	100.0	100.0	26.5
Total number	2333	841	1492		1500	397	1103	

Note: [†]Although the data set ends later, in March 2010, this table shows percentages at comparable points in the academic calendar.

like decision. The probationary contracts are sometimes officially ‘fixed term’, other times ‘continuing’. Due to this inconsistent use, this paper pools academics on fixed-term and ongoing contracts but includes contract status as a control variable in all analyses.

A final important policy is that to be considered for promotion, faculty must apply. There is no automatic promotion review even at ‘tenure’. This policy may affect gender differences in promotion rates because, as Babcock and Laschever (2003) tell us, ‘Women don’t ask’.

(ii) *Background on Recent Academic Gender Policies and Initiatives at UNSW*

During the early 2000s, the administration of UNSW became concerned about gender inequities in the academic workforce at UNSW. The main reason for this concern was the low percentage of women among academic staff and the high concentration of these women at lower levels. The second panel in Table 1 shows the gender distribution in 1999, with 43 per cent of Associate Lecturers being female but only 8 per cent of Professors. The UNSW reports discussed earlier (Probert *et al.*, 2002; BATTERY *et al.*, 2003) focused attention on these differences.

In response to these studies, the UNSW Vice Chancellor established a Gender Equity Reference Group in 2002 and a Gender Equity Strategy in 2005. There were a few relatively minor gender-related policy changes – a 2-week increase in paid maternity leave and new funding for women returning from maternity leave – before 2006. Far more substantive changes began in 2006, when paid maternity leave almost doubled to 26 weeks and UNSW launched the

Academic Women in Leadership (AWIL) Program for women at the top three academic levels. The AWIL Program included workshops on leadership and applying for promotion. These workshops have been held each year since 2006 and have reached more than 100 of the 282 women who have held positions at these academic levels during this period. Other changes were instituted in 2007, notably including gender equity as an explicit goal for Faculty and School heads.

As Table 1 shows, the female percentage of UNSW academic staff increased a full 10 percentage points over the 11 years from 1 January 1999 to 1 January 2010,⁴ with the largest percentage increase at the Associate Professor level and second largest at the Professor level. The empirical analysis here asks whether this increased representation at higher ranks reflected a changed environment or was merely the mechanical effect of higher female representation among later cohorts.

IV Description of Data and Methodology

The data consist of the employment records of the 4834 academic staff members employed at UNSW anytime between 1 January 1999 and 25 March 2010 on either continuing or fixed contracts. Each record has the Faculty and School, gender, date of birth and the exact dates of when the individual started at UNSW, changed academic status (either to a different academic level or changed continuing/fixed sta-

⁴ Although the data set ends in March 2010, this table shows comparable points in the academic calendar.

tus) and/or left UNSW. It also includes the length of any LWOP, maternity leave and part-time work while at a particular level but not the start or stop dates of the leave/part-time work.

In the promotion analysis and some of the mobility analysis, an observation is a person-job, where a 'job' is a period of time at a single academic level. Jobs that had not ended by 25 March 2010 are considered censored. To study promotion or mobility without injecting survivor bias, only 'jobs' that began after 1998 were analysed. This resulted in dropping 904 individuals who did not start any new 'job' after 1 January 1999 from Tables 3, 4, 5 and 7.⁵ For robustness checks, we also re-estimated these analyses: (i) including only those who were hired post-1998, a smaller sample; (ii) adding a dummy variable for whether or not the person was hired post-1998; and (iii) adding this dummy variable plus an interaction term between it and the female dummy. The results were qualitatively the same as those reported here. Note that the promotion analysis of first jobs and the mobility analysis from time-of-hire only apply to those hired post-1998, so these robustness checks were not relevant to those analyses.

The remaining 3139 people had a total of 4575 jobs contained entirely during this window of time, an average of 1.46 jobs per person. The average duration⁶ of these 4575 jobs was 31.9 months and the median duration was 23.9 months. Twenty-three per cent of jobs lasted <1 year, 17 per cent lasted more than 5 years. Forty per cent of jobs were censored because the jobholder remained at UNSW on 25 March 2010. All 'job-based' analyses here cluster errors by person. Appendix I shows the number of observations in the paper's principal analyses.

This paper models promotion and mobility (i.e. leaving the university) as a function of the

⁵ Jobs that started in the 3 weeks before 25 March 2010 were also excluded. Hazard analysis on the entire data set controlling for *date of hire*, faculty, rank of hire, age at hire and ongoing/fixed-term status indicated that those hired before 1 January 1999 (not into top level) were 62 per cent more likely to have been promoted from their first job than those hired later. This is suggestive of extreme survival bias, although it could also be partially due to a non-linear time trend or to unobservables.

⁶ To date, as some are truncated.

duration already spent at that academic level, or for some mobility analysis, of the duration at UNSW. Should temporary leave – either taken as maternity leave or as LWOP – be considered as part of that duration? The specifications reported subtract months on maternity leave or LWOP from duration based on the expectation that most academics are *not* doing tasks such as research or teaching during their leave. The paper also discusses robustness checks where key equations are re-estimated *without* netting out months of leave.⁷

It is possible that periods of leave may affect promotion directly. For example, leave-taking and part-time employment may proxy lack of commitment to UNSW or to academia more generally. Consequently, the paper presents two different specifications, one with LWOP, maternity leave and part-time work dummies as controls and one without them. Differences between the interpretations of these two specifications are discussed in the results section.

As this paper is concerned with gender differences between otherwise comparable people, it would be ideal to control for other characteristics of the faculty member. The data include only a limited set of covariates, most notably broad field as measured by 'Faculty'. Table 2 lists the different Faculties at UNSW and their percentage of females. Engineering had the smallest percentage of females both at the beginning and the end of the study period while the College of Fine Arts and Faculty of Arts and

⁷ The distinction between a temporary leave and a 'permanent' departure is not always clear in the data. In addition to those on official LWOP, faculty who returned to the same academic rank within 18 months are considered as having taken LWOP within the same job. People who returned to a different rank within 18 months were treated as having remained at UNSW but the leave was not assigned to either 'job'. Moving into and out of administrative jobs also posed a categorisation challenge. If a faculty member moved to an administrative job but returned to his/her academic job at the same rank, it was considered a single 'job' at that rank. If a faculty member moved to an administrative job but then returned to a higher rank when the administrative job was finished, the new rank was assumed to start when they first moved to the administrative job. If a faculty member moved to an administrative job and never returned to be a regular faculty member, their faculty job was considered 'censored' at the time they left their faculty job.

TABLE 2
Percentage Female by Faculty

	January 1999		March 2010	
	Total number	% Female	Total number	% Female
Arts and Social Sciences	198	46.0	252	52.4
Built Environment	50	10.0	82	31.7
Business and Economics	176	27.8	255	35.3
College of Fine Arts	53	50.9	68	50.0
Engineering	261	8.1	380	15.8
Law	58	32.8	79	49.4
Medicine	192	33.9	567	50.8
Science	231	24.7	459	29.3
Defence (University) College	156	13.5	186	18.3

Social Sciences vied for the largest percentage of females. Controls also include 'age when job began' (an imperfect proxy for experience) and its square, a first-UNSW-job dummy, a fixed-contract dummy, a linear time trend measured by the date the job began and, when pooling levels, dummy variables for level.

Much of the empirical work uses Cox-proportional semiparametric hazard (survival) analysis. This analysis estimates the likelihood that a person experiences an event (in this case, promotion or leaving UNSW) over time and estimates the effect of factors such as gender on this likelihood. Importantly, it uses data on all people even if they had not yet experienced the event by the last time they are observed.

This paper is primarily concerned with the effect of gender. The female coefficients that are reported in Tables 4–7 are the relative risk ratio, that is, the likelihood that a female gets promoted relative to the likelihood that an otherwise-identical male gets promoted each period:

$$\text{relative risk ratio} = \frac{\text{Prob(promotion) of a female}}{\text{Prob(promotion) of a male}}$$

If men and women are equally likely to be promoted, this ratio will equal 1. Significance levels for risk ratios refer to the null hypothesis that this rate equals 1. The full equations and all other results not shown in the tables are available upon request from the author.

TABLE 3
Starting Rank of Faculty Newly Entering the University 1999–2010

	% of new faculty	% of female new faculty	% of male new faculty	% female of new faculty
Associate Lecturer	43.9	46.6	42.1	41.5
Lecturer	33.7	37.5	31.3	43.5
Senior Lecturer	14.7	11.7	16.5	31.2
Associate Professor	2.9	2.1	3.4	28.1
Professor	4.9	2.1	6.7	16.7
All	100.0	100.0	100.0	39.1

V Results: Gender Differences and Academic Level

(i) First Academic Level

The percentage of females among new entrants to UNSW is monotonically decreasing with academic level. As Table 3 shows, a higher percentage of women than men hired at UNSW post-1998 entered at the lowest level, Associate Lecturer. This gender difference widened over the time period, from 2.5 percentage points in the first half to 5.3 percentage points in the second.

Isolating the two 'regular junior faculty' levels, more people enter UNSW as Lecturers than as Senior Lecturers. There is a large and statistically significant gender difference in entry levels, with a much higher percentage of females entering as Lecturers (43.5 per cent) than as Senior Lecturers (31.2 per cent). Multivariate probit analysis on regular junior faculty hires indicates that even with controls, women are 10 percentage points more likely than men to be hired as a Lecturer as opposed to a Senior Lecturer, significant at the 0.1 per cent level. Because there might be differences between Schools within each Faculty, as a robustness check, the model was re-estimated with specific School dummies using only observations at the 14 largest Schools and found an even greater gender difference in level of first job (16.6 per cent).⁸ Of course, it is quite possible that this difference does not indicate discrimination as

⁸There are too few observations for smaller Schools to allow estimation including them.

age at hire may not adequately capture experience and/or as there may be quality differences between the male and female hires. These possibilities cannot be tested with the available data.

The gender difference in first level has fallen over time. Adding an interaction term between gender and the date the job began suggests that the gender difference was no longer statistically significant after early 2009.⁹ Hence, gender differences in the entry level of new 'regular junior faculty' seem no longer to be the concern they were only a decade ago, although they still should be carefully monitored.

(ii) *Gender Differences in the Likelihood of Promotion to a Higher Academic Level*

As explained above, the promotion likelihood is estimated using semiparametric hazard analysis of the likelihood of promotion each period from a level, considering all 'jobs' that do not end in a promotion as censored at their last observed date, whether it is 25 March 2010 or the date they permanently leave UNSW. Table 4 presents the relative likelihood of promotion of a woman compared with a similar man. This section discusses Specification 1 of the table, which excludes leave/part-time dummies (although duration *does* subtract out months of leave). Results for groups with fewer than 150 observations are not given.

For all levels pooled (row 1), there is no statistically significant gender difference in promotion *ceteris paribus*, either for the sample as a whole or for the subsets of first and subsequent jobs. Rows 2 through 5 indicate that the overall zero gender gap hides some significant but opposite gender differences at individual levels. The major results are that:

- 1 Women hired by UNSW into regular junior faculty jobs at the *Lecturer* level are promoted less rapidly and less often than men hired at that level. The likelihood of promotion each period is almost 30 per cent lower for women than for men.
- 2 Women are *more* likely to be promoted from *Associate Professor* positions than men. In

⁹ Of those hired into a 'regular junior faculty' job, the likelihood that a female would be hired as a Lecturer was 16 percentage points higher than a male. By the beginning of 2010, it was an insignificant 4 percentage points higher.

TABLE 4
Relative Likelihood of Promotion of a Woman Compared to a Man

	All jobs	First UNSW jobs	Not first UNSW jobs
Specification 1: Excluding maternity leave, LWOP and part-time dummies			
All levels	0.948	0.969	1.044
Promotion from Associate Lecturer	1.073	1.057	
Promotion from Lecturer	0.698***	0.727***	0.703
Promotion from Senior Lecturer	0.997	1.128	0.939
Promotion from Associate Professor	1.991***		2.101***
Specification 2: Including maternity leave, LWOP and part-time work dummies			
All levels			
Female	0.990	1.042	1.029
Maternity leave [†]	1.079	0.904	1.361
LWOP [†]	0.921	1.002	0.621
Part-time work [†]	0.523***	0.583***	0.291***
Promotion from Associate Lecturer			
Female	1.131	1.116	
Maternity leave [†]	0.688	0.730	
LWOP [†]	1.194	1.237	
Part-time work [†]	0.633***	0.624***	
Promotion from Lecturer			
Female	0.717*	0.765*	0.674
Maternity leave [†]	1.573*	1.385	1.831
LWOP [†]	0.557**	0.557*	0.549
Part-time work [†]	0.410***	0.453***	0.283***
Promotion from Senior Lecturer			
Female	1.061	1.334	0.930
Maternity leave [†]	1.091	0.448	1.488
LWOP [†]	0.820	1.039	0.748
Part-time work [†]	0.393***	0.571	0.349***
Promotion from Associate Professor			
Female	2.037***		2.243***
Maternity leave [†]	0.932		0.714
LWOP [†]	0.756		0.583
Part-time work [†]	0.224**		0.059***

Notes: Control variables include date job began, age at job beginning (linearly and squared), dummy for Faculty, dummy for continuing job, dummy for first job or rank when appropriate. ***Bold: Significantly different from 1 at 0.01 level. **Bold italics at 0.05 level. *Italics: at 0.10 level. Shaded cells have <150 observations so equations are not estimated. [†]Dummy variables. Coefficient is the likelihood of promotion for those with dummy = 1 compared to those with dummy = 0. Promotion analysis by definition excludes the top rank, Professors.

fact, the hazard analysis suggests that they are about twice as likely as men to be promoted from these positions.

3 There are no other clear gender differences in promotion at other levels. Point estimates are very close to one for both the Associate Lecturer and Senior Lecturer levels.¹⁰

It is facile to conclude that as women are less likely to be promoted than men at one level whereas they are more likely to be promoted at another, *on average* there is no gender promotion 'problem'. That is highly misleading. Although this pattern means that *ex ante*, men and women have similar probabilities of achieving Professor eventually, women are stuck at the low level of Lecturer for more years and correspondingly, at any point of time, the percentage of women observed at lower levels is higher than that of men. In fact, the reason that women are more likely to be promoted from Associate Professor than men may be precisely because only a select group of very able female academics have been successfully promoted to this high level.

The Lecturer level is particularly key to UNSW women academics. Not only are 70 per cent of all regular junior faculty hired as Lecturers, but women are significantly more likely than men to enter their first UNSW job at the Lecturer level compared with entering at the Senior Lecturer level, as seen in Table 3 where the ratio of entering Lecturers to entering Senior Lecturers is more than 3 to 1 for women and less than 2 to 1 for men.¹¹

¹⁰ Women on average take more leave (see Table 7). These hazard analyses were re-estimated without leave netted out and showed no qualitative differences in which gender was promoted faster, although point estimates did move slightly in the direction of a lower female/male risk ratio.

¹¹ If one considers the first promotion as most important for 'regular junior faculty', whichever rank one is hired into, the combination of the facts that men are more likely to enter as Senior Lecturers and that it is more difficult to be promoted from Senior Lecturer rank than from Lecturer rank (median years to promotion are 102 and 81 months respectively) may have meant that women are in fact better off than men in terms of the first promotion. That is not the case. Women are significantly slower than men at getting promoted from their first job if they enter as regular junior faculty (relative risk ratio = 0.800, *P*-value = 0.09).

(iii) Trends Over Time in Promotion of Women at UNSW

Concern over promotion of academic women at UNSW surfaced in the early 2000s, but earlier this paper argued that the major UNSW policy changes to redress gender differences in promotion rates started in 2006. This section asks whether gender promotion differentials decreased considerably from the first to the second half of the decade.

To test this, the promotion results from Specification 1 of Table 4 were re-estimated including two separate female dummies, one for 'jobs' that began in the years before 2006 and the second for jobs that began in 2006 or later (as well as a 2006+ dummy to capture any secular time trend). Note that 55 per cent of females' jobs and 58 per cent of males' jobs in the data set fell into the earlier group. To include similar time spans for those entering UNSW during the different periods, this analysis censored all jobs at 5 years duration. This allows only identification of gender differences in quick promotions, not in median-length (7 years) or longer ones.¹² The results of this analysis are shown in Table 5.

Table 5 indicates that pooling all levels together, being female significantly lowered promotion rates for jobs that began before 2006 but not for jobs that began after this. The difference in the female coefficients pre- and post-2006 is statistically significant. Therefore overall, there was a female promotion disadvantage, but it disappeared after 2006. The insignificant overall promotion disadvantage in Table 4 was conflating these two effects.

Disaggregating by the level of jobs shows considerable differences across levels. For those who started at UNSW as *Associate Lecturers*, the overall insignificant gender difference from Table 4 had been concealing an insignificant (negative) female effect pre-2006 and a significant advantage for women's promotion 2006+.¹³ Again, robustness checks suggest that

¹² Median based on Kaplan–Meier estimates. The data could instead have been categorised by when the job ended. The two approaches imply different assumptions about whether policies throughout the job affect promotion. A major reason to choose the method used here is that it allows for flexible time patterns of the baseline probability of promotion.

¹³ Again, the two coefficients on female are significantly different from each other.

TABLE 5
*Relative Likelihood of Promotion of a Woman
 Compared With a Man By Time Period*

Specification 1: Excluding maternity leave, LWOP and part-time dummies

	All jobs	First jobs	Not first jobs
All levels – pre-2006	0.839**	0.836	0.982
All levels – 2006+	1.278	<i>1.388*</i>	1.236
From Associate Lecturer: pre-2006	0.866	0.856	
From Associate Lecturer: 2006+	1.545**	1.460	
From Lecturer: pre-2006	0.597***	0.643**	0.530**
From Lecturer: 2006+	1.201	1.141	1.439
From Senior Lecturer: pre-2006	0.960	0.680	0.844
From Senior Lecturer: 2006+	1.009	1.362	0.789
From Associate Professor: pre-2006	2.233***		2.528***
From Associate Professor: 2006+	0.874		0.893

Notes: ***Bold: Significantly different from 1 at 0.01 level. **Bold italics at 0.05 level. *Italics: at 0.10 level. Also see notes in Table 4.

women's faster promotion from Associate Lecturer most closely coincided with a 2006 cutoff rather than an earlier or later one or a gradual change.

For *Lecturers*, when all years were combined (Table 4), women were less likely than men to be promoted. Separating this into two periods in Table 5, however, this was only true prior to 2006, when women were approximately 40 per cent less likely than men to be promoted from Lecturer jobs; after 2006, the gender difference was insignificant and the point estimate >1. Robustness checks cutting the time period at alternative points indicate the same qualitative results about trends in Lecturer promotion.¹⁴

For *Senior Lecturers*, the two periods were not significantly different, and no point estimates differed from gender equality.

¹⁴ The likelihood function was highest when the cutoff was 2007, next highest with a 2006 cutoff.

However, women were *less advantaged* in promotion from *Associate Professor* in the later period. There was a strongly pro-female promotion pattern *before* 2006 but no gender difference after this despite the fact that one major policy change – the AWIL Program – applied only to higher ranks.¹⁵ This 2006 change is significant at the 20 per cent level. Given the timing, this could not have been due to the lowered bar for women's promotion at the Lecturer level post-2005.

To summarise results on promotion, women were more likely than men to be promoted from the Associate Lecturer level in the last part of the study period. Women were more likely than men to have been *hired* at the Lecturer level instead of the Senior Lecturer level, although this difference fell over time. Women were less likely to be *promoted* from the Lecturer level than men, although this is true only in the earlier part of the decade. Finally, women were more likely than men to be promoted from the Associate Professor level early in the study period, but not later.

VI Results: Gender Differences in Mobility

This section addresses whether women are more likely than men to leave UNSW and whether failing to get promoted affects men and women's mobility differently. Mobility can be good or bad for a career, depending on its cause. Numerous studies in labour economics demonstrate that mobility due to *non-work-related* reasons hurts careers. However, for academics, much voluntary mobility is work-related, leaving one's current institution for a better offer. If male but not female academics engage in career-enhancing voluntary mobility, this alone would lead to more women at lower ranks.

Unfortunately with these data, there is no way to identify whether mobility is involuntary or voluntary, and if voluntary whether it is for career-enhancing reasons. If job mobility is correlated with slower promotion, however, this suggests the possibility of career-enhancing mobility, whereas if it is correlated with more maternity leave, this suggests the possibility of non-work-related mobility, although in both

¹⁵ The conclusions remain true if the time period is divided instead at 2004, 2005 or 2007. Of these four specifications, the likelihood function was highest in 2007 and next highest in 2006.

TABLE 6
Relative Likelihood of Leaving UNSW for a Woman Versus a Man, from Time of Hire

	All faculty	Began as 'regular junior faculty'	Began as Associate Lecturer	Began as Lecturer	Began as Senior Lecturer	Began as Associate Professor or Professor
Specification 1: Excluding maternity leave, LWOP and part-time dummies						
Female	<i>0.896**</i>	<i>0.819**</i>	0.932	<i>0.827*</i>	0.828	1.224
Specification 2: Including maternity leave, LWOP and part-time work dummies						
Female	0.947	0.863	0.989	0.86	0.896	1.388
Maternity leave [†]	0.513***	0.393***	0.609***	0.381***	0.435	—
LWOP [†]	0.904	0.961	0.827	0.851	1.511	1.129
Part-time work [†]	1.232***	1.320***	<i>1.161*</i>	1.395***	0.856	<i>1.996*</i>

Notes: Also see notes in Table 4. ***Bold: Significantly different from 1 at 0.01 level. **Bold italics at 0.05 level. *Italics: at 0.10 level. Control variables include date job began, age at job beginning (linearly and squared), dummy for Faculty, dummy for continuing job, dummy for entering rank, and dummy for whether ever promoted. —: No one who took maternity leave left UNSW.

cases the direction of causality may run in either direction. We test these possibilities in this section and the following section.

The mobility analysis here censors all jobs when the person reached the age of 55 – when retirement from UNSW is possible – as well as at 25 March 2010. Mobility is modelled as a function of time elapsed since hire at UNSW. Only those people hired post-1998 are included to avoid survival bias.

On average, 28 per cent of academics leave within 2 years of being hired, 39 per cent within 3 years and 52 per cent within 6 years. The probability of leaving falls as level rises, both on average and in the multivariate analysis described below. Therefore, Associate Lecturers are the most likely to leave the University, with two-thirds leaving within 6 years. Combining those who started at UNSW at the 'regular junior faculty' levels of Lecturer and Senior Lecturer, 23 per cent leave within 2 years, 31 per cent within 3 years and 43 per cent within 6 years. This 43 per cent no doubt includes considerable involuntary mobility due to non-renewal after the probationary period. The contrast in mobility *between* Lecturer and Senior Lecturer is sharp (e.g. 46 and 36 per cent respectively leaving within 6 years), suggesting that those entering as Senior Lecturer are much less subject to involuntary mobility, probably because they had already demonstrated ability before being hired at this level. Senior Lecturers, Associate Professors and Professors are all quite similar in mobility.

On average, men are significantly more likely than women to leave UNSW within

2 years of hire (29.0 versus 25.9 per cent). Gender differences in average mobility within 3 or 6 years, and disaggregated by level, are of similar or larger magnitude but not statistically significant.

To compare mobility of *comparable* people, hazard analysis is used that estimates the likelihood of the academic permanently leaving UNSW as a function of time since hire with the same controls as in the promotion analysis plus a dummy for whether the person had ever been promoted, because non-promotion is a powerful motivator for voluntary mobility. (In additional analyses not shown, we also estimated mobility without the previous-promotion dummy and obtained the same conclusions regarding gender.) These hazard equations are estimated for the pooled sample and by level at first hire.¹⁶

The coefficient on the ever-promoted dummy (not shown) was very significantly negative at all starting levels, with magnitudes suggesting that people who were promoted were approximately 80 per cent less likely than the non-promoted to leave UNSW *ceteris paribus*. A similar set of equations were estimated adding an interaction between ever-promoted and female. This interaction term never approached significance in any of the specifications, suggesting that men and

¹⁶ Note that there were not enough observations to estimate separately those who entered at the two highest ranks. Also, because faculty who entered at the Professor rank could not be promoted, the analysis for the Associate/Full Professor rank did not control for previous promotion.

women at UNSW were equally likely to leave *because* they did not get promoted.

Results on the relative risk ratio (women/men) from this estimation are given in Table 6. Specification 1 indicates that women overall are significantly less likely (10 per cent) than men to leave the university. (Specification 2 will be discussed in the following section.) Limiting the analysis to those who were hired into a 'regular junior professor' job, this gender difference widens to 18 per cent. Dividing by starting level, the two starting levels that make up 'regular junior professors' have similar point estimates, although the difference is measured more accurately for the larger group who began as Lecturer. Gender differences are not significant at other starting levels.

However, dividing the gender differences into those hired before and after early 2006 (results not shown), these significant gender differences in mobility were found to apply to the pre-2006 period only. Therefore, female mobility was significantly lower only prior to 2006 for the pooled sample, for those who began as Lecturer, and for those who began as regular junior faculty. After that, women's mobility was not significantly different from men's.¹⁷

We also analysed whether people left UNSW permanently as a function of time in a given job instead of time at UNSW, and results are given in Table 7. Qualitatively, these results were very similar to those in Table 6.

Summarising, the main gender difference in mobility from this analysis is that women are a significant 18 per cent less likely to leave UNSW than men if they start as regular junior faculty. This result is primarily true for the early part of the decade only.

VII The Impact of Maternity Leave, LWOP and Part-Time Work

(i) Descriptive Statistics

A common belief is that women with children are less committed to their jobs and that women tend to leave full-time life-long careers for family reasons. The data can address the role that maternity leave has in slowing promotion and/or in inducing mobility at UNSW. It also

¹⁷ Note that due to large standard errors, it is impossible to conclude that the female coefficient definitely changed from pre and post-2006 ($P = 0.35$).

TABLE 7
Relative Likelihood of Leaving UNSW for a Woman Versus a Man, While at Level

	All faculty	First UNSW jobs	Not first UNSW jobs
Specification 1: Excluding maternity leave, LWOP and part-time dummies			
All levels	0.883**	0.879**	0.915
Leaving from Associate Lecturer	0.898	0.900	
Leaving from Lecturer	0.875	0.881	0.883
Leaving from Senior Lecturer	0.913	0.842	1.003
Leaving from Associate/Full Professor	1.162	1.004	1.221
Specification 2: Including maternity leave, LWOP and part-time work dummies			
All levels			
Female	0.913	0.917	0.953
Maternity leave [†]	0.476***	0.468***	0.498**
LWOP [†]	1.022	0.767***	3.079***
Part-time work [†]	1.450***	1.489***	1.278
Leaving from Associate Lecturer			
Female	0.945	0.944	
Maternity leave [†]	0.588***	0.578***	
LWOP [†]	0.621***	0.613***	
Part-time work [†]	1.380***	1.370***	
Leaving from Lecturer			
Female	0.897	0.914	0.877
Maternity leave [†]	0.432***	0.300***	0.887
LWOP [†]	0.998	0.779	2.230***
Part-time work [†]	1.610***	1.813***	0.948
Leaving from Senior Lecturer			
Female	0.989	0.867	1.320
Maternity leave [†]	0.256***	0.471	0.100***
LWOP [†]	2.902***	1.965**	4.953***
Part-time work [†]	1.166	0.994	1.208
Leaving from Associate Professor or Full Professor			
Female	1.213	1.117	1.318
Maternity leave [†]	—	—	—
LWOP [†]	2.428***	1.222	5.240***
Part-time work [†]	2.320**	2.054	2.529

Notes: ***Bold: Significant at 0.01 level. **Bold Italics: Significant at 0.05 level. *Italics: Significant at 0.10 level. —: No one who took maternity leave left UNSW. Also see notes in Table 4.

allows testing whether maternity leave has a different 'impact' on promotion and mobility than does LWOP and how both compare to part-time work's 'impact'.

The word 'impact' in the previous paragraph was put in quotation marks because the results cannot address causality. The coefficients on leave/part-time dummy variables may capture selection rather than causality. Hence, people who work part-time or take leave may be less committed to their academic careers¹⁸ and therefore be less likely to get promoted and more likely to leave academia. In this case, leave/part-time variables would proxy for this lack of career commitment. Alternatively, people with poor promotion prospects may be more likely to take LWOP to explore other job possibilities, may work part-time jobs, and may even be more likely to have children or take longer maternity leave if they do have children. As a result, these leave/part-time variables would be a reflection of low promotion possibilities and high mobility rather than their cause. All of these possibilities must be kept in mind in interpreting the results.

Overall, 11.4 per cent of women who started UNSW post-1998 took maternity leave during their career at UNSW.¹⁹ For those who took some maternity leave, the average cumulative maternity leave time was 7.9 months. Averaging over jobs of *all* women that started UNSW post-1998 (as a Lecturer or higher) and ended before the woman turned 46, maternity leave averaged 5.4 per cent of jobs' durations (with many women at 0 per cent).

In 2006, UNSW practically doubled the length of paid maternity leave. However, there is no evidence of greater 'take-up' of maternity leave or of longer maternity leaves. In probit analysis of whether or not a woman took maternity leave as a function of the duration of the 'job', a dummy for jobs that began after 2006, plus the standard controls, women in jobs that *began* before or after 2006 were equally likely to take maternity leave;²⁰ the same was true in a tobit analysis of the percentage of a job's months spent in maternity leave. However, similar analysis using a

2006 dummy based on when the job *ended* rather than when it began found a significantly *lower* likelihood (at the 99 per cent level) of taking maternity leave and of average months of maternity leave.²¹ Of those who did take maternity leave, the months of maternity leave per 'job' was not significantly different before and after the policy change, not surprising given the relatively small number of women in this group.

More women (12.1 per cent) than men (8.1 per cent) take LWOP at some point during their career at UNSW. However, the average proportion of time spent in LWOP as a *percentage* of job duration is quite similar for men (1.20 per cent) and women (1.05 per cent) because men who take LWOP take longer absences than women do. UNSW policy allows women who use up all of their paid maternity leave to take a certain amount of LWOP as well. Only 13.6 per cent of jobs with maternity leave also included any LWOP.

Around 21.4 per cent of women's time at UNSW but only 14.5 per cent of men's time is spent in part-time work. Around 38.5 per cent of women versus 25.4 per cent of men have spent some time working part-time by age 55.

(ii) Promotion

Recall that the data include information on months of maternity leave or LWOP while at a given job level, but not precisely when that leave was taken. Leave/part-time variables affect the hazard rate estimation of promotion and mobility via two routes. First, duration nets out maternity leave and LWOP (although below we report also results without netting out leave). Second, in Specification 2, dummies are added as controls for having taken some maternity leave, some LWOP and some part-time work during the period.²²

As more women take leave and work part-time than men, the coefficient on female in Specification 1 (without leave/part-time dummies) was also picking up any 'impact' of

¹⁸ For instance, they may publish less or spend less time on their teaching responsibilities.

¹⁹ Although the employment policy is written vaguely enough to allow men who adopt to take paternity leave, no male took paternity leave during this period.

²⁰ $|t| < 1$ in these analyses. Note that, as in the earlier paragraph, these analyses included women who were <46 before the job's end and started at UNSW at a rank of Lecturer or higher.

²¹ Results were qualitatively similar for a cutoffs at age 40.

²² Dummies over months at leave were used for two reasons. First, they fit better, that is, increase the value of the log-likelihood function. Second, this method minimises the correlation between the equation error and each leave variable that arises simply from the way that the dependent variable was constructed by netting out months of leave.

greater leave and part-time work on promotion and mobility. In contrast, the coefficient on female in Specification 2 indicates what the gender difference would be if men and women had the same leave/part-time behaviour (or had the kinds of characteristics that generate that same behaviour).

As can be seen in Table 4, the addition of leave/part-time dummies in Specification 2 only slightly narrows the gender gap in promotion from Lecturer. Therefore, the fact that women have more leave or part-time work is not responsible for the gender gap in promotion from Lecturer. In contrast, adding these dummies slightly *widens* women's gender advantage in promotion from Associate Professor. Coefficients on female at the other levels that had been insignificant in Specification 1 remain so in Specification 2.

Table 4 also includes the Specification 2 coefficients on the leave/part-time variables. At all academic levels, taking some part-time work is correlated with (significantly) lower promotion rates. Part-time work may indicate less commitment to this job or to an academic career more generally. However, it is important to highlight the fact that, unlike maternity leave and LWOP, part-time hours are not netted out from job duration because the data do not give hours worked each part-time month. Therefore, there may *not* be a negative effect of working part-time on full-time equivalent months until promotion.

On average, LWOP is associated with a significantly longer time until promotion (net of LWOP) only for Lecturers at first jobs. As with part-time work, LWOP might proxy a lack of commitment to their academic career at UNSW; alternatively, LWOP (particularly for Lecturers) may indicate academics that have not been successful at research and are taking time away from teaching to concentrate on research. As a robustness check, this analysis was re-estimated without netting out months of LWOP. In this form, LWOP significantly negatively affects promotion not only for Lecturers but also for Senior Lecturers and Associate Professors.

Results not shown added interaction terms between female and the LWOP and part-time dummies to test whether the associations found between LWOP and part-time work differs between men and women. These interaction terms were not significant even at the 10 per cent level.

Maternity leave does not have a negative association with promotion probabilities in Table 4. Instead, maternity leave increases the likelihood of promotion from Lecturer, although the impact is only significant at the 10 per cent level. Impacts at other levels are not statistically significant. Estimating the impact of maternity leave on the sample of female Lecturers only, the positive effect of maternity leave is larger and more significant (risk ratio = 1.86, $P = 0.02$). In results not shown, coefficients on female dummy and maternity leave were similar before and after 2006. Therefore, the more generous maternity policy starting in 2006 did not change the maternity-leave-promotion association. The positive link between promotion and maternity leave may indicate that women committed to their academic careers request temporary maternity leave rather than leave the university permanently. This link to mobility is investigated below.

As with LWOP, this analysis was re-estimated without netting out maternity leave. There were no qualitative differences for levels besides Lecturer. For Lecturers, the maternity leave dummy has no impact whatsoever (coefficient = 1.005) on promotion. In other words, women who enter as Lecturers and take maternity leave require exactly the same amount of *elapsed time* to be promoted as women entering at this level who do not take maternity leave, even though for one group some of that time is spent on maternity leave.²³

(iii) Mobility

The second specification in Table 6 shows the 'impact' of leave and part-time variables on the likelihood of leaving the university from time-of-hire. The 'job'-specific likelihood of leaving UNSW and the coefficients of interest are given in Table 7.

Mobility gender differences controlling for leave/part-time variables are much smaller than without these controls. In fact, the female coefficient is no longer significant in any Specification 2 estimation in Tables 6 and 7.

Those women who take maternity leave are much *less* likely to subsequently leave the university, at all levels. Therefore in both Tables 6 and 7, the relative risk ratios on maternity leave are highly significantly <1 for most cases and

²³ The same is true using months of maternity leave instead of a dummy.

levels. The one exception is the insignificant (but of similar magnitude) coefficient for those who started as Senior Lecturers, and this *is* significant in estimation on women alone. Only 15 women entered at Senior Lecturer level and took maternity leave, and of these only 3 subsequently left UNSW. Only one woman who entered UNSW as an Associate or Full Professor took maternity leave, so a coefficient on maternity leave could not be estimated for this group. (Parenthetically, she did not subsequently leave UNSW.) The maternity leave results corroborate the previous conjecture based on the promotion analysis. Maternity leave appears to be correlated with the presence of career commitment rather than its absence.

Coefficients on maternity leave are in stark contrast to those on LWOP. Of particular interest, among academics who had previously been promoted (i.e. in non-first jobs), those who take LWOP are three times as likely to leave (Table 7). Perhaps, these academics are using LWOP to 'try out' an alternative employer. In light of this, it is interesting to note that although women still take more LWOP than men in these non-first jobs, the gender gap is smaller than for LWOP at first jobs. This may be because 'successful' men at UNSW use LWOP to shop around for new jobs more than do successful women.²⁴

Finally, academics who work part-time are more likely to subsequently leave the university. Part-time work is perhaps a stepping stone to leaving. Women at UNSW use part-time work much more than men, and it may be that part-time women are truly on a 'mommy track'.

None of the mobility results in Specification 2 are qualitatively different when estimated separately for the earlier and later period, including the impacts of LWOP, maternity leave and part-time work as well as the gender differences controlling for these leave variables.

VIII Summary and Discussion

More women than men faculty are found at lower academic ranks at UNSW, as at many universities throughout the world. This, in part, is a consequence of the trend of increasing women's

participation in academia over the past 40 years. This case study has shown that at UNSW, at least, the preponderance of women at lower ranks reflects other causes as well.

This paper is mostly concerned with those on the regular academic ladder, those who started the university at Lecturer level or higher. Three factors contribute to the greater representation of women among Lecturers. First, women are more likely than men to be hired as Lecturers than as Senior Lecturers, even controlling for age and Faculty. Second, women are less likely than men to be promoted from Lecturer levels, with a 30 per cent average difference. Third, female Lecturers are less likely than male Lecturers to leave the university. The Lecturer level is therefore a critically important bottleneck for women's academic careers at UNSW.

One possible explanation for all three facts is that women entering academia in general (and UNSW specifically) are of lower quality or less committed to research. This was suggested by earlier surveys showing Australian academic women focus on research less than men (Poole *et al.*, 1997; Asmar, 1999). The nature of academic employment changed in the early 1990s when the Go8 were established as research institutions (White, 2001), and this could have led to the 1990s results in the earlier literature. However, by the mid-2000s, women and men were equally focused on research at least at higher ranks (Diezmann & Grieshaber, 2010), although women did remain more concerned about work-family conflicts even in the 2000s (Thanacoody *et al.*, 2006).

A related reason could be that UNSW is not able to hire women of as high quality as the available men because of greater international competition for high-performing females. However, the international literature on gender differences in academia has not identified any affirmative action in the hiring of academic women.

Women academics being less committed or capable than men could lead to many of this paper's findings. Men would be promoted faster; they would receive their PhD at an earlier age and, consequently, a male of a given age would be hired at a higher rank than a similar-age woman. Also, men would have more offers from other universities and hence more mobility, and men just a few years post-PhD at other institutions would be more likely to be wooed by UNSW at the Senior Lecturer level.

²⁴ Recall that this excludes people post-retirement age.

Several aspects of the analysis here, however, shed doubt on women's lower commitment as the explanation of the gender differences found. First, although some women do seem to be choosing a track with less commitment by working part-time and taking LWOP, the paper has found that even women who chose neither have a much lower probability of promotion from Lecturer than men. Moreover, women who take maternity leave are if anything *more* likely to get promoted.

Without more information including publication data, we are not able to know whether the lower promotion rates of female Lecturers were the result of lower quality or of discrimination. One discrimination model that fits well with the results found here is Fryer (2007). Fryer develops a dynamic model of statistical discrimination that results in 'flipping', that is, in discrimination against a minority group at lower job levels and yet discrimination *in favour* of that group at higher levels. Essentially, Fryer's result is due to the fact that if employers believe the minority group is less able, they will discriminate against them initially; however, minority group members who overcome the initial discrimination are higher quality than other workers. The Fryer flipping-discrimination model would predict both the observed hiring into lower ranks and slower promotion of female Lecturers on the one hand and the faster promotion of female Associate Professors on the other. Also, assuming similar discrimination existed at other Australian universities, female Lecturers at UNSW would have fewer outside offers and therefore this model would predict lower mobility of women at this rank.

If Fryer flipping-discrimination is the explanation for pre-2006 gender differences and if 2006 policy changes truly led to gender-blind hiring and promotion, what does the theory predict would occur post-2006? There would have been fewer female disadvantages in hiring and promotion at the lower ranks, as indeed is the case. However, it would take considerably more than 5 years before the female Associate Professors applying for promotion would be as low quality as the males. Therefore, this theory cannot explain the post-2006 Associate Professor result.

Whatever the explanation for the gender differences in the first half of the decade, the results here do shed light on the effectiveness of the 2006 UNSW policies designed specifically to combat gender discrimination. Expansion of

maternity leave could not have been responsible for equalising gender promotion rates, as the take-up and average duration of maternity leave substantially decreased. Similarly, the AWIL seems unlikely to have led to the observed changes in promotion rates, as it was targeted at the three highest levels and not at the two lower levels (Associate Lecturers and Lecturers), yet promotion of women increased relative to men at the two lower levels but decreased at the Associate Professor level.

It is possible that other policy changes were responsible for observed changes in 2006/2007. For instance, at the same time, UNSW's central administration made decreasing gender differentials a part of Heads of School and Heads of Faculty evaluations. Also, general promotion policies (not specifically related to gender) changed simultaneously, including a return to a tenure-like process for some Schools and revised general promotion policies and procedures. All of these could have contributed to increasing gender-blindness. However, further research is needed to know whether any of these policy changes may have equalised Associate Professor promotion rates.

Whatever the cause of the original gender differences and the observed 2006 changes, continuing monitoring is needed to know whether the recent equalisation of gender promotion is a permanent phenomenon, or just a temporary one that disappears when consciousness of gender inequities fade.

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Appendix I: Number of Observations

Promotion Analysis

	All jobs	First UNSW jobs	Not first UNSW jobs
All levels	4575	3139	1436
Promotion from Associate Lecturer	1494	1446	48
Promotion from Lecturer	1504	1113	391
Promotion from Senior Lecturer	1076	484	592
Promotion from Associate Professor	501	96	405

Notes: Promotion results for any cell <150 are not reported in Table 5. These are shaded. Promotion analysis not estimated for right two columns separately.

Mobility Analysis

Leaving UNSW from Time of Hire

All levels	3102
Regular Junior Faculty	1488
Began as Associate Lecturer	1430
Began as Lecturer	1048
Began as Senior Lecturer	440
Began as Associate Professor or Professor	184

Leaving UNSW While at Rank

	All jobs	First UNSW jobs	Not first UNSW jobs
All levels	4573	3080	1493
Left UNSW from Associate Lecturer job	1463	1419	44
Left UNSW from Lecturer job	1415	1038	377
Left UNSW from Senior Lecturer job	1003	439	564
Left UNSW from Associate or Full Professor job	692	184	508

Notes: Mobility analysis excludes those who started after they turned 55. Mobility results for any cell <150 are not reported in Table 7. These are shaded.