Effects of university prestige and courses on graduates' earnings

Background paper supporting the
Mapping Australian higher education, 2014-15 report

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Grattan Institute Report No. 2014-13, November 2014

This report was written by Ittima Cherastidtham, Grattan Associate and Andrew Norton, Grattan Institute Higher Education Program Director. It provides background information supporting the *Mapping Australian higher education, 2014-15* report, published by the Grattan Institute in October 2014.

We would particularly like to thank Ian Li for his advice and input. The opinions in this report are those of the authors and do not necessarily represent the views of any of the people acknowledged above or Grattan Institute founding members, affiliates, individual board members. Any errors or omissions are the authors' responsibility.

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This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute.

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This report may be cited as:
Cherastidtham, I., & Norton, A. (2014) *Effects of university prestige and courses on graduates' earnings,* Grattan Institute

ISBN: 978-1-925015-64-5

Overview

The *Mapping Australian Higher education, 2014-15* report published by the Grattan Institute in October 2014 is the third report in an annual series. It puts key facts and their context in one place. This year, it included a section on whether university prestige and the field of study a student pursues can improve his or her employment outcomes. This paper expands on that analysis, providing more detail on statistical methods and results.

Grattan's study makes a new contribution to the existing literature by exploring the effect of prestige on a graduate's probability of being in full-time employment and their lifetime earnings.

This report shows that graduates of sandstone universities and of technology universities earn about six per cent more than graduates of other universities over a 40-year career.

Yet field of study is a greater driver of income differences among graduates than is university attended. For example, a graduate who chose engineering at any university over science is likely to earn more than a graduate who chose science at a sandstone university.

Table of Contents

Figures

Tables

1. Income for university types and courses

Earnings of Australian workers vary with their level of education. Although it is difficult to fully control for prior ability difference between higher education graduates and school leavers, it is generally accepted that higher education improves graduates' earnings and job opportunities.[1] Incomes also differ significantly among graduates. This chapter explores two reasons why incomes might differ: the type of university a student attends and the course taken.

With about 40 universities and 130 higher education providers, Australian students have a range of higher education options. The significance of these choices will increase if fees for domestic undergraduate students are deregulated, as the Government intends. Prospective students will need to decide whether universities charging premium fees offer value for money.

There is no survey that can reliably tell us whether graduates of specific universities do better than others over the long run. But one of Australia's most important social surveys, the Household, Income and Labour Dynamics in Australia Survey (HILDA), recently added a question on university attended.[2] By grouping together bachelor-degree graduates from similar universities we can use HILDA to analyse the financial benefit of attending a certain type of university.

This section supplements HILDA with two surveys that look at graduates at the beginning of their careers. One is the Longitudinal Surveys of Australian Youth (LSAY), which tracks young people from age 15 to their mid-20s.[3] The paper also reports on research by others based on the Graduate Starting Salaries survey (GSS), which is sent to all people completing a course at an Australian university.

1.1 University groupings in Australia

This paper's analysis of graduate earnings divides Australian universities into four groupings: the Group of Eight, the Australian Technology Network plus Swinburne University (technology universities), the Innovative Research Universities group (IRU), and other universities. Due to the smaller number of their graduates in HILDA, members of the Regional Universities Network are included with other universities in the statistical analysis and described as 'Other'.

A full list of universities and their groups is in Table 1.

[1] See for example Borland, *et al.* (2000); Leigh (2008)

[2] HILDA is a longitudinal survey, which began in 2001. The survey is conducted yearly where the latest available wave is 2012. It is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). See Melbourne Institute (2012) for further details.

[3] LSAY is a longitudinal survey of Australian youth. The survey is managed and funded by the Australian Government Department of Education, with support from state and territory governments. Our study uses the 2003 cohort in which Survey participants were 15 years old in 2003. See NCVER (2014) for further details.

Our categories largely correspond to the lobby groups that represent groups of universities. These lobby groups formed because their member institutions share similar histories and priorities that differ from other universities. Both these characteristics and how others perceive them could influence graduate outcomes.

The universities represented by the Group of Eight lobby group, sometimes called the sandstone universities, include the oldest mainland universities. They receive most government research funding.[4]

The technology universities were transformed from institutes of technology in the 1980s and 1990s, and still have a strong orientation towards industry. All bar Swinburne University are members of the Australian Technology Network.

Universities in the Innovative Research Universities group were generally established in suburban areas in the 1960s and 1970s, meeting growing demand for university education at that time. They have always had a research orientation.

1.2 University prestige in Australia

Prestige is a signal of standing; a prestige good or service is often seen as the best of its type. The concept of prestige is particularly influential in higher education, where quality is hard to measure. It reflects perceptions, justified or not, about where the highest quality is to be found. Students looking for the best courses and employers looking for the best graduates are likely to use university prestige to help make their choices. University prestige is associated with higher graduate earnings in the United States and to a lesser extent the United Kingdom.[5] There are four main reasons why university prestige might matter:[6]

- Human capital effect: graduates of prestigious universities may receive higher quality education due to factors such as better teachers and greater resources;
- Signalling effect: employers cannot directly evaluate the skills of graduates, so they may rely on university prestige as a signal of a job candidate's potential;
- Social capital effect: those who attend prestigious institutions may leave with more valuable professional networks;
- Selection effect: factors such as cognitive ability and social background which increase the probability of attending a prestigious university and also increase subsequent earnings.

Prestige is a subjective measure, revealed by the value that people place on a good or service with a particular brand. Our study uses three metrics to assess university prestige. These are fees, ATARs and international rankings.

Fees

Prestige is associated with high prices, so one prestige indicator is how much students pay for their courses. Fees for international

[4] Norton and Cherastidtham (2014), p 48

[5] Thomas (2000); Zhang (2007); Hussain, *et al.* (2009)

[6] Lindahl and Regner (2005); Gerber and Cheung (2008)

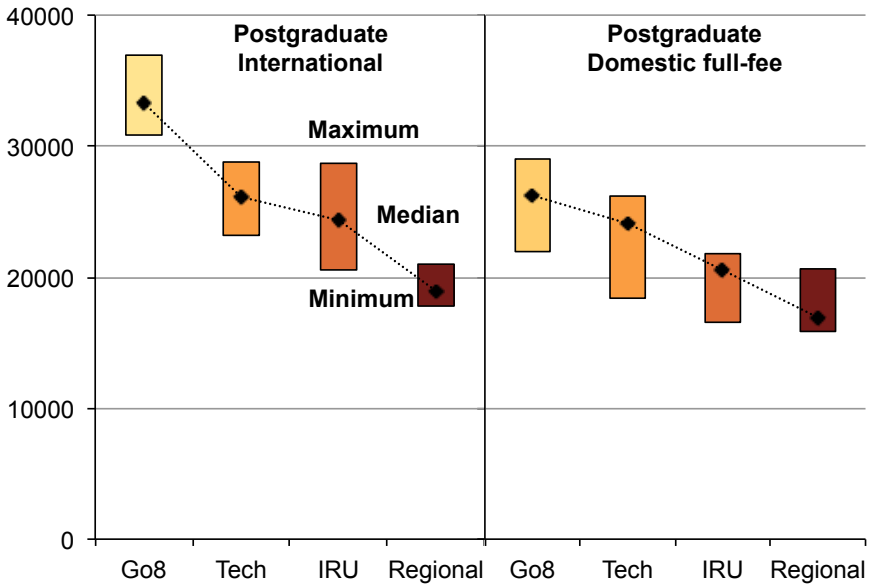
students and most domestic postgraduates are already deregulated, giving us a guide to the market value of different universities. Figure 1 shows annual fees for domestic and international students in a master of commerce course.

Both markets have the same hierarchy of fees charged. The Group of Eight universities charge the highest median fee in each case, and regional universities charge the lowest fee in each case. The same is true in most other fields of study.

Although median fees rank in the same order in both markets, high prestige universities, particularly Group of Eight, charge more of a premium for international undergraduates than domestic full-fee students. With more local knowledge, Australian students may see less of a difference between technology and Group of Eight universities.

Figure 1: Fees for commerce students, by university group

$2014, annual fee



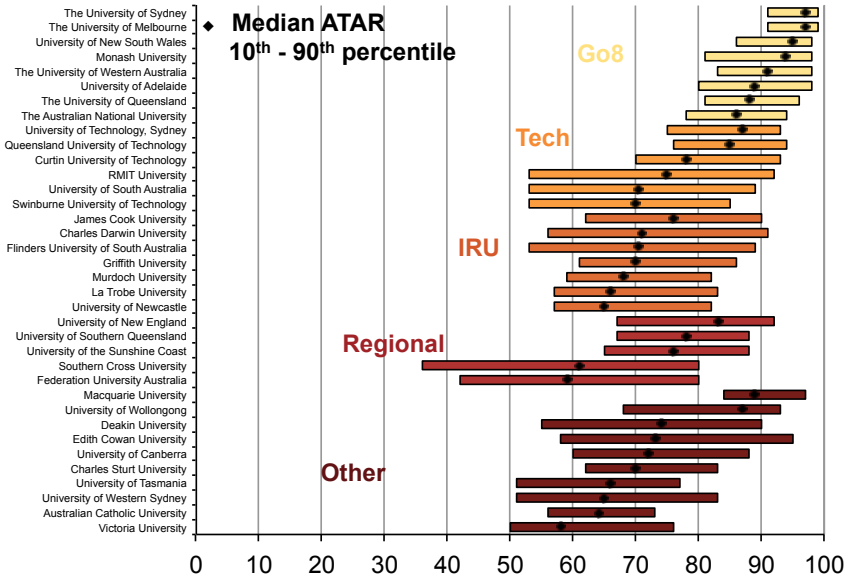
Source: Grattan data collection from university websites

ATAR

ATAR ranks school students by their academic performance, creating a potential measure of academic prestige. Figure 2 shows the range of ATARs for bachelor of business or commerce courses by university. Unlike the published cut-offs that report the lowest ATAR for normal admission, Figure 2 shows the range of ATARs of enrolled commerce students. Group of Eight universities generally have higher ATARs than other university groups. This pattern holds for most other courses.[7]

Although Group of Eight universities usually have the highest median ATARs, universities in the different groupings enrol students with overlapping ATAR ranges. This implies that some students who could attend a Group of Eight university choose to enrol somewhere else.

Figure 2: ATARs of business and commerce students, by university



Notes: ATAR data is classified in terms of field of education. Business and Management is used except for the University of Adelaide where Other Management and Commerce is used and for the University of Western Australia where Management and Commerce is used.
Source: Data provided by the Department of Education

International rankings

International rankings of universities have become important indicators of prestige over the last decade. They receive wide publicity, and universities promote their own position in the rankings when they do well.

The different international rankings vary in what they measure.

[7] The exceptions are teaching and nursing, where median ATARs for Group of Eight and technology universities are more similar than for other disciplines. Not all Group of Eight universities have undergraduate courses in these fields.

The Shanghai Jiao Tong Academic Ranking of World Universities focuses exclusively on research performance. The Times Higher Education and QS World University Rankings cover research performance as well as indicators of teaching quality and graduate employability.[8]

The ranking measure of university prestige does not show the overlaps between the Group of Eight and other groups evident in the fee and ATAR data. Across all three rankings, Group of Eight universities outperform other groups. Four Australian universities, all of them in the Group of Eight, make the top 100 Shanghai Jiao Tong World Universities. The other four Group of Eight institutions are ranked within the top 200 universities. Group of Eight universities have consistently outperformed other groups over time.[9]

The relative rankings of technology and IRU universities are not clear. More IRU institutions than technology universities are in the Shanghai Jiao Tong ranking, but technology universities outnumber IRU members in the Times Higher Education rankings, and typically do better in the QS rankings.

[8] ARWU (2014); Quacquarelli Symonds (2014); Times Higher Education (2014-15). There are many critiques of the statistics and methodologies of the rankings, especially for non-research indicators. See for example Marginson (2014).
[9] The data is collected from 2009 to 2014 for the Shanghai Jiao Tong, Times Higher Education, and QS World University Rankings.

Overall relativities

On all three prestige metrics, Group of Eight universities outperform the other university groups. As a result, our study assumes Group of Eight institutions are the prestigious Australian universities.

The hierarchy below the Group of Eight is less clear. The technology universities on average have the second highest median ATAR and fees, but there is overlap between their member institutions and those in the IRU. The two groupings each have mixed results in the international rankings.

1.3 Does attending a prestigious university improve employment prospects?

In general, a higher education qualification improves employment prospects.[10] University prestige is not necessary for getting a job. HILDA shows that Group of Eight graduates are only marginally more likely to be employed than graduates from Other universities. Group of Eight and technology university graduates have similarly high employment prospects, after controlling for other factors that influence employment.

Whether graduates work full or part-time has a large impact on their earnings. In 2011, Australian full-time workers had average earnings of $75,504 per year, 2.6 times more than average part-time pay.[11] Graduates from Group of Eight universities are equally

[10] Norton and Cherastidtham (2014), section 9.3
[11] ABS (2014)

likely to have a full-time job compared to graduates of other universities with comparable individual characteristics.[12]

For Australian graduates, field of study affects full-time job prospects more than type of university attended. Compared to science graduates, graduates with education degrees are marginally less likely to find themselves unemployed, but graduates with humanities or creative arts qualifications are about 2.5 times more likely to be unemployed.[13]

All these results take into account factors other than course taken that might affect employment outcomes. These include age, gender, children in the household, location, and whether English is spoken at home.

1.4 Does attending a prestigious university increase starting salaries?

The first salaries graduates receive can help examine whether university prestige affects graduate income. Since employers cannot easily assess the actual skills of job applicants, they may instead use a proxy measure such as university attended. This would be a signalling effect. Starting salaries may also reflect actual or assumed human capital acquired at university, rather than the effects of subsequent training and experience.[14]

Using the Longitudinal Survey of Australian Youth (LSAY), we estimate the impact of prestige on full-time starting salaries.[15] Comparing the earnings of Group of Eight with other graduates, we find no significant difference in their full-time starting salaries.[16] Additional analysis compares the starting salaries of each university group: Group of Eight, technology universities, IRU institutions and Other universities. Graduating from a Group of Eight university has no impact on starting salaries compared to any other university group.[17]

Since the signalling effects of prestige should be most prominent in graduates' first jobs, this suggests signalling has a weak impact on first full-time earnings. Other researchers, however, report that Group of Eight graduates are more likely to be in jobs matching their qualifications, a finding we return to in the next section.[18]

The salary results are consistent with previous Australian research, which finds that university attended has no or little impact on graduates' starting salaries.[19] Where earnings

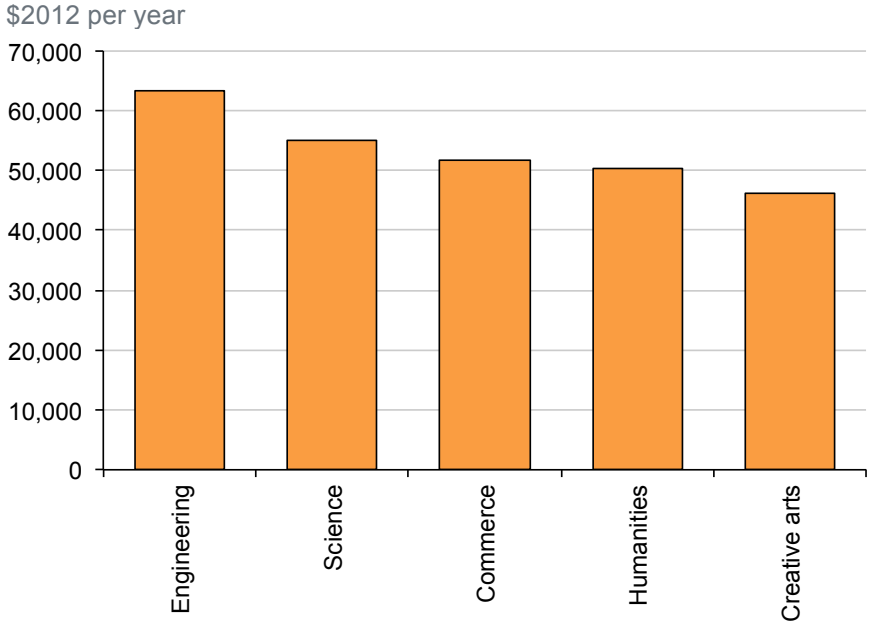
[12] Given Group of Eight graduates have a similar likelihood of being in full-time employment, but are less likely to be unemployed, this implies that Group of Eight graduates are more likely to be in part-time employment on average. Based on analysis of the HILDA survey, this difference is because Group of Eight graduates are more likely to prefer part-time work or to be working part-time because they are doing additional study.
[13] 'Society and culture' is a category that includes the humanities and social sciences.
[14] Miller and Volker (1982)
[15] 2003 cohort
[16] See Table 5, column 4 for the full of results.
[17] The analysis adjusts for differences in graduates' characteristics, including individual background and job characteristics. See 'Statistical report on financial returns to attending a prestige university' for more details.
[18] Li and Miller (2013) find that Group of Eight graduates are more likely to be in a job that requires their qualifications and Lee (2014) finds Group of Eight male graduates are more likely to find prestigious jobs. Job prestige is highly correlated with field of study and this may bias the result.
[19] Birch, *et al.* (2009); Li and Miller (2013); Lee (2014)

differences are found, Australian Technology Network (ATN) universities performed better than Group of Eight universities, according to a study using data from the Graduate Starting Salaries survey. The largest starting salary premium identified in Australian studies is approximately 3.5 per cent for ATN and 1.9 per cent for Group of Eight universities over Other universities.[20]

Three Australian studies estimate full-time starting salaries for individual universities.[21] One found that starting salaries between two Group of Eight universities can vary by up to 13 per cent. The difference may be more due to locational than university factors, but grouping universities may conceal important differences between them. The most recent study found a starting salaries difference of 12 percentage points between the highest and lowest university, after controlling for other factors known to affect earnings. Unfortunately, we cannot conduct our analysis by individual university, due to the small number of people in LSAY and HILDA.

Field of education has a greater impact on full-time starting salaries than prestige. Figure 3 shows median starting salaries of comparable graduates from different disciplines. Graduating with an engineering degree can improve a graduate's starting salary by about 15 per cent compared to a science degree.[22] Graduating from commerce, humanities or creative arts rather than science typically reduces a graduate's earnings. The median annual full-time starting salary for a science graduate was $55,000 in 2012; if a similar graduate had chosen engineering, he or she could earn about $8,000 more. But if a similar graduate had chosen commerce or humanities, he or she could earn about $3,000 or $4,500 less.[23]

Figure 3: Median full-time starting salaries by field of education



Notes: Humanities is a subset of society and culture. Due to how the data is classified it also includes economics. Only statistically significant results at 90 per cent are shown. A median graduate from physical sciences is the baseline. The data only includes bachelor degree graduates.
Sources: Grattan analysis of LSAY (2003 cohort) and GCA (2013a)

[20] Li and Miller (2013). In the Li and Miller analysis, Swinburne University is in the Other group.
[21] Birch, *et al.* (2009); Li and Miller (2013); Carroll, *et al.* (2014)
[22] See Table 5, column 4 for the full of results.
[23] GCA (2013b) using physical sciences.

1.5 Does attending a prestigious university increase lifetime earnings?

Although university prestige effects are hard to see in starting salary data, these could emerge over time. Possibly graduates have human capital advantages employers cannot observe during the initial hiring process, but which they recognise and reward financially as graduates' careers progress. The social capital acquired at a prestigious university may also take time to show benefits.

In the HILDA survey, Group of Eight bachelor-degree graduates employed full-time earn 10 per cent more than non-Group of Eight graduates who are employed full-time.[24] Not all of this is due to human or social capital differences. Prestigious universities on average admit people with higher academic ability, as can be seen in Figure 2 on university ATARs. Compared to other higher education institutions, prestigious universities also enrol more students who attended private schools, and whose parents are more likely to have degrees and high-status jobs than the general population.

Using HILDA, we can directly adjust the results to take account of social background but not prior academic ability. As a result, it is possible that our analysis over-states the advantages in going to a Group of Eight university, as opposed to just having high academic ability.[25] However, school results are indirectly taken into account because of their link with socioeconomic status. Once these selection effects are factored in, the Group of Eight income premium drops by about four percentage points. In other words, Group of Eight universities get good results partly because they take students who would do well wherever they studied.

We can extend the analysis by dividing the non-Group of Eight group into technology universities, the IRU and Other universities. Using Other universities as the baseline group, Figure 4 shows the impact on full-time earnings over a career. Graduates from technology and Groups of Eight universities earn about 6 per cent more than the graduates of universities in the Other category. Graduates of IRU universities earn about 2 per cent more.[26]

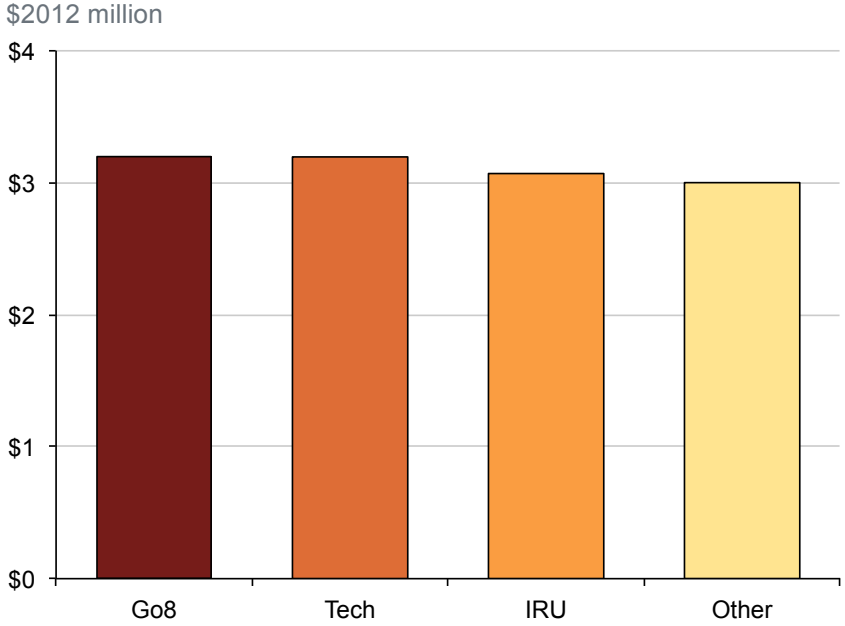
To demonstrate the impact of the earnings premium, a typical science graduate from a non-Group of Eight, technology or IRU university who works full-time earns $75,000 a year. If she went to a technology or Group of Eight university, she could expect to earn $4,900 more a year. Over a 40-year career the difference in lifetime earnings would be nearly $200,000.

The earnings premium may be partly due to the initial job-matching process. Ian Li and Paul Miller find that, shortly after course completion, Group of Eight and ATN graduates are more likely to have jobs that require their qualifications.[27] When graduates rate their qualification's job relevance, Group of Eight

[24] The data includes full-time salaries of bachelor degree graduates from their first full-time job until the age of 67. The survey was conducted from 2001 to 2012. See Table 7, column 8 for the full set of results.
[25] Group of Eight graduates are more likely to go on to postgraduate study than graduates from other university groups (Beyond Graduation Survey 2012). This is likely to remove some of the most academically able Group of Eight students from our bachelor-degree based analysis, reducing ability bias in the data.
[26] See Table 8, column 1 for the full set of results.
[27] Li and Miller (2013)

graduates are more likely than graduates of Other universities to say their qualification is a formal job requirement. Technology university graduates are more likely to rate their qualification as a formal requirement or as important to their job.[28] Possibly Group of Eight and technology graduates have more opportunities to use and develop their human capital, leading to higher lifetime earnings.

Figure 4: Career earnings by university groups



Notes: Assumes a 40-year full-time working career. The data only includes bachelor degree graduates.
Source: Grattan analysis of HILDA (2012)

The starting salaries and career earnings results both suggest that research-based prestige is not particularly important in the Australian labour market, at least for bachelor degrees. The technology universities either do not rate or get low ratings in the research-driven international rankings, but their graduates earn as much as those from Group of Eight universities, which dominate research funding and rankings.

[28] Grattan analysis using Graduate Destination Survey 2010.

Earnings differences among graduates of Australian universities are much smaller than in the US. Some American studies estimate that the earnings premium for attending a prestigious private university is over 20 per cent, more than triple our Australian finding.[29] Possibly this is due to the large differences among American universities and colleges compared to Australia.[30]

Group of Eight universities take nearly a quarter of Australian bachelor-degree students, so they are not highly selective compared to the top American universities. For example, Harvard University has fewer than 7,000 undergraduates in an American undergraduate population of nearly 10.6 million, less than 1 in 1,500. Australia's top-ranked University of Melbourne has 24,000 of Australia's 700,000 bachelor-degree students, or about 1 in 30.

The high fees and large endowments of elite American universities enable much higher per student spending than in Australia. This may help their students acquire more human capital while at university. By contrast, Australia's public university funding system narrows resource differences between universities.

1.6 Lifetime earnings by field of education

As with starting salaries, a graduate's field of study affects his or her lifetime earnings more than institutional prestige. An engineering graduate earns about 11 per cent more than a science graduate with otherwise similar personal characteristics.[31] Graduating from humanities or creative arts is estimated to reduce full-time earnings by 11 and 33 per cent respectively compared to science.

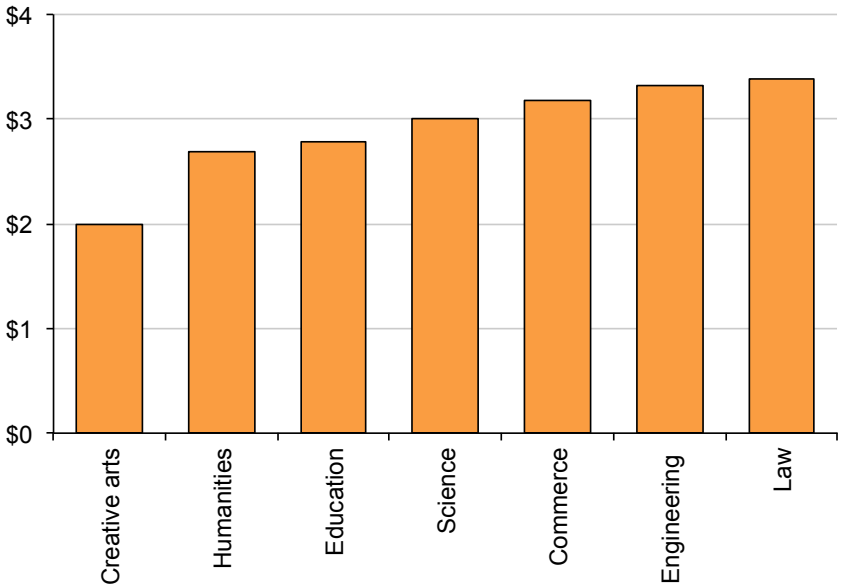
To demonstrate the impact of a student's choice of discipline, Figure 5 shows expected lifetime earnings for a median graduate of a university in the Other category. Using the same science graduate as the earlier example, her lifetime earnings are about $3 million.[32] If instead of science she chose to study law, she could expect to earn about $400,000 more in her lifetime. If she chose engineering instead of science, she could expect to earn $300,000 more. But if she chose education, humanities or creative arts instead of science, she could expect to earn around $200,000, $300,000, or $1 million respectively less over her lifetime.

[29] Behrman, *et al.* (1996); Brewer, *et al.* (1999)
[30] For discussion of the US system see: Behrman, *et al.* (1996); Hoxby (1997); Brewer, *et al.* (1999); Heckman (1999); Thomas (2003); Black, *et al.* (2005); Zhang (2005).

[31] See Table 8, column 1 for the full set of results.
[32] Assuming a 40-year full-time working life.

Figure 5: Expected lifetime earnings by field of education (bachelor degree graduates of Other universities)

$2012 million



Notes: Humanities is a subset of society and culture. Due to how the data is classified it also includes economics. The estimate assumes 40 years of working full-time. The calculation is based on a median science graduate who attended a non-Group of Eight, technology or IRU university. The data only includes bachelor degree graduates.

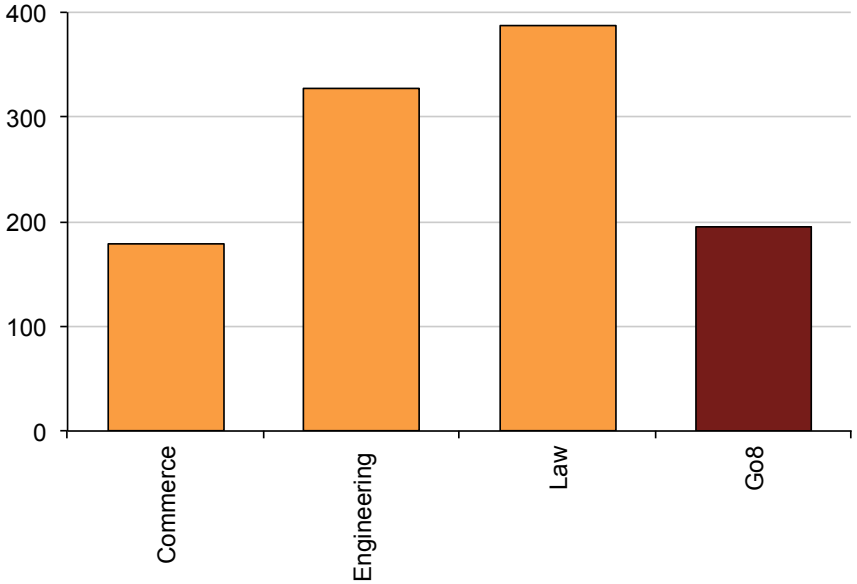
Sources: Grattan analysis of HILDA (2012)

The choice of field of education generally matters more to lifetime earnings than the choice of university. For example, Figure 6 looks at the choices of a hypothetical prospective science student. If she took her science course at a Group of Eight rather than an Other university, it would increase her income by about $200,000.

But if she instead took a law course at an Other university it would increase her income by nearly $400,000 – twice the improvement of attending a Group of Eight university.[33]

Figure 6: Choice of field of education compared to choice of university

Increase earnings over studying science at a non-Group of Eight, Technology and IRU university
$2012



Note: Assumes 40 years of working full-time.

Source: Grattan analysis of HILDA (2012)

[33] These differences are in 2012 dollars, and have not been discounted with a personal discount rate.

1.7 Conclusion

In the current debate on fee deregulation, many people are concerned that Group of Eight universities would charge high fees, reflecting their prestige.

We find that Group of Eight prestige has no reliable effect on full-time starting salaries or the chances of getting a full-time job. Yet it is associated with other advantages. Group of Eight bachelor-degree graduates are more likely to get first jobs matching their qualifications. Their lifetime salaries are six per cent higher than graduates of Other universities. That provides some financial capacity to pay higher fees.

Our research also suggests that, for financially-oriented students, the technology universities may represent better value for money. Their graduates earn similar amounts more over their careers, but Figure 1 shows that typically these universities charge lower fees than the Group of Eight universities.

Financially, the discipline studied matters more than the choice of university. Studying law instead of science can increase a graduate's lifetime earnings by $400,000 – twice the gain from attending a prestigious university. The most important higher education choice is not where to study, but what to study.

2. Methodology

This chapter describes the methodology used in estimating the effect of attending prestigious university. The analysis focuses on the return to prestige for a bachelor degree. Returns to prestige are categorised into 3 aspects: starting salaries, lifetime salaries, probability of being unemployed and having full-time employment as an extension.

Universities are categorised into 4 groups: Group of Eight (Go8), technology (tech), Innovative Research Universities (IRU) and Other. Table 1 describes universities that are included in these groups. For the reasons described in section 1.2, Go8 universities are assumed to represent prestigious institutions.

Table 1: List of institutions used in regression models

Group	University
Go8	Australian National University Monash University The University of Adelaide The University of New South Wales The University of Melbourne The University of Sydney The University of Queensland The University of Western Australia
Technology (tech)	Curtin University of Technology Queensland University of Technology RMIT University University of South Australia University of Technology, Sydney Swinburne University of Technology
IRU	Charles Darwin University Flinders University Griffith University James Cook University La Trobe University Murdoch University The University of Newcastle
Other	Central Queensland University Southern Cross University Federation University Australia The University of New England University of Southern Queensland University of the Sunshine Coast Australian Catholic University Charles Sturt University Bond University Deakin University Edith Cowan University Macquarie University University of Divinity Torrens University Australia University of Canberra University of Notre Dame, Australia University of Tasmania University of Wollongong University of Western Sydney Victoria University

2.1 Starting salaries

Starting salaries for graduates in full-time employment are used in our analysis. Since graduates of prestigious universities disproportionately pursue further study, including graduates' in part time employment would bias the results downwards.

The main data source is the Longitudinal Survey of Australian Youth. The data is collected from respondents who were 15 years old in 2003 through until they were 24 years old in 2012.[34] Least squares estimator is used, and the explanatory variables are listed in Table 2.

The dependent variable is weekly income. It is converted into real 2012 dollars using CPI. Natural log is then applied to the variable to handle the non-linear relationship between income and the explanatory variables.[35]

Since the return to prestige is shown to be statistically insignificant, we decided not to pursue selection bias adjustment as in the model for lifetime salaries. The full set of results is shown in Table 5.

Table 2: Explanatory variables for the starting salaries regression model

Group	Variable
University groupings	Go8 Technology IRU Other (omitted to represent the baseline)
Personal characteristics	Gender Age[36] NESB[37] Partnered[38] PISA scores for numeracy and literacy
Locality	New South Wales Victoria Queensland Australian Capital Territory Western Australia and Northern Territory Tasmania and South Australia (omitted to represent the baseline)
Work	Hours worked per week
Fields of study	Engineering Nursing Other health (incl. medicine) Education Commerce

[34] 2003 cohort
[35] As a result, income values of zero or less are discarded from the model.
[36] Gompertz form of age is used. See Borland and Suen (1994).
[37] NESB is an acronym for non-English speaking background. Based on the same definition used in HILDA for main English speaking countries, NESB includes graduates' who were not born in Australia, New Zealand, United Kingdom, Canada, USA, Ireland or South Africa.
[38] Partnered includes married and de-facto.

	Humanities Creative arts Other disciplines (incl. agriculture, architecture and hospitality) Science (omitted to represent the baseline)

2.2 Lifetime salaries and employment prospects

Estimating returns to prestige often suffers from selection bias. There are theoretical reasons to suggest that the selectivity of prestigious institutions can affect graduates' earnings independent of the quality of institutions (section 1.2). Empirically, many studies also find evidence of selection bias.[39]

The difficulty in identifying the return to attending prestigious institutions originates from differences between students who attend prestigious universities and non-prestigious universities. Family characteristics and socio-economic background play a significant role in determining the likelihood of students attending prestigious universities. These characteristics are determined prior to attending university and are usually correlated with higher earnings.

Two techniques have been used to control for selection bias. These are selection correction and propensity score matching on a matched sample. The preferred model is the selection correction model as it provides maximum efficiency.[40]

The primary data source is the Household Income and Labour Dynamics in Australia (HILDA) Survey. We restrict the sample to bachelor degree graduates who are 67 years or younger.

In the lifetime salaries model, the dependent variable is financial year gross wages and salary of bachelor degree graduates with full-time employment. Since the HILDA survey spans from 2001 to 2012, CPI is used to adjust income into 2012 dollars.[41] Similar to the starting salaries model, natural log is applied to real income to handle the non-linear relationship between income and explanatory variables.

In the employment model, two dependent variables are used: unemployed and full-time employment. The data excludes people who are not in the labour force.

2.2.1 No ability correction

The analysis starts by estimating the outcomes without any attempt to control for selection bias. In the lifetime earnings model, the Ordinary Least Squares model is used. Logistic regression is used to estimate the probability of being in full-time employment and unemployment. The explanatory variables are listed in Table 4. The regression results are shown in Table 7, Table 10 and Table 13

2.2.2 Selection correction

The model follows a similar approach to Brewer *et al.* (1999). Without correcting for selection bias, any systematic differences

[39] Loury and Garman (1995); Behrman, *et al.* (1996); Brewer, *et al.* (1999)
[40] See GCA (2014) for discussion.
[41] ABS (2013)

between the cohorts of graduates will be attributed to attending a prestigious university. A selection correction term is used to correct for the selection bias by using the likelihood of attending a prestigious university to effectively control for any systematic differences between cohorts of students. The selection correction term represents an individual's predicted probability of selecting a prestigious university. Unlike propensity score matching on a matched sample model, the selection correction model allows for a linear control of selectivity and does not reduce the sample size. As a result, the selection correction model provides greater efficiency in the estimation process.

The probability of selecting a prestigious university is derived from individual, school and family characteristics (including socio-economic background) using a logistic model.[42] The explanatory variables are listed in Table 3.[43] The regression results are shown in Table 6.

Table 3: Explanatory variables for the propensity score estimation model

Group	Variable
Personal characteristics	Indigenous NESB[44]
Family background	Mother's AUSEI06 score[45] Father's AUSEI06 score[46] Mother's post-school education[47] Father's post-school education[48] Have sibling/s Oldest child Lived with biological parents at 14 years of age
School characteristics	Catholic Independent Government (omitted to represent the baseline)

The selection correction term and the explanatory variables in Table 4 are included in this second stage of the model.[49] A least

[42] Based on the earliest wave of data available in HILDA survey
[43] Propensity score for different regressions are based on group-specific data.

[44] Same definition as in Table 2.
[45] Australian Socioeconomic Index 2006 (AUSEI06) is the latest Australian National University occupational status index. The scale is a continuous measure. It ranges between 0 and 100 where 100 represents the highest occupational status. See McMillan, *et al.* (2009), p 123-149 for an overview of the scale's development. The occupational information is based on mother's (or father's) occupation when a graduate was 14 years old.
[46] See note 40.
[47] Binary outcome where 1 represents mother (or father) completed an educational qualification after leaving school and 0 for otherwise.
[48] See note 43.
[49] Since multiple models are estimated, not all variables are applicable to every equation.

squares estimator is used to estimate lifetime earnings and a logistic regression model is used to estimate the probability of being unemployed and probability of being in full-time employment. Regression results are shown in Table 8, Table 11 and Table 14.

Table 4: Explanatory variables for the second stage regressions using selection correction model and propensity score matching.

Group	Variable
University groupings	Go8 Tech IRU Other (omitted to represent the baseline) All other (incl. technology, IRU and other; omitted to represent the baseline)
Personal characteristics	Gender Indigenous NESB Partnered Have child/children under 5 Have child/children between the age of 5 and 14
Locality	Major city New South Wales Victoria Queensland Australian Capital Territory Western Australia and Northern Territory Tasmania and South Australia (omitted to represent the baseline)
Study	Part-time study
Work	Hours worked per week[50] Years in paid work
Fields of study	Engineering Nursing Other health (incl. medicine) Education Commerce Law Humanities (incl. economics and social sciences) Creative arts Other disciplines (incl. agriculture, architecture and hospitality) Science (omitted to represent the baseline)

2.2.3 Propensity score matching on a matched sample

The model derives effects of prestige by pairing each graduate in who went to a prestigious institution with a 'similar' graduate who did not attend a prestigious university. The similarity between individuals is based on individual's propensity score. By only comparing like to like, the matching process helps to control for any systematic differences between the cohorts of students who attend prestigious universities and students who do not. A propensity score represents an individual probability of (being in the treatment group) attending a prestigious university.[51] The score uses the same set of covariates as in the selection correction model. Each 'treated' observation is then matched with

[50] 'Hours worked (per week)' is excluded from the employment model.
[51] See Rosenbaum and Rubin (1985) for a discussion on methodology.

a control observation using Caliper matching where the largest distance is 0.05.

Once the matched sample is established, a random-effects model is used to estimate the effect of attending a prestigious university (being in the treatment group). The regression results are shown in Table 9, Table 12 and Table 15.

3. Detailed statistical results

Table 5: Regression results for starting salaries

	(1)	(2)	(3)	(4)
Starting salaries	Demographics	Field of study	Year-specific effects	Prior ability
Go8	0.0163	0.000537	0.00191	-0.0105
	(0.0169)	(0.0166)	(0.0167)	(0.0175)
Technology	0.0214	0.0171	0.0175	0.0121
	(0.0213)	(0.0204)	(0.0204)	(0.0205)
IRU	0.00645	-0.00998	-0.00981	-0.0112
	(0.0213)	(0.0205)	(0.0206)	(0.0206)
Female	-0.0872***	-0.0682***	-0.0685***	-0.0677***
	(0.0143)	(0.0144)	(0.0144)	(0.0150)
NESB	0.0137	0.0153	0.0150	0.0101
	(0.0235)	(0.0224)	(0.0224)	(0.0399)
Age	0.0328***	0.0275***	0.0149	0.0113
	(0.00653)	(0.00638)	(0.0236)	(0.0236)
Partnered	-0.0211	-0.0189	-0.0193	-0.0189
	(0.0175)	(0.0167)	(0.0168)	(0.0168)
NSW	0.0298	0.0410*	0.0430*	0.0398*
	(0.0238)	(0.0228)	(0.0229)	(0.0229)
VIC	-0.0188	-0.0121	-0.0131	-0.00996
	(0.0239)	(0.0230)	(0.0230)	(0.0231)
QLD	0.0393	0.0383	0.0387	0.0376
	(0.0249)	(0.0239)	(0.0241)	(0.0241)

WA & NT	0.0817***	0.0712***	0.0737***	0.0713***
	(0.0249)	(0.0237)	(0.0239)	(0.0239)
ACT	0.0901***	0.122***	0.123***	0.118***
	(0.0320)	(0.0310)	(0.0310)	(0.0311)
Hours worked (per week)	0.0109***	0.00977***	0.00980***	0.00969***
	(0.00105)	(0.00101)	(0.00101)	(0.00101)
Engineering		0.153***	0.152***	0.148***
		(0.0310)	(0.0311)	(0.0311)
Nursing		0.0374	0.0370	0.0449
		(0.0346)	(0.0346)	(0.0348)
Other health (incl. Medicine)		0.0216	0.0221	0.0205
		(0.0269)	(0.0269)	(0.0269)
Education		0.0158	0.0143	0.0226
		(0.0311)	(0.0312)	(0.0314)
Commerce		-0.0594**	-0.0581**	-0.0539**
		(0.0260)	(0.0260)	(0.0261)
Humanities		-0.0848***	-0.0822***	-0.0803***
		(0.0307)	(0.0307)	(0.0308)
Creative arts		-0.160***	-0.159***	-0.155***
		(0.0310)	(0.0310)	(0.0311)
Other disciplines		-0.0610**	-0.0607**	-0.0605**
		(0.0294)	(0.0294)	(0.0294)
Born in Australia				-0.00905
				(0.0347)
PISA score on literacy				0.000102
				(0.000127)
PISA score on numeracy				0.000149

				(0.000124)
Constant	5.727***	5.905***	6.153***	6.090***
	(0.158)	(0.155)	(0.499)	(0.502)
R-squared	0.153	0.221	0.224	0.227

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. A sample interpretation for the estimate of engineering is studying engineering could improve a graduate's starting salary by 15 per cent compared with studying science.*

Table 6: Regression results for selection correction term for lifetime salaries

	(1)	(2)	(3)	(4)
PSM	Go8 v. All other	Go8 v. tech	Go8 v. IRU	Go8 v. Other
Indigenous	0.0713***	0.0805***	0.0888***	0.0639***
	(0.0419)	(0.0524)	(0.0574)	(0.0379)
Mother's occupation (AUSEI06)	0.996***	0.995***	1.007***	0.995***
	(0.000975)	(0.00155)	(0.00164)	(0.00101)
Father's occupation (AUSEI06)	1.006***	1.007***	1.007***	1.005***
	(0.000937)	(0.00146)	(0.00154)	(0.000983)
Mother's post-school education	1.487***	1.511***	0.818**	1.576***
	(0.0721)	(0.112)	(0.0640)	(0.0811)
Father's post-school education	1.070	0.727***	1.067	1.143***
	(0.0503)	(0.0519)	(0.0815)	(0.0565)
NESB	0.564***	1.155	1.952***	0.449***
	(0.0389)	(0.131)	(0.280)	(0.0318)
Catholic school	1.756***	1.274***	1.194**	2.009***

	(0.0929)	(0.103)	(0.101)	(0.114)
Independent school	2.545***	1.612***	1.505***	3.215***
	(0.133)	(0.130)	(0.131)	(0.184)
With sibling/s	0.982	1.049**	1.027	0.961***
	(0.0133)	(0.0231)	(0.0227)	(0.0134)
Oldest child	1.065	1.082	0.875**	1.069
	(0.0450)	(0.0689)	(0.0596)	(0.0479)
Lived with biological parent/s	0.910	0.816**	0.632***	1.004
	(0.0561)	(0.0732)	(0.0582)	(0.0661)
Constant	0.174***	1.335***	1.109	0.241***
	(0.0127)	(0.143)	(0.124)	(0.0185)

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. A sample interpretation of the estimate for Catholic school is the odds of attending a prestigious university are 1.7 times larger for a student who went to a Catholic school than a student who went to a public school.*

Table 7: Regression results for lifetime earnings with no ability control

	Go8 v. All				By university group			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lifetime earnings	Demographics	Location (counterfactual: TAS and SA)	Field of study (counterfactual: science)	Year-specific effects	Demographics	Location (counterfactual: TAS and SA)	Field of study (counterfactual: science)	Year-specific effects
Go8	0.0796***	0.0722***	0.0602***	0.0669***	0.100***	0.0987***	0.0875***	0.0968***
	(0.0164)	(0.0155)	(0.0158)	(0.0155)	(0.0194)	(0.0189)	(0.0190)	(0.0186)
Technology					0.0710***	0.0748***	0.0654***	0.0719***
					(0.0170)	(0.0190)	(0.0183)	(0.0181)
IRU					0.000877	0.0225	0.0317*	0.0343*

					(0.0201)	(0.0197)	(0.0186)	(0.0179)
Female	-0.143***	-0.135***	-0.0859***	-0.0886***	-0.143***	-0.134***	-0.0879***	-0.0908***
	(0.0257)	(0.0263)	(0.0277)	(0.0280)	(0.0263)	(0.0268)	(0.0281)	(0.0283)
Male with partner	0.161***	0.168***	0.167***	0.157***	0.158***	0.165***	0.164***	0.153***
	(0.0210)	(0.0213)	(0.0210)	(0.0209)	(0.0211)	(0.0214)	(0.0210)	(0.0209)
Female with partner	0.000678	-0.00830	-0.0114	-0.00869	0.000700	-0.00807	-0.0112	-0.00846
	(0.0268)	(0.0271)	(0.0273)	(0.0273)	(0.0269)	(0.0271)	(0.0272)	(0.0272)
Indigenous	-0.0485	-0.0118	-0.0179	-0.0489	-0.0507	-0.0136	-0.0207	-0.0522
	(0.0884)	(0.0872)	(0.0815)	(0.0798)	(0.0890)	(0.0879)	(0.0821)	(0.0802)
NESB	-0.0786***	-0.108***	-0.138***	-0.146***	-0.0843***	-0.113***	-0.142***	-0.150***
	(0.0253)	(0.0258)	(0.0256)	(0.0262)	(0.0255)	(0.0259)	(0.0256)	(0.0262)
Years in paid work	0.0139***	0.0140***	0.0149***	0.0150***	0.0140***	0.0141***	0.0149***	0.0151***
	(0.000711)	(0.000728)	(0.000722)	(0.000713)	(0.000716)	(0.000730)	(0.000722)	(0.000713)
Hours worked (per week)	0.0136***	0.0139***	0.0130***	0.0134***	0.0135***	0.0138***	0.0130***	0.0134***
	(0.00101)	(0.00101)	(0.000976)	(0.000987)	(0.00102)	(0.00102)	(0.000988)	(0.00100)
Male with child/ren younger than 5	0.135***	0.128***	0.126***	0.130***	0.134***	0.127***	0.125***	0.129***
	(0.0229)	(0.0237)	(0.0231)	(0.0233)	(0.0229)	(0.0237)	(0.0232)	(0.0234)
Male with child/ren between 5 and 14 years old	0.0831***	0.0854***	0.0827***	0.0877***	0.0811***	0.0845***	0.0828***	0.0878***
	(0.0266)	(0.0269)	(0.0259)	(0.0262)	(0.0265)	(0.0269)	(0.0258)	(0.0261)
Female with child/ren younger than 5	-0.0627	-0.0603	-0.0601	-0.0623	-0.0574	-0.0550	-0.0556	-0.0574
	(0.0510)	(0.0495)	(0.0490)	(0.0489)	(0.0510)	(0.0496)	(0.0491)	(0.0489)
Female with	-0.0598*	-0.0407	-0.0371	-0.0423	-0.0515	-0.0332	-0.0329	-0.0376

child/ren between 5 and 14 years old								
	(0.0343)	(0.0333)	(0.0325)	(0.0321)	(0.0340)	(0.0328)	(0.0322)	(0.0318)
Major city		0.149***	0.133***	0.132***		0.139***	0.125***	0.123***
		(0.0145)	(0.0144)	(0.0143)		(0.0150)	(0.0148)	(0.0147)
NSW		0.0922***	0.0767***	0.0780***		0.108***	0.0912***	0.0940***
		(0.0233)	(0.0237)	(0.0234)		(0.0241)	(0.0243)	(0.0240)
VIC		0.0538**	0.0406	0.0399		0.0612**	0.0470*	0.0470*
		(0.0273)	(0.0256)	(0.0251)		(0.0276)	(0.0258)	(0.0253)
QLD		0.0461*	0.0210	0.0216		0.0476*	0.0217	0.0225
		(0.0246)	(0.0248)	(0.0246)		(0.0249)	(0.0251)	(0.0249)
ACT		0.220***	0.201***	0.206***		0.242***	0.222***	0.229***
		(0.0382)	(0.0367)	(0.0371)		(0.0396)	(0.0378)	(0.0384)
WA & NT		0.149***	0.119***	0.118***		0.154***	0.124***	0.124***
		(0.0226)	(0.0230)	(0.0221)		(0.0225)	(0.0227)	(0.0216)
Studying part-time			0.0538***	0.0451***			0.0534***	0.0444***
			(0.0167)	(0.0166)			(0.0168)	(0.0168)
IT			0.124***	0.117***			0.128***	0.121***
			(0.0356)	(0.0352)			(0.0349)	(0.0345)
Engineering			0.179***	0.173***			0.169***	0.161***
			(0.0335)	(0.0332)			(0.0326)	(0.0322)
Nursing			0.0449	0.0482			0.0548*	0.0591**
			(0.0315)	(0.0304)			(0.0310)	(0.0299)
Other health (incl. medicine)			0.240***	0.228***			0.243***	0.230***
			(0.0554)	(0.0557)			(0.0552)	(0.0554)
Education			-0.0425*	-0.0429*			-0.0358	-0.0354

			(0.0234)	(0.0226)			(0.0231)	(0.0222)
Commerce			0.0905***	0.0864***			0.0920***	0.0880***
			(0.0249)	(0.0248)			(0.0248)	(0.0246)
Law			0.173***	0.169***			0.173***	0.169***
			(0.0465)	(0.0467)			(0.0467)	(0.0469)
Humanities			-0.0750**	-0.0760***			-0.0728**	-0.0736**
			(0.0295)	(0.0292)			(0.0296)	(0.0293)
Creative arts			-0.206***	-0.223***			-0.210***	-0.228***
			(0.0555)	(0.0554)			(0.0552)	(0.0551)
Other disciplines			-0.0851**	-0.0832**			-0.0880**	-0.0864**
			(0.0359)	(0.0368)			(0.0358)	(0.0367)
Constant	10.21***	10.00***	10.01***	9.908***	10.19***	9.979***	9.987***	9.878***
	(0.0519)	(0.0583)	(0.0539)	(0.0631)	(0.0539)	(0.0601)	(0.0553)	(0.0657)
Year effects	No	No	No	Yes	No	No	No	Yes
R-squared	0.185	0.201	0.225	0.237	0.186	0.203	0.226	0.239

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 5 for a sample interpretation of the results.*

Table 8: Regression results for lifetime earnings using selection correction model

	(1)	(2)	(3)	(4)
Lifetime earnings	Go8 v. All	Go8 v. Tech	Go8 v. IRU	Go8 v. Other
Go8	0.0597***	0.000945	0.0371**	0.0650***
	(0.00251)	(0.000970)	(0.0173)	(0.00132)
Female	-0.102***	-0.0432	-0.138**	-0.0935***
	(0.00806)	(0.0748)	(0.0662)	(0.0328)
Male with partner	0.148***	0.190***	0.0945***	0.139***

	(0.00604)	(0.0282)	(0.0214)	(0.0173)
Female with partner	-0.00239	-0.0469	0.0464	0.00145
	(0.00971)	(0.0534)	(0.0465)	(0.0325)
Indigenous	-0.104***	-0.400*	-0.0567	-0.0497
	(0.0392)	(0.213)	(0.0756)	(0.0534)
NESB	-0.207***	-0.153***	-0.173***	-0.200***
	(0.0250)	(0.0171)	(0.00932)	(0.0140)
Years in paid work	0.0131***	0.0151***	0.0156***	0.0125***
	(5.33e-05)	(0.00196)	(0.00130)	(0.000373)
Hours worked (per week)	0.0115***	0.0143***	0.0141***	0.0101***
	(0.000392)	(0.000841)	(0.00124)	(0.000524)
Male with child/ren younger than 5	0.171***	0.172***	0.223***	0.183***
	(0.0214)	(0.000477)	(0.0262)	(0.0294)
Male with child/ren between 5 and 14 years old	0.123***	0.105***	0.129***	0.145***
	(0.0348)	(0.0122)	(0.000145)	(0.0208)
Female with child/ren younger than 5	-0.181***	-0.109***	-0.159***	-0.187***
	(0.0228)	(0.000904)	(0.0288)	(0.0677)
Female with child/ren between 5 and 14 years old	-0.0772***	-0.0310	-0.0821***	-0.0823***
	(0.000352)	(0.0305)	(0.0222)	(0.0319)
Major city	0.141***	0.0374	0.0654***	0.156***
	(0.00521)	(0.0309)	(0.00622)	(0.0164)
NSW	0.0666***	0.0904*	0.241***	0.0507***

	(0.0204)	(0.0532)	(0.0780)	(0.0109)
VIC	0.000993	0.0180	0.133***	-0.0141*
	(0.00691)	(0.0532)	(0.0392)	(0.00740)
QLD	0.00506	0.0410**	0.162***	-0.0320
	(0.0240)	(0.0199)	(0.0430)	(0.0327)
ACT	0.180***	0.238***	0.415***	0.175***
	(0.0410)	(0.0793)	(0.0442)	(0.00587)
WA & NT	0.0860***	0.121***	0.322***	0.0815***
	(0.0102)	(0.0246)	(0.0304)	(0.0108)
Studying part-time	0.00908	0.0303	0.0872**	-0.01000
	(0.0443)	(0.0210)	(0.0339)	(0.0230)
IT	0.131***	0.183***	0.248***	0.102**
	(0.0214)	(0.0583)	(0.0455)	(0.0481)
Engineering	0.109**	0.122***	0.103**	0.0896***
	(0.0480)	(0.00216)	(0.0501)	(0.0106)
Nursing	-0.0219	0.0454	0.0148	-0.0434***
	(0.0376)	(0.0458)	(0.0560)	(0.00603)
Other health (incl. medicine)	0.205**	0.315***	0.292***	0.216***
	(0.104)	(0.0512)	(0.0498)	(0.0644)
Education	-0.0734***	-0.111**	-0.0773***	-0.0969***
	(0.0122)	(0.0512)	(0.00337)	(0.0272)
Commerce	0.0596***	0.0880***	0.0920***	0.0499***
	(0.00733)	(0.00146)	(0.0297)	(0.0158)
Law	0.129***	0.230***	0.168***	0.118***
	(0.0197)	(0.0269)	(0.0320)	(0.0418)
Humanities	-0.106***	-0.0708**	-0.0255	-0.105***

	(0.00406)	(0.0286)	(0.0185)	(0.0355)
Creative arts	-0.336***	-0.193***	-0.186***	-0.365***
	(0.0217)	(0.0257)	(0.0258)	(0.000141)
Other disciplines	-0.132**	-0.0286	-0.00886	-0.148***
	(0.0562)	(0.0187)	(0.0239)	(0.0279)
Constant	10.06***	9.895***	9.786***	10.10***
	(0.0343)	(0.0161)	(0.129)	(0.0202)
Propensity score	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R-squared	0.196	0.244	0.238	0.177

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 5 for a sample interpretation of the results.*

Table 9: Regression results for lifetime earnings using matched sample

Lifetime earnings	(1) Go8 v. All: Random effects model	(2) Go8 v. Tech: Random effects model	(3) Go8 v. IRU: Random effects model	(4) Go8 v. Other: Random effects model
Go8	0.0622***	-0.0140	0.0829***	0.0629***
	(0.0184)	(0.0285)	(0.0152)	(0.0086)
Female	-0.103**	0.0222	-0.231***	-0.0904**
	(0.0318)	(0.0413)	(0.0308)	(0.0369)
Male with partner	0.234***	0.280***	0.0816*	0.234***
	(0.0232)	(0.046)	(0.0272)	(0.018)
Female with partner	-0.0122	-0.0883	0.0974	-0.0568
	(0.0347)	(0.0488)	(0.0527)	(0.0284)
Indigenous	-0.237	0.272	0.119	0.112

	(0.0629)	(0.158)	(0.1786)	(0.0629)
NESB	-0.205***	-0.0784*	0.0547	-0.173***
	(0.0366)	(0.0325)	(0.0301)	(0.0205)
Years in paid work	0.0138***	0.0172***	0.0176***	0.0168***
	(0.0003)	(0.0018)	(0.0011)	(0.001)
Hours worked (per week)	0.0127***	0.0129***	0.00992***	0.00867***
	(0.0008)	(0.001)	(0.0006)	(0.0006)
Male with child/ren younger than 5	0.177***	0.213***	0.161***	0.162***
	(0.0141)	(0.0348)	(0.0257)	(0.0147)
Male with child/ren between 5 and 14 years old	0.0901***	0.0914**	0.0808*	0.188***
	(0.012)	(0.0172)	(0.0235)	(0.0166)
Female with child/ren younger than 5	-0.0735	-0.258***	-0.174*	-0.0653
	(0.036)	(0.0693)	(0.0411)	(0.0263)
Female with child/ren between 5 and 14 years old	0.0354	-0.129**	-0.0903	-0.0404
	(0.0188)	(0.0416)	(0.0417)	(0.0302)
Major city	0.0919***	-0.00167	0.00609	0.0909***
	(0.0117)	(0.0192)	(0.0281)	(0.0149)
NSW	0.191***	0.166***	0.203***	0.112**
	(0.0215)	(0.0801)	(0.0424)	(0.0389)
VIC	0.130***	0.134***	0.0770	0.0659
	(0.0242)	(0.0806)	(0.0509)	(0.0436)
QLD	0.132***	0.122**	0.162***	0.0319
	(0.0254)	(0.0646)	(0.0576)	(0.0525)
ACT	0.0775	0.285***	0.418***	0.150**

	(0.0212)	(0.0785)	(0.0821)	(0.0516)
WA & NT	0.167***	0.173***	0.321***	0.0297
	(0.037)	(0.072)	(0.0426)	(0.0477)
Studying part-time	0.0561	0.0230	0.109**	0.0370
	(0.0105)	(0.0248)	(0.0104)	(0.0212)
IT	0.0838	0.0735	0.127	-0.0321
	(0.0422)	(0.0502)	(0.0876)	(0.0532)
Engineering	0.110**	0.101*	0.250***	0.0750
	(0.0433)	(0.0805)	(0.0549)	(0.0627)
Nursing	-0.00902	0.0857	-0.0614	-0.0105
	(0.0566)	(0.0734)	(0.0951)	(0.0495)
Other health (incl. medicine)	0.394***	0.437***	0.0458	0.255***
	(0.0416)	(0.115)	(0.0674)	(0.0538)
Education	-0.0807*	-0.113**	-0.0392	-0.110**
	(0.0165)	(0.0513)	(0.0441)	(0.0285)
Commerce	0.144***	0.128***	0.168***	0.0670*
	(0.0191)	(0.054)	(0.057)	(0.0196)
Law	0.0783	0.162**	0.191**	0.0578
	(0.0332)	(0.0669)	(0.0744)	(0.0281)
Humanities	-0.0582	-0.0277	-0.0920	-0.208***
	(0.0299)	(0.0614)	(0.0385)	(0.0304)
Creative arts	-0.286***	-0.0130	-0.0416	-0.440***
	(0.0474)	(0.0664)	(0.0905)	(0.0361)
Other disciplines	-0.00351	0.142**	-0.0372	-0.0656
	(0.0322)	(0.065)	(0.0289)	(0.0495)
Constant	9.771***	9.789***	10.09***	10.05***

	(0.0899)	(0.107)	(0.120)	(0.0932)
Year effect	Yes	Yes	Yes	Yes
R-squared	0.199	0.290	0.253	0.212
Number of pair	368	236	164	338

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 5 for a sample interpretation of the results.*

Table 10: Regression results for full-time employment with no ability control

	(1)	(2)	(3)	(4)
Full-time employment	Demographics	Location	Field of study: v. Science	Year-specific effects
Go8	1.032	1.038	1.011	1.013
	(0.0465)	(0.0474)	(0.0475)	(0.0474)
tech	1.311***	1.305***	1.163**	1.167**
	(0.0799)	(0.0825)	(0.0710)	(0.0710)
IRU	1.138**	1.126*	1.096	1.102
	(0.0750)	(0.0745)	(0.0726)	(0.0732)
Female	0.763***	0.770***	0.908	0.909
	(0.0435)	(0.0450)	(0.0550)	(0.0550)
Male with partner	1.916***	1.984***	1.879***	1.889***
	(0.123)	(0.129)	(0.119)	(0.118)
Female with partner	0.519***	0.501***	0.510***	0.508***
	(0.0409)	(0.0409)	(0.0393)	(0.0389)
Indigenous	0.599***	0.594***	0.656**	0.656**
	(0.110)	(0.109)	(0.130)	(0.128)
NESB	0.897*	0.868**	0.850***	0.854***
	(0.0530)	(0.0507)	(0.0508)	(0.0514)

Years in paid work	0.985***	0.985***	0.987***	0.986***
	(0.00224)	(0.00225)	(0.00234)	(0.00233)
Male with child/ren younger than 5	1.450***	1.411***	1.421***	1.422***
	(0.187)	(0.185)	(0.183)	(0.184)
Male with child/ren between 5 and 14 years old	1.878***	1.878***	1.901***	1.900***
	(0.211)	(0.209)	(0.210)	(0.209)
Female with child/ren younger than 5	0.131***	0.131***	0.120***	0.120***
	(0.0158)	(0.0162)	(0.0147)	(0.0148)
Female with child/ren between 5 and 14 years old	0.235***	0.234***	0.220***	0.219***
	(0.0256)	(0.0252)	(0.0235)	(0.0233)
Major city		1.120***	1.112**	1.114**
		(0.0480)	(0.0491)	(0.0489)
NSW		1.302***	1.244***	1.243***
		(0.0865)	(0.0829)	(0.0836)
VIC		0.921	0.900	0.900
		(0.0724)	(0.0722)	(0.0726)
QLD		1.400***	1.358***	1.357***
		(0.130)	(0.129)	(0.130)
ACT		1.185*	1.109	1.106
		(0.118)	(0.110)	(0.111)
WA & NT		1.273***	1.234**	1.234**
		(0.108)	(0.107)	(0.109)
IT			1.828***	1.858***
			(0.221)	(0.231)
Engineering			1.866***	1.897***

			(0.178)	(0.185)
Nursing			0.665***	0.675***
			(0.0555)	(0.0573)
Other health (incl. medicine)			0.676***	0.683***
			(0.0892)	(0.0908)
Education			1.474***	1.491***
			(0.0916)	(0.0942)
Commerce			1.906***	1.932***
			(0.137)	(0.142)
Law			1.504***	1.532***
			(0.199)	(0.209)
Humanities			0.820***	0.832**
			(0.0588)	(0.0623)
Creative arts			0.664***	0.682***
			(0.0775)	(0.0807)
Other disciplines			1.489***	1.511***
			(0.148)	(0.150)
Constant	4.066***	3.227***	2.721***	2.920***
	(0.216)	(0.262)	(0.244)	(0.343)
Year effects	No	No	No	Yes
Pseudo R2	0.132	0.136	0.153	0.154

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 5 for a sample interpretation of the results.*

Table 11: Regression results for full-time employment using selection correction model

	(1)	(2)	(3)	(4)
Full-time employment	Go8 v. All	Go8 v. Tech	Go8 v. IRU	Go8 v. Other

Go8	1.021	0.923	0.944	1.040
	(0.0545)	(0.0751)	(0.0740)	(0.0630)
Female	0.951	1.288	1.030	0.832**
	(0.0780)	(0.220)	(0.138)	(0.0712)
Male with partner	1.938***	2.538***	1.631***	1.615***
	(0.162)	(0.389)	(0.240)	(0.136)
Female with partner	0.469***	0.447***	0.508***	0.538***
	(0.0478)	(0.0927)	(0.0851)	(0.0533)
Indigenous	0.475***	0.121***	0.494	0.670
	(0.101)	(0.0587)	(0.291)	(0.176)
NESB	0.714***	0.756*	0.877	0.721***
	(0.0464)	(0.126)	(0.138)	(0.0527)
Years in paid work	0.983***	0.968***	0.971***	0.984***
	(0.00203)	(0.00358)	(0.00425)	(0.00214)
Male with child/ren younger than 5	1.350***	1.327	1.409	1.597***
	(0.149)	(0.243)	(0.367)	(0.221)
Male with child/ren between 5 and 14 years old	1.821***	3.031***	3.114***	1.764***
	(0.180)	(0.571)	(0.770)	(0.207)
Female with child/ren younger than 5	0.122***	0.0699***	0.0790***	0.115***
	(0.0163)	(0.0182)	(0.0203)	(0.0198)
Female with child/ren between 5 and 14 years old	0.225***	0.140***	0.142***	0.250***
	(0.0256)	(0.0314)	(0.0383)	(0.0350)
Major city	1.131**	1.241**	0.949	1.074
	(0.0555)	(0.136)	(0.0796)	(0.0661)

NSW	1.318***	1.325*	0.969	1.402***
	(0.100)	(0.214)	(0.151)	(0.103)
VIC	0.963	0.933	0.649***	1.065
	(0.0725)	(0.101)	(0.0771)	(0.0759)
QLD	1.502***	1.547***	1.157	1.678***
	(0.124)	(0.202)	(0.164)	(0.135)
ACT	1.099	0.987	0.716	1.196
	(0.148)	(0.233)	(0.191)	(0.150)
WA & NT	1.259**	1.116	0.823	1.399***
	(0.118)	(0.194)	(0.156)	(0.115)
IT	2.236***	2.797***	2.925***	1.991***
	(0.304)	(0.627)	(0.836)	(0.327)
Engineering	1.947***	1.730***	1.470*	1.785***
	(0.214)	(0.309)	(0.301)	(0.224)
Nursing	0.685***	0.419***	0.369***	0.715***
	(0.0556)	(0.0938)	(0.0825)	(0.0730)
Other health (incl. medicine)	0.674***	0.779	0.637*	0.782
	(0.0933)	(0.152)	(0.147)	(0.142)
Education	1.551***	1.184	1.107	1.597***
	(0.107)	(0.181)	(0.161)	(0.116)
Commerce	2.013***	1.906***	2.020***	2.008***
	(0.139)	(0.272)	(0.329)	(0.153)
Law	1.556***	1.427*	1.379	1.585***
	(0.211)	(0.292)	(0.277)	(0.199)
Humanities	0.855**	0.697**	0.719***	0.854*
	(0.0584)	(0.101)	(0.0884)	(0.0715)

Creative arts	0.653***	0.346***	0.307***	0.781**
	(0.0716)	(0.0518)	(0.0625)	(0.0980)
Other disciplines	1.678***	1.588***	1.350*	1.453***
	(0.172)	(0.251)	(0.221)	(0.160)
Constant	3.995***	4.083***	10.26***	3.974***
	(0.540)	(1.189)	(2.868)	(0.518)
Year effects	Yes	Yes	Yes	Yes
Pseudo R2	0.167	0.210	0.197	0.152

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 6 for a sample interpretation of the results.*

Table 12: Regression results for full-time employment using matched sample

	(1)	(3)	(5)	(7)
Full-time employment	Go8 v. All: Random effects model	Go8 v. Tech: Random effects model	Go8 v. IRU: Random effects model	Go8 v. Other: Random effects model
Go8	1.125	0.678**	1.031	1.151
	(0.0701)	(0.154)	(0.0677)	(0.0797)
Female	1.083	1.022	1.425	0.661*
	(0.1084)	(0.2031)	(0.198)	(0.0877)
Male with partner	2.979***	2.296***	2.368**	1.804***
	(0.116)	(0.172)	(0.153)	(0.0826)
Female with partner	0.232***	0.565	0.355**	0.447***
	(0.132)	(0.131)	(0.2809)	(0.142)
Indigenous	0.169**	0.105***	0.220	0.220*
	(0.213)	(0.592)	(0.479)	(0.185)
NESB	0.483***	1.167	1.681	0.513***

	(0.0838)	(0.1976)	(0.257)	(0.158)
Years in paid work	0.965***	0.974***	0.963***	0.961***
	(0.00328)	(0.0055)	(0.00499)	(0.0026)
Male with child/ren younger than 5	1.397	1.152	0.793	1.178
	(0.095004)	(0.2056)	(0.181)	(0.1053)
Male with child/ren between 5 and 14 years old	2.633***	2.716***	2.335*	2.083***
	(0.114)	(0.134)	(0.273)	(0.0314)
Female with child/ren younger than 5	0.0555***	0.0377***	0.0581***	0.0656***
	(0.1039)	(0.318)	(0.2046)	(0.112)
Female with child/ren between 5 and 14 years old	0.133***	0.0991***	0.123***	0.220***
	(0.128)	(0.197)	(0.2408)	(0.1054)
Major city	1.192*	1.234	0.700*	1.276
	(0.0611)	(0.136)	(0.159)	(0.07802)
NSW	1.485**	1.971**	1.011	1.991***
	(0.0855)	(0.2031)	(0.185)	(0.177)
VIC	0.803	1.027	0.514*	1.174
	(0.0873)	(0.175)	(0.242)	(0.158)
QLD	1.564*	1.441	1.243	2.760***
	(0.08795)	(0.2065)	(0.2036)	(0.142)
ACT	1.037	3.974	1.443	1.416
	(0.222)	(0.595)	(0.6206)	(0.179)
WA & NT	1.546	1.104	0.571	1.897**
	(0.111)	(0.263)	(0.278)	(0.167)
IT	5.610***	1.434	6.471***	5.152***

	(0.167)	(0.237)	(0.3997)	(0.218)
Engineering	2.775***	1.551	1.630	3.660***
	(0.194)	(0.152)	(0.3698)	(0.178)
Nursing	0.677	0.402**	0.185***	1.204
	(0.1509)	(0.318)	(0.217)	(0.09403)
Other health (incl. medicine)	0.954	0.870	0.255***	1.201
	(0.185)	(0.416)	(0.4541)	(0.1707)
Education	1.410	1.781*	1.558	1.705**
	(0.0687)	(0.235)	(0.215)	(0.173)
Commerce	3.486***	1.789*	2.030**	2.681***
	(0.0968)	(0.138)	(0.323)	(0.138)
Law	1.708*	1.343	2.034	1.553*
	(0.123)	(0.162)	(0.363)	(0.1805)
Humanities	0.549**	0.801	0.566	0.761
	(0.162)	(0.2808)	(0.2305)	(0.169)
Creative arts	0.596	0.434**	0.571	0.307***
	(0.1503)	(0.323)	(0.285)	(0.268)
Other disciplines	1.714*	2.255*	2.177	1.959**
	(0.135)	(0.222)	(0.3802)	(0.2013)
Constant	4.184***	3.604**	14.47***	4.136***
	(1.464)	(1.895)	(10.50)	(1.587)
Year effect	Yes	Yes	Yes	Yes
Number of pair	564	315	245	543
Pseudo R2	0.173	0.172	0.183	0.156

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 6 for a sample interpretation of the results.*

Table 13: Regression results for unemployment with no ability control

	(1)	(2)	(3)	(4)
Unemployed	Demographics	Location	Field of study: v. Science	Year-specific effects
Go8	0.686***	0.654***	0.560***	0.561***
	(0.0961)	(0.0921)	(0.0820)	(0.0819)
tech	0.822	0.810	0.786	0.787
	(0.134)	(0.141)	(0.150)	(0.150)
IRU	1.141	1.139	1.077	1.074
	(0.177)	(0.193)	(0.184)	(0.184)
Female	0.743**	0.735**	0.700***	0.700***
	(0.0974)	(0.0974)	(0.0955)	(0.0961)
Male with partner	0.610***	0.598***	0.623***	0.622***
	(0.0914)	(0.0902)	(0.0921)	(0.0931)
Female with partner	0.957	0.978	0.981	0.983
	(0.218)	(0.225)	(0.226)	(0.227)
Indigenous	4.989***	5.373***	5.605***	5.797***
	(1.125)	(1.237)	(1.356)	(1.419)
NESB	2.586***	2.506***	2.450***	2.442***
	(0.253)	(0.250)	(0.241)	(0.243)
Years in paid work	0.981***	0.982***	0.983***	0.983***
	(0.00479)	(0.00477)	(0.00490)	(0.00489)
Male with child/ren younger than 5	0.707	0.714	0.698	0.692
	(0.174)	(0.178)	(0.173)	(0.172)
Male with child/ren between 5 and 14 years old	0.597**	0.599**	0.594**	0.592**

	(0.129)	(0.130)	(0.130)	(0.130)
Female with child/ren younger than 5	1.731**	1.695*	1.821**	1.857**
	(0.484)	(0.478)	(0.512)	(0.523)
Female with child/ren between 5 and 14 years old	1.401	1.428	1.551	1.540
	(0.444)	(0.450)	(0.495)	(0.495)
Major city		1.251*	1.200	1.194
		(0.164)	(0.156)	(0.155)
NSW		0.984	0.999	1.000
		(0.199)	(0.206)	(0.209)
VIC		1.252	1.249	1.244
		(0.232)	(0.234)	(0.235)
QLD		0.972	1.012	1.007
		(0.200)	(0.210)	(0.209)
ACT		0.628	0.621	0.616
		(0.323)	(0.321)	(0.319)
WA & NT		0.819	0.892	0.888
		(0.192)	(0.208)	(0.210)
IT			1.011	1.015
			(0.280)	(0.282)
Engineering			0.748	0.758
			(0.195)	(0.202)
Nursing			0.489**	0.489**
			(0.159)	(0.160)
Other health (incl. medicine)			2.022**	2.030**
			(0.616)	(0.624)

Education			0.552***	0.557***
			(0.116)	(0.119)
Commerce			0.955	0.962
			(0.152)	(0.159)
Law			0.835	0.835
			(0.314)	(0.315)
Humanities			2.058***	2.067***
			(0.331)	(0.332)
Creative arts			2.208***	2.211***
			(0.567)	(0.577)
Other disciplines			0.746	0.753
			(0.245)	(0.245)
Constant	0.0489***	0.0403***	0.0401***	0.0495***
	(0.00612)	(0.00861)	(0.00847)	(0.0143)
Year effects	No	No	No	Yes
Pseudo R2	0.0444	0.0476	0.0650	0.0676

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. See Table 6 for a sample interpretation of the results.*

Table 14: Regression results for unemployment using selection correction model

	(1)	(2)	(3)	(4)
Unemployed	Go8 v. All	Go8 v. Tech	Go8 v. IRU	Go8 v. Other
Go8	0.573***	0.834	0.534**	0.575***
	(0.0931)	(0.177)	(0.157)	(0.0972)
Female	0.728*	0.388***	0.693	0.944
	(0.126)	(0.0800)	(0.270)	(0.229)

Male with partner	0.605***	0.250***	0.448*	0.798
	(0.102)	(0.0546)	(0.201)	(0.163)
Female with partner	0.870	2.709***	2.390	0.629*
	(0.240)	(1.006)	(1.539)	(0.171)
Indigenous	7.278***	3.528**	6.206**	6.218***
	(3.253)	(2.100)	(4.853)	(3.152)
NESB	2.946***	5.082***	3.172***	2.891***
	(0.434)	(1.531)	(0.993)	(0.542)
Years in paid work	0.987**	0.991	0.997	0.988*
	(0.00607)	(0.0138)	(0.00981)	(0.00682)
Male with child/ren younger than 5	0.739	1.217	0.864	0.577
	(0.189)	(0.800)	(0.450)	(0.223)
Male with child/ren between 5 and 14 years old	0.583**	0.333*	0.302	0.615*
	(0.138)	(0.199)	(1.433)	(0.166)
Female with child/ren younger than 5	1.834*	0.266	0.741	2.393**
	(0.647)	(0.286)	(0.585)	(1.061)
Female with child/ren between 5 and 14 years old	1.600	1.078	0.708	1.598
	(0.555)	(0.365)	(3.379)	(0.508)
Major city	1.178	1.669	1.912	1.140
	(0.188)	(0.654)	(0.924)	(0.190)
NSW	1.026	0.221***	0.791	1.269
	(0.230)	(0.0897)	(0.392)	(0.343)
VIC	1.276	0.635*	1.486	1.513*
	(0.283)	(0.161)	(0.864)	(0.326)

QLD	1.061	0.695	1.289	1.469
	(0.269)	(0.155)	(0.521)	(0.401)
ACT	0.542	0.198***	0.436	0.717
	(0.300)	(0.121)	(0.253)	(0.387)
WA & NT	1.095	0.327***	0.820	1.548
	(0.265)	(0.0892)	(0.637)	(0.457)
IT	1.076	0.253**	0.859	1.182
	(0.403)	(0.145)	(0.663)	(0.399)
Engineering	0.782	0.966	1.875	0.678
	(0.200)	(0.461)	(0.795)	(0.301)
Nursing	0.551*	0.616	-	0.572*
	(0.187)	(0.418)		(0.188)
Other health (incl. medicine)	2.453**	3.702***	4.316***	2.694***
	(0.895)	(1.818)	(2.144)	(1.011)
Education	0.595**	1.323	1.223	0.352***
	(0.141)	(0.701)	(0.804)	(0.0999)
Commerce	1.098	1.874	2.461**	1.042
	(0.183)	(0.770)	(0.999)	(0.207)
Law	0.911	0.577	1.541	0.896
	(0.400)	(0.480)	(1.096)	(0.445)
Humanities	2.390***	3.169***	4.154***	2.336***
	(0.379)	(1.293)	(1.402)	(0.506)
Creative arts	2.645***	4.520***	2.773*	2.333**
	(0.719)	(2.505)	(1.547)	(0.827)
Other disciplines	0.583	0.179***	-	0.708
	(0.244)	(0.108)		(0.231)

Constant	0.0371***	0.0600***	0.0166***	0.0300***
	(0.0138)	(0.0559)	(0.0143)	(0.0119)
Year effects	Yes	Yes	Yes	Yes
Pseudo R2	0.0770	0.171	0.111	0.0805

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. – insufficient sample size. See Table 6 for a sample interpretation of the results.*

Table 15: Regression results for unemployment using matched sample

	(1)	(2)	(3)	(4)
Unemployed	Go8 v. All: Random effects model	Go8 v. Tech: Random effects model	Go8 v. IRU: Random effects model	Go8 v. Other: Random effects model
Go8	0.458***	0.976	0.412***	0.730
	(0.112)	(0.0584)	(0.1069)	(0.0588)
Female	0.748	0.489*	1.178	1.152
	(0.167)	(0.1001)	(0.199)	(0.0964)
Male with partner	0.687	0.302***	0.904	0.801
	(0.08799)	(0.1093)	(0.213)	(0.0758)
Female with partner	1.135	1.964	1.186	1.017
	(0.182)	(0.143)	(0.245)	(0.1196)
Indigenous	2.770	3.301	13.89**	-
	(0.2698)	(0.438)	(1.192)	(0.384)
NESB	3.084***	5.089***	1.129	3.082***
	(0.133)	(0.1041)	(0.123)	(0.0926)
Years in paid work	0.983*	0.978	0.997	0.990
	(0.00369)	(0.00516)	(0.00393)	(0.00519)

Male with child/ren younger than 5	0.684	1.340	0.617	0.652
	(0.157)	(0.1068)	(0.267)	(0.554)
Male with child/ren between 5 and 14 years old	0.623	0.386	0.202	0.230**
	(0.165)	(0.113)	(0.3045)	(0.143)
Female with child/ren younger than 5	0.845	0.311	1.380	2.150
	(0.184)	(0.0854)	(0.263)	(0.622)
Female with child/ren between 5 and 14 years old	0.983	1.129	0.493	2.305
	(0.176)	(0.15998)	(0.322)	(0.233)
Major city	1.426	1.083	1.232	1.307
	(0.1797)	(0.137)	(0.213)	(0.144)
NSW	0.669	0.236***	1.866	0.991
	(0.161)	(0.157)	(0.326)	(0.08996)
VIC	1.081	0.783	2.520	0.943
	(0.138)	(0.112)	(0.3103)	(0.1039)
QLD	1.080	0.515	1.181	0.612
	(0.137)	(0.1076)	(0.298)	(0.0732)
ACT	0.441	-	-	0.400
	(0.451)			(0.2797)
WA & NT	0.788	0.380	2.775	0.773
	(0.2395)	(0.135)	(0.335)	(0.229)
IT	0.566	0.908	1.600	0.231
	(0.337)	(0.341)	(0.362)	(0.3046)

Engineering	0.722	1.057	3.223	0.889
	(0.3036)	(0.20699)	(0.319)	(0.198)
Nursing	0.374	0.763	-	0.941
	(0.536)	(0.3047)		(0.245)
Other health (incl. medicine)	1.958	4.030*	-	1.485
	(0.223)	(0.358)		(0.2401)
Education	0.705	1.700	0.969	0.215**
	(0.191)	(0.237)	(0.162)	(0.227)
Commerce	1.427	2.473*	2.764	1.977*
	(0.177)	(0.238)	(0.218)	(0.1017)
Law	1.163	-	1.206	0.600
	(0.1702)		(0.298)	(0.192)
Humanities	4.134***	2.941*	3.275**	3.015***
	(0.1098)	(0.253)	(0.155)	(0.152)
Creative arts	4.154***	6.297***	4.406**	3.876**
	(0.154)	(0.255)	(0.355)	(0.276)
Other disciplines	0.379	0.227	-	0.458
	(0.378)	(0.328)		(0.331)
Constant	0.0225***	0.0631***	0.00767***	0.0104***
	(0.0143)	(0.0510)	(0.00894)	(0.00804)
Year effects	Yes	Yes	Yes	Yes
Number of pair	564	315	237	543
Pseudo R2	0.0839	0.156	0.145	0.0857

*Notes: Standard errors in parentheses (bootstrapped where sample size is sufficient). *** p<0.01, ** p<0.05, * p<0.1. – insufficient sample size. See Table 6 for a sample interpretation of the results.*

References

ABS (2013) *Consumer price index, Cat. 6401.0*, Australian Bureau of Statistics

ABS (2014) *Average weekly earnings, Australia, Cat. 6302.0*, Australian Bureau of Statistics

ARWU (2014) 'Academic Ranking of World Universities', accessed 24 August 2014, from http://www.shanghairanking.com/World-University-Rankings-2014/Australia.html

Behrman, J., Constantine, J., Kletzer, L. and McPherson, M. (1996) *The impact of college quality on wages: are there differences among demographic groups?*, Working Paper No. DP-38

Behrman, J., Rosenzweig, M. and Taubman, P. (1996) 'College choice and wages: estimates using data on female twins', *Review of Economics & Statistics*, 78, p 672-785

Birch, E., Li, I. W. and Miller, P. (2009) 'The influences of institution attended and field of study on graduates' starting salaries', *Australian Economic Review*, 42, p 42-63

Black, D. A., Kermit, D. and Smith, J. A. (2005) 'College quality and wages in the United States', *German Economic Review*, 6(3), p 415-443

Borland, J., Dawkins, P., Johnson, D. and Williams, R. (2000) *Returns to Investment in Higher Education*, Melbourne Institute from http://www.melbourneinstitute.com/downloads/reports/rihe.pdf

Borland, J. and Suen, A. (1994) 'The experience-earnings profile in Australia', *Economic Record*, 70(208), p 44-55

Brewer, D., Eide, E. and Ehrenberg, R. (1999) 'Does it pay to attend an elite private college?', *Journal of Human Resources*, 34(1), p 104-123

Carroll, D., Heaton, C. and Tani, M. (2014) *Returns to university quality in Australia: a two-stage analysis*, IZA discussion paper no. 8473

GCA (2013a) *GradStats: employment and salary outcomes for recent higher education graduates 2013*, Graduate Careers Australia

GCA (2013b) *Graduate Salaries 2013*, Graduate Careers Australia from http://www.graduatecareers.com.au/wp-content/uploads/2014/07/AGS_reports/GCA_Graduate_Salaries_2013/GCA_Graduate_Salaries_2013.pdf

GCA (2014) *Graduate Destinations 2013: A report on the work and study outcomes of recent higher education graduates*, Graduate Careers Australia

Gerber, T. P. and Cheung, S. Y. (2008) 'Horizonal stratification in postsecondary education', *The Annual Review of Sociology*, 34, p 299-318

Heckman, J. (1999) *Policies to foster human capital*, NBER Working Paper Series, No. 7288

HILDA (2012) *Household, Income and Labour Dynamics in Australia Survey*, Melbourne Institute of Applied Economic and Social Research, University of Melbourne

Hoxby, C. (1997) *How the changing market structure of US higher education explains college tuition*, NBER Working Paper Series, No. 6323

Hussain, I., McNally, S. and Telhaj, S. (2009) *University quality and graduate wages in the UK*, CEE Discussion Papers, London School of Economics

Lee, J. (2014) 'The attainablity of university degrees and their labour market benefits for young Australians', *Higher Education*, 68(3), p 449-469

Leigh, A. (2008) 'Returns to education in Australia', *Economic Papers*, 27(3), p 233-249

Li, I. W. and Miller, P. (2013) 'The absorption of recent graduates into the Australian labour market: variations by university attended and field of study', *Australian Economic Review*, 46(1), p 14-30

Lindahl, L. and Regner, H. (2005) 'College choice and subsequent earnings: Results using Swedish sibling data', *The Scandinavian Journal of Economics*, 107(3), p 437-457

Loury, L. and Garman, D. (1995) 'College selectivity and earnings', *Journal of Labor Economics*, 13(2), p 289

Marginson, S. (2014) 'University rankings and social science', *European Journal of Education*, 49(1), p 45-59

McMillan, J., Beavis, A. and Jones, F. (2009) 'The AUSEI06: A new socioeconomic index for Australia', *Journal of Sociology*, 45(2), p 123-149

Melbourne Institute (2012) 'HILDA Survey', accessed 28 October 2014, from http://www.melbourneinstitute.com/hilda/

Miller, P. and Volker, P. (1982) *Starting salaries and destinations of graduates in Australia*, Centre for Economic Policy Research, Australian National University, paper no. 56

NCVER (2014) *About the LSAY program*, National Centre for Vocational Education Research, accessed 28 October 2014, from http://www.lsay.edu.au/aboutlsay/about.html

Norton, A. and Cherastidtham, I. (2014) *Mapping Australian higher education, 2014-15 version*, Grattan Institute

Quacquarelli Symonds (2014) 'QS World University Rankings 2014-15', from http://www.topuniversities.com/

Rosenbaum, P. and Rubin, D. (1985) 'Constructing a control group using multivariate matched sampling methods that incorporate the propensity score', *The American Statistician*, 39(1), p 33-38

Thomas, S. L. (2000) 'Deferred costs and economic returns to college major, quality, and performance', *Research in Higher Education*, 41(3), p 281

Thomas, S. L. (2003) 'Longer-term economic effects of college selectivity and control', *Research in Higher Education*, 44(3),

Times Higher Education (2014-15) 'Times Higher Education World University Rankings', from http://www.timeshighereducation.co.uk/world-university-rankings/

Zhang, L. (2005) 'Do measures of college quality matter? The effect of college quality on graduates' earnings' *The Review of Higher Education*, 28(4), p 2005

Zhang, L. (2007) 'The way to wealth and the way to leisure: The impact of college education on graduates' earnings and hours work', *Research in Higher Education* 49(3), p 199-213