



Beyond graduation



How important is that first job?

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Executive Summary

This study looks at the relationship between outcomes from the Graduate Destination Survey (2011), conducted about four months after completion of an undergraduate course, and from the Beyond Graduation Survey (2014) conducted three years later. By combining these two surveys for a matched cohort of graduates we investigate the extent to which early outcomes impact on the labour market experience of recent graduates three years later. While we expect to find that labour market outcomes improve on average, our focus is the extent to which there is state dependence or persistence. Does having a full-time job four months after graduation make any difference in the probability of having a full-time job three years later? The key question is whether the Graduate Destination Survey provides long term evidence of how well graduates are doing in the labour market or whether it is only capturing the immediate transition and therefore providing little real insight into how well graduates are doing in the labour market.

In brief, we find that the early experience of graduates has a lasting impact on their labour market experience. Those graduates who do not find full-time employment at the time of the Graduate Destination Survey are substantially less likely to have full-time employment three years later. Moreover, the quality of the full-time job at the time of the Graduate Destination survey impacts on the quality of job held three years later (for those in a job at both points).

The study also finds out that background characteristics – gender, field of study, type of university, level of course - all impact on outcomes in the Beyond Graduation Survey but that the import of these characteristics is ‘washed out’ to a fair extent by the experience at the time of the Graduate Destination Survey. That is, the immediate transition seen at the Graduate Destination Survey provides a strong signal as to likely outcomes in the longer term.

The main conclusion from the study is that any criticism of the Graduate Destination Survey along the lines ‘that it is conducted too soon after course completion to provide a good picture of how well graduates are doing in the labour market’ is not valid. The Graduate Destination survey provides a very strong signal as to how well graduates are doing in the labour market. That first job matters.

1. Introduction

The Graduate Destination Survey (GDS) has been part of the furniture of the higher education sector for a number of decades now. It is conducted some four months after graduation and collects data about what the graduate is doing, with considerable detail about their employment, including starting salaries and detailed occupational descriptions. Given when it is administered, the GDS clearly measures transitions rather than, necessarily, final destinations. It has been criticised for this very reason and, consequently, several cohorts of graduates have been invited to take part in a follow-up survey three years after the GDS - the Beyond Graduation Survey (BGS). This paper considers the cohort of graduates who completed their studies in 2010 and subsequently responded to the GDS in 2011 and the BGS in 2014 (see Graduate Careers Australia 2015 for details).

While we can use the BGS to measure employment rates well after graduates have had the opportunity to be absorbed by the labour market, this would provide little of interest. We know from cross-sectional survey and Census data that graduates on average do well in the labour market, and therefore to say that the GDS underestimates employment rates tells us little. Earlier work by Coates and Edward (2009) documents how labour market outcomes change over five years after graduation, with – not surprisingly - employment rates and salaries increasing. Graduate Careers Australia (2010, 2011, 2012, 2013, 2014 and 2015⁴) similarly document later surveys (including the one which we are analysing) showing again that labour market outcomes do improve after the initial transition. Of more interest is whether the early experience of graduates has a lasting effect on their careers, and whether the GDS provides an informative window on how graduates are faring in the labour market.² This is what we wish to pursue in this paper.

Specific questions revolve around the role of transition and include:

- Do the university of graduation and field of education have a lasting effect on graduate employment outcomes?
- Does the lack of a full-time job four months after graduation impact on the probability of being in full-time employment three years later? And similarly, does the lack of a full-time job impact on the 'quality' of a job obtained three years later?
- Is there a long-term penalty to taking a 'poor quality' job four months after graduation?

Our expectation is that what happens in the early transition will have long last impacts – that persistence or state dependence is likely. This is intimated by Carroll and Tani (2013) who show that those graduates who are over-educated after graduation (that is, working in a job that does not require a university degree) will tend to remain overeducated while those who are not overeducated are less likely to become over-educated. In a similar vein, Mavromaras et al. (2013) show that over-skilling is highly persistent, although less so for graduates relative to those with lower levels of education.

The above questions are not straightforward for a number of methodological reasons. First, the response rate of the BGS survey is quite poor (of those responding to the GDS around 13% completed the BGS), and it is likely that there is an element of non-response bias. The conventional wisdom is that the response rates tend to be higher for those graduates who are relatively successful. The second issue is that there may be all sorts of selection biases at work. For example, those graduates not able to get a job four months after graduation may have poorer degrees than those who do get a job, even after we have controlled for their field of study and

² The GDS concluded in 2015 and was replaced by the Graduate Outcomes Survey (GOS) which is administered six months after course completion. We can expect any conclusions from our analysis to apply equally well to the GOS.

graduating university. Similarly, those obtaining a ‘poor quality’ job after graduation may have lower employment skills than those who obtain a ‘high quality’ job. We endeavour to address these methodological issues as much as we can.

We begin the paper with some simple descriptive statistics from the GDS and the BGS (Section 2). This is followed by an analysis of response to the BGS; specifically, we model the probability of responding to the BGS as a function of gender, university type, field of study, type of degree, and whether the graduate was in full-time employment or not at the time of the GDS. Section 4 looks at the importance of university type and field of study in impacting on the probability of having a full-time job and job quality three years or so after completion – well after the immediate transition. Section 5 then looks at whether having a full-time job after three months has any effect on having a full-time job after three years, and Section 6 at the role of the quality of the initial (GDS) job on employment and job quality three years later. We end with a brief conclusion.

2. Simple descriptive statistics³

We follow earlier work (Karmel and Carroll 2016) and split graduates into three mutually exclusive and exhaustive outcome categories: those in full-time employment; those in full-time study; and, those in neither full-time employment nor full-time study. The cohort we are scrutinising had graduated with an undergraduate qualification in 2010, and at the time of the GDS was 24 years and under, comprised Australian citizens or permanent residents, and was located in Australia.

Table 1 shows the status of graduates in 2011 from the GDS and in 2014 from the BGS.

Table 1: Whether in full-time work or full-time study, 2011 and 2014 (per cent)

	2011	2014
Full-time work	48.3	70.8
Full-time study	21.6	14.3
Other	30.1	14.9
Total	100.0	100.0
Sample size	43,855	5,693

We see that the GDS captures information at a time of transition and that, as expected, the proportion in full-time employment increases substantially by the time of the BGS (over 20 percentage points). However, the BGS still has around 15% in each of the full-time study and the ‘other’ categories. Clearly, the BGS is still measuring transitions to some extent, although it is over three years from initial completion.

We also present measures of job ‘quality’ from the GDS and BGS for those in full-time employment (Table 2). As in Karmel and Carroll (2016) we have three measures: the annual salary, the average occupational salary⁴ for the job held by the graduate, and the Australian Bureau of Statistics skill level (1 is the highest value and is typically associated with a professional job requiring a degree).

³ Readers are directed to Graduate Careers Australia (2015) for a detailed set of tabulations.

⁴ The average occupational salary is the average income of a particular ANZSCO occupation code for a full-time employed person, derived from the 2011 Population Census. As such it measures job quality by capturing potential career earnings. See Karmel and Carroll (2016) for details.

Table 2: Quality of job if in full-time employment, 2011 and 2014

	2011	2014
Annual salary	51238	69226
Average occupational salary	75889	80602
ABS skill level (highest =1, lowest=5)	1.65	1.34

Not surprisingly, we see that the average quality of the job held by a graduate in full-time employment has improved between the GDS and BGS. The average annual salary increases by around 35% while the average occupational salary increased by around 6%. The disparity between the increases in these two measures reflects the increases that new graduates get as they gain experience, although there is some improvement in the occupational pecking order of the job. The latter is also reflected in an improvement in the ABS skill level measure, as more graduates move into professional jobs.

3. Analysis of response

One of the issues with any sort of panel survey is that the response rates of the second wave tend to be lower than the first wave. This is of no consequence if the response (or non-response) is random, but typically those who respond have different characteristics compared to those who do not respond. We check for this by running a logistic regression, where the dependent variable is whether the person responded or not to the BGS (Table 3).

Table 3: Logistic regression of response to the BGS

		Coef.	SE	Z
Sex				
	Male			
	Female	0.35	0.03	10.9
Field of study				
	1 Natural and physical sciences	0.22	0.05	4.1
	2 Information technology	0.41	0.09	4.6
	3 Engineering and related technology	0.28	0.06	4.4
	4 Architecture and Building	-0.10	0.09	-1.0
	5 Agriculture, Environmental and Related	0.16	0.12	1.4
	6 Medicine and related	0.04	0.05	0.9
	7 Education	-0.17	0.07	-2.5
	8 Management and commerce			
	9 Society and culture	0.20	0.05	4.4
	10 Creative arts	0.24	0.05	4.5
University grouping				
	Group of Eight			
	Australian Technology Network	-0.51	0.04	-12.3
	Innovative research universities	-0.25	0.04	-6.1
	Regional	-0.25	0.07	-3.5
	Ungrouped	-0.75	0.04	-19.0
Level of course				
	Pass bachelor			
	Honours	0.18	0.05	4.0
Outcome at GDS				
	Full-time work	0.22	0.03	6.6
	Full-time study	-0.03	0.04	-0.8
	Other			
Constant		-1.97	0.05	-41.4
Sample size	43849			
Pseudo R-squared	0.0219			

We see that response to the BGS is not random, with women more likely to respond than men, and variation in response across fields of study (for example, graduates in information technology and engineering and related technology more likely to respond), and university grouping (Group of Eight graduates more likely to respond), and level of course (honours graduates more likely to respond). However, we also see that those who were in full-time work at the time of the GDS were more likely to respond, indicating that the more successful graduates are more likely to respond to the BGS. While not reported here, we also found that there was a positive correlation between the salary as reported at the GDS and the probability of responding to the BGS which provides further evidence of this relationship between labour market success and BGS response.

The fact that response is not random indicates that one needs to be very careful in looking at the raw outcomes, and that it is important to use control variables. We can go one step further, though, by testing whether relationships are robust to weighting by the inverse of the predicted probability of response at the BGS. This is addressed in the following section.

4. Do field of study and university type have a long-term impact?

In the earlier paper we found that field of study and university type had an impact on graduate outcomes. The BGS allows us to see whether these factors have a longer-term effect or whether the impact affects only the immediate transition, as measured by the GDS. Table 4 presents the results of a regression where we model the probability of being in full-time work at the BGS as a function of sex and certain characteristics of the course which the individual had completed, namely field of study, university type, and whether the individual had a pass or honours degree. In order to take into account the differential response we noted earlier, we also ran a weighted regression, with the weights equal to the inverse of the probability of responding at the BGS. This enables us to check the robustness of our model in light of possible response bias.

Table 4: Logistic regression with dependent variable in full-time employment at BGS

		Coef (unweighted)	SE	Z	Coef (weighted)
Sex					
	Male				
	Female	-0.12	0.07	-1.7	-0.12
Field of study					
	1 Natural and physical sciences	-1.94	0.12	-16.1	-1.88
	2 Information technology	-0.23	0.24	-0.9	0.02
	3 Engineering and related technology	-0.22	0.17	-1.3	-0.25
	4 Architecture and Building	-0.72	0.23	-3.2	-0.61
	5 Agriculture, Environmental and Related	-0.79	0.26	-3.1	-0.60
	6 Medicine and related	-0.91	0.12	-7.6	-0.88
	8 Education				
	7 Management and commerce	-0.52	0.17	-3.1	-0.49
	9 Society and culture	-1.24	0.11	-11.2	-1.16
	10 Creative arts	-1.48	0.13	-11.7	-1.42
University grouping					
	1 Group of Eight				
	2 Australian Technology Network	0.21	0.09	2.3	0.20
	3 Innovative research universities	0.06	0.09	0.7	0.03
	4 Regional	0.06	0.16	0.4	0.08
	9 Ungrouped	-0.05	0.09	-0.6	-0.05
Level of course					
	Pass bachelor				
	Honours	-0.44	0.09	-5.0	-0.45
Constant		1.98	0.11	18.4	1.87
Sample size		5693			5631
Pseudo R-squared		0.0736			0.0708

We see that the background variables do make a difference to the probability of being employed three years after the initial survey. Not surprisingly, being female leads to a lower probability of being full-time employed at the time of the BGS. Field of study also plays a role with natural and physical sciences, society and culture and creative arts all leading to markedly lower full-time employment probabilities relative to other fields of study. Part of the reason for this is that full-time study at the time of the GDS impacts on employment levels. Thus it is not surprising to see that

Group of Eight graduates have a lower probability of being in full-time employment at the BGS, because more have gone on to full-time study.

We see that the coefficients under the weighted regression models are very similar, indicating that the differential response is handled effectively through the control variables.

We can run an analogous model for those in full-time study at the BGS (Table 5).

Table 5: Logistic regression with dependent variable in full-time study at BGS

		Coef. (unweighted)	SE	Z	Coef. (weighted)
Sex	Male				
	Female	-0.04	0.09	-0.4	-0.02
Field of study					
	1 Natural and physical sciences	2.64	0.18	14.6	2.50
	2 Information technology	-0.22	0.48	-0.5	-0.20
	3 Engineering and related technology	0.71	0.24	2.9	0.68
	4 Architecture and Building	1.21	0.31	3.9	0.88
	5 Agriculture, Environmental and Related	1.16	0.36	3.2	0.84
	6 Medicine and related	1.22	0.19	6.3	1.09
	8 Education	-0.39	0.40	-1.0	-0.55
	7 Management and commerce				
	9 Society and culture	1.55	0.18	8.6	1.41
	10 Creative arts	1.40	0.20	6.9	1.26
University grouping					
	1 Group of Eight				
	2 Australian Technology Network	-0.60	0.13	-4.6	-0.59
	3 Innovative research universities	-0.32	0.12	-2.8	-0.32
	4 Regional	-0.34	0.22	-1.5	-0.28
	9 Ungrouped	-0.46	0.12	-3.7	-0.50
Level of course					
	Pass bachelor				
	Honours	0.60	0.10	5.9	0.69
Constant		-3.01	0.17	-17.3	-2.85
Sample size		5693			5631
Pseudo R squared		0.1263			0.1272

We see little difference between the rates of males and females going on to further study. By contrast there is considerable variation across fields of study with the natural and physical sciences field having the highest proportion being in full-time study at the BGS, followed by society and culture, and the creative arts. The fields with the lowest proportions in full-time study at the BGS are education, information technology and management and commerce. Among the university groupings it is the Group of Eight that stands out with the highest proportion of graduates in full-times study at the BGS. Not surprisingly those with honours degrees are more likely to be in full-time study than those with pass degrees.

We note that weighting the observation by the inverse of the probability of response makes little difference to the values of the coefficients. Thus for brevity in subsequent models we present only the unweighted results; the unweighted models also have the advantage of larger sample sizes and generally smaller standard errors.

Regression coefficients are difficult to interpret so we also present predicted probabilities of being in full-time employment and full-time study, where we allow each variable to vary holding other groups of variables at their average values. We can also derive the predicted probability of being in neither full-time work nor full-time study (since the three categories are comprehensive and mutually exclusive). The results are presented in Table 6.

Table 6: Predicted probabilities of being in full-time employment, full-time study or neither at the BGS, by selected variables

	Full-time employment	Full-time study	Other
Male	0.77	0.08	0.16
Female	0.74	0.07	0.18
Natural and physical sciences	0.49	0.34	0.17
Information technology	0.84	0.03	0.13
Engineering and related technology	0.84	0.07	0.09
Architecture and Building	0.77	0.11	0.12
Agriculture, Environmental and Related	0.75	0.11	0.14
Medicine and related	0.73	0.11	0.16
Education	0.87	0.02	0.10
Management and commerce	0.80	0.04	0.16
Society and culture	0.66	0.15	0.19
Creative arts	0.61	0.13	0.26
Group of Eight	0.74	0.10	0.15
Australian Technology Network	0.78	0.06	0.16
Innovative research universities	0.76	0.08	0.17
Regional	0.76	0.07	0.17
Ungrouped	0.73	0.07	0.20
Pass bachelor	0.76	0.07	0.17
Honours	0.67	0.12	0.21

The table spells out the variation across the various classifications. We see some evidence that the proportion in full-time employment is inversely related to the proportion in full-time study, with the obvious example of natural and physical sciences having the lowest proportion in full-time employment and the highest proportion in full-time study. Groups with the highest proportions in neither full-time employment nor full-time study (which we take as a proxy for an unsatisfactory transition) are the graduates from the creative arts (26%), followed by society and culture (19%). The field of study with the lowest proportion in neither full-time employment nor full-time study is engineering and related technology. Female graduates have only a slightly higher rate than male graduates (despite the fact that some females in this category would have family responsibilities which would preclude full-time employment). A complicating factor is that in some cases the high proportions of graduates in neither full-time employment nor full-time study is also reflecting graduates who went on to further study at the GDS, and therefore some are in the position of being again a 'new' graduate with only a short period of time since the completion of their study. The point is that the transition can last many years for some graduates, especially when they undertake further full-time study, and that graduates from some fields of study tend to be more successful than graduates from others.

5. Does state at GDS impact on employment at BGS?

The primary focus of this paper is whether lack of labour market success at the time of the GDS has a long-term impact on outcomes. The simplest way of looking at this is to run a logistic regression with the same controls as before but including the three GDS outcomes of being in full-time employment, full-time study or in neither of these categories.⁵

Table 7: Effect of GDS outcomes on the probability of being in full-time employment at BGS

	Coef.	SE	Z
Sex			
Male			
Female	-0.15	0.07	-2.0
Field of study			
1 Natural and physical sciences	-1.55	0.13	-12.2
2 Information technology	-0.16	0.26	-0.6
3 Engineering and related technology	-0.31	0.17	-1.8
4 Architecture and Building	-0.58	0.24	-2.5
5 Agriculture, Environmental and Related	-0.57	0.27	-2.1
6 Medicine and related	-0.99	0.12	-8.0
7 Education	-0.56	0.17	-3.3
8 Management and commerce			
9 Society and culture	-0.94	0.12	-8.1
10 Creative arts	-1.15	0.13	-8.8
University group			
1 Group of 8			
2 Australian Technology Network	0.12	0.10	1.2
3 Innovative research universities	0.00	0.09	0.0
4 Regional	0.02	0.17	0.1
9 Ungrouped	-0.06	0.09	-0.7
Level of degree			
Pass bachelor			
Honours	-0.54	0.09	-5.9
GDS outcome			
outcome			
1 FT employed	1.12	0.08	14.5
2 FT study	-0.36	0.08	-4.3
Neither FT emp nor FT study			
Constant	1.46	0.12	12.3
Sample size	5631		
Pseudo R-squared	0.132		

⁵ While there are three categories we need dummies for only two because the categories are exhaustive. For simplicity, we present the results for the unweighted model

It is not surprising to find undertaking full-time study immediately after course completion impacts negatively on the probability of being in full-time employment at the BGS; some graduates will still be studying while others have had less time in the (full-time) labour market compared to other graduates. However, what is more interesting is that those neither in full-time employment nor full-time study at the GDS have a significantly lower probability of being in full-time employment at the BGS compared to those who were in full-time employment. Thus, the short-term outcomes as measured by the GDS continue to have an impact for at least three years. We also see that the effect of some of the factors is 'washed out' by the inclusion of the GDS outcomes. For example, the type of university has little impact once we control for outcomes at the GDS, despite the clear relationship between university attended and short-term outcomes.

We see that outcomes at the time of the GDS have long lasting effects. We can also test to see if the quality of the job for those who had full-time employment at the GDS impacts on the probability of being employed at the BGS (Table 8). We do this by including in our model the salary level of the full-time job held by the individual at the GDS, and the average occupational salary of the occupation of that full-time job (in logarithmic form). These are, of course, only entered for those in FT employment at the time of the GDS.

Table 8: Effect of GDS outcomes on the probability of being in full-time employment at BGS

		Coef. (Unweighted)	SE	z
Sex	Male			
	Female	-0.13	0.08	-1.7
Field of study				
	1 Natural and physical sciences	-1.52	0.13	-11.7
	2 Information technology	-0.17	0.26	-0.7
	3 Engineering and related technology	-0.32	0.18	-1.8
	4 Architecture and Building Agriculture, Environmental and	-0.49	0.25	-2.0
	5 Related	-0.49	0.28	-1.7
	6 Medicine and related	-0.94	0.13	-7.2
	7 Education	-0.54	0.18	-3.0
	8 Management and commerce			
	9 Society and culture	-0.83	0.12	-6.9
	10 Creative arts	-1.10	0.14	-8.1
University grouping				
	1 Group of Eight			
	2 Australian Technology Network	0.10	0.10	1.0
	3 Innovative research universities	-0.04	0.10	-0.5
	4 Regional	-0.05	0.17	-0.3
	9 Ungrouped	-0.01	0.10	-0.1
Level of course				
	Pass bachelor honours	-0.60	0.10	-6.2
GDS outcome				
	FT employed	-10.89	2.90	-3.8
	FT study	-0.37	0.08	-4.4
	Other			
Quality of GDS job				
	ln(full-time salary)	0.61	0.29	2.1
	ln(average weekly occupational salary)	0.75	0.26	2.8
Constant		1.41	0.12	11.5
Sample size		5140		
Pseudo R-squared		0.1422		

We see that the quality of the job at the GDS does have an effect on the probability of being in full-time employment at the BGS. It is difficult to see from the coefficients exactly the size of the effect so undertake some simple calculations: we take an individual who had a full-time job at the GDS who hypothetically had a salary at the 10th percentile of the annual salary and at the 10th percentile of the average occupational wage, and contrast that persons with one from the 90th percentile of the annual salary and the 90th percentile of the average occupational salary. By calculating the predicted probability of being in full-time employment for these hypothetical individuals we can see

the impact of having a ‘good’ job compared to a ‘bad’ one (see Table 9).⁶ In order to round out the calculations, we also calculate the probability of being in full-time study (the model is in the Appendix). These two models enable us to calculate predicted probabilities for the outcomes at the BGS, conditional on the outcomes at the GDS.

Table 9: Predicted probabilities of BGS outcomes, conditional on GDS outcomes.

GDS	Prediction of outcome at BGS		
	FT employed	FT study	Neither FT employed nor FT study
FT employed (90th percentile)	92.6	1.3	6.0
FT employed (10th percentile)	84.1	5.1	10.8
FT study	58.2	19.6	22.2
Neither FT employed nor FT study	66.8	9.0	24.2

We see that those in ‘good’ full-time jobs at the GDS have a greater probability (8.5 percentage points) of being in a full-time job at the BGS, and conversely a lower probability (3.8 percentage points) of being in full-time study. Clearly, the quality of the job influences the decision as to whether the individual stays in full-time employment or undertakes further study as an alternative to full-time work. In addition, considerable numbers (9%) of those neither in full-time work nor full-time study at the GDS also turn to full-time study. It seems that further study at the BGS is reflecting, at least to some extent, poor outcomes in the labour market following an individual’s first degree.

6. What is the role of the quality of the initial job (at GDS)

We use two measures of job quality (of those in full-time employment) in our analysis. The first is the annual salary at the time of the BGS, and the second is the average occupational salary at the BGS. The average occupational salary provides an indication of how well the occupation pays over an individual’s career as distinct from the immediate annual salary.

In Table 10 we provide the results from three models, all of which have as the dependent variable the logarithm of the annual salary from the BGS. The first model has the background variables we used earlier as the independent variables (sex, field of study, university grouping, whether the individual has an honours degree). The second model incorporates the GDS outcome (in full-time work, in full-time study, in neither full-time work nor full-time study). This model tells us the extent to which the early transition impacts on the quality of the job at the BGS. For example, does not having a full-time job at the GDS impact on the quality held at the time of the BGS? *A priori* reasoning does not help that much in predicting the sign of the coefficient on the GDS full-time employment variable. On one hand, those not having a full-time job at the GDS may be of poorer quality than their peers, or employers may see a long transition as a signal about prospective candidates. On the other hand, able candidates may eschew a job offer unless the job is commensurate with what they are expecting.

Finally, we include, for those in full-time employment at the GDS, the two measures of job quality relating to the job held at the GDS. The coefficients on these variables will indicate the extent to which the quality of the early GDS job matters three years later.

⁶ The 90th and 10th percentiles for the GDS annual salary for those employed full-time are \$95,000 and \$44,793 respectively. The 90th and 10th percentiles for the GDS average weekly occupational salary for those employed full-time are \$1,950 and \$1,141 respectively.

Table 10: Impact of GDS outcomes on annual salary of those in full-time employment at BGS

		Base model Coef.	plus GDS outcomes Coef.	plus quality of GDS job		
				Coef.	SE	Z
Sex	Male					
	Female	-0.08	-0.09	-0.06	0.01	-6.4
Field of study						
	1 Natural and physical sciences	-0.02	0.00	0.00	0.02	-0.3
	2 Information technology Engineering and related technology	0.02	0.02	0.01	0.02	0.3
	3	0.12	0.11	0.03	0.02	1.9
	4 Architecture and Building Agriculture, Environmental and Related	-0.07	-0.06	-0.06	0.03	-2.5
	5	-0.08	-0.07	-0.04	0.03	-1.2
	6 Medicine and related	0.06	0.05	0.03	0.01	2.1
	7 Education	-0.01	-0.02	-0.04	0.02	-2.4
	8 Management and commerce					
	9 Society and culture	-0.06	-0.04	-0.03	0.01	-2.2
	10 Creative arts	-0.17	-0.14	-0.11	0.02	-7.1
University group						
	1 Group of 8					
	2 Australian Technology Network	0.01	0.01	0.02	0.01	1.8
	3 Innovative research universities	-0.04	-0.05	-0.02	0.01	-1.5
	4 Regional	-0.03	-0.04	0.00	0.02	0.1
	9 Ungrouped	-0.04	-0.04	-0.01	0.01	-1.2
Level of course						
	Pass bachelors					
	Honours	0.06	0.05	0.03	0.01	2.5
GDS outcome						
	1 Full-time employment		0.13	-6.32	0.26	-23.9
	2 Full-time study		0.01	0.01	0.01	0.8
	Other					
Quality of GDS job						
	Ln(annual salary)			0.51	0.03	19.9
	Ln(av occ weekly salary)			0.13	0.02	5.4
Constant		11.18	11.09	11.07	0.01	880.5
Sample size		3685	3645	3301		
R-squared		0.129	0.178	0.309		

In the base model, we see that the background characteristics of the student do impact on annual salary of graduates at the BGS. Females on average get paid 8 per cent less than males (and this is controlling for field of study), engineering and related technology graduates get paid particularly well, and those with creative arts degrees particularly badly (a differential of around 29 per cent),

those from the Group of Eight or the Australian Technology Network get paid 3-5% more than other graduates, and those with honours degrees about 6% more than those with pass degrees.⁷

These differentials are significantly ameliorated though when we control for the GDS outcomes, indicating that early transition to a full-time job is very beneficial for the individual in the longer-term. We see that those with a full-time job at the GDS get paid some 13% more than those neither in a full-time job nor in full-time study. Additional study does not appear to have a pay-off at the time of the BGS, with those in full-time study at the GDS earning only 1% more than those in neither full-time employment nor full-time study. This is not to say that there are not gains from further study (increased human capital?) but any gains have not been realised within the three year period defined by the BGS.

We see also that both measures of job quality at the time of the GDS impact on the quality of the job at the BGS. To give some idea of the size of the impact, we see that having a job at the GDS at the 90th percentile in terms of both salary and average occupational salary, is expected to increase the salary at the BGS by about 45% compared to having a job at the time of the GDS at the 10th percentile.

This model also can help to answer the question whether any full-time job is better than no full-time job at all. We see that in our final model, incorporating job quality at the GDS, we have a coefficient on full-time employment at the GDS of -6.32 compared to the zero for those in neither full-time study nor full-time employment. This implies that the cut-off point where a full-time job is equivalent to neither a full-time job nor full-time study of is an annual salary of \$556 ($\ln 556 = -6.32$). Of course such a salary is not feasible, implying that any full-time job is better than none. Putting it another way a person at the 10th percentile of the salary distribution and the average occupational salary distribution can expect to earn over double that of an individual who was neither in full-time employment nor full-time study at the time of the GDS.

We now repeat the analysis with the weekly average occupational wage as the dependent variable. The results are presented in Table 11.

⁷ We need to be a little careful with the interpretation of these results because they are conditional on the field of study classification. For example, medicine and related will include nursing which pays considerably less than medicine. There is also an interaction between field of study and sex because of occupational segregation, with nursing and education being heavily female dominated. This no doubt will affect the coefficient on sex.

Table 11: Impact of GDS outcomes on average occupational weekly salary of those in full-time employment at BGS

		Base model Coef	Plus GDS outcomes Coef	Plus quality of GDS job Coef	SE	z
Sex						
	Male					
	Female	-0.06	-0.06	-0.05	0.01	-6.2
Field of study						
	1 Natural and physical sciences	-0.02	-0.01	-0.01	0.01	-0.7
	2 Information technology	0.05	0.04	0.03	0.02	1.5
	3 Engineering and related technology	0.11	0.10	0.06	0.01	4.2
	4 Architecture and Building Agriculture, Environmental and	-0.01	-0.01	-0.01	0.02	-0.6
	5 Related	-0.07	-0.06	-0.05	0.03	-1.6
	6 Medicine and related	0.00	0.00	-0.01	0.01	-1.2
	7 Education	-0.05	-0.05	-0.06	0.02	-3.6
	8 Management and commerce					
	9 Society and culture	-0.02	-0.02	-0.01	0.01	-0.7
	10 Creative arts	-0.10	-0.09	-0.07	0.01	-5.4
University grouping						
	1 Group of Eight					
	2 Australian Technology Network	-0.06	-0.06	-0.04	0.01	-4.8
	3 Innovative research universities	-0.08	-0.08	-0.05	0.01	-5.5
	4 Regional	-0.08	-0.08	-0.05	0.02	-2.9
	9 Ungrouped	-0.08	-0.08	-0.05	0.01	-5.4
Level of course						
	Pass bachelors					
	Honours	0.03	0.03	0.02	0.01	1.8
GDS outcome						
	1 Full-time employment		0.08	-2.93	0.22	-13.3
	2 Full-time study		0.05	0.05	0.01	5.1
	Other					
In (full-time GDS salary)				0.06	0.02	2.8
In (average occupational weekly salary)				0.33	0.02	15.9
Constant		7.41	7.35	7.33	0.01	693.8
Sample size		3965	3919	3532		
R squared		0.124	0.146	0.19		

The general pattern of the results closely follows those of Table 10. Clearly, the outcomes at the GDS have an important influence on the quality of job at the BGS, with those in full-time employment having an average occupational salary around 8% higher than those in neither full-time employment nor full-time study at the GDS. Interestingly, those in full-time study at the GDS also are in better paying occupations than those neither in full-time employment nor full-time study at the GDS (average occupational salary 5% higher). This is a different result to that from the annual salary model where there was little premium for this group; perhaps the differing result is explained by the fact that those in full-time study at the GDS will have relatively low work experience at the BGS but their further study has helped them get into 'better' occupations.

We see that the import of the background control variables of gender, field of study, university grouping and level of course become less pronounced when we control for GDS outcomes, and even less pronounced when we control for the quality of the GDS job. However, they still play a role: for example, after we control for GDS outcomes and the quality of the GDS job, the average occupational weekly wage (for full-time workers) is 5% lower for females; 7% lower (than management and commerce) for the creative arts and 6% higher (than management and commerce) for engineering and related technology; around 4-5% higher for Group of Eight graduates; and 2% per cent higher for honours graduates.

Both measures of job quality impact on the average occupational weekly salary. Not surprisingly, the GDS average occupational weekly salary has a bigger effect on the BGS average occupational weekly salary than does the GDS annual salary – the opposite situation compared to the effects on the BGS annual salary.

We also see that the impact of a ‘good’ job compared to a ‘bad’ job at the GDS on the BGS average occupational salary is somewhat less than that observed for the BGS annual salary; the expected BGS average occupational salary for an individual observed at the 90th percentile of the two measures at the GDS is around 22% higher than the average occupational salary for an individual observed at the 10th percentile at the GDS. The elapse of three years does tend to blur the impact of an initial ‘good’ or ‘bad’ jobs in the sense that the difference observed at the GDS is much stronger than the predictions for the BGS. We see that at the GDS the 90th percentile jobs have salaries over double (according to the annual salary measure) and about 70% higher (according to the average occupational salary measure) than for the 10th percentile jobs, while the predictions for the BGS conditional on the quality of the GDS job are margins of 45% and 22% respectively. That is, the impact of the GDS job does attenuate over time but it still quite strong after three years.

The models we have fitted in this last section are conditional on the sample being in full-time employment, full-time study or neither at the time of the GDS. The assignment to each of these groups is, of course, not random, which means that the coefficients on the variables may be affected by selection bias. For example, it may be the case that those obtaining full-time employment at the GDS have better degrees or higher aptitude for work than other graduates. To investigate this, we used the classic Heckman (1979) approach, where the first stage is the probability that a respondent has full-time employment at both GDS and BDS, and the second stage models the salary of the BGS job conditional on the quality of the GDS job. For the selection equation we used our standard set of explanatory variables and two variables capturing employment in graduates’ final year of study.⁸ For the second stage model, the BGS salary was modelled as a function of our standard set of explanatory variables, and an auxiliary variable (to correct for selection bias) constructed from the first stage model. The results of this model, omitted here in the interest of brevity, are not substantively different than those from the uncorrected models, indicating that selection bias is not driving our results.

7. Conclusion

The GDS measures outcomes for graduates some four months after course completion. Thus it captures transitions rather than the long-term position of graduates in the labour market. This has led to criticism that the GDS does not provide a reliable picture of the position of graduates in the labour market. This criticism has particular salience at the moment when we have observed a

⁸ The two final-year employment variables appear in the selection model but not the second stage wages model, and thus are used to identify the model. We included these variables in the selection equation but not the wages equation on the basis that employment in the final year of study would have a significant impact on the probability of full-time work at the GDS (and therefore subsequently the BGS), but would be unlikely to have a significant impact on the salary of the job held three years later.

dramatic decline in the proportion of recent graduates in full-time employment since 2008 (see, for example, Karmel and Carroll 2016). This paper scrutinises this criticism by looking at the relationship between GDS outcomes and outcomes three years later, as measured by the BGS.

In summary, outcomes at the BGS are strongly related to outcomes at the GDS. The immediate transition for graduates has long lasting effects. In particular, those in full-time employment at the GDS are much more likely to be in full-time employment three years later. Moreover, those in a 'good' job at the GDS are more likely to be in full-time employment at the BGS, and more likely to be in a better job (where the quality of the job is measured by salary and expected salary).

We also see that full-time study plays a role in transitions. Many of those who go on to further full-time study at the GDS are still in a process of transition at the BGS, with relatively low proportions in full-time employment three years after course completion. However, we also see that sizable proportions of less successful graduates at the GDS (those neither in full-time employment nor full-time study, and those in poorer quality jobs) choose subsequently to undertake further full-time study. This is understandable because the opportunity cost of doing so is lower than their more successful peers. We are not, though, in a position to look at the eventual outcomes of this choice.

The main take-home message from this research is that the GDS outcomes are powerful indicators of how graduates are faring in the labour market in the longer term. While the GDS captures immediate transitions, these transitions have long-lasting consequences. Three years goes nowhere near washing out the early transitions; thus movements in GDS outcomes need to be taken very seriously as indicating real changes in the position of graduates in the labour market. The criticism that the timing of the GDS is too early to judge graduate outcomes is not valid. That first job matters.

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Appendix

Appendix table 1: Effect of GDS outcomes on the probability of being in full-time study at BGS

		Coef	SE	Z
Sex				
	Male			
	Female	-0.04	0.10	-0.4
Field of study				
	1 Natural and physical sciences	2.11	0.19	11.1
	2 Information technology	-0.09	0.49	-0.2
	3 Engineering and related technology	0.74	0.26	2.8
	4 Architecture and Building Agriculture, Environmental and	0.77	0.35	2.2
	5 Related	0.73	0.39	1.9
	6 Medicine and related	1.16	0.20	5.7
	7 Education	-0.22	0.40	-0.6
	8 Management and commerce			
	9 Society and culture	1.01	0.19	5.4
	10 Creative arts	0.96	0.21	4.5
University grouping				
	1 Group of Eight			
	2 Australian Technology Network	-0.39	0.14	-2.8
	3 Innovative research universities	-0.22	0.13	-1.7
	4 Regional	-0.12	0.24	-0.5
	9 Ungrouped	-0.54	0.14	-4.0
Level of course				
	Pass bachelor			
	Honours	0.82	0.11	7.2
GDS outcome				
	FT employed	18.68	4.23	4.4
	FT study	0.90	0.10	8.7
	Other			
Quality of job at GDS				
	ln(full-time salary)	-1.25	0.43	-2.9
	ln(average weekly occupational salary)	-0.85	0.39	-2.2
Constant		-2.72	0.19	-14.2
Sample size	5140			
Pseudo R-squared	0.2001			