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From the Managing Editor

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the CENTRE for
LABOUR MARKET RESEARCH

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From the Managing Editor

Welcome to the first issue of the *Australian Journal of Labour Economics* for 2020. As I announced in the last issue of 2019, we have now moved to producing two issues of the *AJLE* per year to ensure more timely publication. As it happens this has been particularly appropriate given the rapidly changing labour market, industrial relations and education in Australia at this time. Our next issue of *AJLE* will contain articles by labour market scholars on the impact of the COVID-19 crisis on these and other aspects of interest to our readers. No doubt, the effects of the crisis and its aftermath will continue to be the subject of research for some time yet and the *AJLE* will provide quality articles on this as well as other issues in labour economics, economics of education and industrial relations.

As always, this issue of *AJLE* contains articles of interest to scholars and practitioners on a variety of topics but all have important implications for policy. The paper by Andrew Wright and Brian Dollery of the University of New England examines the extent to which financial penalties affect the compliance of the unemployed with requirements for unemployment benefits. They find that higher financial penalties for non-attendance at provider appointments do increase attendance.

The article by Jee Young Lee and myself, from the University of Canberra, provides an analysis of the labour market outcomes of graduates holding a Creative Arts degree. The principle finding is that despite a much greater increase in the number of people graduating with Creative Arts degrees, their labour market prospects are generally good, although the returns are less than for most other degrees. A number of policy issues arising from the findings of the paper are discussed.

Leonora Risse, of RMIT University and Harvard University, has contributed a very interesting paper on the relationship between women's self-confidence and their career advancement. This is important given the widespread advice commonly given to women to show more confidence to advance themselves and narrow the gender gap. She tests the hypothesis that higher confidence is linked to higher likelihood of job promotion but finds this only to be the case for men! Readers will find this paper very interesting and relevant in the debate over closing the gender gap.

The final paper is by Robert Breunig and Diana Hourani of the Australian National University, Sasan Bakhtiari of the Commonwealth Department of Industry, Innovation and Science, and Elisabetta Magnani of Macquarie University. It looks at the relationship between the financial constraints facing firms and the workforce composition of firms with respect to employment of casual and non-casual workers. The findings are that firms which are relatively unconstrained (have better access to credit and equity) are more likely to increase the proportion of casuals in their growing workforce. Financially constrained firms are more likely to use existing workers more intensively rather than expand employment. The results are interesting in that they draw attention to the role of finance in the employment decisions of firms.

I hope you enjoy reading the articles in this issue and we look forward to bringing you the next issue shortly.

Phil Lewis
Managing Editor

The impact of varying penalty values on compliance with unemployment payment requirements: An analysis using 2015/16 Australian National Data

Andrew Wright^a University of New England

Brian Dollery^b University of New England

Abstract

Existing empirical research on unemployment payment schemes has demonstrated that financial penalties affect unemployment payment recipients' behaviour. However, limited empirical work exists on the effects of varying penalty values as well as compliance with requirements (as opposed to employment outcomes). In order to address this gap in the literature, this paper examines the extent to which higher-value penalties enhance unemployment payment recipients' compliance with requirements. It does this using a natural experiment under Australian administrative rules, whereby identical recipients can face penalties varying in value by 100 per cent. Those receiving larger penalties were found to be significantly more likely to comply with requirements compared to those receiving smaller penalties. However, contrary to expectations, no evidence was found supporting earlier evidence that women respond more strongly to penalties than men.

JEL Codes: J68, J65, I38

Keywords: Compliance; Financial penalties; Unemployment Assistance; Welfare Policy

We acknowledge the Australian Department of Education, Skills and Employment for providing access to the administrative data necessary to undertake this analysis. Andrew Wright also acknowledges financial support through the Australian Government Research Training Program Scholarship.

1. Introduction

Notwithstanding the ubiquity of unemployment payment systems internationally, only a limited number of empirical studies have examined the effect of unemployment penalties on compliance with payment requirements, as opposed to employment outcomes. This represents a significant gap in the empirical literature.

A key reason that penalties exist is to encourage people to comply with their requirements, such as participation in active labour market programs or public employment services (Langenbucher 2015). While the end goal of payment requirements may be to increase employment, the extent to which policies designed to increase compliance with requirements are effective is important in its own right. For example, in Australia, over the 2017-18 financial year, approximately \$1.7 billion was spent by the Australian government on providing and monitoring the requirements with which jobseekers need to comply (Department of Jobs and Small Business 2019). This is over 10 per cent of the value paid on unemployment payments themselves (approximately \$15 billion was spent on payments which may require participants to meet requirements (Department of Social Services 2019)). If policies designed to incentivise compliance with requirements do not achieve their intended purposes, this raises significant questions about the optimum design of these policies and requirements themselves. Furthermore, a central reason for unemployment payment requirements in Australia and elsewhere has been to buttress public support for unemployment payments (Disney *et al.* 2010). Thus, empirically investigating the effects of incentives encouraging unemployed persons to meet their requirements is important to inform future policy development.

The present paper seeks to partially address this gap in the literature by empirically examining the extent to which higher value income support penalties motivate Australian jobseekers to comply with payment requirements. Optimal job search models, including welfare penalties (see, for instance, Van den Berg *et al.* 2004; Abbring *et al.* 2005 and Boone *et al.* 2007) predict that the presence of unemployment payment penalties for not sufficiently looking for work increase jobseekers' optimal level of job search intensity and speed their transition into employment. In an Australian context, where jobseekers can be penalised for not attending appointments with employment service providers, higher penalties should result in higher levels of attendance.

While theory would suggest that if jobseekers are aware of penalty arrangements, this should lead to their changing their behaviour before facing financial penalties, multiple studies find that jobseekers change their behaviour following application of a penalty (see, for example, Arni *et al.* 2012; Svarer 2011 and Bookmann *et al.* 2014). There is also evidence that this effect is greater for women than men (Abbring *et al.* 2005; Van der Klaauw and Van Ours 2013).

In the context of the Australian unemployment payment system, this suggests that higher-value penalties will result in higher future appointment attendance - and that a greater effect will be observed for women.

These expectations are examined using a propensity score matching approach, administrative data and a natural experiment. This natural experiment is created by administration procedural rules, whereby two identically behaving jobseekers can have a penalty – termed a Provider Appointment Report (PAR) – varying in value by 100 per cent based on factors outside of their control. These penalties apply for non-attendance at compulsory appointments with private employment service providers and are calculated as 10 per cent of the person's payment rate multiplied by the number of days until jobseekers attend re-engagement appointment. As we shall see in section four, administrative arrangements mean that the penalty value is outside of the control of both jobseekers and providers. This arrangement has the effect of controlling for selection effect factors of who receives higher value payment penalties (such as those discussed in Van den Berg *et al.* 2004; Lalive *et al.* 2005 and Svarer 2011). This allows for unbiased estimates of the effect of changing penalty values on jobseekers' behaviour.

The data used for this study includes information on jobseeker characteristics that determine eligibility for employment services and unit-level information on 1.1 million jobseekers' attendance at 11.43 million appointments between 1 October 2015 and 30 September 2016.

The paper is divided into five main parts. Section two provides a synoptic review of the extant empirical literature. Section three offers a brief description of the Australian unemployment payments institutional environment by way of background. The empirical methodology employed in the paper is set out in section four. Section five presents the empirical findings of the analysis. The paper ends with some brief concluding remarks in section six on the significance of our empirical findings.

2. Empirical evidence

Existing empirical evidence has established a relationship between penalties and employment entry. For example, Abbring *et al.* (2005) examined Dutch social security data on sanctions during unemployment insurance spells beginning in 1992 and found sanctions significantly raised re-employment rates and that this effect was greater for women. Looking at all industries they found penalties increased the hazard of re-employment by 58 per cent for men and 67 per cent for women. However, they found that this effect differed by industry with re-employment hazards increased by 61 per cent for men in the metal and 36 per cent in the banking industry, compared to 98 and 85 per cent for women in those industries respectively. Abbring *et al.* (2005) also found reducing benefits appears less important than monitoring and threat of further more severe sanctions. In an additional study of Dutch benefit recipients, Van der Klaauw and Van Ours (2013) found that benefit sanctions increased the rate of exit from payment by 21 per cent for men and 47 per cent for women.

Similarly, a study by Arni *et al.* (2012) found Swiss jobseekers' job finding rate and exit from benefits increases after the application of a sanction. However, they also established that warnings of a penalty (without application) increased the job finding and exit rate. This echoed the findings of an earlier Swiss study by Lalive *et al.* (2005).

While these studies and others show jobseekers respond to penalties, there is less evidence regarding the effects of changing penalty values. While Van den Berg *et al.* (2004) found that sanctions more than double the transition rate from unemployment (an increase of 140 per cent) they also found that this does not appear to vary much depending on penalty magnitude. They contend that any financial effect of increased penalty values could be dominated by non-financial considerations. However, they also stress that - unlike selection problems of whether a penalty is imposed - they are unable to control for selection of which penalty value is applied.

Some empirical research has shown stricter application of penalties can increase the rate jobseekers move into employment. Bookmann *et al.* (2014) found that German welfare agencies that applied penalties at a higher than average rate were found to result in significant increases in the likelihood of jobseekers finding work for all studied six months after a penalty, ranging between 24 and 58 percentage points. Conversely, Taulbut *et al.* (2018) found only a short-term effect on exit from payment to employment due to higher sanction rates.

It should be stressed that no existing studies were found that specifically examined the effect of varying penalty values on jobseekers' compliance with their requirements, such as attending interviews.

Questions in existing empirical research to be considered in the current study

A problem for empirical estimation that has been raised in existing evaluations of active labour market programs or incentives associated with unemployment benefits is selection effects (Card *et al.* 2010, Carling *et al.* 2001). Similarly, Abbring *et al.* (2005) and Griggs and Evans (2010) argue that sanction or penalty application is not random, and those who have been penalised may have other characteristics associated with higher penalty likelihood that may lead to jobseekers facing a penalty. Indeed, Wu *et al.* (2006) found those least able to succeed in the labour market are most likely to be sanctioned. Many studies have accounted for these effects by modelling the process of receiving a penalty, as well as the outcome (see, for example, Van den Berg *et al.* 2004).

A further concern for analysis identified in the empirical analysis of welfare penalties is differing administrative arrangements following penalties. This could be explicit, such as in the Dutch system where jobseekers are more closely monitored following the application of a penalty (Van den Berg *et al.* 2004 p. 213) or based on revised welfare agency expectations of previously penalised jobseekers. Several studies have shown increased monitoring of jobseekers can significantly affect their behaviour (for instance McVicar 2010; Borland and Tseng 2007 and Klepinger *et al.* 2002).

As we noted earlier, in this paper we employ a natural experiment whereby recipients of higher or lower penalties are otherwise treated identically – with Australian administrative arrangements surrounding a one-day or two-day PAR penalty identical. This should ensure these potential effects will not unduly influence our results.

3. Institutional arrangements

Australian payments for the unemployed are relatively unusual internationally in that non-time-limited support is provided at a flat rate, irrespective of previous work history. These payments are provided from general revenue to anybody meeting eligibility criteria and complying with other requirements. Recipients need not have previously worked and rates do not depend on previous earnings (Australian Government 2018). In addition, payments are not time limited. In contrast, most OECD countries primarily provide unemployment support through insurance schemes, with time-limited support dependent on contributions made into the scheme (OECD 2012).

To receive payment, Australian jobseekers must look for work and undertake certain activities (Department of Human Services 2018). Requirements vary according to individuals' particular circumstances, such as age, assessed work capacity, caring responsibilities and the employment service they are required to participate in (Australian Government 2018A). However, unlike most countries, these requirements are not set and enforced by public agencies, but instead by contracted employment services providers (within guidelines set by the national government). Australia is also the only OECD country where employment services are fully privatised (OECD 2012).

The vast majority (94 per cent) of Australian jobseekers are assisted through the program titled 'jobactive' (Australian National Audit Office 2017). The current study will examine these jobactive jobseekers. Under jobactive, providers' activities are regulated through contract, and they are generally responsible for helping jobseekers meet their requirements, look for work and become job ready. They do this by providing assistance with résumé writing, targeted training, support and interview preparation. Providers also work with local employers and refer jobseekers to particular labour market opportunities (Department of Employment 2016).

Providers of jobactive services are paid an administration fee for each jobseeker on their caseload with larger payments for those who find work or enter full-time education (and leave servicing). These payments are also generally higher for those with more barriers to work and longer unemployment duration and in regional areas (Australian Government 2015).

If job seekers do not meet their requirements, then their payment may be affected. In the present context, over the period covered by our data - 1 October 2015 to 30 September 2016 - where jobseekers did not attend compulsory appointments with their provider without a valid reason, providers could elect to recommend a penalty be applied. The penalty is referred to as a PAR and it is generally valued at 10 per cent or 20 per cent of jobseeker's fortnightly payment. PARs were introduced from July 2015 and ceased in most of Australia on 1 July 2018 (The Parliament of the Commonwealth of Australia 2018).

Use of PARs was unusual. This is because providers have a number of other options for re-engaging jobseekers who do not attend appointments. For instance, providers could suspend a jobseeker's payment (paused with back pay) until they re-engage, without recommending further penalty (Department of Jobs and Small Business 2017).

In terms of the penalty application process, when jobseekers do not attend appointments, their payment is temporarily suspended until contact is made with the jobseeker. The provider then determines if jobseekers have a valid reason for missing their appointment. Payment remains suspended until jobseekers attend a re-engagement appointment, at which point jobseekers are generally back-paid suspended payments. However, providers may elect to impose PAR penalty.

In order to apply a PAR, an appointment must be available within the next two business days or the suspension ends (and no penalty is applied) (Department of Jobs and Small Business 2017). Where a PAR is applied, if jobseekers attend a re-engagement appointment with the provider (a) the next business day, the penalty is 10 per cent of their fortnightly payment, and (b) two business days later, the penalty is 20 per cent of their payment. Jobseekers cannot choose when their appointment will be offered and providers must formally notify jobseekers several days in advance of regular appointments (Department of Jobs and Small Business 2017). This means that appointment availability the next business day is determined prior to jobseekers' non-compliance, and at the time of booking the re-engagement appointment neither jobseekers nor providers have control over re-engagement appointment availability (and therefore whether the jobseeker receives a one-day or two-day PAR).

These arrangements mean two jobseekers in the same circumstances behaving identically could have penalty values varying by a factor of 100 per cent based purely on factors outside their or their providers' control. This enables us to determine if there is an effect from higher penalty values on compliance with requirements and if that effect will be sustained.

If jobseekers do not attend a scheduled appointment within two business days (without a good reason), their penalty continues to increase until they actually attend a subsequently scheduled appointment. However, as the jobseeker has deliberately not attended the appointment that was available to them, their penalty value is within their control. Accordingly, PAR penalties of longer than two days are excluded from the current study.

It could be argued that because the difference in penalty for a one or two-day PAR is relatively small in absolute terms (a difference of \$54.60 for a single childless recipient aged over 21), there is minimal financial impact for individuals. However, for Australian unemployment payment recipients, this likely represents a significant sum. This is because eligibility criteria for payments include reductions based on personal, partner and (for those aged less than 22) parental income. In addition, payments also have waiting periods to ensure that jobseekers draw on their own resources before taxpayer-funded support (Australian Government 2018A). Furthermore, payment rates are deliberately set to act as a short-term safety net that is not an 'attractive or viable' alternative to paid work (Australian Government 2012 p. 26). Indeed, the maximum fortnightly rate of basic payment for a single, childless recipient aged over 21 as at March 2019 is \$555.70 (Department of Human Services 2019). This is less than 40 per cent of the national minimum wage, which is \$740.80 per week (Fair Work Ombudsman 2019). These arrangements contribute to Australia having the most highly targeted welfare system in the OECD in terms of assistance received by the poorest 20 per cent of the population relative to the richest 20 per cent (Whiteford 2010). In addition, these

arrangements mean that only around one third of those unemployed actually receive unemployment payments (Australian Bureau of Statistics 2014), despite the fact that all those willing to meet requirements and with financial resources below relevant thresholds may receive payment.

The eligibility criteria, payment rates, means testing and waiting periods have the combined effect that jobseekers receiving unemployment payments tend to have very limited other financial support available. This would likely affect the responsiveness of jobseekers to varying penalty levels. Further, as PAR recipients typically have been receiving these payments for a long period (median unemployment duration is 21 months), it is likely that any PAR penalty recipients have exhausted any other available means of financial support. This implies that any financial penalty affecting jobseekers receiving Australian unemployment payments is likely to have a strong financial impact.

4. Empirical strategy

As we have seen in section 3, under Australian Government administrative arrangements, if jobseekers have a PAR penalty applied the value of that penalty can vary by 100 per cent for reasons outside of the control of jobseekers or their providers. We use this administrative arrangement to test whether receiving a two-day PAR penalty rather than a one-day PAR penalty increases the likelihood of jobseekers complying with their requirement to attend appointments with their provider. We use Propensity Score Matching (PSM) to control for any systematic relation between jobseeker characteristics and whether they received a one or two-day PAR penalty.

Because both the one-day and two-day PAR groups have experienced a penalty - and are thus non-compliant in the same way and selected to receive the same type of penalty - this overcomes any selection bias based on who is selected to receive a penalty. Furthermore, since the same administrative processes occur, potential behavioural responses due to differences in post-penalty monitoring are unlikely to exist.

Data description

As part of prior efforts by the then Department of Jobs and Small Business, data was extracted from administrative systems. This data was employed in the current analysis and included unit-level data on 1.1 million jobseekers' attendance at 11.43 million jobactive appointments between 1 October 2015 and 30 September 2016. However, to compare the effect of varying penalty values, we examine only those jobseekers who faced a one or two-day PAR penalty. Jobseekers who did not face a penalty, or whose penalty value was within their control (i.e. greater than two days), were excluded. Over the period, jobseekers faced the application of a one or two-day PAR penalty over 11,000 times.

As mentioned, our outcome variable of interest was whether jobseekers complied with their requirement to attend compulsory appointments with their providers. This needed to be derived from data that providers are contractually required to record for each scheduled appointment on the day of the appointment (Australian Government 2015). Specifically, whether jobseekers:

- attended the appointment;
- did not attend, but had a valid reason;
- had no valid reason, but the provider is exercising discretion in not recommending a penalty; or
- did not attend and did not have a valid reason.

Beginning with every PAR and appointment in between 1 October 2015 and 30 September 2016, records were sorted by unique jobseeker and by date. For every PAR, the outcome for their next appointment not required to re-start their payment was derived (since payments are suspended until jobseekers attend a re-engagement appointment). This was recorded in binary terms: one if jobseekers attended their subsequent appointment or had a valid reason for not attending their appointment and zero if jobseekers did not attend without valid reason, regardless of whether providers decided to use discretion and not recommend a penalty apply. This is because jobseekers' behaviour is the key variable of interest, and if jobseekers had a valid reason for not attending, then they are not being non-compliant. Likewise, if jobseekers do not attend their appointment without a valid reason, they are being non-compliant, regardless of how the provider elects to deal with that non-compliance.

The data also includes information on jobseekers' characteristics such as the number of previous compliance events, months unemployed and demographic factors, including age, gender, and some vulnerabilities. Unfortunately, variables are only included in the data if they are used for assessing eligibility for payment, servicing or compliance decisions. For example, no data is included on whether a jobseeker has exited payment during the period, although this can be inferred from whether or not the jobseeker had a subsequent appointment scheduled. Although not statistically significant, those who receive a two-day PAR are less likely to have a subsequent appointment scheduled than those who received a one-day PAR (9.2 per cent of those who receive a two day PAR do not have a subsequent appointment scheduled, compared to 8.3 per cent of those who receive a one-day PAR). While the main question of interest in this study is the effect of penalties on compliance with behaviour for those who continue to receive unemployment payments, this is a potential source of bias in the analysis.

In addition to the length of the PAR, and the outcome variables, the following other variables were included:

- The count of jobseekers' non-compliance events as at the PAR application;
- The count of appointments as at the PAR application;
- The number of months the person has been unemployed as at the PAR application;
- If the person is in the Work for the Dole Phase and has Annual Activity Requirements (additional requirements that usually commence after one year on payment for six months at a time);
- The jobseeker's age;
- If jobseekers are recorded as a parent, and the age of their youngest child;
- If jobseekers are recorded as having a disability or illness resulting in an assessed partial work capacity of less than 30 hours per fortnight;
- If jobseekers are recorded as from a culturally or linguistically diverse (CALD) background;
- If jobseekers are recorded as having recorded previous criminal convictions;
- If jobseekers are male or female;
- If jobseekers are recorded as at risk of homelessness;
- If jobseekers are under the age of 22 (this results in a lower payment rate)

Jobseekers' characteristics are recorded as they are specified in administrative records at the time of the appointment that ends the penalty. The exception to this is the number of previous non-compliance events, which is recorded in the extract of the penalty record.

Variable balance

Balance in observable characteristics between those who faced a one-day PAR and those who faced a two-day PAR supports the proposition that neither providers nor jobseekers control what type of penalty they receive. For the non-categorical variables in our data, no significant relation between treatment assignment (whether the person received a one or two day PAR) was found prior to matching and t-tests found no significant differences in the means which are very similar, as can be seen in Table 1. Visual examination of the proportionate frequency for each non-categorical variable also shows very similar profiles, and Kolmogorov-Smirnov tests found no significant differences in the distribution.

Table 1: Means of non-categorical variables

	<i>1-day PAR</i>	<i>2-day PAR</i>	<i>p value</i>
Age	28.51	28.66	0.38
Breach sequence	28.19	28.28	0.83
Appointment sequence	20.61	20.58	0.89
Months unemployed	32.82	33.39	0.38

Table 2 shows that the categorical variables were also well balanced between groups. A chi square test was used to assess any relation with the treatments, followed by Cramer V tests to examine the strength of any relationships (as described in McHugh 2013). Significant relationships were found only between the likelihood of facing either a one or a two-day PAR and whether a person is an ex-offender or is from a culturally and linguistically diverse background. However, for both, Cramer's V tests show this relationship is very weak (0.017 and 0.025 respectively). Additionally, variable balance was also assessed by logistic regression of assignment to the treatment group on other variables and compared via likelihood ratio test to logistic regression excluding other variables (as described in Hansen and Bowers 2008). The null hypothesis that the model is better without the inclusion of additional variables was not rejected, suggesting no significant relationship between variables and treatment assignment.

Table 2: Categorical variable balance

	<i>1-day PAR</i>	<i>2-day PAR</i>	<i>p value</i>
Per cent parent	1.6	1.4	0.47
Per cent with an assessed partial capacity to work	1.4	1.3	0.47
Per cent assessed as at risk of homelessness	19.0	18.5	0.48
Per cent male	65.5	66.0	0.54
Per cent with Annual Activity Requirements	45.2	46.5	0.14
Per cent ex-offender	32.0	30.4	0.05
Per cent from culturally and linguistically diverse background	11.5	13.2	0.00

On the basis of the argument that a one-day or two-day PAR is predominantly due to chance, and that there is some (mixed) evidence of no systemic relation between treatment assignment and covariates, an argument could be made that treatment efficacy could be compared through a straight comparison of attendance rates following a one or two-day PAR. This results in significant increases in attendance at the next appointment following a two-day PAR - 2.25 percentage points (average attendance at the next appointment was 60.32 per cent for those who received a one-day PAR and 62.57 per cent for those who received a two-day PAR). However, this is not our preferred method as assignment to treatment is not truly random and there may be a

relationship between treatment and some variables that could potentially be correlated with treatment, which would make this method invalid. For example, although neither providers nor jobseekers have control over appointment availability, an unscrupulous provider who wanted a more non-compliant jobseeker to face a larger penalty could lie and tell them no appointment was available the next day (so they faced a two-day PAR rather than a one-day PAR). While this is unlikely, it is theoretically possible. Additionally, as mentioned above a very weak relation was found between whether somebody received a one or two-day PAR and whether they were an ex-offender or from a culturally or linguistically diverse background.

PSM method

To account for any potential systematic relation between penalty value and jobseeker characteristics, a PSM approach using nearest neighbour matching was adopted for this study. Examples of the use of PSM in studying unemployment payments include Borland and Tseng (2007), Schnieder (2008) and Dengler (2019). For completeness, we present both average treatment effect (where each subject is matched with a subject with the opposite treatment with the closest propensity score) and the average treatment effect on the treated (where matches are only made for treated subjects)

As propensity scores only predict allocation to treatment, some scholars have argued that over-specification is not a problem (see, for instance, Filho *et al.* 2012). Indeed, inclusion of too many variables does not result in bias, although it does increase the variance (Caliendo and Kopenig 2008). While there is a theoretical argument for only including variables which predict assignment to the treatment group (Austin 2011), in Monte Carlo simulations testing different PSM model specifications, Brookhart *et al.* (2006) found it preferable to include all variables related to either the treatment assignment or the outcome variable. They suggest this is because there may be statistically insignificant relations between treatment exposure and variables related to outcomes. Accordingly, in the present analysis this approach was adopted, with variables included if there is a theoretical reason to expect that there could be a relation to either treatment or outcome. Other than if the penalty was a one or two-day PAR, retained variables were:

- The count of jobseekers' previous non-compliance events as at the PAR application;
- The number of months the person has been unemployed as at the PAR application;
- The jobseeker's age;
- If the jobseeker has Annual Activity Requirements;
- If the person is recorded as an ex-offender;
- If the person is from a culturally and linguistically diverse background;
- If jobseekers are recorded as having a disability or illness resulting in an assessed partial work capacity of less than 30 hours per fortnight;
- If the person is male;
- If the person is a parent;
- If the person is aged under 22.

The majority of these variables were included due to potential relation to the outcome variable, compliance with the requirement to attend the next appointment. Previous non-compliance is included because jobseekers who have historically been non-compliant are more likely to continue to be so. Similarly, age is included as administrative income support data shows that younger jobseekers are more likely to be non-compliant (Department of Employment 2017).

Jobseekers' duration of unemployment may affect their willingness to comply with requirements as jobseekers would likely consider that there is less benefit of their attending appointments if they have been unemployed long term without appointments assisting their finding work. Additionally, unemployment duration would also be related to the strength of jobseekers' local labour market, which unfortunately is not a variable that we have available in our data.

Whether job seekers have a disability affecting their capacity to work, are parents, or have Annual Activity Requirements all affect the potential intensity of other requirements. Parents and those with a disability affecting their capacity to work generally have the same requirements as other jobseekers, however legislative criteria allow them to choose to instead 'fully meet' their requirements through undertaking 30 hours of paid work per fortnight (Australian Government 2018A). Annual Activity Requirements in contrast are additional requirements that jobseekers need to meet for six months each year – generally after 12 months unemployment (Australian Government (2019)). Additional requirements may affect jobseekers' willingness to attend appointments due to the cumulative difficulty of meeting requirements.

Similarly, whether jobseekers are aged under 22 is included as an additional variable because these jobseekers receive Youth Allowance which is lower than the Newstart Allowance older job seekers receive (Newstart was renamed JobSeeker payment from March 2020). Under the optimal job search models discussed in the introduction, a lower payment rate would be expected to affect their willingness to meet requirements such as appointment attendance.

The reason jobseekers' sex is included is because of the previous empirical findings of Abbring *et al.* (2005) and Van der Klaauw and Van Ours (2013) that women are more likely to move off payment following application of a penalty than men. This would be expected to imply that men are less likely to increase their compliance following a penalty relative to women.

Finally, variables related to whether a jobseeker was an ex-offender or from a culturally or linguistically diverse background were included due to the evidence of a weak relation to treatment assignment, discussed above. Potentially whether somebody is from a culturally or linguistically diverse background could delay their ability to attend an appointment in a small number of cases if they needed to arrange an interpreter. There is also possibility that these two variables could affect jobseekers' likelihood of finding employment, which may affect their likelihood of choosing to attend an appointment with their provider.

Assumptions

For PSM to be valid, two assumptions must hold: (a) conditional independence (or strongly ignorable treatment assignment (Rosenbaum 1984)) and (b) common support (or overlap) (Caliendo and Kopenig 2008). Conditional independence refers to the assumption that all variables that affect both treatment assignment and outcome are observed and common support refers to the assumption that for any given value of the variables, a person could either be treated or not (Schnieder 2008).

Conditional independence

While variables are observed to control for many factors which could affect whether or not a person could attend an appointment one or two business days later, there remains a risk that other non-observed variables could affect whether a person would receive a one-day or two-day PAR, such as lack of transport availability or some other factor affecting jobseekers' ability to attend appointments. However, there is no reason to suspect that this might be the case due to the lack of control that jobseekers and providers have over appointment availability, and the proximity in time of appointments resulting in one or two-day PARs. For example, while we unfortunately do not have data on jobseekers' transport availability, this is unlikely to change from one business day to the next. Bus timetables would be expected to be the same, and jobseekers would be no more or less likely to have access to their own transport etc. Similarly, ideally, we would have data on the strength of the local labour market. However, this is unlikely to change in between appointments – or affect the likelihood of a one or two-day PAR.

Further, in the event that there is any unobserved characteristic of the jobseeker that makes them less likely to attend an appointment the next business day (and thus more likely to receive a two-day PAR), then this would also be expected to make the person less likely to attend a subsequent appointment. Any (unlikely) potential bias from unobserved characteristics would thus be expected to understate the effects of stronger penalties on future compliance.

Additionally, whenever a circumstance outside of an individual's control affects jobseekers' ability to attend a requirement, providers are required to record that the jobseeker had a valid reason –so jobseekers would face neither a one or two-day PAR (Department of Jobs and Small Business 2017). Circumstances such as lack of transport availability, caring responsibilities, illness etc. would all be considered as valid reasons for not attending appointments.

Common support

The common support condition requires that for a given set of variables there is not perfect predictability, and it is possible for the subject to either be in the treatment or control group (Caliendo and Kopenig 2008). In the current analysis, the predicted propensity scores indicate that it is possible for all subjects to be in either the treatment or control group. Further, the estimated propensity score densities are very similar for both those experiencing a one-day PAR, or a two-day PAR.

Post-matching covariate balance

To ensure comparability of treatment and control groups, and that PSM models are appropriately specified, the balance of the covariates in the matched sample should be evaluated (Zhang *et al.* 2019). Covariate difference between the matched treatment and control groups is commonly assessed through examination of standardised difference (Austin 2009; Zhang *et al.* 2019). Negligible covariate difference is generally accepted as being indicated by an absolute standardised difference of less than 0.1 (Staffa and Zurakowski 2018; Austin 2009).

5. Results

Estimates of average treatment effect show jobseekers to be 2.4 percentage points more likely to attend their next appointment, significant at the 0.05 level. Estimates of the average treatment effect on the treated show jobseekers to be 3.6 percentage points more likely to attend their next appointment, also significant at the 0.05 level. However, for both estimations the confidence intervals are very large – as can be seen in Table 3. For reference, total average attendance at the next appointment is 61.2 per cent, 60.3 per cent for those who received a one-day PAR and 62.6 per cent for those who received a two-day PAR.

Table 3: PSM average treatment effect on compliance at next appointment

	<i>Coefficient</i>	<i>Standard Error</i>	<i>p value</i>	<i>95% Confidence Interval</i>	
Average Treatment Effect	0.024	0.011	0.023	0.003	0.045
Average Treatment Effect on the Treated	0.036	0.012	0.003	0.012	0.060

n= 11,515 (6,606 one-day PARs, 4,809 two-day PARs)

Sequential analyses were also performed on male and female job seekers, however with no conventionally significant results – as shown in Table 4 and 5 respectively. Given the significant findings for the entire cohort, presumably this is due to the high variance of our matching models. Notwithstanding these issues, our results show no evidence for a stronger effect of higher value penalties on women than men.

Table 4: Male PSM average treatment effect on compliance at next appointment

	<i>Coefficient</i>	<i>Standard Error</i>	<i>p value</i>	<i>95% Confidence Interval</i>	
Average Treatment Effect	0.014	0.013	0.299	-0.012	0.040
Average Treatment Effect on the Treated	0.029	0.015	0.058	-0.001	0.060

n= 7,576 (4,391 one-day PARs, 3,185 two-day PARs)

Table 5: Female PSM average treatment effect on compliance at next appointment

	<i>Coefficient</i>	<i>Standard Error</i>	<i>p value</i>	<i>95% Confidence Interval</i>	
Average Treatment Effect	0.021	0.018	0.247	-0.014	0.055
Average Treatment Effect on the Treated	0.012	0.020	0.557	-0.028	0.052

n= 3,939 (2,315 one-day PARs, 1,624 two-day PARs)

However, a weakness of the PSM approach is that it provides average treatment effects, and not coefficients for each variable in the same way as regression would. As a result, while the high variances of our models may obscure any effect, if there is a truly stronger effect for women than men more generally, it is also possible that it may be hidden due to correlations between sex and other variables in our analysis. One relation often raised is that women are more likely to be primarily responsible for raising children. This is also true in our sample, although parents are quite unlikely to receive a PAR penalty (0.5 per cent of males in the sample are recorded as parents, compared to 3.5 per cent of females). Relations between sex and other variables in our sample are that women generally have fewer previous instances of non-compliance, and are less likely to be recorded as an ex-offender, from a culturally and linguistically diverse background, or having an assessed partial capacity to work. Similarly, although women are equally likely to receive a one or two-day PAR, they are less likely to receive a PAR in the first place. Women are responsible for only 34 per cent of our sample, despite accounting for half of unemployment payment recipients (Department of Social Services 2019a).

6. Conclusion

Our results support previous empirical work showing that penalties can change jobseekers' behaviour after application of penalties. However, our results do not support the empirical findings of Abbring *et al.* (2005), and Van der Klaauw and Van Ours (2013) that women are more likely to move off payment following application of a penalty than men. However, this is likely due to the high variances of our matching models, the relatively small sample size of women relative to men, and potentially selection effects on who receives a PAR in the first place.

Our results build on earlier empirical work in three ways by demonstrating:

1. that higher value penalties can result in higher levels of behavioural change than lower value penalties;
2. that penalties can motivate change in compliance behaviour, not just employment outcomes; and
3. that penalty values affect jobseekers' behaviour in the unique Australian income support and employment services system.

The prediction that higher value welfare penalties for non-attendance at compulsory provider appointments will result in higher future attendance is thus supported by the results.

While our findings demonstrate that changing penalty values influence Australian jobseekers' behaviour, it could be argued that these penalty values are too low to ensure 'adequate' compliance with requirements for this cohort. This is because a doubling in penalty value resulted in an estimated 2.4 or 3.6 percentage point increase in the likelihood of jobseekers attending appointments. This is from a low base of 60.3 per cent attendance following a one-day PAR – significantly below the 79 per cent compliance rate observed by all jobseekers in the 2016-17 financial year (Department of Employment 2017).

While PARs are likely significant penalties for jobseekers due to the low financial reserves available for Australian unemployment payment recipients, and the fact that a PAR represents either 10 or 20 per cent of these jobseekers' fortnightly income, PAR recipients are likely more resistant to behavioural change than regular jobseekers. This is because PAR penalties require recommendation by providers, and they are more likely to recommend these penalties for persistently non-compliant jobseekers, who would be expected to have more entrenched behavioural patterns. Other cohorts may respond more strongly to penalties of this value.

In conclusion, our results support the proposition that changes to penalty values can be an effective policy lever for increasing jobseekers' compliance with their requirements. While our results do not find evidence supporting earlier empirical work showing sex differences in penalty responses, an implication of these earlier findings is that to elicit a desired level of behaviour change through penalties it is important for policymakers to consider the demographics of those likely to be penalised.

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The labour market outcomes of Australian Creative Arts degree holders

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Abstract

The number of university places in Creative Arts degrees has risen at a much faster rate than for other degree programs. This represents a big increase in investment in Creative Arts education. This is despite the previous evidence that in 2006 for most Creative Arts graduates the degree was not a financially worthwhile investment. Since then a number of important changes have occurred affecting the graduate labour market which might have been expected to make investment in Creative Arts education even less profitable. This paper examines the careers of those having bachelor's degrees in Creative Arts in 2016. In particular the monetary returns from these degrees under a range of assumptions are calculated. The results show that for the average person, the returns to these degrees are positive although the private rate of return compares unfavourably with most alternative degrees. Potential reasons for this turnaround and implications are discussed.

JEL Codes: J23, J26, J44, Z11

Keywords: creative arts, university graduates, career paths, economics of education, human capital, rate of return

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1. Introduction

Daly *et al* (2015) using 2006 Census data on university graduates from a number of disciplines found that for Creative Arts graduates the rate of return for the median income earners was negative implying that the degree was not financially worthwhile. The term Creative Arts encompasses a variety of sub-disciplines ranging from visual arts, drama and music to communications and media studies. Furthermore this latter category has quite diverse areas such as journalism, creative writing, marketing and film production.

Since the Daly *et al* (2015) study a number of important developments have occurred in the graduate labour market including the Global Financial Crisis (GFC) and a big expansion in university places under the 'demand-driven' system. In addition, structural and technological change continue to change the mix of skills in demand (Lewis 2015). In particular the biggest increase in demand for skills has been for interactive skills – the ability to relate to customers, employees and fellow workers (Kelly and Lewis 2010, Lewis 2015). This would be expected to have impacted on the demand for graduates from different disciplines depending on the relative intensity of development of interactive skills.

Australia has established policy priorities around increasing and diversifying higher education participation (Bridgstock and Cunningham 2016). Since 2012, Australia has had a 'demand driven system' of enrolments, which has allowed individual institutions to determine the number of students they enrol in bachelor level courses. However, as Bennett (2019) points out, in terms of the benefits from higher education there has been greater focus on access to higher education than on graduate outcomes. There has also been growing debate over the oversupply of graduates and the increasing precarity of employment among graduates; particularly Creative Arts graduates (Stokes and Wright 2012). Given the relatively high growth rate of the creative innovative industries and growth in the creative workforce (Cunningham 2018) the observed outcomes of Creative Arts degrees—precarious and delayed employment and relatively low salary returns (Ball, Pollard and Stanley 2010; Comunian *et al.* 2010; Cunningham and McCutcheon 2018; Pollard 2013) are incongruous.

While the notion of the intrinsic value of higher education may influence the debate around whether creative degrees lead to 'value for money' (Comunian and Brook 2019; Tomlinson 2018), there has also been growing demand for empirical investigations to analyse both their economic and social value. Empirical examinations, using well-established, including Australian Census data (Bennett 2019), can help us to better understand career building pathways among creative graduates and changes over time in the value of higher education participation.

This paper seeks to provide an update on the economic benefits to the individual of pursuing a university degree in Creative Arts given the changes outlined above. An analysis of the career of an 'average' Australian university graduate in the Creative Arts is provided. Here the emphasis is on the labour market experience and economic returns to Creative Arts graduates with a view to comparing the value of a Creative Arts degree with other university alternative courses. The non-monetary benefits of a Creative Arts degree to individuals and society, which are usually assumed to be positive, are beyond the scope of this paper and not, therefore, included. However, we do think the results have implications for government policy and for university funding.

The analysis relies mainly on the data from the 2016 Census of Population and Housing because it provides unit records on every graduate living in Australia.

Two general approaches have been adopted. First, a profile of Creative Arts graduates is used to describe the labour market outcomes of Creative Arts graduates from age 21 years, usually the youngest age of a graduate, up to age 65 years, assumed to be the usual retirement age. Several labour market indicators such as employment status, income and occupation are used to compose the profile. The second approach is to calculate the private rate of return to a university degree. This is a technique well-known to labour economists but not, generally, familiar to non-economists.

Numerous international and country-specific studies have calculated the rate of return to individual's investment in education. The basic idea is that education not only provides consumption benefits to students, but it is also an investment which involves sacrificing income in the present to raise future income. According to the human capital framework time spent in education has the potential to raise future income by enhancing people's skills and raising their productivity. The return from a degree is compared to the return on non-human assets (usually the interest rate) and the return on other qualifications to assets the value of an investment in a particular course, in this case a Creative Arts degree.

An alternative view, that a degree acts as a screening device to employers rather than an increase in human capital, is also considered in the context of the Creative Arts.

The paper is structured as follows. The next section defines the group of people of interest and provides a profile of Creative Arts graduates. This is followed by a description of the rate of return method adopted and the results obtained by applying the approach to Creative Arts graduates. The paper concludes with a discussion of the results and implications for policy.

2. Profile of Creative Arts graduates

For the purpose of this paper a Creative Arts graduate is defined as someone holding a bachelor's degree in the Australian Standard Classification of Education (ASCED) two-digit field of study 10 – Creative Arts (ABS 2001). Degrees in this field are:

Performing arts

Music
Drama and theatre studies
Dance
Performing arts, n.e.c.

Visual arts and crafts

Fine arts
Photography
Crafts
Jewellery making
Floristry
Visual arts and crafts, n.e.c.

Graphic and design studies

Graphic arts and design studies
Textile design
Fashion design
Graphic and design studies, n.e.c.

Communication and media studies

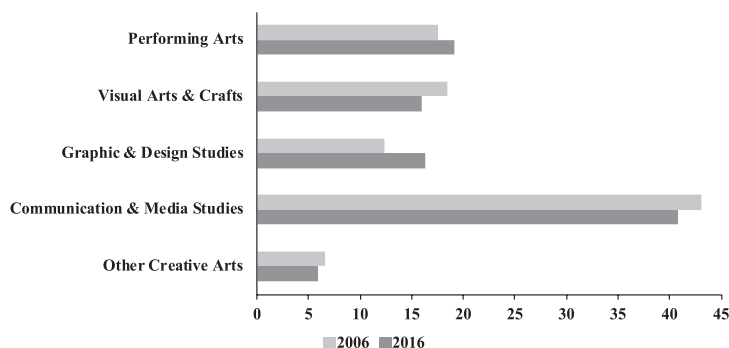
Audio visual studies
Journalism
Written communication
Verbal communication
Communication and media studies, n.e.c.

Other Creative Arts

Creative Arts, n.e.c.

Figure 1 shows that the largest number (about 40 percent) of students are in Communication and Media studies and the mix of graduates by sub-discipline has not changed greatly over the decade.

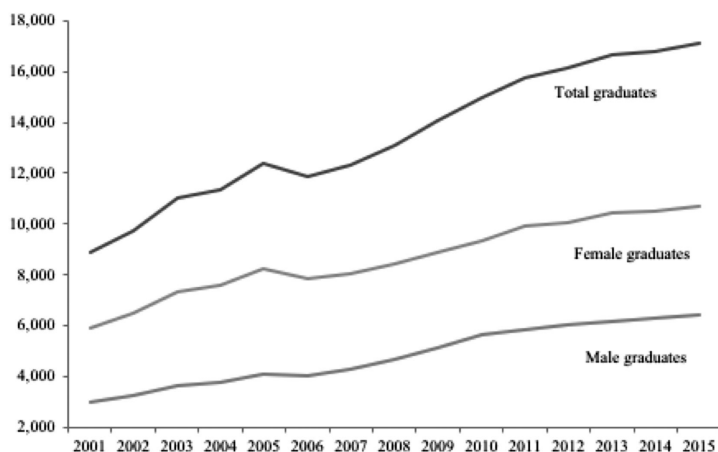
Figure 1: Composition of Creative Arts completions by sub-discipline, per cent, 2006 and 2016



Source: Department of Education and Training, unpublished.

In 2016 there were 79,990 domestic students enrolled in and 17,017 students graduating with a bachelor degree in Creative Arts degree. Of these 62.2 per cent were female compared to 59.3 per cent for all graduates (DET 2017). The demand for Creative Arts courses and, hence the number of completions has been growing over time at a rate greater than the number graduating in all degrees – 92 per cent between 2001 and 2016 for Creative Arts compared to 39 per cent for all graduates– the annual growth rate for males was 5.7 per cent compared to 4.4 per cent for females (DET 2017). Students from high SES backgrounds are more likely while students from low SES backgrounds are less likely to be found in Creative Arts courses than in other degrees (DET 2018).

Figure 2: Completions in Creative Arts degrees



Source: Department of Education and Training (2016), uCube, Higher Education Data.

3. Employment status

According to the 2016 Census, 198,533 people of working age (21 to 65 years) held a degree in the Creative Arts. The gender distribution of all those holding a Creative Arts degree is very similar to that of current new graduates [Table1]. Of all Creative Arts graduates, 51.6 per cent were in full-time employment and 28.8 per cent were in part-time employment. 5 per cent unemployed (were not engaged in either full-time or part-time employment), and 14.5 per cent were not in the labour force. Female graduates had a lower rate of full-time employment compared to male graduates, while part-time employment was higher among females than males. 17.6 per cent of female graduates were not in the labour force, which was double the percentage of male graduates.

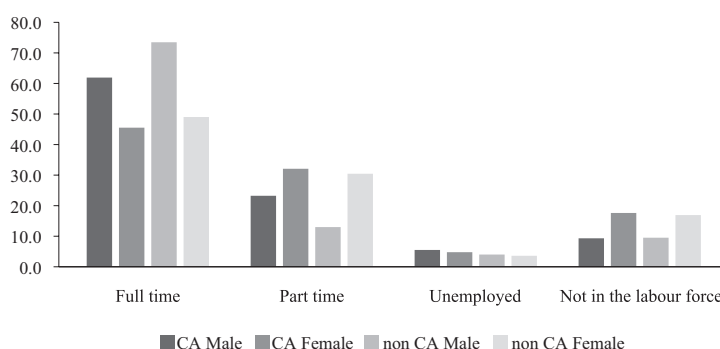
Table 1: Employment status of Creative Arts graduates

Employment status		Number			Per cent		
		Male	Female	Total	Male	Female	All
Employed	full-time	45,546	56,904	102,450	61.9	45.5	51.6
	part-time	17,094	40,094	57,188	23.2	32.1	28.8
Unemployed		4,052	5,970	10,022	5.5	4.8	5.0
Not in the labour force		6,857	22,016	28,873	9.3	17.6	14.5
Total		73,549	124,984	198,533	100.0	100.0	100.0

Source: Census of Population and Housing, 2016, unpublished

Figure 3 shows the labour force status of Creative Arts graduates and other graduates by gender. Of Creative Arts graduates 61.9 per cent of males and 45.5 per cent of females are employed full-time compared to 73.5 per cent and 49.0 per cent, respectively, for other graduates. Therefore, a significantly smaller percentage of Creative Arts graduates are employed full-time than other graduates. While for females, the part-time employment rate is virtually the same for both groups of graduates, about 30 per cent, the rate for males is significantly higher, 23.2 per cent, than that of other graduates, 13.0 per cent. The unemployment rate for Creative Arts graduates is slightly lower than for the graduate labour force as a whole, but for males it is 1.5 percentage points greater for other graduates and 1.2 percentage points for females. There is little difference between the two groups of graduates with respect to the percentage not in the labour force.

Figure 3: Employment status of Creative Arts and all other graduates, per cent



Source: Census of Population and Housing, 2016, unpublished.

In summary, Creative Arts graduates do not appear to have greatly unfavourable labour market outcomes, in terms of unemployment or not in the labour force. However, the incidence of part-time work is more prevalent among male Creative Arts graduates than for other graduates. This supports the anecdotal view, supported by Throsby and Zednick (2010) for example, that, at least for males, some Creative Arts graduates make use of part-time employment to support their artistic pursuits. However, as will be demonstrated later in the paper the number pursuing arts-related occupations form a minority of Creative Arts graduates.

In summary, the distribution of labour force states is somewhat different to that of other graduates, which may be because of differences in demand for the skills that Creative Arts graduates possess (partly through their degree programs) or supply decisions of those graduates who have somewhat different views of paid work and wish to devote time to less marketable arts-related activities. Whatever the reason, it is evident that some Creative Arts graduates experience more time in non-standard forms of employment and thus may obtain less economic benefits than other graduates.

4. Occupation

Of full-time employed Creative Arts graduates, more than half (52.1 per cent) are engaged in professional occupations, followed by management (17.3 per cent) and clerical and administrative occupations (11.1 per cent) [Table 2]. A much higher rate of full-time employment in clerical and administrative occupations was observed among female graduates (14.4 per cent) than male graduates (6.9 per cent). Female Creative Arts graduates are much less likely to be in professional occupations than other female graduates. This is probably due to the high representation of women in nursing and teaching which also makes the proportion of all male degree holders in professional occupations also less than that of female graduates.

Table 2: Occupation of full-time employed Creative Arts and all graduates, per cent

	<i>Creative Arts</i>			<i>Other graduates</i>		
	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Professionals	53.7	50.9	52.1	53.7	60.8	56.9
Managers	16.1	18.2	17.3	23.2	15.7	19.8
Clerical/administrative workers	6.9	14.4	11.1	7.4	12.3	9.6
Sales workers	5.3	6.6	6.0	3.3	2.7	3.0
Technicians/trades workers	9.3	3.3	6.0	5.3	1.9	3.8
Community/personal service workers	4.1	4.9	4.6	3.3	5.3	4.2
Labourers	2.4	1.1	1.7	1.8	1.0	1.5
Machinery operators/drivers	2.1	0.4	1.2	2.0	0.3	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

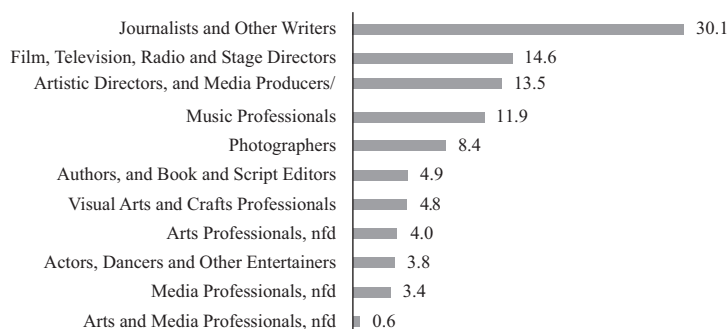
Source: Census of Population and Housing, 2016, unpublished

In most respects the distribution of Creative Arts graduates by major occupation group is not dissimilar to that of other graduates with the possible exception of those employed in the relatively unskilled sales occupations. Although the percentages employed in sales are twice that of other graduates as a percentage of all degree holders in Creative Arts the numbers are quite small.

It can, therefore, be concluded that most Creative Arts graduates are employed in occupations that would be expected of university graduates generally. While it might be thought that Creative Arts graduates are more likely to face mismatch between education and jobs than other graduates, the evidence suggests that Creative Arts degrees equip graduates for many jobs not necessarily directly related to students' main areas of study.

A closer examination of Creative Arts graduates in professional occupations [Figure 4] reveals that only 27 per cent are employed in arts-related professional occupations defined according to the ABS standard classification of occupations.¹

Figure 4: Arts and media related occupations of Creative Arts graduates in professional occupations



Source: Census of Population and Housing, 2016, unpublished

Of these 27 per cent of all Creative Arts graduates who are employed in arts-related occupations, the greatest number (30 per cent of the 27 per cent or 8 percent of all Creative Arts graduates) are employed as journalists or other writers (35 per cent for females and 24 per cent for males). This means that only about 19 per cent of all Creative Arts graduates are employed in other arts related occupations. This is something which needs to be considered by universities when designing curriculums for arts students if the aim of a degree is (partly) to develop skills in demand by the labour market.

The major industries of employment of Creative Arts graduates are professional services, education services and information media and communications [Table 3]. Apart from obvious preponderance of Creative Arts graduates in the last two of these industries the distribution of employment by industry is quite disparate indicating that these graduates are widely spread across the occupational distribution.

1 Arts and Media Professionals, ABS ANZCO

Table 3: Industry of employment, Creative Arts and other graduates, per cent

	<i>Creative Arts</i>		<i>Other</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
Professional, Scientific/technical Services	17.5	15.5	19.0	10.6
Education and Training	14.2	16.1	12.0	24.0
Information Media/telecommunications	12.9	10.3	2.7	1.4
Retail Trade	8.6	11.2	5.2	4.8
Arts and Recreation Services	8.1	6.5	1.4	1.2
Public Administration and Safety	5.9	6.9	9.3	8.6
Accommodation and Food Services	5.7	5.5	3.5	3.0
Manufacturing	5.2	3.4	5.6	2.4
Construction	3.3	1.5	4.7	1.4
Health Care and Social Assistance	3.2	7.0	11.2	27.6
Administrative and Support Services	3.0	3.3	2.4	2.4
Transport, Postal and Warehousing	2.6	1.4	3.9	1.3
Financial and Insurance Services	2.5	3.1	7.6	4.6
Wholesale Trade	2.5	2.5	3.2	1.7
Other Services	2.3	2.9	2.0	1.8
Rental, Hiring and Real Estate Services	1.3	1.6	1.8	1.2
Agriculture, Forestry and Fishing	0.6	0.6	1.2	0.8
Electricity, Gas, Water and Waste Services	0.5	0.5	1.6	0.6
Mining	0.3	0.3	2.1	0.6

Source: Census of Population and Housing, 2016, unpublished

Comparing industry of employment by gender, less prominent gender segmentation was observed among Creative Arts graduates than other graduates. For example, the rate of employment in professional services among male graduates (19 per cent) is almost double that of female graduates (10 per cent), whereas there was no significant difference between genders among Creative Arts graduates with 17 per cent for male and 15 per cent for female. Also, the gender segmentation observable for non-Creative Arts graduates is not evident for Creative Arts graduates. For instance, among non-Creative Arts graduates, education and training; and health care and social assistance are highly gender segmented.

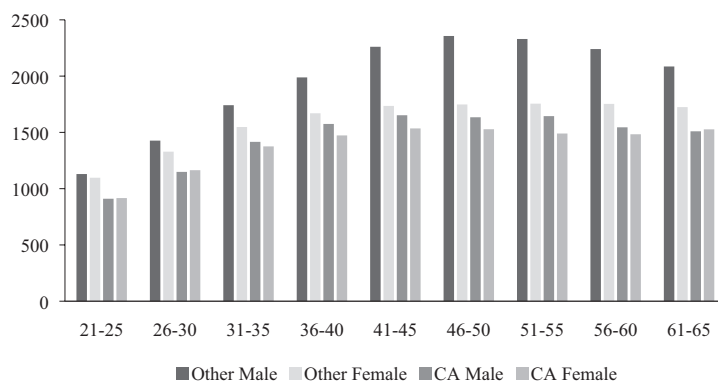
Taken together with the evidence of the occupational distributions noted earlier, what emerges is that the 'non-specific' nature of careers based on a Creative Arts degree mitigates against gender segmentation. This view will be examined later in the paper where we examine salaries of Creative Arts graduates.

5. Earnings

We now turn to the wage outcomes of Creative Arts graduates compared to others. In particular, if the “struggling artist” anecdote is an observable phenomenon then it is necessary to look beyond the labour force status of Creative Arts graduates and to examine their lifetime earnings.

Several important features are noticeable, particularly that Creative Arts graduates earn less at all ages than other graduates [Figure 5]. What is more, the differences in income increase with age. Given that these are incomes of only those employed full-time, differences in income must be due to differences in wages and salaries, not hours worked or labour force status. The value of human capital, both acquired through education and through experience, is clearly less for Creative Arts than for other graduates.

Figure 5: Median income per week, by gender and age, creative artists and other graduates, \$ per week (full-time)



Source: Census of Population and Housing, 2016, unpublished

Differences in the gender wage gap are evident for the two cohorts of graduates. There is a gender wage gap for both sets of graduates but the income differences between men and women is more pronounced for other graduates than for Creative Arts graduates. The gender wage gap for non-Creative Arts graduates increases with age but does not for Creative Arts graduates. In fact, for graduates in Creative Arts in the youngest and oldest age groups women earn a small premium over men.

Goldin (2014, 2015) regards the reasons for differences in pay according to gender in the labour market relate mainly to the way in which work is structured. In her view where substitutability between workers is greater, it would be expected that differences in male and female pay would be less. The relatively small gender wage gap among Creative Arts graduates is indicative of the largely general nature of their skills which makes them male and female workers easily substitutable between tasks.

6. Rate of return to a Creative Arts degree

Here we use a familiar human capital approach to examine the economic benefits over a graduate's career, namely rate of return analysis. It is not intended here to explain in detail the method of rate of return analysis since this is readily accessible elsewhere (see, for instance, Daly *et al.* 2015, Lewis *et al.* 2004), but basically it treats investment in human capital (education) in the same way as an investment in physical capital. Whereas education provides consumption benefits to students, and it could be argued that this is particularly so in the Creative Arts, it is also an investment which involves sacrificing income and incurring other costs in the present to raise future income. We consider here only the financial costs and benefits of a degree. These (actual and opportunity) costs of a university education are taken as the individual's investment in education and the returns to this investment are the additional income earned by the individual over their lifetime, over and above what the individual would earn if they only had schooling up to Year 12. The rate of return is calculated in the same way as the return from an investment in a physical or financial asset such as the rate of interest.

According to the human capital framework, time spent in education has the potential to raise future income by enhancing people's skills and raising their productivity. An alternative interpretation of the higher earnings of the more educated is derived from the screening hypothesis which argues that formal education does not actually alter an individual's productivity but acts as a screening device used by employers to select workers. However, it has been argued that for many artists a university education is a particularly poor screening measure (see for instance Benhamou 2016) since a university qualification matters less than artistic talent which can be better evaluated through other means. Again, however, it is necessary to point out that few Creative Arts graduates are employed in arts related occupations and are employed in a wide variety of occupations and industries so perhaps a Creative Arts degree is a good screening device for the more generalist jobs they do.

While it difficult to distinguish between the competing explanations, what is important is that on average people with higher levels of education earn more than those with lower levels of education across a wide range of countries and time periods. From an individual's point of view, the evidence strongly suggests that investing in education is worthwhile (see for instance Daly *et al.* 2015 for the evidence for Australia).

It has been claimed that education also benefits society as a whole which and this has been discussed at length in the literature (see, for instance Daly *et al.* 2015). For instance, it has been argued that a more highly educated workforce contributes to a more informed and tolerant society (Lewis *et al.* 2010). It would be expected that this argument would be particularly strong for creative artists. Recent research in Australia (Kassenboehmer *et al.* 2018) found that university education significantly increased agreeableness and extraversion in students from disadvantaged backgrounds, and this was not related to specific degrees or teacher quality. They maintain that agreeability and extraversion are linked to marketability of graduates. However, it was pointed out earlier that Creative Arts students are disproportionately from higher SES backgrounds than other students.

Increased levels of education can lead to credentialism and, where there is an excess supply of graduates, the creation of a group with unsatisfied expectations about their position in the job market. In the case of creative artists credentialism may be particularly rife given that typically arts courses used to be the domain of colleges and drama schools which have now been brought into the university sector. It may be questionable as to whether being a creative artist really requires a university degree. On the other hand, as the occupational distributions above demonstrate, few persons possessing a Creative Arts degree are employed in a related occupation. Therefore, a university degree which typically contains units in a wider range of subjects and skills attainment than suggested by the degree's major, may be appropriate for a world of work where demands are continually changing.

Australia, like most countries, subsidises public universities. There is, therefore, an opportunity cost associated with the use of these public funds. While the social rate of return (which attempts to incorporate these external effects) is frequently discussed in the literature, there are a relatively small number of studies that have attempted to quantify it.

In estimating the returns to higher education, no account is taken of the effect of unmeasured characteristics such as natural ability, motivation and family background on outcomes.

The results presented here are based on cross sectional data from the 2016 Census and are, therefore, an estimate of the expected average rate of return to investment in a Creative Arts bachelor's degree if the earnings differentials between high school and university graduates observed in 2016 were to continue over the course of a graduate's working life. The current incomes of graduates of different ages therefore are assumed to provide a useful guide to inform such a decision. so perhaps a Creative Arts degree is a good screening device for the more generalist jobs they do

The following discussion outlines the assumptions made in this paper. The data used for the earnings calculations are from the 2016 Census of Population. For comparison, the same calculations are done for all first degree holders.

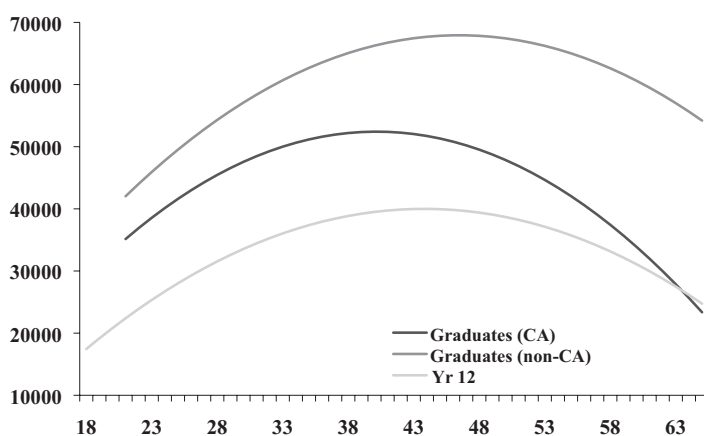
A simple regression relating median income to age and age squared was estimated to provide a smooth series for median incomes at each age for degree holders and for those with only up to Year 12 education. Net incomes were then calculated using the 2016/17 income taxation rates.

In the first modelling exercise incomes are the medians for all people with a given qualification in an age category and all labour market states are included; full and part-time employed, unemployed and not in the labour force. They, therefore, reflect the different employment outcomes for graduates compared with Year 12 completers and males compared with females as well as any income differences that exist due to differences in labour force status. The population of graduates is split into male and female since research shows returns to degrees are often quite different for females compared to males (Daly *et al.* 2015). In a second exercise only those in full-time employment were considered.

It is assumed that all students work part-time during their studies. In keeping with Daly *et al.* (2015), the estimate of hours worked is taken from a survey by McInnes and Hartley (2000) which found students work an average of 15 hours a week and earn \$18 an hour over a year. Adjusting this to 2016 prices yields an estimate of \$16,146 per year before tax.

All students are assumed to choose to finance their university course fees though the HECS-HELP loan scheme and repay debts according to the minimum payments Australian Tax Office schedule as they earn after completion of their study. Students are assumed to bear \$1980 in costs for books, materials etc. This is based on a 2006 estimate by the then Australian Vice Chancellors Committee (AVCC 2007) adjusted to 2016 prices.

Figure 7a: Median annual income, Creative Arts, other degrees and year 12 graduates by age, \$ per year (females)



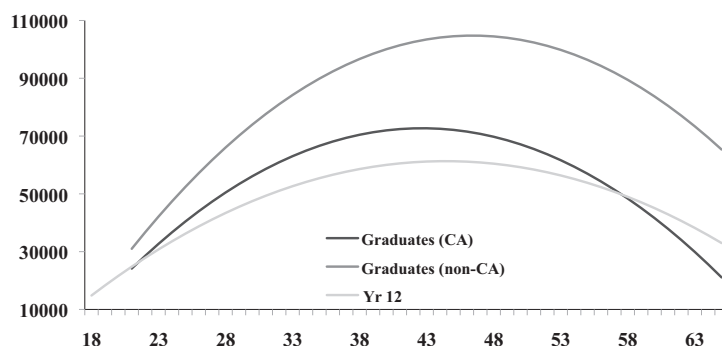
Source: Authors' estimates derived from Census of Population and Housing, 2016, unpublished.

Turning now to gender differences in earnings but including all graduates, irrespective of labour force status, Figures 7a and 7b show the age earnings profiles for, respectively females and males.

The difference in earnings of Creative Arts graduates and other university graduates compared to year 12 school leavers is much greater when only female graduates are considered Figure 7a). This is partly due to the relatively low earnings of women with only Year 12 level education – the benefits of university education are greater for women than for male graduates. The rate of return for female Creative Arts graduates is estimated to be 11 per cent, but still below that of other female graduates, 15 per cent.

Turning to males, from all labour force states, Figure 7b shows that the earnings of Creative Arts university graduates, although greater than the earnings of Year 12 graduates, at least under age 58 years, are well below those of graduates with other degrees. This is reflected in the rate of return for Creative Arts degrees, estimated to be 5 per cent compared to 15 per cent for other university graduates.

Figure 7b: Median annual income, Creative Arts degrees, other degrees and year 12 graduates by age, \$ per year (males)

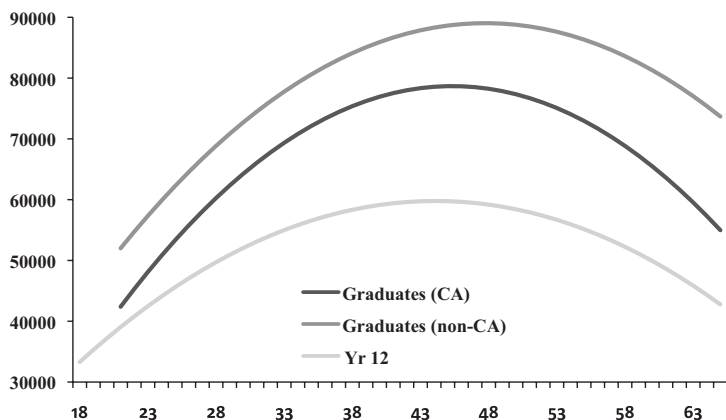


Source: Authors' estimates derived from Census of Population and Housing, 2016, unpublished.

In the cases above, everyone is included in the rate of return estimates no matter how much they work or even if they do not work at all. Unemployment or a greater incidence of part-time work may significantly affect the returns to a degree. Also, many (perhaps most) women leave the labour force for periods of time to look after children. The profiles earlier in the paper illustrated that many women are working part-time or not in the labour force. For males, the incidence of part-time employment is greater for Creative Arts graduates than for other university graduates.

Therefore, it is interesting to control for this by selecting only those working full-time. In the scenario considered here both the university graduates group and the comparator group (Year 12 graduates) only include those working full-time.

Figure 8a: Median annual income of females working full-time, Creative Arts, other degrees and year 12 graduates by age, \$ per year.

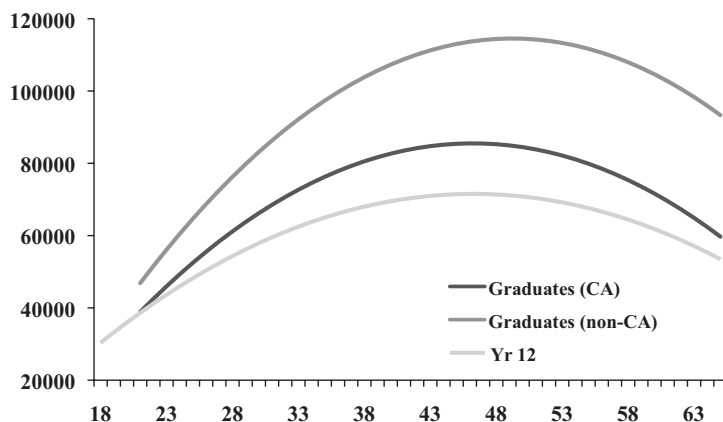


Source: Authors' estimates derived from Census of Population and Housing, 2016, unpublished.

Figure 8a shows the age earnings profiles as before but for only females working full-time. Because only those employed full-time are included the rates of return reflect only differences in salaries (returns to human capital) rather than employment status. Clearly, the gap between Creative Arts graduates and other graduates, although still fairly wide, narrows considerably when only those working full-time are considered.

The rate of return falls slightly, from 11 per cent to 9 per cent, as does the rate of return for other university graduates, from 15 per cent to 13 per cent. The reason for the fall in rate of return is that women who only have year 12 qualifications have higher percentage increases through working full-time than university graduates.

Figure 8b: Median annual income of males working full-time, Creative Arts, other degrees and year 12 graduates by age, \$ per year.



Source: Authors' estimates derived from Census of Population and Housing, 2016, unpublished.

Figure 8b shows the age earnings profiles for males working full-time. The earnings gap between Creative Arts and other graduates is widened, but the earnings gap between Creative Arts and Year 12 graduates is also widened. The rate of return to a Creative Arts degree for males working full-time is estimated to be 7 per cent, higher than the 5 per cent for all male Creative Arts graduates. The rate of return compares unfavourably with other degrees which have an estimated rate of return of 14 per cent for those working full-time and for those included in the case of all males.

It is interesting to compare the estimated rates of return for Creative Arts in this paper with estimates for previous years. Daly *et al.* (2015), using similar methodology to that of this paper estimated the rate of return to Creative Arts (and a range of other degree) using data from the 2006 Census. They found that the rate of return was negative – from a financial viewpoint students would have been better off not going to university and getting a job. Similar conclusions were reached by Lewis and Lee (2019) using 2011 data.

The above results suggest that a Creative Arts degree provides a 'generalist' degree which provides skills for a range of occupations with reasonable financial returns, though not as high as for most other degrees. By comparison, it is interesting to compare a Creative Arts degree with the degree which probably most matches it as a generalist degree, namely, Humanities.

Table 4: Selected labour market measures of the median graduate, 2016.

Rate of return		
	<i>Male</i>	<i>Female</i>
Creative Arts	5%	9%
Humanities	4%	6%
All Bachelors	13%	13%
Unemployment rate		
	<i>Male</i>	<i>Female</i>
Creative Arts	1.3%	1.3%
Humanities	0.5%	0.8%
All Bachelors	0.7%	1.0%
Employed in professional or managerial professions		
	<i>Male</i>	<i>Female</i>
Creative Arts	60.9%	54.2%
Humanities	72.1%	54.1%
All Bachelors	81.4%	68.8%

Source: Corliss, Daly and Lewis (2019)

Note: These estimates of rate of return are for what the authors call the ‘base case’ assumptions in their report and differ somewhat from the assumptions in this paper.

Corliss, Daly and Lewis (2019) have produced a range of measures of labour market ‘match’ for a number of degrees. Table 4 presents three of these – rate of return, unemployment rate, and occupation of employment as a percentage of employment of all graduates from their respective discipline. The results in Table 4 are for the ‘median’ graduate in the earnings distribution.

The rate of return to a Creative Arts degree is comparable, if somewhat higher, than for Humanities but much lower than for other degrees. Nevertheless, the rate of return for both ‘generalist’ degrees is still higher than the long-term interest rate, making the degrees a worthwhile investment for the ‘median’ student.

Creative Arts graduates, both male and female, have higher unemployment rates than other graduates which would contribute to lower median earnings. Humanities graduates have somewhat lower unemployment rates than other graduates but do better than Creative Arts graduates.

The third indicator of market match in Table 4 is the percentage employed in professional or managerial occupations. Generally, a university education should equip graduates for these broad occupation categories – as opposed to alternatives such as trades, labouring and sales occupations. Here there are quite distinct differences between graduates with the two generalist degrees and other degrees. Creative Arts and Humanities graduates have much lower percentages employed in occupations which might be regarded as ‘appropriate’ to their degree. This is particularly the case for Creative Arts graduates and, within this discipline, males. The mismatch between education and occupation could be a major reason for the lower rates of return.

Despite the lower rates of return, in the light of previous work and the results for 2016 in this paper, there appears to have been a remarkable change in fortunes for (most) graduates in Creative Arts. This is particularly interesting given the huge expansion in university places in Creative Arts degrees identified in this paper. The implication is that there has been an increased demand for the skills these graduates possess, but this is a topic for future research. Nevertheless, it may indicate that the fundamental changes in skills demand brought about by structural and technological change (Lewis *et al.* 2010) has created a favourable market for the skills that Creative Arts graduates possess. Further analysis of this is warranted, not least by Arts faculties themselves, if curriculum design etc is to be harnessed to this growing demand.

7. Conclusion

The career outcomes of Creative Arts graduates are not too different from other degree holders with respect to unemployment and labour force participation. They are to be found in a great variety of occupations and industries. The evidence that Creative Arts graduates are to a great extent not employed in arts-related jobs implies that a Creative Arts degree is largely a ‘generalist’ degree equipping graduates with a range of skills fitted to the labour market. There is evidence of mismatch for some graduates in that they are less likely to be found in professional or managerial occupations. The rate of return to a Creative Arts degree for most is lower than for other degrees, which implies that a Creative Arts degree does not provide individuals with as large monetary benefits as degrees in other subjects. The rate of return is similar or better than for another generalist degree, Humanities. However, the estimated rates of return are positive and certainly greater than the rate of interest. Considering students for whom a Creative Arts degree represents both an enjoyable experience (consumption good) and a low but reasonable financial return, the degree may well be regarded as a good investment for students. Since not everyone chooses a degree which has a high rate of return and most of the degrees require similar skill sets for entry, it is clear that people choose their degree and subsequent career on the basis of a set of qualities, only one of which is pay.

It has been argued (see, for example Throsby and Zednick 2010) that university education adds little to 'arts' human capital. It does, however, provide access to 'non-arts' jobs which allow individuals to pursue their arts interests. The results suggest that for many people a Creative Arts degree represents a consumption good rather than an investment in human capital with over half of students funded totally by government since they do not repay HECS-HELPS debts. It is not the intention here to comment on the desirability of this, but Creative Arts degrees education could be thought of as a large subsidy to the arts. The case for public funding of Creative Arts degrees relies on the argument that the arts have considerable external benefits to society as a whole, but this is beyond the scope of this paper.

Interestingly, it has been argued that increased university funding of arts education might make Creative Arts graduates worse off (Towse, 2006). Increasing the supply of graduates entering low paying occupations would be expected to further reduce their pay and employment prospects. However, the results suggest that in a period of big increases in Creative Arts graduates the rewards to these degrees increased. This is likely due to the fact that few of these graduates are in arts-related occupations but have a range of skills which are growing in demand as structural and technological change continue to transform the Australian labour market.

It is worth noting that the Creative Arts group consists of a diverse range of sub-disciplines whose graduates may have quite different labour market outcomes than those of the group as a whole. The study of these sub-disciplines is worthy of study but beyond the scope of this paper.

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Leaning in: Is higher confidence the key to women's career advancement?

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Abstract

Women's lack of confidence is commonly regarded as a key reason why women lag behind men's career outcomes. This paper interrogates this claim by examining the empirical link between an individual's confidence and job promotion prospects through a gender lens. We use nationally-representative data for 7533 individuals collected in the Household, Income and Labour Dynamics in Australia (HILDA) Survey in 2013. Confidence is captured by a psychometric survey instrument, Achievement Motivation, which is dually comprised of 'hope for success' and 'fear of failure'. Using Oaxaca-Blinder decomposition, we detect that higher hope for success is linked to a higher likelihood of job promotion, but only amongst men. This finding provides no evidence to support the widespread advice commonly given to women that they need to 'lean in' and show more confidence as the mechanism to close gender gaps in the workplace.

JEL Codes: J16 (Economics of Gender; Non-labour Discrimination); J710 (Labour Discrimination); M5 (Personnel Economics: Firm Employment Decisions; Promotions)
Keywords: job promotion; gender; discrimination; personality traits; non-cognitive traits

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1. Introduction

Job promotions are an important mechanism by which individuals can advance their occupational standing within their work organisation. A higher hierarchical position generally translates into higher earnings and greater job responsibility, as well as greater decision-making power and authority. As such, any differences in men's and women's job promotion mechanisms are potentially an important driver of gender differentials in earnings, leadership and societal influence (Booth 2009).

Conventionally, labour economists have analysed job promotions as a function of an individual's human capital traits, workplace characteristics and broader labour market conditions. These factors reflect the worker's value to the firm as well as the job promotion opportunities available to them. However, management literature informs us that human resource decisions – who is hired, who gets promoted and who gets a pay rise – are often also tied to more heterogeneous attributes such as a worker's personality traits. These attributes are often incorporated into firms' human resource decisions through the use of psychometric testing (Dattner 2013; Diekmann and König 2015) but are a relatively new addition to the toolkit used by economists to understand labour market outcomes (Almlund, Duckworth, Heckman and Kautz 2011).

Existing literature on gender differentials in personality suggests that, on average, men and women differ in their psychological and behavioural characteristics in ways that matter for labour force outcomes. This includes, for instance, perceived differences in men's and women's willingness to compete, take risks and engage in bargaining behaviour (Bertrand 2010; Croson and Gneezy 2009; Eckel and Grossman 2002; Gneezy, Niederle and Rustichini 2003; Niederle and Vesterlund 2007). These findings build on foundational psychological literature that identifies that men tend to score higher on agentic traits such as assertiveness, while women tend to score higher on communal and expressive traits such as nurturance (Feingold 1994). Such tendencies – which may arise for various reasons including cultural norms and socialisation – may lessen women's likelihood to engage in actions that would otherwise advance their careers, such as initiating wage negotiations or nominating themselves for a leadership role (Babcock and Laschever 2003; Booth 2009; Bowles, Babcock and Lai 2007). The push within contemporary organisational culture urging women to show stronger confidence and assertiveness in the workplace – reflected in the 'lean in' movement initiated by Facebook Executive Sheryl Sandberg and expounded upon in contemporary professional development literature¹ – draws further attention to the potential for gender differences in personality traits to drive gender gaps in career outcomes.

The rationale for the 'lean in' campaign rests on the assumption that women lack the necessary confidence to pursue career-advancing behaviours, and that this deficiency contributes to their lower pay and occupational ranks.² However, existing literature also indicates that women are at risk of encountering negative repercussions for displaying ambition and assertiveness in workplace settings (Heilman 2012;

1 See Sandberg (2013) and other examples such as Shipman and Shipman (2014).

2 Sandberg writes: 'In addition to the external barriers erected by society, women are hindered by barriers that exist within ourselves. We hold ourselves back ... by lacking self-confidence, by not raising our hands, and by pulling back when we should be leaning in' (Sandberg, 2013, p.8).

O'Neill and O'Reilly 2011; Rudman and Phelan 2008). Given the resources that are now being invested in the 'lean in' movement, the links between personality traits and labour market outcomes need to be scrutinised as a matter of economic inquiry. In this study, we cast a gender lens on the link between confidence and job promotion, to ascertain whether the advice being offered to women to 'lean in' and act as confidently as men will deliver the payoffs it promises.

Many previous studies examining the impact of confidence and other personality characteristics on workplace outcomes have been based on cohort-specific or firm-specific samples, or produced in experimental settings, resulting in limited sample representation. In a new contribution to this literature, this paper uses real-world job promotion data for over 7500 individuals based a nationally-representative, workforce-wide sample of respondents.

2. Exploring the link between personality and job promotion

2.1 Theoretical rationale

As canvassed in the literature on firm behaviour, there are several reasons why employers may want to promote their workers, including to: retain and reap the returns of their investment in their workers' human capital; incentivise higher productivity; incentivise firm loyalty and reduce staff turnover; expand the firm's workforce; and fulfill staffing needs at higher occupational levels (Baker, Gibbs and Holmstrom 1994; Fairburn and Malcomson 2001; Milgrom and Roberts 1992). In an economics framework, it is assumed these reasons ultimately contribute to the achievement of the firm's own objectives: profit maximisation in the private sector, or the effective provision goods and services according to legal or statutory obligations in the public sector. Consequently, we surmise that an employer's decision to promote a worker depends on their evaluation of a worker's productive value to the firm. This may be observed in objectively measurable ways such as their educational qualifications, cognitive skills, years of experience and job performance, or signalled in less formal ways such as through the demonstration of personal characteristics that matter for workplace productivity.

From the worker's perspective, we can identify possible reasons why an individual might seek a job promotion, again founded on the assumption that these reasons contribute towards the individual's own objective, which in this case is to maximise utility. Since job promotion is usually rewarded by higher remuneration, higher status and greater responsibility within the firm's organisational structure, we assume that the individual will seek job promotion on the basis that they gain personal utility from these rewards. The likelihood that a worker will apply for a job promotion should depend on their valuation of these rewards, as well as their own assessment of their productivity capacity to fulfill the requirements of the job role and chances of success.

Empirically, it is usually only possible to observe whether or not a worker has been promoted, but not observe whether they applied, nor whether the promotion opportunity was available in the first place. The detection of any empirical relationship between job promotion and personality characteristics could reflect might therefore reflect characteristics that make an individual more likely to work in a firm with

greater promotion opportunities in the first place; that predispose an individual to seek out promotions; or that are more valuable to the firm. We encompass these factors in the formulation of our hypotheses.

Our first hypothesis is that firms will value characteristics in their workers that are affiliated with higher productivity and the capacity for organisational leadership. Hence, we anticipate that individuals who possess such personality traits are more likely to be promoted. Our second hypothesis is that individuals are more likely to apply for promotion if they exhibit characteristics that are associated with the confidence to take on a challenge, ambition, self-determination, and an appetite for change and risk. This reasoning also implies that an individual who has the competency to fulfill the role – but not as much confidence as other candidates who apply for it – may not select into the applicant pool. This poses the potential for personality characteristics to have a distortionary effect on the promotion process that leads to an inefficient, sub-optimal labour market outcome, which is what the ‘lean in’ advice aims to address.

Analysing how the links between job promotion and personality are patterned by gender provides clearer insights into the extent to which promotion outcomes can be explained by differences in men’s and women’s personality profiles, or indeed in by differences in how men and women’s traits are valued in the workplace. This builds on previous studies of gender discrimination in job promotion processes have considered the factors that could explain firms’ preferential treatment of workers on the basis of gender. For example, it has been reasoned that firms could have a strategic incentive to offer job promotions to men over women on an expectation that women are statistically more likely to exit workforce due to family formation roles, which reduces the firms’ returns on their investments in their female workers (Rosen and Lazear 1990). The author conclude that this form of statistical discrimination means that women are held to a higher standard of performance than men in their applications for promotion. The detection of any gender bias in our study could signal that this type of preferential treatment is still at play.

2.2 Personality traits under analysis

To capture a person’s confidence, we use a psychometric instrument defined in the psychology literature as Achievement Motivation. Attributed to the work of Murray (1938), McClelland, Atkinson, Clark and Lowell (1953), Atkinson (1964), McClelland (1987) and Nicholls (1984), this measure describes an individual’s drive to fulfill or surpass their personal standards, their past performances or that of others. The psychological literature posits that this drive can be incentivised by either a ‘hope for success’, reflecting the degree to which an individual favours situations in which they are challenged and can test their capabilities, or by their ‘fear of failure’ which reflects their apprehension about fulfilling a given task. Achievement Motivation has been previously used in the context of labour market outcomes by Risse, Farrell and Fry (2018), who found that gender gaps in confidence partly explain gender gaps in pay, albeit only a small fraction. While this present study builds on the work of Risse *et al.* (2018), it will be seen that the role of confidence in explaining gender pay gaps is different to how confidence operates in the context of job promotion, warranting this dedicated analysis.

In addition to confidence, in this paper we examine whether gender differentials might also be apparent in the way that other personality traits are linked to job promotion prospects. This allows us to investigate whether any gender differences in the returns to confidence reflect broader gender-patterned biases and stereotypical norms within workplace culture. For this, we include in our analysis two other dimensions of personality that are commonly examined in labour market studies – the Big Five personality traits and Locus of Control (LOC).

Defined in the psychology literature by Costa and McCrae (1985, 1992), the Big Five are five broad dimensions which collectively provide a holistic picture of an individual's temperaments in everyday situations. The five traits comprise *agreeableness* (the tendency to act in a way that is cooperative, tolerant, forgiving, trusting, altruistic, compromising and unselfish); *conscientiousness* (the tendency to be organised, dependable, responsible, hard-working and efficient); *emotional stability* (the degree to which an individual's emotional reactions are consistent and predictable, demonstrated by calmness and even-temperedness³); *extraversion* (the orientation of an individual's interests towards the outer world of people and things, characterised by being active, sociable and talkative); and *openness to experience* (the tendency to be open to new intellectual, cultural or aesthetic experiences, characterised by being creative, curious, imaginative and broad-minded).

LOC has been defined in the psychological literature by Rotter (1954, 1966) as the extent to which an individual believes that their life outcomes are within their realm of personal control, and determined by their own efforts rather than by fate, luck or other external forces. As such, LOC can be measured according to an internal locus (the degree to which an individual believes that their life outcomes depend on their own actions) and an external locus (the degree to which an individual believes that outcomes depend on factors that are outside of their control).

The HILDA Survey data that we use for our analysis shows that men and women differ, on average, in these personality variables (reported in more detail in Table 1 in the Data section). Men show a higher level of hope for success than women, while women show a higher fear of failure. Women generally show a higher level of agreeableness, conscientiousness and extraversion than men, while men have a higher tendency to be open to new experiences. Men display a higher level of internal net LOC than women, although the gender differential for LOC is narrower and less statistically significant than the differentials observed for the other personality traits. No significant gender differential is detected for emotional stability. These gender-based differentials for our sample of the Australian population generally accord with patterns reported by previous studies (Shekhar and Devi 2012; Steinmayr and Spinath 2008) and among other cultures and nationalities (Costa, Terracciano and McCrae 2001; Lee and Ohtake 2016). The questionnaire items that were used to construct these variables are detailed in the Data section of this paper.

3 Emotional stability can also be defined inversely as neuroticism, characterised by volatility in emotional levels and states.

2.3 Sensitivity and stability of personality characteristics

A solid stream of literature asserts that an individual's personality is largely shaped throughout childhood and adolescence, stabilising by the time an individual reaches adulthood (Almlund, Duckworth, Heckman and Kautz 2011; Cervone and Pervin 2008; Costa and McCrae 1988; Costa, Herbst, McCrae and Siegler 2000; Cobb-Clark and Schurer 2012; Pervin 2003; Roberts and DelVecchio 2000; Wooden 2012). More recently, the availability of longitudinal panel data has facilitated the detection of ongoing age-based trends in personality traits throughout adulthood, attributed to the maturation process (Borghans, Duckworth, Heckman and ter Weel 2008; Pervin 2003; Roberts and Mroczek 2008). These changes tend to occur during an individual's early adulthood and most elderly years. The inclusion of age variables in our regression, and concentration on the working-age population, helps us to control for these age-variant effects.

Even if an individual's personality traits are relatively stable throughout adulthood, this does not preclude the possibility that they can be influenced by changes in the external environment, including an individual's work situation, predisposing the model to endogeneity. Previous longitudinal analyses of LOC and the Big Five traits, conducted at the level of the individual, have generally concluded that these traits show no or only weak responsiveness to external shocks such as major life events or changes in an individual's job or income (Cobb-Clark and Schurer 2012, 2013). Other studies that have detected intra-individual fluctuations have interpreted such fluctuations to be a transient response to an unexpected life event, allowing for the possibility that these traits will return to pre-shock levels in the long-term (Boyce, Wood, Daly and Sedikides 2015; Specht, Egloff and Schumukle 2011).

These past studies, however, largely pertain the Big Five traits and LOC. The fact that Achievement Motivation is only available in one year of our dataset precludes us from directly testing its intra-individual stability or responsiveness to our outcome variable of interest. As discussed in Risse *et al.* (2018), the psychological literature underpinning Achievement Motivation purports that an individual's motivation to take action entails both an incentivising motive, which is regarded as fairly stable, as well as an expectancy that a certain action will result in the desired outcome, which may be influenced by past experiences (Hill *et al.* 1983, in reference to Atkinson 1964). We acknowledge these limitations and run robustness checks to look for possible signs of endogeneity as far as our data permits.

2.4 Previous studies

Within the psychology and management literature, several previous studies have examined the relationship between personality characteristics and promotion or leadership within the workplace. Many of these studies rely on measures of correlation, including Boudreau and Boswell (2001), Seibert and Kraimer (2001), Judge, Bono, Ilies and Gerhardt (2002) and Ng, Eby, Sorensen and Feldman (2005). Where significance was detected among these studies, promotion or leadership was found to be positively correlated with conscientiousness, emotional stability, extraversion and openness to experience, negatively correlated with agreeableness, and unrelated to LOC. The rigour of these analyses, however, is limited by the absence of control variables including gender.

Econometric regressions that control for firm and worker's characteristics provide more reliable indications of the characteristics associated with promotion. Using multivariate analysis to model the likelihood of an individual being in an executive position, and including controls for gender, Fietze, Holst and Tobsch (2011) detected a positive association with conscientiousness, emotional stability, extraversion, openness to experience and willingness to take risks, and a negative association with agreeableness. Gender was not found to be significant. Gelissen and de Graf (2006) found upward job mobility to be positively associated with extraversion, negatively associated with conscientiousness but only among women, and unrelated to all other Big Five traits. Gender was found to be significant in favour of men. Also concluding that gender is a significant factor, Johnston and Lee (2012) found that the inclusion of the Big Five personality traits could not explain away the significance of gender, though without detailing the coefficients of the Big Five traits. Lee and Ohtake (2014) detected that extraversion is positively related to promotion into management positions among males, though not among females, though make no conclusions about the significance of gender per se.

Another stream of studies concentrates on gender differences in promotion probabilities, though without including personality characteristics. Some have found that gender is not a significant determinant, attributing the gender gap to other factors such as a tendency for women to be more weakly attached to the workforce (Booth and Francesconi 2000; Booth, Francesconi and Frank 2003) or to select into jobs that offer fewer promotion opportunities (Groot and van den Brink 1996). Other studies of promotion probabilities conclude that gender itself is significant in explaining promotion prospects (Addison, Ozturk and Wang 2014; Blau and DeVaro 2007; Cassidy, DeVaro and Kauhanen 2016; Cobb-Clark 2001; Pema and Mehay 2010), for various reasons including the interruptive effect of family on women's career trajectories. To our knowledge, no previous empirical studies in the economics and related literature have explicitly examined the role of an individual's level of confidence in explaining gender differentials in job promotion outcomes, making this paper's analysis a new contribution to the literature.

3. Econometric model

3.1 Measuring the likelihood of job promotion

We define the likelihood that an individual receives a job promotion as y_i^* and express the latent probability of promotion as:

$$y_i^* = x_i' \beta_i + \varepsilon_i \quad (1)$$

where x_i our explanatory variables including personality characteristics, β_i denotes the respective coefficients, i refers the individual, and ε_i denotes the random error term distributed as $\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$. While the true probability function cannot be observed, we can observe whether or not the individual is promoted, assigning a value of $y_i = 1$ if the individual is promoted or $y_i = 0$ if not. Given this binary definition, we adopt a discrete choice probit specification where our observed variable is assumed to align to the latent probability function as follows:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (2)$$

3.2 Adjusting for sample selection

Since promotion outcomes can be observed only amongst individuals who are employed, we apply a two-stage model to control for non-random differences in the characteristics of those who are employed and those who are not, analogous to Heckman's (1979) two-step model used in linear wage regressions (Neuman and Oaxaca 2004). Adjusting for sample selection can avert biased and inconsistent estimates (Greene 2003, 2006; van de Ven and van Praag 1981) and improve asymptotic properties of the estimates through preserving the sample size (Ramanathan 1998). As our selection equation, the likelihood of the individual being employed in the labour force is founded on a latent probability function:

$$z_i^* = w_i' \delta + u_i \quad (3)$$

where z_i^* refers to the likelihood of employment, w_i denotes the explanatory variables that determine the likelihood of employment, δ denotes the respective coefficients, and u_i is the error term distributed as $u_i \sim N(0, \sigma_u^2)$. The latent probability cannot be observed but is estimated according to our observation of whether or not the individual is employed, defined as a binary variable z_i :

$$z_i = \begin{cases} 1 & \text{if } z_i^* > 0 \\ 0 & \text{if } z_i^* \leq 0 \end{cases} \quad (4)$$

The application of a discrete choice specification for both the selection and outcome equations generates a specification referred to as a Heckprobit model (Pastore, 2005), named in reference to the adaptation of Heckman's selection technique to a probit equation.

The likelihood that an individual is promoted is conditional on whether or not y_i is observed ($z_i = 1$). Adjusting for this condition, the expected probability of promotion is expressed as:

$$\begin{aligned} E[y_i^* | x_i, z_i = 1] &= (x_i' \beta_i) + E[\varepsilon_i | x_i', z_i = 1] \\ &= (x_i' \beta_i) + E[\varepsilon_i | u_i > -w_i' \delta] \end{aligned} \quad (5)$$

The correlation between the error terms of the outcome and selection equations is assumed to follow a bivariate normal distribution:

$$(\varepsilon_i, u_i) \sim BVN(0, 0, \sigma_\varepsilon^2, \sigma_u^2, \rho) \quad (6)$$

With reference to the correlation coefficient ρ , and normalising $\sigma^2 = 1$, the expected value of the latent probability function is now expressed as:

$$\begin{aligned} E[y_i^* | x_i, z_i = 1] &= (x_i' \beta_i) + \rho \phi(-w_i' \delta) / [1 - \Phi(-w_i' \delta)] \\ &= (x_i' \beta_i) + \theta \lambda_i \end{aligned} \quad (7)$$

where ϕ and Φ represent the density and cumulative functions of the standard normal distribution, λ_i represents the inverse Mills ratio equal to $\lambda_i = \phi(-w_i' \delta) / \Phi(-w_i' \delta)$, and θ is shorthand for $\rho \sigma_\varepsilon$.⁴ The significance of the correlation coefficient ρ determines whether sample selectivity exists.

3.3 Oaxaca-Blinder decomposition

To identify gender differences in the factors that explain job promotions, we adopt the Oaxaca-Blinder decomposition technique (Blinder 1973; Oaxaca 1973). This approach disaggregates sources of gender differences in promotion outcomes into two components: endowment effects which account for differences in the types of characteristics that men and women possess,⁵ and coefficient effects which account for any differences in the way that men and women are rewarded or penalised for the same characteristic.⁶ As per Mavromaras and Helmut (1997), the decomposition equation is expressed as:

$$y_m^* - y_f^* = \beta_p(\bar{x}_m - \bar{x}_f) + (\beta_m - \beta_p)\bar{x}_m + (\beta_p - \beta_f)\bar{x}_f + \theta_p(\lambda_m - \lambda_f) + (\theta_m - \theta_p)\lambda_m + (\theta_p - \theta_f)\lambda_f \quad (8)$$

4 The log-likelihood function with the inclusion of selection effects is defined as: $\ln L = \sum_{y_i=1, z_i=1} \ln[\Phi_2(x_i' \beta_i, z_i' \delta, \rho)] + \sum_{y_i=0, z_i=1} \ln[\Phi_2(-x_i' \beta_i, z_i' \delta, -\rho)] + \sum_{z_i=0} \ln[1 - \Phi_2(z_i' \delta)]$ where Φ_1 refers to the univariate cumulative distribution function and Φ_2 refers to the bivariate cumulative distribution function (Montmarquette, Mahseredjian and Houle 2001; van de Ven and van Praag 1981, 1983).

5 The term 'endowment' does not necessarily imply 'natural' endowment, but simply characteristics that the individual is observed to display at this point of their life.

6 As per Risse *et al.* (2018), we adopt the terms 'endowment effects' and 'coefficient effects' in place of 'explained effects' and 'unexplained effects' traditionally used in Oaxaca-Blinder decomposition, to avoid potential misinterpretation of the unexplained effect as a residual.

where y_m^* and y_f^* denote the underlying likelihood of promotion and $\bar{x}_m$ and $\bar{x}_f$ denote the average level of characteristics, and β_m and β_f are coefficients to be estimated, for males (m) and females (f) respectively. We adopt the Neumark approach in estimating a coefficient based on a pooled sample (denoted by subscript p) as the reference point against which the gender-specific coefficients can be compared (Neumark 1988; Oaxaca and Ransom 1984).

4. Data

4.1 Dataset

The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a nationally represented dataset that allow us to map an individual's personality characteristics against their job promotion outcomes, controlling for comprehensive range of demographic and workplace variables. Although the HILDA Survey has been collected annually since 2001, information on participants' personality is not collected every year. Given that Achievement Motivation is collected only once (in 2012), to avert reverse causality, we use data on job promotions in the year that follows (2013).

Our outcome variable of interest – whether or not an individual experienced a job promotion – is sourced from the life events section of the HILDA Survey which directly asks respondents whether or not they were promoted at work during the past year.⁷ The raw data indicate that, within the course of a year, around 9 per cent of all employed workers experienced a job promotion, fractionally higher among men.

4.2 Construction of personality variables in the HILDA Survey

The personality indicators used in this analysis have been validated in the field of psychology and are increasingly being applied in the fields of economics and organisational management. To derive the Achievement Motivation variables, respondents were asked to rate how strongly they related to a set of statements that reflect their readiness to test their capabilities and place themselves in a challenging situation, detailed in Table 1. These items were derived from the Revised Achievement Motives Scale that was designed and validated by Lang and Fries (2006). Responses could take a value from 1 to 7, with a higher value representing a strong level of agreement with the statement. For each individual, we take the average value of their responses to the four survey items for hope for success to generate an overall measure of their hope for success. Similarly, we take the average of their responses to the five items for the fear of failure to compute their overall measure of fear of failure.

7 The survey asks for this information with the following questionnaire item: “We now would like you to think about major events that have happened in your life over the past 12 months. For each statement cross either the YES box or the NO box to indicate whether each event happened during the past 12 months. If you answer “YES”, then also cross one box to indicate how long ago the event happened or started”. The list of major life event includes “Promoted at work”. The questionnaire does not ask the individual to specify anything further about the nature of the promotion. The list of major life events also includes “Changed employer” and there is little overlap in the occurrence of job promotions and changes in employer (analysis available on request). This supports the assumption that individuals' job promotion responses largely refer to promotions with their current employer and within their existing organisation.

Principal factor analysis indicated that the survey items load onto these two dimensions as expected. The survey items fulfil internal reliability criteria with a Cronbach's alpha score of 0.759 for hope for success and 0.838 for fear of failure.

To derive the Big Five personality trait variables in the HILDA Survey, respondents were presented with an inventory of 36 adjectives and asked to rate how strongly they believed that each adjective described them. Responses could take a value from 1 to 7, with a higher value denoting a stronger attachment to that adjective. The inventory of adjectives aligns to the underlying five-factor structure defined by Costa and McCrae (1985, 1992), and previously applied by Goldberg (1992) and Saucier (1994).⁸ Table 1 presents the adjectives that were ultimately used to construct the Big 5 personality characteristics in the HILDA Survey data. Through this process, a numerical measurement is attained for each individual for each of the Big Five traits. While achievement-related characteristics, such as challenge-orientation, have also been previously used in analyses of individuals' labour market outcomes (for example, Dunifon and Duncan 1998; O'Connell and Sheikh 2007), we know of no previous studies that have used Achievement Motivation, or any other metric for confidence, in a gender-based analysis of job promotion outcomes.

To derive the LOC variables, respondents were asked to rate how strongly they identified with a list of statements reflecting the degree to which they felt that they have control over their outcomes and experiences in life, reported in Table 1. On a scale from 1 to 7, a higher value signifies stronger agreement with the statement. It is common practice to combine the internal and external measures into a 'net' measure (Cobb-Clark and Schurer 2013) especially when there are a low number of survey items available, as is the case with our internal LOC measure. We adopt this practice and arrive at a single numerical measurement of net internal LOC, for each individual, indicative of the overall degree to which they feel that outcomes are within their control. The survey items fulfil the internal reliability criteria with a Cronbach's alpha score of 0.840.

To isolate the explanatory contribution of each aspect the individual's personality, we regress four models: the first is a baseline that excludes any personality variables; the second includes Achievement Motivation; the third includes the Big Five traits; and the fourth includes LOC.⁹

In terms of how we predict these particular personality characteristics to align with our hypotheses, we firstly expect a positive relationship between job promotion and characteristics that are valuable to the firm, such as productive capacity and organisational leadership. Accordingly, we anticipate a positive link with conscientiousness, indicative of an individual's diligence, proficiency, and organisational skills. This aligns with previous research that identifies a link between conscientiousness and job performance

⁸ Further information on the construction of these variables is available in Losoncz (2009) and Melbourne Institute of Applied Economic and Social Research (2013).

⁹ We refrain from estimating a 'kitchen sink model' that simultaneously contains all personality three categories, as factor analysis reveals cross-loading between Achievement Motivation and LOC, as analysed in Risse *et al.* (2018) and consistent with the argument that confidence in one's capacity to take on a challenge requires a belief that one's life outcomes are dependent on one's own actions (Cobb-Clark 2015).

(Barrick and Mount 1991; Cubel, Nuevo-Chiquero, Sanchez-Pages and Vidal-Fernandez 2016). We also expect firms to positively value extraversion given that an ability to effectively manage and interact with people is a requirement of many high-ranked jobs (Barrick and Mount 1991). We speculate that a cooperative temperament and a capacity to remain calm under pressure will be valued by the firm, manifested by a positive return to agreeableness and emotional stability. Although it is conceivable that confidence equates to higher productivity, the existing literature does not offer any evidence to substantiate this link. If anything, the literature across various domains suggests that high levels of confidence – or overconfidence – can act as a cognitive bias that detracts from an individual's performance and rational decision-making (Barber and Odean 2000, 2001; Invernizzi, Menozzi, Passarani, Patton and Viglia 2016; Malmendier and Tate 2005; Simon, Kim, Houghton and Deng 2011). Hence we do not speculate any link between confidence and job promotion to be supported by reasons relating to productivity and performance.

As our second hypothesis, we anticipate a positive relationship between job promotion and characteristics that make an individual more likely to put themselves forward for promotion in the first place. This is where we expect confidence to play an explanatory role in predicting promotion rates, captured by hope for success and (inversely) fear of failure. Characteristics that denote self-determination, such as internal LOC, or an appetite for new opportunities, such as openness to new experience, also align with this hypothesis.

4.3 Other explanatory and control variables

We include personal characteristics to reflect an individual's productivity, effort and commitment to the firm. These variables include age, cognitive ability¹⁰, and a dummy variable denoting whether the individual has undertaken on-the-job training in the preceding year, as a way to capture human capital. Number of years of employment with their employer¹¹ and a dummy variable to denote whether the individual usually worked overtime hours in the preceding year are used to proxy the individual's effort and commitment to the firm, following Landers *et al.* (1996). Educational qualifications are not included directly but are captured by our proxy measure of promotion opportunities described next.¹²

To capture the promotion opportunities available to the worker, we construct a set of variables using job vacancies data as a proxy for promotion opportunities. Information on job vacancies in the Australian labour market is available on the basis of industry and geographical state or territory, and the educational qualification sought

10 We use the average of three cognitive tests scores that are administered in the HILDA Survey: the Backward Digit Span test (a test of memory), the Symbol Digits Modalities test (a test of attention, visual scanning and motor speed) and the National Adult Reading test (a word pronunciation test regarded as a measure of intelligence) (see Wooden 2013). We computed the average of each individual's score across all three tests. We use observations collected in 2012 as these tests were not administered in 2013.

11 Tenure in occupation can be included as a measure of accumulated experience, but this variable is highly correlated with tenure with employer, which is already included.

12 Educational qualifications are found to be significant in determining the likelihood of employment and hence included at selection stage.

of the applicant. We take the number of job vacancies advertised in each industry, state or territory, and qualification level, and scale relative to the existing composition the workforce.¹³ Vacancies data according to industry and geography were sourced from the Australian Bureau of Statistics' Job Vacancies catalogue¹⁴ and vacancies data according to skill level were sourced from the Australian Government Department of Jobs and Small Business's Internet Vacancy Index (IVI).¹⁵

We include additional workplace characteristics that further control for the promotion opportunities available to the worker. These include dummy variables to denote whether they work in the public or private sector, or in casual or permanent employment, and categorical dummies for firm size. All variables for employment characteristic variables refer the individual's job characteristics after the potential promotion has taken place (that is, in 2013). A limitation of our data is that we cannot source any further demand-side factors that might also influence job promotion outcomes, such as more specific characteristics about the worker's employer or the availability of promotion opportunities within their specific firm. The analysis is confined to employees only, and omits individuals who are either self-employed, an employee of their own business or an unpaid worker in a family business, for whom any incidence of a job promotion would not be informative to our study.

As per previous studies, we do not include earnings as an explanatory variable, as many of the determinants of promotion are also direct determinants of earnings. Furthermore we have no theoretical foundation to hypothesise that higher-earning workers are more or less likely to be promoted than lower-earning workers in the absence of the comprehensive set of variables that we already include to capture their productive capabilities and promotion opportunities.

In the selection equation, we include demographic characteristics that predict labour force participation: whether or not the individual is currently studying, their highest educational qualification, English proficiency, relationship status, whether or not they recently had a baby, their number of children according to age, whether or not they have carer responsibilities, and whether the individual has a disability or health condition. The factors that are empirically not significant in predicting job promotion outcomes therefore serve as exclusion restrictions.

Our total sample is restricted to individuals of core working-age (18 to 64 years inclusive). A description of all variables is provided in Table 1 and summary statistics are presented in Table 2.

13 For example, an industry which makes up 10 per cent of total employment, yet contributes to 15 per cent of all advertised job vacancies, would be assigned a relative measure of $15/10=1.5$, indicative of relatively strong promotion opportunities.

14 Australian Bureau of Statistics (ABS) *Job Vacancies*. Cat. no. 6354.0.

15 *Internet Vacancy Index (IVI)*, Labour Market Information Portal. Department of Jobs and Small Business Australia Government Accessible at <<http://lmip.gov.au/default.aspx?LMIP/GainInsights/VacancyReport>>

Table 1: Description of variables

<i>Variable</i>	<i>Description</i>
Outcome variable	
Promoted	Promoted at work in the past year (0=No; 1=Yes)
Personal characteristics	
Female	Gender (0=Male; 1=Female)
Age 18-29 (base)	Age category of individual in years (0=No; 1=Yes)
Age 30-39	Age category of individual in years (0=No; 1=Yes)
Age 40-49	Age category of individual in years (0=No; 1=Yes)
Age 50-64	Age category of individual in years (0=No; 1=Yes)
Cognitive test scores	Average score on cognitive test scores, scaled from 0 (lowest possible score) to 1 (highest possible score)
Tenure with employer	Number of years of employment with current employer
Overtime hours	Usual weekly hours equalled or exceeded 50 hours in preceding year (0=No; 1=Yes)
On-the-job training	Undertaken on-the-job training in preceding year (0=No; 1=Yes)
Employment characteristics	
Public sector	Sector of employment (0=Private; 1=Public)
Casual	Type of employment contract (0=Permanent; 1=Casual)
Firm size 2-19 (base)	Works in a firm which employs 2 to 19 workers (0=No; 1=Yes)
Firm size 20-49	Works in a firm which employs 20 to 49 workers (0=No; 1=Yes)
Firm size 50-99	Works in a firm which employs 50 to 99 workers (0=No; 1=Yes)
Firm size 100-499	Works in a firm which employs 100 to 499 workers (0=No; 1=Yes)
Firm size 500+	Works in a firm which employs 500 or more workers (0=No; 1=Yes)
Job opportunities by industry	Relative job demand according to individual's industry, measured as a ratio of the industry's share of job vacancies relative to its share of the total current workforce
Job opportunities by qualification	Relative job demand according to individual's qualification level, measured by the ratio of each qualification level's share of job vacancies to its share of the total current workforce
Job opportunities by state/territory	Relative job demand according to individual's state/territory, measured by the ratio of the state/territory's share of job vacancies to its share of the total current workforce
Personality characteristics#	
Big Five	Averaged response to: 'How well do the following words describe you?' on a scale from 1 (does not describe me at all) to 7 (describes me very well):
Agreeableness	cooperative; kind; sympathetic; warm
Conscientiousness	disorganised [^] ; efficient; inefficient [^] ; orderly; sloppy [^] ; systematic
Emotional stability	envious [^] fretful [^] jealous [^] moody [^] temperamental [^] touchy [^]
Extraversion	bashful [^] ; extraverted; lively; talkative; quiet [^] ; shy [^]
Openness to experience	complex; creative; deep; imaginative; intellectual; philosophical
Achievement Motivation	Averaged response to: 'How much you agree or disagree with each of the following statements?' on a scale from 1 (strongly disagree) to 7 (strongly agree):

Hope for success	'When confronted by a difficult problem, I prefer to start working on it straight away'; 'I like situations where I can find out how capable I am'; 'I enjoy situations that make use of my abilities'; 'I am attracted to tasks that allow me to test my abilities'
Fear of failure	'I start feeling anxious if I do not understand a problem immediately'; 'Even when nobody is watching, I feel anxious in new situations'; 'In difficult situations where a lot depends on me, I am afraid of failing'; 'I am afraid of tasks that I cannot work out or solve'; 'I feel uneasy about undertaking a task if I am unsure of succeeding'
Locus of Control (LOC)	Averaged response to: 'How much you agree or disagree with each of the following statements?' on a scale from 1 (strongly disagree) to 7 (strongly agree):
Net internal LOC	'What happens to me in the future mostly depends on me'; 'I can do just about anything I really set my mind to do' (internal loci) 'I have little control over the things that happen to me'; 'There is really no way I can solve some of the problems I have'; 'There is little I can do to change many of the important things in my life'; 'I often feel helpless in dealing with the problems of life'; 'Sometimes I feel that I'm being pushed around in life' (external loci)

Notes: **Industry:** ANZSIC refers to the Australian and New Zealand Standard Industry Classifications, Australian Bureau of Statistics (ABS) Cat. no. 1292.0. The 1-digit ANZSIC categories were: Mining; Manufacturing; Electricity, gas, water and waste services; Construction; Wholesale trade; Retail trade; Accommodation and food services; Transport, postal and warehousing; Information media and telecommunications; Financial and insurance services; Rental, hiring and real estate services; Professional, scientific and technical services; Administrative and support service; Public administration and safety; Education and training; Health care and social assistance; Arts and recreation services; Other services. The Agriculture, forestry and fishing industry was omitted due to low sample representation. **Qualifications:** Qualifications were categorised in commensuration with skill level according to the Australian Qualifications Framework (AQF), defined by the Australian Qualifications Framework Council as follows: 1 equates to Bachelor degree or higher; 2 equates to Advanced Diploma or Diploma; 3 equates to Certificate III or IV; and 4 equates to Year 12 or Certificate I or II. **Geographic location:** ASGS refers to the Australian Statistical Geography Standard, Australian Bureau of Statistics (ABS) Cat. no. 1270.0.55.005. **Achievement Motivation:** Questionnaire items were sourced from Melbourne Institute of Applied Economic and Social Research (2012). **Big Five:** Questionnaire items were sourced from Melbourne Institute of Applied Economic and Social Research (2013). Losonc (2009) provides further detail on which adjectives were used to construct the final version Big Five traits accounting for factor loading. Note that numerical values for adjectives denoted by ^ were reversed for the computation of the relevant trait. **LOC:** The items for the internal and external loci of control were combined to create a single measure which equates to net internal LOC, using the method described by Cobb-Clark and Schurer (2013). Questionnaire items were sourced from Melbourne Institute of Applied Economic and Social Research (2011). For numerical interpretability, personality characteristics were standardised to take a mean value of 0 and a standard deviation of 1 in the estimation of computing marginal effects. Descriptions for the variables used the selection equation are not reported for brevity but are available from the author.

Table 2: Summary statistics

	<i>Pooled</i>		<i>Men</i>		<i>Women</i>		<i>Gender differential</i>
	<i>Mean</i>	<i>Std. dev</i>	<i>Mean</i>	<i>Std. dev</i>	<i>Mean</i>	<i>Std. dev</i>	
Outcome variable							
Promoted	0.094	0.292	0.101	0.301	0.088	0.283	
Personal characteristics							
Female	0.554	0.497	0.000	0.000	1.000	0.000	
Age 18-29 (<i>base</i>)	0.277	0.448	0.286	0.452	0.270	0.444	
Age 30-39	0.200	0.400	0.205	0.404	0.197	0.398	
Age 40-49	0.221	0.415	0.218	0.413	0.223	0.417	
Age 50-64	0.301	0.459	0.291	0.454	0.309	0.462	
Cognitive test scores	0.551	0.122	0.545	0.126	0.555	0.119	***
Tenure with employer	6.600	7.727	6.911	8.132	6.308	7.317	***
Overtime hours	0.326	0.469	0.329	0.470	0.323	0.468	
On-the-job training	0.369	0.483	0.355	0.479	0.382	0.486	
Employment characteristics							
Public sector	0.278	0.448	0.231	0.421	0.324	0.468	***
Casual	0.180	0.384	0.152	0.359	0.207	0.405	***
Firm size 2-19 (<i>base</i>)	0.317	0.466	0.328	0.470	0.307	0.461	
Firm size 20-49	0.189	0.391	0.175	0.380	0.202	0.402	*
Firm size 50-99	0.130	0.337	0.129	0.335	0.132	0.338	
Firm size 100-499	0.213	0.410	0.221	0.415	0.205	0.404	
Firm size 500+	0.150	0.357	0.146	0.353	0.154	0.361	
Job opportunities by industry	0.942	0.602	0.991	0.538	0.896	0.654	***
Job opportunities by qualification	1.008	0.279	0.973	0.297	1.035	0.260	***
Job opportunities by state/territory	0.991	0.313	0.991	0.307	0.991	0.317	
Personality characteristics							
Achievement Motivation							
Hope for success	5.298	1.013	5.376	1.002	5.235	1.018	***
Fear of failure	3.662	1.348	3.399	1.293	3.871	1.355	***
Big Five							
Agreeableness	5.452	0.895	5.179	0.895	5.673	0.833	***
Conscientiousness	5.125	1.014	5.003	0.997	5.223	1.016	***
Emotional stability	5.100	1.069	5.093	1.054	5.107	1.081	
Extraversion	4.426	1.111	4.292	1.043	4.534	1.151	***
Openness to experience	4.299	1.042	4.365	1.010	4.247	1.064	***
Locus of Control							
Net internal LOC	5.496	1.097	5.533	1.070	5.466	1.118	*
Number of observations							
Employed individuals only	5765		2822		2943		
Total observations	8044		3589		4455		

Note: Summary statistics are based on the sample used in baseline specification (Model #1). Summary statistics for the variables used the selection equation are not reported for brevity but are available from the author. For numerical interpretability, personality characteristics were standardised to take a mean value of 0 and a standard deviation of 1 in the estimation of computing marginal effects. Gender differentials denote whether the difference between men's and women's mean values is significant at the ***1%; **5%; *10% critical level. *Source:* Author's analysis using the HILDA Survey.

5. Empirical results

5.1 Predictors of job promotion

Reported in Table 3, the baseline model (Model #1) indicates that job promotion is inversely related to a worker's age and tenure¹⁶, and positively related with undertaking overtime hours and on-the-job training in the prior year. This is consistent with our expectation that a worker's commitment to the firm enhances their value. Possibly this also signals that firms allocate training to workers who are already identified as candidates for promotion. Workers employed in large firms, or in industries with relatively strong job opportunities, experience higher promotion prospects, while those on casual contracts experience weaker prospects. Promotion opportunities tend to diminish the longer that a worker has been employed in their firm, which is a likely reflection of them nearing the upper tiers of the promotion ladder.

With the inclusion of Achievement Motivation (Model #2 in Table 3), we find that hope for success is positively related to the probability of job promotion, as anticipated, while fear of failure is unrelated. The inclusion of the Big Five traits (Model #3 in Table 3) reveals that workers who are relatively more extraverted, open to experience and conscientious are more likely to be promoted, consistent with our hypotheses. Workers with a higher net internal LOC experience higher promotion prospects (Model #4 in Table 3). All of these empirical links are consistent with our hypotheses.

¹⁶ The squared value of tenure was initially included as an explanatory variable to test for diminishing marginal returns, but omitted due to non-significance.

Table 3: Likelihood of job promotion: Heckprobit coefficient results

	Model #1		Model #2		Model #3		Model #4	
	Baseline		Achievement Motivation		Big Five		Locus of Control	
Outcome equation (Promoted or not)								
Personal characteristics								
Female	0.012 (0.051)		0.019 (0.054)		0.001 (0.056)		0.023 (0.055)	
Age 30-39	-0.124 (0.063)	**	-0.101 (0.066)		-0.112 (0.064)	*	-0.097 (0.068)	
Age 40-49	-0.424 (0.069)	***	-0.390 (0.072)	***	-0.412 (0.070)	***	-0.416 (0.074)	***
Age 50-64	-0.495 (0.080)	***	-0.464 (0.082)	***	-0.503 (0.083)	***	-0.491 (0.084)	***
Cognitive test scores	0.275 (0.231)		0.338 (0.241)		0.272 (0.241)		0.283 (0.248)	
Tenure with employer	-0.018 (0.004)	***	-0.018 (0.004)	***	-0.017 (0.004)	***	-0.022 (0.005)	***
Overtime hours	0.224 (0.062)	***	0.187 (0.066)	***	0.217 (0.063)	***	0.212 (0.068)	***
On-the-job training	0.187 (0.048)	***	0.190 (0.050)	***	0.179 (0.049)	***	0.203 (0.052)	***
Employment characteristics								
Public sector	0.024 (0.061)		0.020 (0.064)		0.028 (0.062)		0.038 (0.065)	
Casual	-0.471 (0.078)	***	-0.477 (0.083)	***	-0.490 (0.080)	***	-0.475 (0.084)	***
Firm size 20-49	0.107 (0.070)		0.117 (0.073)		0.104 (0.071)		0.100 (0.075)	
Firm size 50-99	0.013 (0.082)		0.008 (0.086)		0.008 (0.083)		-0.057 (0.089)	
Firm size 100-499	0.188 (0.067)	***	0.196 (0.071)	***	0.191 (0.068)	***	0.179 (0.072)	**
Firm size 500+	0.160 (0.077)	**	0.169 (0.080)	**	0.165 (0.078)	**	0.156 (0.082)	*
Job opp. by industry	0.141 (0.038)	***	0.149 (0.040)	***	0.141 (0.039)	***	0.140 (0.041)	***
Job opp. by qualification	0.062 (0.088)		0.056 (0.092)		0.040 (0.089)		0.074 (0.095)	
Job opp. by state/territory	0.098 (0.072)		0.129 (0.075)	*	0.088 (0.074)		0.134 (0.077)	*
Personality characteristics								
Achievement Motivation								
Hope for success			0.106 (0.029)	***				

Note: #Full results used the selection equation are not reported for brevity but are available from the author. Significant at: ***1%, **5%, *10% critical level. Standard errors are in parentheses. (df) denotes degrees of freedom. Age is relative to reference category of 18-29 years. Firm size is relative to firms with 2-19 employees. Educational qualification is relative to secondary school or below. Observation count differs slightly across the models due to variation in the number of non-responses for the personality trait variables. *Source:* Author's analysis using the HILDA Survey.

Emotional stability is found to be inversely related to job promotion prospects. While this seems counterintuitive to our initial hypothesis – as neuroticism connotes a tendency to worry under pressure – organisational management literature also suggests that feelings of anxiety can in fact motivate a neurotic employee to work harder (Bendersky and Shah 2013). Furthermore, neuroticism is associated with stronger firm loyalty (Erdheim, Wang and Zickar 2006). Compatible with our findings, a worker's anxiety about leaving their current firm can motivate their commitment, meaning that are more likely to remain in their firm and climb their firm's internal hierarchical ladder, rather than seek out opportunities in other organisations.

Also at odds with our initial hypothesis, agreeableness has no significant link to job promotion prospects. Although agreeableness is conceivably a trait that would be highly valued within organisations, because cooperative individuals might be more likely to foster harmonious and productive working relationships, it is also possible that agreeable individuals are more likely to engage in behaviour that works against their career advancement in current job promotion systems. For example, highly agreeable workers might be more willing to allocate their time away from their own work tasks to help colleagues, and be less likely to engage in self-focused, competitive behaviours that would advance their own career ahead of others, such as singling out their individual contribution in a collaborative project.

Our curiosity lies in whether these links between personality traits and job promotion prospects are consistent across men and women. We therefore disaggregate the estimation into gender-specific samples. We compute the average marginal effects of personality variables, using standardised values so that marginal effects can be quantifiably interpreted as the percentage increase in job promotion prospects associated with a one-standard-deviation increase in the characteristic of interest.

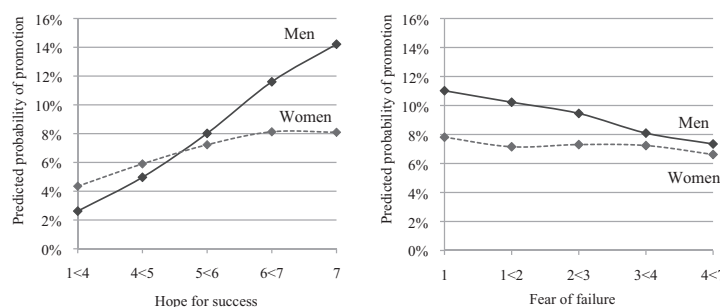
Hope for success is associated with higher promotion prospects on average across the entire sample: a one-standard-deviation increase in hope for success is linked to a 1.9 per cent boost in the likelihood of a job promotion (Table 4). Yet when disaggregated by gender, a stark disparity emerges. Among men, an increase in hope for success lifts the prospect of a job promotion by 3.3 per cent, but this link between confidence and job promotion loses statistical significance among women. Fear of failure remains non-significant as a predictor of job promotion prospects among both men and women. Figure 2 illustrates these gender differences in predicted promotion rates according to Achievement Motivation levels.

Table 4: Likelihood of job promotion: Heckprobit marginal effects of Achievement Motivation model

	Men	Women	Pooled
Personality characteristics			
Achievement Motivation			
Hope for success	0.033 (0.008) ***	0.004 (0.007)	0.019 (0.005) ***
Fear of failure	-0.001 (0.007)	0.000 (0.006)	0.000 (0.005)
Model criteria			
Total observations	3354	4199	7533
Uncensored observations	2644	2791	5435
Censored observations	710	1408	2118
Wald χ^2	105.83 (18 df)	96.61 (18 df)	180.70 (19 df)
Prob> χ^2	0.0000	0.0000	0.0000
Log likelihood	-2169.78	-2907.87	-5307.67
Predicted promotion rate	8.55%	6.97%	7.55%

Note: Significant at: ***1%; **5%; *10% critical level. Marginal effects based on Heckprobit specification reported as Model #2 in Table 3. Full coefficient results available from the author.
Source: Author's analysis using the HILDA Survey. Standard errors are in parentheses. (df) denotes degrees of freedom.

Figure 1: Predicted promotion rate for men and women according to Achievement Motivation



Note: Promotion probabilities are estimated for 2013 using Achievement Motivation responses collected in 2012. Categories at the lower levels of Hope for success and at the higher levels of Fear of failure are grouped due to small sample sizes. Source: Author's analysis using the HILDA Survey.

Turning to the Big Five traits (Table 5), a one-standard-deviation increase in conscientiousness, extraversion or openness to experience is linked to an approximate 1 percentage-point increase in job promotion prospects on average across the entire sample. However, again when disaggregated by gender, the significance of this link is only retained among the male workforce. An inverse relationship is detected between emotional stability and job promotion prospects, yet only among women. This finding could indicate that anxiety about separating from an employer has a stronger influence on women's labour force behaviour than men's.

Table 5: Likelihood of job promotion: Heckprobit marginal effects of Big Five model

	<i>Men</i>	<i>Women</i>	<i>Pooled</i>
Personality characteristics			
Big Five			
Agreeableness	-0.009 (0.007)	-0.001 (0.007)	-0.003 (0.005)
Conscientiousness	0.018 (0.007) ***	0.000 (0.006)	0.010 (0.005) **
Emotional stability	-0.006 (0.007)	-0.012 (0.006) *	-0.009 (0.005) *
Extraversion	0.017 (0.007) **	0.007 (0.006)	0.012 (0.005) ***
Openness to experience	0.023 (0.008) ***	0.005 (0.007)	0.013 (0.005) **
Model criteria			
Total observations	3583	4450	8033
Uncensored observations	2819	2941	5760
Censored observations	764	1509	2273
Wald χ^2	124.44 (21 df)	102.94 (21 df)	206.13 (22 df)
Prob> χ^2	0.0000	0.0000	0.0000
Log likelihood	-2304.63	-3061.27	-5652.58
Predicted promotion rate	8.74%	7.01%	7.63%

Note: Significant at: ***1%; **5%; *10% critical level. Marginal effects based on Heckprobit specification reported as Model #3 in Table 3. *Source:* Author's analysis using the HILDA Survey. Standard errors are in parentheses. (df) denotes degrees of freedom.

An increase in LOC of one standard deviation corresponds to a higher likelihood of promotion by around 1 percentage point on average (Table 6). This positive association heightens to a 1.8 percentage point gain among men, but diminishes into non-significance among women.

Table 6: Likelihood of job promotion: Heckprobit marginal effects of Locus of Control model

	<i>Men</i>	<i>Women</i>	<i>Pooled</i>
Personality characteristics			
Locus of Control			
Net internal LOC	0.018 (0.007) **	0.003 (0.007)	0.010 (0.005) **
Model criteria			
Total observations	3201	4002	7203
Uncensored observations	2548	2656	5204
Censored observations	653	1346	1999
Wald χ^2	101.24 (17 df)	93.67 (17 df)	180.46 (18 df)
Prob> χ^2	0.0000	0.0000	0.0000
Log likelihood	-2034.12	-2763.67	-5039.75
Predicted promotion rate	8.49%	6.89%	7.49%

Note: Significant at: ***1%; **5%; *10% critical level. Marginal effects based on Heckprobit specification reported as Model #4 in Table 3. *Source:* Author's analysis using the HILDA Survey. Standard errors are in parentheses. (df) denotes degrees of freedom.

In sum, being more confident, conscientious, extraverted, open to experiences, or self-determinant is not found to make a statistical difference to women's job promotion prospects – despite these characteristics all being positively associated with higher promotion rates for men.

Among the other explanatory factors, we observe several other gender disparities that display strong statistical significance. Working in a large firm appears to improve men's promotion prospects by at least around 4 percentage points, yet has no statistical link to the job promotions of women. A factor that does appear to boost women's job promotion prospects is overtime work: women who regularly work above a full-time workload are 6 percentage points more likely to be promoted, whereas men's prospects are lifted by only 3 percentage points at best. Women's promotion prospects appear to benefit slightly more than men's from expansions in job opportunities in their state or territory, suggesting that women's job promotion opportunities are more closely tied to the conditions of the labour market. The links between job promotion and age, tenure, on-the-job training, casual employment and industry-based job expansion are largely consistent across genders.

5.2 Oaxaca-Blinder decomposition effects

The endowment and coefficient effects of the Oaxaca-Blinder decomposition model are presented in Table 7, where a positive sign informs us that the effect generates an advantage to men, while a negative sign indicates an advantage to women. Men are advantaged by their higher average levels of hope for success, as well as the higher benefit that they experience for this trait. Men are also advantaged by their higher average levels of openness to experience, whereas women are advantaged by their higher average levels of conscientiousness and extraversion. Men, however, experience a higher return on these latter two traits. While there is not a sizeable enough difference in men's and women's average levels of LOC to generate an endowment effect, men are advantaged by receiving a higher positive return on this trait.

Table 7: Oaxaca-Blinder decomposition of personality characteristics

	<i>Endowment effects</i>			<i>Coefficient effects</i>		
Model #2 Achievement Motivation						
Hope for success	0.013	(0.005)	***	0.119	(0.041)	***
Fear of failure	0.002	(0.009)		-0.005	(0.023)	
Model #3 Big Five						
Agreeableness	0.013	(0.014)		-0.044	(0.056)	
Conscientiousness	-0.012	(0.006)	*	0.110	(0.045)	**
Emotional stability	0.000	(0.001)		0.033	(0.042)	
Extraversion	-0.016	(0.006)	**	0.059	(0.033)	*
Openness to experience	0.008	(0.003)	**	0.048	(0.036)	
Model #4 Locus of Control						
Net internal LOC	0.002	(0.002)		0.083	(0.043)	*

Note: Significant at: ***1%; **5%; *10% critical level. Standard errors in parentheses. Oaxaca-Blinder decomposition is based on the Heckprobit specifications presented in Table 3. Number of observations and model criteria align to the results presented in Table 3. As the estimation is based on a probit specification, only the signs, and not the numerical value, of the coefficients can be interpreted. Only the decomposition effects for personality variables are reported, with full results available from the author. *Source:* Author's analysis using the HILDA Survey.

Across all the personality characteristics for which one gender is receiving a more favourable return than the other gender, there are no instances in which women are the ones reaping the advantage. Noting that we applied the gender-neutral pooling methodology proposed by Neumark (1988) which makes no prior assumptions that the returns to a given characteristic necessarily favour either men or women, all of the gender biases that emerge in terms of returns to personality characteristics happen to work in favour of men. Comparing these results to Risse *et al.* (2018), we observe that gender biases in returns to confidence emerge only in the context of job promotion outcomes, not wage outcomes. This implies that job promotion decisions – which are often determined through personal interviews with a panel – are more heavily exposed to subjective biases and influenced by societal norms.

5.3 Disaggregation by industry, occupations and firm size

We disaggregate the sample by industry, occupation and firm size to investigate whether the gender-specific effects of confidence are more prominent within particular segments of the workforce.¹⁷ Selection into the respective workforce industry, occupation and firm size is controlled for using education and English proficiency as exclusion restrictions, given that these variables were found to have no predictive significance in the outcome equation. The advantageous links between confidence and job promotion prospects prevail most strongly in favour of men in mining, transport, postal and warehousing, and the arts and recreation industries, and among trade workers, technicians, labourers, machinery operators and drivers. Also within

¹⁷ Tables of results are not reported for brevity but are available on request.

these occupations, women experience a higher penalty than men for displaying fear of failure. These gender biases amplify with firm size.

Among managers, we find that men and women managers are penalised for showing fear of failure, yet men are penalised more – a potential signal of the influence of gender norms when it comes to positions of leadership and authority.

5.4 Robustness checks and limitations

We inspected the data for any empirical indications that an individual's confidence level could have been influenced by previous experiences of job promotions.¹⁸ Firstly, we exploit the fact that the HILDA Survey asks respondents 'how long ago did the job promotion occur?', with responses disaggregated by quarterly year periods. If a job promotion were to affect an individual's confidence level, then we might anticipate that individuals who were promoted more recently would have a higher level of confidence than those who were promoted relatively longer ago. When we inspect the Achievement Motivation levels of workers according to how recently they were promoted – ranging from '0 to 3 months ago' to '22 to 24 months ago' – we observe that workers who were promoted relatively recently do not statistically differ in their average levels of hope for success or fear of failure compared to workers who were promoted longer ago (Appendix A).

Secondly, to account for the potential that an individual's previous experiences of being promoted at work may have lifted their level of confidence, we run a version of the model that excludes all individuals who received job promotion during the three years leading up to the year under observation (that is, at any point from 2010 to 2012). The results are robust to this restricted sample. Ideally, we would also seek to examine the data for any signs that an individual's confidence may have been adversely by any unsuccessful past attempts for a job promotion. An unfortunate limitation to our dataset is that we cannot identify individual who applied for promotion but failed, and therefore cannot explicitly control for this effect.

Thirdly, we take into account the possibility that job promotion opportunities are less likely to be available to workers who have recently commenced their job or who have reached their peak of their career ladder. We exclude workers who were already at manager level in the previous year, since this occupational group is likely to over-represent individuals at the peak of their career progression and are less likely to have the opportunity to be promoted further. Turning to the other end of the spectrum, we exclude individuals whose tenure with their current employer is less than one year, as this sub-sample is likely to over-represent people for whom the opportunity to be promoted might not yet be a feasible possibility. The coefficients for hope for success and fear of failure, and their respective endowment and coefficient effects, are unchanged in levels of significance. Despite these robustness checks, we acknowledge the data limitations of this analysis which mean that potential measurement errors, omitted variable bias and multicollinearity may still exist.

18 Tables of results are not reported for brevity but are available on request.

6. Discussion of results

Having detected a positive link between workers' hope for success and job promotion prospects, and having observed that women display lower average levels of confidence than men, it might seem logical to infer that the way to advance women's careers is to increase their confidence: this rationale underpins the 'lean in' movement. However, the gender lens we have incorporated into this analysis points towards the critical caveat that must be applied to our understanding of confidence in the workplace: we do not detect any statistically significant evidence to support the claim that higher confidence translates into stronger job promotion prospects for women in the same way that it appears to lift the job promotions prospects of men. This gender disparity is consistent with the organisational behaviour literature which finds that, relative to men, women can experience a lower return – and even a penalty or backlash – for demonstrating ambition, confidence and assertiveness in the workplace (Bowles, Babcock and Lei 2007; Catalyst 2007; Ibarra, Ely and Kolb 2013; O'Neill and O'Reilly 2011). One reasoning behind this is that the act of women showing ambition and authority contravenes gender-patterned cultural norms and expectations of behaviour (Eagly and Wood 1991; Eagly and Karau 2002) and that such non-conformity evokes repercussions that can include lower job promotion prospects (O'Neill and O'Reilly 2011). Our findings also align with studies of the 'sticky floor' phenomenon which conclude that women's stagnant career advancement has more to do with discrimination on the part of the employer, rather than the attributes or behaviours of female workers themselves (Artz, Goodall and Oswald 2018; Baert, De Pauw and Deschact 2016).

Gender-biased patterns in job promotion can reflect gender-biased norms in relation to competency and leadership that may prevail within an organisation and broader culture (Metz and Kulik 2014). Consistent with a societal stereotype that positions men as the 'template' worker and leader, all of the Big Five and LOC personality characteristics that were found to be associated with job promotion in this analysis were characteristics that empirically typify males more than females. Furthermore, our finding that the link between workers' confidence and job promotion prospects is most prominent within the male-dominated segments of the workforce suggests that the salience of gender-based stereotypes contributes to these gender-patterned promotion outcomes. Our finding that men are penalised more than women for displaying fear of failure, especially at management level, also aligns with stereotypical gendered expectations, namely that men should demonstrate strength, control and fearlessness in authoritative or high-pressured situations. This is a gender norm which not only impedes equitable opportunities for women but can also impose potentially harmful repercussions on men's wellbeing (Whitehead 2014).

In terms of the mechanisms that might perpetuate these gender biases in job promotion outcomes, our results are consistent with the observation that leadership appointments tend to reflect the profiles of those who are already in positions of authority and making the appointment decisions – a behaviour that aligns with affinity bias (Gorman 2005). Specifically, it has been found that men's higher confidence may play a role in driving gender-biased 'imitation effects'. Past research show that, when placed in an evaluator role, confident men tend to project their own self-confidence onto

other men, resulting in them overestimating the performance capabilities of other men while under-estimating the performance capabilities of women (Albrecht, von Essen, Payys and Szech 2013). Women in evaluator roles were not found to act in such a way.

These findings also help to explain why women remain under-represented in senior occupational ranks. A workforce that systematically favours confident men overconfident women in its promotion outcome sends the message that successful leadership equates to a confident male: this signal can explain women's reluctance to 'lean in' in the first place. The perpetual under-representation of any socio-demographic group in the upper tiers of an organisation can also deny the opportunity for under-represented individuals to demonstrate their capacity to perform these roles, eliciting the effects of statistical discrimination and consequently reinforcing leadership stereotypes (Oettinger 1996; Bjerk 2008). There is also evidence that higher levels of confidence can inflate a worker's promotion prospects unduly: studies show that more confidence individuals are perceived, by others, as more competent, regardless of their actual level of competency (Anderson, Brion, Moore and Kennedy 2012).

If these gender biases result in the most capable candidate being overlooked for the job, the repercussions can spill beyond individual-level effects and lead to firm-wide and economy-wide losses in efficiency and performance. Not only is there a lack of evidence that higher confidence equates to higher performance, there is growing awareness of the dangers of relying on a candidate's confidence as a signal of their competency and leadership potential. Organisational management literature cautions us that the characteristics that a candidate may use to persuade others of their superior capability for the job – confidence, charisma and high self-esteem – are the same traits that are likely to make them an incompetent leader and can have the effect of veiling their shortcomings, including potential narcissistic tendencies (Chamorro-Premuzic 2019). Organisations that value merit-based systems of job appointments, and seek the most capable candidate for the job, would be advised to evaluate the processes that guide their appointment decisions and adopt design mechanisms that facilitate the objective evaluation of every candidate (Bohnet 2016). These steps can reduce the risk that candidates' expressed level of confidence distorts the decision-making process.

While the well-intentioned 'lean in' movement may encourage more women to act more confidently and opt into the promotions pool, a growing body of literature suggests that caveats need to be applied to the advice. Firstly, the psychology literature informs us that personality traits are not easily malleable. Secondly, even if personality could be deliberately changed, there is no robust evidence that they will be rewarded for becoming more confident in the workplace. Thirdly, the 'lean in' advice places the onus on women to change, perpetuating the notion that workplaces requires women to conform to the model of behaviour demonstrated largely by men (Wille *et al.* 2018), neglecting and devaluing the potential gains that different dispositions can bring to the workplace. These caveats imply that, instead of urging all workers to converge towards a stereotyped norm that prescribes success as a function of one's confidence, it would be more effective for organisations to focus on the performance gains that could be achieved through the diversity of personal attributes offered by their workforce. This approach is supported by research that identifies the economic gains of organisational diversity especially in relation to decision-making (Hunt *et al.* 2018). Encouraging

organisations to scrutinise the effectiveness of their own structures and systems, rather than placing the responsibility on women to change, also accords with an emerging body of literature that points to the flaws and futility of treating women's attributes as a deficiency (Fox 2017; Orr 2019).

As these findings are based on average effects across the entire workforce, women who are inspired by the 'lean in' advice should not be deterred from putting themselves forward for career advancement. The implication of these findings is that women are advised to assess the signals within their organisation as to whether confidence among females is likely to be rewarded.

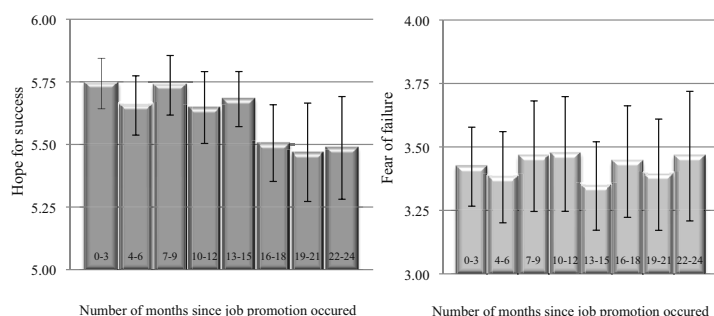
7. Conclusion

This paper presents the first large-scale, nationally representative study of the empirical link between an individual's confidence and job promotion prospects, examined through a gender lens. While promotion rates do not differ significantly between men and women, the characteristics associated with job promotion do. Our finding that hope for success is linked to higher job promotion prospects among men – but not among women – provides no evidence to support the widespread advice that is often given to women to 'lean in' and show more confidence and ambition in the workplace. A meritocratic, gender equitable system of job appointment will be difficult to achieve if organisations continue to reward attributes such as confidence and extraversion in gender-biased ways, and without solid evidence that these attributes matter for job performance and leadership capacity in the first place.

This study's findings suggest that the path toward gender equality should be less about attempting to change women, and more about changing the ways that women are evaluated differently to men. This requires that organisations transparently identify and prioritise the attributes that truly matter for workplace performance and leadership – and refrain from being swayed by the traits that do not.

Appendix A

Figure A1: Hope for success and fear of failure levels of individuals who were promoted during past two years, according to recency of job promotion



Note: Columns indicate mean level and vertical bars indicate the bounds of 95% confidence intervals around the means. Sample sizes, in order from the '0-3 months' to the '22-24 months' categories: 297; 220; 165; 117; 247; 141; 128; 109 (for Hope for success) and 297; 217; 164; 119; 241; 142; 128; 110 (for Fear of failure). *Source:* Author's analysis using the HILDA Survey.

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Do financial constraints affect the composition of workers of a firm?

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Abstract

We study the relationship between financing constraints and the workforce composition of firms that employ both casual and non-casual workers. We use data on Australian firms from 2009-2014 and a more direct measure of firm financial constraints than previous studies. We show that the proportion of casual workers in firms grew over the time period being analysed. This was the case regardless of whether a firm was financially constrained or not. However, the magnitude of this change differed between financially constrained and unconstrained firms. We find that of firms whose workforces were growing, financially constrained firms hired relatively fewer casual workers than financially unconstrained firms did. This is consistent with firms using internal financing to cope with a lack of access to credit and equity.

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1. Introduction

Recent studies have explored how financing constraints affect firm decision-making. Most of these studies have focused on decisions about fixed capital investment, and have found the effects significant and important. Fewer studies have investigated how financing constraints affect employment decisions. This paper provides new evidence on the effect of financial constraints on the mix of casual and other workers in small and medium-sized Australian firms.

Understanding the effect of financing constraints on firm employment decisions is crucial for two reasons. First, as small firms innovate and expand they often confront shortages in access to credit and equity. Firms may resort to self-financing which may affect how they hire and remunerate labour. For example, firms may pay current employees less or ask them to work harder in exchange for a promise of a share of future growth.

A second reason why this is an important question is that we know that employment suffers during financial crises, but often with a lag. Understanding how shocks in the macro economy are transmitted to the labour market requires understanding firm-level decision-making about employment. Our paper contributes to both of these larger literatures.

We classify firms as financially constrained based on their responses about access to financing in the Australian Bureau of Statistics' Business Characteristics Survey. This is a much more direct measure of financial constraint than has been used in previous studies which have generally tried to infer financial constraint from firm financial data.

Being financially constrained is generally viewed as different than simply having cash flow problems. The literature generally views financial constraint as being equivalent to an inability to access finance, either in the immediate term or persistently. If firms are unable to access finance and are funding business activities through their own funds this may generate cash flow problems. But this is distinct from cash flow problems which may be experienced by a failing firm which simply isn't generating enough sales to cover cost. As we discuss below in sections 2.1 and 3, we use information about access to finance and firm innovative activities to attempt to get at this definition of financial constraint.

Using this information, we analyse changes in the composition of employment for firms that are financially constrained and ones that are not. This paper focuses on how these two firm types change the mix of casuals and non-casuals in their workforce when their workforce is growing or shrinking.

We study Australian firms over the years immediately following the Global Financial Crisis. Our data cover small- and medium-sized firms; that is firms with less than 200 employees. We find that, for the firms studied, there was an interaction between financing constraints and employment decisions. Namely, firms that increased the size of their workforces gradually increased the share of their workforces that were employed on a casual basis. However, the magnitude of that increase was greater for financially unconstrained firms.

Casual workers in financially constrained firms were not disproportionately affected when firms reduced the size of their workforces. Firms that saw a shrinking workforce had relatively more casual workers over time, but the magnitude of this change did not differ based on whether a firm was financially constrained.

We make three contributions in this paper. First, we use a novel measure of financial constraint which has not previously been used in the literature. This measure is a more direct measure of firm financial constraint based on incapacity to access finance. Second, we provide the first evidence for Australia which is also insightful for a wide range of other countries given the mix of policy in Australia. Australia's welfare settings are similar to many European countries but its labour market institutions have evolved significantly over the past 40 years. Labour markets in Australia have moved from centralised wage setting to a much more decentralised approach and have been shifting towards a more United States (US)-style approach over the last 40 years, see Gregory (2002). Like the US, immigration is a key feature of Australia's labour market. Wage inequality has increased and, has to some degree mirrored growing wage inequality in the US, see Sila and Dugain (2019). Australia retains a high minimum wage and its 'award' system where the wages and conditions of many workers are determined by union-negotiated awards despite low and decreasing rates of unionisation. Finally, we add to the evidence about the nature and type of effects that firm financial constraints have on firm employment decisions.

This paper is organised as follows: Section 2 reviews the relevant literature. We describe the data in Section 3. In Section 4 we explain our definition of financially constrained firms and examine whether our definition corresponds to other elements of firm characteristics. Section 5 reports the results of regressions analysing the effect of financial constraint on changes in firms' employment mix and discusses the implications. We conclude in Section 6.

2. Background

The analysis in this paper complements the literature on financial constraints, which explores decisions of firms when they are unable to get access to financing. A large part of this literature proposes different approaches to identifying and measuring financial constraints. The analysis in this paper is also relevant to the literature on the determinants of firm employment dynamics. Each of these areas is discussed below.

2.1 What does it mean to be financially constrained?

Firms are assumed to have access to finance in many traditional models of firm behaviour. But in reality situations arise in which firms are unable to borrow money or issue debt. Firms in this position must rely at least in part on internal financing to fund activities. This reliance on internal funding sets a limit on what financially constrained firms can do.

Since the late 1980s researchers have explored this interaction between access to financing and firm behaviour. The broadest (and most common) definition of financial constraints in the literature refers to firms facing a wedge between the cost of internal and external financing.¹

Many papers on the effect of financial constraints on firm behaviour or outcomes focus on the relationship between financial constraints and firm investment decisions.² What has emerged is relatively widespread agreement that financially constrained firms invest less than unconstrained firms.

Fewer studies have considered the effects of financial constraints on other types of firm behaviour. They have found that financing constraints can hamper productivity (Ferrando and Ruggieri (2018)) and can have a negative effect on total employment (Nickell and Nicolitsas (1999), Smolny and Winker (1999)). Michelacci and Quadrini (2009) concluded that firms are more likely to pay low wages when they are financially constrained and higher wages after they become unconstrained. Almeida *et al.* (2013) found that financial constraints are positively associated with firm-level innovative efficiency and found that being constrained can force firms to make better investment decisions.

These findings point to a statistically significant relationship between financing constraints and firm decision-making.³ This paper is motivated by the intuition that if financial pressures affect firm decisions about investment, employment levels and wages, they could also affect decisions about the types of workers that firms employ. Caggese and Cuñat (2008) found that financially constrained firms use fixed term workers more intensively, and more often use them to absorb employment volatility.

Their findings offer a useful comparison point for this paper. They study a sample of Italian firms and workers. Our evidence, from Australia, is important in determining whether we see similar effects at different time periods and under very different labour market institutions.

2.2 Measuring financial constraint

Firm-level datasets do not typically contain information explicitly stating whether a firm is financially constrained. Instead, researchers must often determine whether a firm is financially constrained by looking at other information.

Approaches to doing this can differ significantly between studies and depending on what information is available. For example, Kaplan and Zingales (1997) assign firms a degree of financial constraint based on quantitative and qualitative information about financing from company annual reports. Cleary (1999) determines a financial constraint hierarchy using multiple discriminant analysis, classifying firms as either financially constrained or unconstrained based on whether they are increasing or decreasing dividend payments. Other approaches to determining financial constraint involve solving a structured model numerically and using the results of the model to

1 For example, Kaplan and Zingales (1997)

2 See, for example, Kaplan and Zingales (1997), Cleary (1999) and Campello *et al.* (2010).

3 Our focus is on firm behaviour. There is also a literature on decisions by credit providers about which firms to fund and the firm characteristics which determine that decision—see Araujo and Hambur (2018) for Australian evidence using similar data to ours.

form portfolios with different financial constrained rankings (Whited and Wu (2006); Caggese and Cuñat (2008)).

Here, we identify financially constrained firms from their survey responses about access to funds. Since the survey data provide information that closely relates to the financial constraint definition (see below), more indirect financial modelling of financial constraints is not required.⁴ The responses that we use are a much more direct measure of financial constraints faced by a firm.

2.3 Determinants of firm employment decisions

This paper is also related to the literature exploring changes to firm employment composition. Papers typically model a simplified two-tier system including fixed term contracts and permanent contracts.⁵ Fixed term contracts are treated as having a smaller firing cost, which drives a wedge in employment security and separation rates for the two types of workers.

Much of the literature on the employment composition of firms examines the economic effects of loosening employment protection laws, which liberalise the use of fixed-term contracts. For example, Dolado *et al.* (2002) considered the effects of an upsurge in temporary work following the Spanish labour market reforms in the 1990s. They found the changes resulted in higher worker and job turnover rates, and lower unemployment duration for fixed-term workers. Their results were more mixed for the unemployment rate. While lower firing costs associated with fixed-term contracts contributed to employment growth, this also resulted in lower investment in human capital, higher wage pressure and a more unequal distribution of unemployment duration.

Similarly, Blanchard and Landier (2002) concluded that reforms allowing firms to hire workers on fixed-duration contracts can lead to perverse outcomes, with high turnover in fixed-duration jobs and higher unemployment.

However, outside the context of fixed-term contract liberalisation, few studies have investigated the interaction between business cycle effects and managerial decisions on hiring and firing fixed-term or casual workers. This small literature is reviewed in section 5 of Bakhtiari *et al.* (2020). One important paper related to our study is Caggese and Cuñat (2008), which investigated this point with reference to financial constraints. They propose two possible effects of financial constraints on the composition of employment. The first is that firms experiencing financial constraint value internally generated earnings highly and therefore demand more productive permanent workers. The second is a demand for fixed term workers who are more flexible and therefore able to absorb liquidity shocks. They found that the latter effect dominates and as a result financially constrained firms increase their use of fixed term workers by relatively more than unconstrained firms.

4 One shortcoming of our data is that they do not contain much detailed financial information. We are thus unable to compare our approach to that of other studies which use accounting and financial measures to generate a firm-level measure of financial constraint.

5 For example, Saint-Paul (1993).

3. Data

The analysis in this paper uses the Australian Bureau of Statistics' (ABS) Business Longitudinal Database (BLD). The BLD contains confidentialised unit record data for Australian businesses. It is based on matched annual administrative data from the Australian Taxation Office (ATO) and survey data collected by the Australian Bureau of Statistics through its Business Characteristics Survey (BCS).⁶ Each panel was sampled once a year for five years.⁷ Two panels were used for this analysis:

- BLD13, the panel covering the period 2008-09 to 2012-13
- BLD14, the panel covering the period 2009-10 to 2013-14

The ABS obtains information about key characteristics of small- and medium-sized Australian firms through the BCS.⁸ This includes information about employment levels by employment type, firms' ability to access external funds and issues affecting business performance. The database is also a rich source of information on industry, type of legal organisation and changes to business performance.

A range of firms are represented in the sample. On average across the panel, about 6 per cent of firms had no employees, about 30 per cent had one or two, 35 per cent of firms had between two and 100, and 27 per cent had between 100 and 200.

The sample design involves the use of panels that represent the Australian business population at the point in time that each panel is initiated into the BLD. The sample for each BLD panel is stratified by industry division and business size. Industry is based on ANZSIC 1993 division, and business size is based on a derived employment size indicator - Derived Size Benchmark (DSB). DSB is a derived item using ATO data which models employment and formed a part of stratification for all ABS business surveys at the time of the panels' selection.

The scope of the BLD is actively trading businesses in the Australian economy. An actively trading business is one which is registered for an ABN and remits Goods and Services Tax. The BLD includes both non-employing and employing businesses in the Australian economy except for some categories of businesses including: large businesses (i.e. with 200 or more employees) or complex businesses (those which comprise multiple Australian Business Numbers); all units classified to Financial

6 Since we began this paper, the ABS has created a new business data resource which is available to researchers, the Business Longitudinal Analysis Data Environment (BLADE), which contains detailed tax information for all firms, not just those in the BCS sample. See [https://www.abs.gov.au/websitedbs/d3310114.nsf/home/statistical+data+integration+-+business+longitudinal+analysis+data+environment+\(blade\)](https://www.abs.gov.au/websitedbs/d3310114.nsf/home/statistical+data+integration+-+business+longitudinal+analysis+data+environment+(blade)). As the key variables that we use are from the BCS, we would not necessarily have more information if we used BLADE. There is promising research to be done using the tax information in BLADE for a variety of research questions.

7 More information is available at: Australian Bureau of Statistics. 2016. 8168.0.55.001 Microdata: Business Characteristics, Australia, 2009-10 to 2013-14 <http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/0679921D4D1F3566CA257ACA00100CAC?opendocument>

8 Firms are defined as small- or medium-sized if they have less than 200 employees. This is the Australian definition, different than the OECD definition based upon 250 employees.

corporations, and General Government. Non-employing businesses were kept in the sample since in some cases these businesses became employing businesses over time.⁹

Finally, it is important to note a couple of key limitations of the data. First, BLD data may be partially missing for an individual business and no imputation is applied for missing data. Second, firm deaths occur in the sample: some firms cease operation or undergo structural change. However, no action is taken to adjust for entry of new firms nor do we try to identify which 'new' firms are merely re-configurations of 'exiting' firms. As such the sample is not entirely representative of Australian firms over the life of the panel. As indicated above, the data are limited to small- and medium-sized businesses with fewer than 200 employees. Readers should interpret our results with this in mind.

One obvious potential critique of our use of self-reported financial constraint data is that they may not accurately reflect underlying firm financial conditions. Respondent subjectivity could bias responses and we have no way to test these subjective responses against objective financial data as our data do not contain accounting or financial information that could be used to construct alternative measures of financial constraints. If firm managers are overly pessimistic or optimistic about the firm's financial situation, their responses might over- or under-state financial constraints.¹⁰ However, as we show below the percentage of firms who report being financially constrained is similar to other studies and seems reasonable. Also, the reports of firm financial constraints are correlated with other firm characteristics in the way one would expect.

4. Classification results

In this paper we classify a firm as being financially constrained if the data show that, in a given year, the firm:

- attempted to obtain debt or equity financing and was unable to obtain either; or
- did not attempt to obtain debt or equity financing but cited a lack of access to additional funds as a factor significantly hampering its business activities or performance; or
- did not attempt to obtain debt or equity financing but cited a lack of access to additional funds as a factor significantly hampering innovation.

⁹ More information and the full list of excluded businesses is available at: Australian Bureau of Statistics. 8168.0.55.002 - Technical Manual: Business Longitudinal Database, CURF, Australia, 2004-05 to 2009-10 <https://www.abs.gov.au/ausstats/abs@.nsf/Products/8168.0.55.002~2004-05+to+2009-10~Main+Features~About+the+Business+Longitudinal+Database?OpenDocument>

¹⁰ We note that progress is being made in Australia in making more business data available to researchers and addressing this question and studying larger firms are important future research objectives.

The first criterion captures firms which strictly fall within the definition of financial constraints adopted for this paper. The second and third attempt to capture firms which are likely to be financially constrained but may not have attempted to seek debt or equity financing. This could happen for many reasons. For example, a firm may have viewed the likelihood of obtaining financing as low, or may have previously been denied financing. The second criterion is broader than the first and may incorrectly identify some financially unconstrained firms as being financially constrained. But this risk is low and outweighed by the need for a proxy by which to identify financially constrained firms which did not attempt to obtain external financing.

However, it should be noted that the results in this paper are sensitive to this variable's design. In particular, the results in Table 5 were repeated using only the first criterion, and the coefficient of the financial constraint indicator in those regressions was no longer statistically significant. However, it is our view that using all three of the conditions listed above gives a more complete and correct picture of financial constraint.

Another important limitation to bear in mind is that the concept of financial constraint is not strictly binary. This study considers financial constraint as a firm's inability to obtain debt or equity financing, but realistically, a firm could be constrained from obtaining even a small amount of financing, making them very financially constrained. Alternatively, they could be able to obtain a limited amount of financing but less than they want, making them somewhat financially constrained. Seen this way, there could be a spectrum of financial constraint, with the degree of financial constraint being related to the wedge between the financing that a firm needs and what it can attain. In our paper, in classifying firms, we are agnostic on the degree of financial constraint as we have no way of measuring the size of this wedge.

Table 1 summarises the outcomes of the financial constraint classification. Overall, about 17 per cent of firms in the sample were identified as financially constrained.¹¹ Table 1 presents weighted descriptive statistics. Throughout the paper, we use the weights provided with the survey for all descriptive statistics so that they can be interpreted as describing the population. We also use weights for regressions – unweighted regression results are very similar and are available from the authors upon request.

Table 1: Percentage of financially constrained firms by year

<i>Year</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>
Per cent constrained	15.4	16.4	19.4	17.7	17.1	13.5

11 The number of financially constrained firms went up in Australia in the aftermath of the Global Financial Crisis. We have data going back to 2006-07 from which we can calculate the proportion of financially constrained firms. However, the employment composition variables which are key to our analysis are flawed in this earlier period so we only consider data from 2009 onward. This is consistent with the tightening of credit markets after the crisis began.

The percentage of firms identified as constrained is comparable with other studies. For example, in the sample of Kaplan and Zingales (1997), 14.7 per cent were identified as being constrained. Ferrando and Ruggieri (2018) also find similar rates of firm financial constraint across a wide range of countries in the Euro zone. They find that the incidence of being “absolutely constrained” ranges from 12.6 per cent in The Netherlands to 23.1 per cent in France, which is the same order of magnitude as what we find.¹²

The accuracy of our classification scheme is further explored in Table 2, which shows the relationship between the financial constraint measure and other variables that indicate operational and financial performance. Firms are asked a series of questions such as “Compared to the previous year, how has the amount of expenditure on structured training for employees changed.” Firms can respond “Increased”, “Decreased” or “Stayed the same”. We compare these answers to our definition of financial constraint in Table 2.

The table suggests that firms identified as being financially constrained in the sample were more likely to:

- have experienced a reduction in profitability, productivity or number of employees
- have cut expenditure on structured training for its employees
- have cut the social contributions they make
- have experienced a decline in sales
- be firms that received financial assistance from the government
- have abandoned business activity¹³

All of the differences are statistically significant and consistent with the subjective measure of firm financial constraints being related to firm fundamentals in ways that would be expected. For most of these variables, we do not observe the actual amounts, we only know firms’ responses as to whether they have increased or decreased.

Average cash flow in financially constrained firms in the sample is also significantly lower (on average 30 per cent lower) than for unconstrained firms. As already discussed, other financial information is unavailable in the BLD.

12 Ferrando and Ruggieri (2018) distinguish between absolutely constrained, relatively constrained and unconstrained firms. Absolutely constrained firms are those that cannot get external finance, as opposed to finance at a high cost, which is in line with our definition of financial constraint

13 The BCS refers in particular to abandonment of business activities concerned with the development or introduction of new or significantly improved goods, services, processes or methods planned for implementation in the future in a particular year.

Table 2: Percentage of constrained and unconstrained firms by other measures of firm performance

<i>Compared to the previous years, firms with declining:</i>	<i>Not constrained</i>	<i>Constrained</i>	<i>Overall</i>
Profitability	37.7%***	47.1%	39.3%
Productivity	19.0%***	25.6%	20.1%
Number of employees	12.3%***	21.1%	13.8%
Expenditure on training	2.9%***	6.2%	3.5%
Social contributions	4.9%***	9.5%	5.7%
Total sales	48.3%***	51.8%	49.0%
Firms receiving financial assistance (grants, subsidies, etc.)	11.5%**	13.1%	11.8%
Firms which abandoned development	4.4%***	11.9%	5.6%

*, **, *** indicate statistically significant differences between Constrained and Not constrained groups at the 10%, 5%, and 1% levels, respectively.

Table 3 shows results from logistic regressions of the probability that a firm is identified as being financially constrained. This was done as an additional check that the variable we constructed was a reliable measure of financial constraint. The logistic regressions show similar results to Table 2. The likelihood of a firm being classified as constrained is higher for firms that have cited declining profitability, declining social contributions, etc. Firms facing greater competition were also more likely to be classified as constrained. Similarly, the extent to which financial measures were cited as a business focus for firms had a positive relationship with the likelihood of being classified as financially constrained. Overall, the results in Table 3 support the measure of financial constraint which we use in this paper.

Table 3: Correlates of firm financial constraint
Table entries are log-odds ratios from logistic regression

	<i>Dependent variable: indicator for firm being financially constrained</i>		
	(1)	(2)	(3)
Constant	0.11 *** (0.017)	0.10 *** (0.02)	0.07 *** (0.01)
Year 2009-10	1.01 (0.13)	1.02 (0.13)	1.05 (0.14)
Year 2010-11	1.26 * (0.16)	1.27 * (0.17)	1.32 ** (0.17)
Year 2011-12	1.10 (0.14)	1.09 (0.14)	1.12 (0.15)
Year 2012-13	1.00 (0.13)	1.01 (0.14)	1.04 (0.14)
Year 2013-14	0.95 * (0.13)	0.75 * (0.12)	0.77 * (0.13)
Log total number of employees	0.95 ** (0.021)	0.95 ** (0.02)	0.95 ** (0.02)
Financial measures a business focus (small extent)	1.78 *** (0.24)	1.72 *** (0.23)	1.58 *** (0.22)
Financial measures a business focus (moderate extent)	1.92 *** (0.24)	1.85 *** (0.23)	1.66 *** (0.21)
Financial measures a business focus (major extent)	2.38 *** (0.24)	2.20 *** (0.27)	1.93 *** (0.24)
Profit declined	1.35 *** (0.10)	1.32 *** (0.10)	1.29 *** (0.10)
Social contributions declined	1.71 *** (0.21)	1.64 *** (0.21)	1.61 *** (0.21)
Abandoned development		2.61 *** (0.30)	2.48 *** (0.29)
Degree of competition - minimal			1.57 *** (0.25)
Degree of competition - moderate			2.07 *** (0.305)
Degree of competition - strong/tough			1.90 *** (0.24)
Pseudo-R2	0.0254	0.0361	0.0430
Prob > chi2	0.00	0.00	0.00
Number of observations	15,251	15,172	15,172

Standard errors are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. The dependent variable is the financial constraint indicator, which takes the value of 1 if the firm is financially constrained and 0 otherwise. Independent variables are: financial measures a business focus – in the survey, firms are asked to what extent financial measures affected overall business performance and dummies were created for these responses (options were: not at all; small extent; moderate extent; major extent) ; profitability declined – indicator of whether a firm stated in the survey that, compared to the previous year, profitability had declined ; social contributions declined

– indicator of whether a firm stated in the survey that, compared to the previous year, profitability had declined; abandoned development – indicator of whether a firm has abandoned any kind of development (options include goods or services, operational processes, marketing methods, etc); degree of competition – in the survey, the firms were asked about the degree of competition their firm faced, based on the number of competitors (options were: captive market/no effective competition; minimal; moderate; strong/tough).

5. Financial constraints and employment composition

In this paper we consider casual workers. There is a distinction in Australia between casual workers and either part-time workers or fixed-term workers. In Australia, casual employees generally have no guaranteed hours of work, may work irregular hours, do not receive sick leave or vacation leave and employment can be ended without notice or penalty by either the worker or the firm. There is usually no specified end date to casual employment. Casual workers are entitled to a higher hourly wage rate (often called a ‘casual loading’) that is paid in lieu of other benefits. Casual workers are entitled to 2 days unpaid carer’s leave and 2 days unpaid compassionate leave per occasion as well as unpaid community service leave. The Business Characteristics Survey questionnaire refers to casual workers as those who receive a higher rate of pay to compensate for lack of permanency and leave entitlements. In the survey, casual employees can work part-time, full-time or more than 35 hours per week.

Fixed term workers have contracts with specified end dates. They can be either full-time or part-time and they receive the same benefits and wages as permanent staff. In our data we can distinguish between casual and non-casual workers and between part-time and full-time workers, but not between fixed-term and permanent. The distinction in Australia is not crisp with many “permanent” staff on “fixed-term” arrangements that are periodically rolled over.

Our paper analyses casual workers relative to all other types of workers. So we are comparing employment of workers who can be terminated at a moment’s notice with very little cost to all other employees where termination must either wait for a pre-specified date or where it is likely to be costly.

The percentage of casual workers in Australian firms is currently at around 20 per cent of the workforce, the same level as it was in 1998, Wooden and Richardson (2016).¹⁴ But in the interim the percentage of casual workers has fallen, particularly following the GFC’s onset in 2008 – see Figure 2 in Parliamentary Library (2018). Table 4 shows that our analysis covers a time period when, overall, firms were increasing the share of their workforce employed on a casual basis. This increase, since 2012, comes off the back of drops in the percentage of casual workers in firms immediately following the GFC, so it can be interpreted as a period of recovery to pre-GFC levels.¹⁵

14 See the discussion at: <https://theconversation.com/factcheck-has-the-level-of-casual-employment-in-australia-stayed-steady-for-the-past-18-years-56212>. 20 per cent is for all employed persons; the number goes up to about 25 per cent when restricted to employees. See also Australian Bureau of Statistics (ABS) (2013) for population estimates.

15 We separately analysed a BLD panel covering 2006-07 to 2010-11. Our analysis confirmed that prior to the GFC, about 20 per cent of workers were employed on a casual basis overall. However, we had to exclude those years (pre-2009) from our analysis due to data deficiencies as described in footnote 11.

Note that the level of casual workers that we show in Table 4 is lower than the population estimates described in the preceding paragraph. In the data, there were some firms where the number of casual workers is reported as missing. We re-coded these to zero for the purpose of our analysis. If instead, we drop those firms we get a percentage of casual workers from 19 to 22 per cent across the years of our data, and smaller year-on-year changes in the number of casuals, in line with the population estimates. If we re-do the analysis presented below in Table 5 on this smaller sample (dropping firms with missing number of casual employees), the results are quite similar to what we report.¹⁶ Given this, our preference is to use the larger sample.

In this paper we explore the relationship between the percentage of casual workers in a firm and financial constraint. Financially constrained firms tend to have a higher percentage of casual workers, as can be seen in Table 4.¹⁷

Table 4: Casual workers as a percentage of all workers in financially constrained and unconstrained firms

<i>% casual employees</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>
Unconstrained firms	13.3	13.5	14.7	14.7	16.1	19.1
Constrained firms	16.8	18.8	16.1	17.4	17.9	17.6
Overall	13.9	14.4	15.0	15.2	16.4	18.9

Note: Casual employees are defined as those who typically receive a higher rate of pay to compensate for a lack of permanency and leave entitlements. They can be employed on either a full time or part time basis.

We focus on the change in the percentage of casual workers over time to determine whether a relationship exists between financial constraint and changes to a firm's employment mix of casual and non-casual workers. The regressions that follow use the changes in this percentage¹⁸ from time $t-1$ to t as the dependent variable. In the regressions, we regressed the level change in the percentage of casual workers in a firm with respect to financial constraint indicators and other variables.

We use fixed effects regression (Table 5) to control for time-invariant, unobservable factors. Factors such as quality of management, firm culture or efficiency of production could affect firm composition. These factors cannot be controlled for using the available data. Given that our panel length is relatively short, many of these factors are reasonably invariant within firms. Fixed effects regressions can thus overcome potential endogeneity from these unobserved factors.

¹⁶ These results are available from the authors upon request.

¹⁷ We also estimated a fractional response model where we control for year, industry, and type of legal organisation. The relationship between the percentage of casual workers and being financially constrained remains statistically significant and positive. Readers interested in obtaining these results may contact the authors directly.

¹⁸ For example, if 5 per cent of a firm's employees at time $t-1$ are casuals, and 8 per cent are casuals at time t , then the percentage point change would be +3 per cent. This amount is the dependent variable in the regressions.

One concern with fixed effects estimation is that it uses variation within firms to identify the coefficients. In our case this presents no problem as there was a reasonable amount of variation in the financial constraint variable within each firm; financial constraint status changed over time for about 60 per cent of firms in the sample.

Table 5: Fixed effects regressions: the impact of financial constraint on the change in the proportion of casual workers in a firm

<i>Variables</i>	<i>Dependent variable: change in per cent of casual workers in firm</i>			
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
Constant	0.090 *** (0.014)	0.102*** (0.023)	0.093*** (0.020)	0.077*** (0.031)
Financially constrained	-0.030** (0.014)	-0.023 (0.019)	-0.003 (0.033)	-0.057*** (0.023)
Log total number of employees	-0.037*** (0.004)	-0.037*** (0.000)	-0.033*** (0.007)	-0.044*** (0.000)
2010-11	0.006 (0.013)	-0.001 (0.024)	-0.020 (0.019)	-0.050 (0.026)
2011-12	-0.014 (0.012)	-0.046** (0.021)	-0.010 (0.571)	0.035 (0.025)
2012-13	-0.001 (0.013)	-0.010 (0.020)	-0.041** (0.024)	-0.069*** (0.024)
2013-14	-0.007 (0.019)	-0.024 (0.033)	-0.062** (0.031)	-0.078*** (0.030)
R-squared	0.0393	0.0399	0.0485	0.0531
Prob > F	0.0000	0.0000	0.0000	0.0000
Number of observations	12,209	5,299	2,391	3,979

Standard errors are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. The dependent variable is the level change in the percentage of casual employees in a firm over a one year period (t-1 to t). Independent variables are: financial constraint indicator (indicator of whether a firm is financially constrained); Logged total number of employees; Year dummies. Regressions (2) to (4) represent different subsets of the sample of firms depending on whether their workforce decreased, stayed the same or increased over the panel respectively.

Regression (1) of Table 5 shows that the total effect of the constant, time variables, and financial constraint variable is positive in the regressions. So for both constrained and unconstrained firms, the proportion of casual workers in firms was increasing. This is consistent with Table 4. But the coefficient of the financial constraint indicator is statistically significant and negative. This suggests that in the years following the GFC, financially constrained firms saw a smaller percentage increase in casual workers than unconstrained firms.

Since the dependent variable is the change in a percentage, it is not immediately clear whether changes in the numerator or denominator drive the overall result.¹⁹ This is why in the regression results presented in columns (2) to (4) of Table 5, we split the sample into firms whose workforce was shrinking, remaining unchanged or growing.

The regression results show that the financial constraint indicator is not significant for firms that were shrinking their workforces or keeping them unchanged (regressions (2) and (3) respectively). The overall effect was still positive (the proportion of casual workers in the firm increased over time) but there was no statistically significant difference in the magnitude of this change between constrained and unconstrained firms.

But there was a statistically significant difference for firms whose workforces were growing (regression (4)). While those firms again experienced an increase in the proportion of casual workers over time, the increase was less for financially constrained firms. That is, of firms that were in a hiring position, financially constrained firms hired relatively fewer casual workers compared to unconstrained firms. This shows that firms whose workforces were growing primarily drove the result in regression (1) of Table 5.

We undertook a couple of robustness checks. First, we re-estimated the above models excluding any firms that had fewer than 5 employees in any year. The substantive results are unchanged. Second, we re-defined the financial constraint variable using only the first response from Section 4 above. This basically restricts the definition of financial constraint to firms who attempted to obtain debt or equity financing. As already mentioned, the results become statistically insignificant if we do this.

Our conclusion from that exercise is that it is important to include firms who faced financial constraint but who did not seek debt or equity finance. As discussed above, firms with dim prospects of obtaining finance through these sources may not have even attempted them. But they are still financially constrained and they should be included as such in the analysis.

This result reflects the aggregate behaviour of all firms in the sample. These firms span different industries in 14 of the 19 broad industry divisions of the Australian and New Zealand Standard Industrial Classification.²⁰ This result would likely differ by industry, particularly as some industries such as Retail Trade or Accommodation and Food Services use casual employees more intensively.

19 That is, the percentage of casual workers in a firm could simply be growing because total number of employees was shrinking.

20 The data do not contain any firms in the following industries: Electricity, Gas, Water and Waste Services; Financial and Insurance Services; Education and Training; Health Care and Social Assistance. The BLD documentation makes it clear that these industries are not included in the data but provides no explanation as to why.

There does appear to be some evidence for differential effects by industry. However, our sample sizes are such that it is hard to produce convincing analysis. Splitting the sample into different industry groups shows that industries such as retail trade see a much bigger difference in the effect of financial constraints on employment composition. Conversely, for some industries, the effect of financial constraint is statistically insignificant. More data would be required to estimate the difference in effects of financial constraints by industry.

Further work using more detailed data may help shed some light on why this difference between financially constrained and unconstrained firms exists. One possible explanation could be in line with the reasoning in Caggese and Cuñat (2008). They suggested that some firms experiencing financial constraint value internally generated earnings highly and therefore demand more productive permanent workers. However, in their paper Caggese and Cuñat find that firms' demand for flexible, casual workers dominated their demand for more productive permanent workers.

One additional difference between our analysis and theirs is the time period being analysed. Further work on this topic would be useful to discern whether there is a statistically significant difference between constrained and unconstrained firms' hiring decisions under more stable economic conditions. It may indeed be that this finding is exclusive to firms which may be recovering from an economic downturn.

6. Discussion

Our paper shows that financial constraints can impact on employment decisions taken by firms. In our study we see that financially constrained firms saw a smaller percentage increase in casual workers than unconstrained firms. This is consistent with firms holding off on hiring new workers and resorting to some type of 'internal financing'. Policies that can alleviate financial constraints for small and medium-sized firms can be expected to have positive effects on employment as firms will be able to hire more workers when they require them.

Other research on small and medium-sized firms (SMEs) suggests that these firms play an important role in the economy. Organisation for Economic Development and Cooperation (OECD) (2019) shows that SMEs make up a significant part of the private sector and constitute 50 to 60 per cent of value added. SMEs have played an important role in job creation and economic dynamism. They serve as an engine of job creation (Neumark *et al.* (2011); Ayyagari *et al.* (2011)) and are seedbeds of developing entrepreneurial talent and innovation (Acs and Audretsch (1987); Acs and Audretsch (1994); Brunswicker and Vanhaverbeke (2015)).

There is growing evidence that the recent slowdown in productivity and wage growth is at least partly due to increasing mark-ups and a lack of competition among firms – see Baqaee and Farhi (2017); Loecker and Eeckhout (2017); and Gutiérrez (2017). This may in part be driven by financial constraints on SMEs.

Binding financial constraints can prevent small firms from emerging and growing and creating competition and dynamism in the economy. The need for this dynamism and the job-creating role of SMEs is greater than ever as countries try to recover from the COVID-19 pandemic.

While our paper does not evaluate particular policies, it points to the need for government to ascertain whether financial constraints are a barrier for small firms and whether there are programs that could be of assistance. As Bakhtiari *et al.* (2020) point out in their extensive review on this issue, such programs are fraught. Governments can be poor judges of which firms are likely to succeed and programs to help small businesses can often be co-opted by large businesses.

This suggests that the Australian government should take an experimental approach and try a few different programs using methodologically sound evaluation methods to ascertain success or failure. The growing availability of large-scale administrative data makes this easier and means that academics can be part of the process.

7. Conclusion

Previous studies have shown that a variety of firm decisions are affected by financial constraints. This paper contributes to that literature by exploring how employment decisions of firms are affected by the presence of financial constraints.

Our study employs a novel definition of financial constraint based upon firms' own reports of inability to access financing. Previous studies have used indirect measures of financial constraints inferred from balance sheet data. The survey responses that we use provide a much more direct measure of whether or not a firm is impacted by financial constraints.

Using six years of Australian firm-level data, we investigate how the percentage of casual workers in financially constrained firms differs from unconstrained firms when the size of firms' workforces changed. It finds that for firms that increased the size of their workforces, the share of casual workers in the firm increased for both constrained and unconstrained firms. However, those that were financially constrained saw a smaller percentage increase in casual workers than unconstrained firms.

When facing financial constraints, one way that firms can cope is by 'internal financing'. This can take the form of deferred salary increases for staff or using staff more intensively. Our results on firm use of casual workers seem to fit with these explanations. Expanding firms that are not financially constrained hire more casual workers whereas financially constrained firms don't. This is consistent with firms using their own workers more intensively as they grow rather than expanding employment.

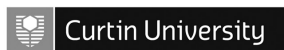
Note that our results are quite different from those of Caggese and Cuñat (2008). There could be many reasons for these differences including the time period studied and the very large differences in the Australian and Italian labour markets. This highlights the importance of country-specific evidence around the relationship between firm financial constraints and employment decisions.

Overall, our results support the prediction that firms' employment decisions are affected by the presence of financial constraints. While further work is required to explain the exact firm behaviours generating these results, they are useful insofar as they shed new light on how financing constraints affect employment activities of firms in Australia and this can help in designing policy to address these financial constraints.

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