



# Research Report 1/2018

## **Employee and employer characteristics and collective agreement coverage**

Stage 2: research following the publication of *Explaining recent trends in collective bargaining*

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- Australian Chamber of Commerce and Industry (ACCI);
- Australian Industry Group (Ai Group);
- Australian Council of Social Service (ACOSS);
- Australian Council of Trade Unions (ACTU);
- Australian Government; and
- State and territory governments.

A draft of this report was also workshopped with the MWRG prior to finalisation.

The contents of this paper are the responsibility of the authors and the research has been conducted without the involvement of members of the Fair Work Commission.

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## 1 Introduction

Wage-setting in Australia features a complex system of interdependencies between awards, collective agreements (CAs) and individual arrangements (IAs). How an employee comes to have their pay and conditions set has long been the subject of close study. Due to a declining trend in collective agreement coverage, the purpose of this report is to examine the influence of employee and employer characteristics on collective agreement coverage.

We use the latest Survey of Employee Earnings and Hours (EEH) by the Australian Bureau of Statistics (ABS) to examine a range of factors which affect the probability that an employee is covered by a collective agreement at a point in time. The report addresses the following questions:

1. How do employee characteristics affect their likelihood of being covered by a collective agreement?
2. How does union density at the industry and occupational level affect the likelihood of an employee being covered by a collective agreement?
3. How do these effects vary if we compare the likelihood of being covered by a collective agreement to being covered by awards or by individual arrangements?
4. How do these effects vary for employees in the private and public sectors?
5. How does this vary for employees in the retail and hospitality sectors, where wages in awards and collective agreements are similar?

This report presents a second stage of research following the publication of, *Explaining recent trends in collective bargaining*, which provides an analysis of changes in collective agreement coverage over time.<sup>1</sup> This analysis takes advantage of cross-sectional, unit-record data to measure the impacts of factors including industry and occupation of employment, employer size, casual and part-time employment status, and junior employee status.

## 2 Data and methods

This analysis uses the Confidentialised Unit Record File (CURF) from the 2016 EEH. The 2016 survey comprises data on around 53 000 employees. A description of the variables used in the analysis is provided in the Appendix together with summary statistics. The data was accessed using the ABS' Remote Access Data Laboratory (RADL). The RADL is a data query service which allows access to the unit record data, while limiting the type and size of outputs to ensure that individuals and organisations are non-identifiable.

The data show that about one in five employees is employed on a casual basis, while 37 per cent are employed part-time. Around 7 per cent are under 21 years old, while over 83 per cent work in organisations of at least 20 employees. One in five employees works in the public sector, while the largest industries of employment are healthcare, public administration, and education.

We estimate the probability of CA coverage within a cross-sectional probit regression framework. It is assumed that CA coverage is related to a range of underlying demographic and employment characteristics. These variables include gender, sector of employment, industry of employment, occupation of employment, casual employment status, full-time vs part-time status, employer size,

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<sup>1</sup> Peetz D & Yu S (2017), [Explaining recent trends in collective bargaining](#), Research Report 4/2017, Fair Work Commission, February.

junior employee status, and union density at the industry and occupational levels. The model specification is given as follows:

$$P(Y = 1|X) = f(\alpha + \beta X)$$

There are three outcome variables of interest. The first  $Y1$ , takes a value of 1 if an employee is covered by a registered or unregistered collective agreement, and a value of 0 for all other forms of wage-setting. The second  $Y2$ , takes a value of 1 if an employee is covered by a registered or unregistered collective agreement, and a value of 0 if the employee's wage is set at exactly the award. The third  $Y3$ , takes a value of 1 if an employee is covered by a registered or unregistered collective agreement, and a value of 0 if the employee's wage is determined by a registered or unregistered individual arrangement.

Analysis of the three outcomes is undertaken for all employees, as well as for the following subsamples:

- Private sector employees in the retail and hospitality industries;
- Private sector employees outside the retail and hospitality industries;
- Public sector employees.

The rationale for this sub-sample analysis is because we anticipate the possibility of different causal relationships between those sectors and that indeed turns out to be the case. In retail and hospitality, for example, the gap between award and CA wages is, according to EEH data, close to zero. Consequently, the factors driving the choice between CA-coverage and alternative mechanisms may be different in these industries. For example, a high CA wage premium in most industries could indicate that CAs there are often a means of obtaining better wages and conditions and so driven by employee interest in higher pay, whereas in the absence of such a wage premium in retail and hospitality the motivations for CAs may be different there; the different uses of CAs across the sectors might in turn suggest different determining factors. Similarly, given the higher rates of CA coverage in the public sector, the factors driving variation in wage-setting in the public sector may be different to those in the private sector.

The function  $f(.)$  is assumed to follow a normal distribution, and maximum likelihood estimators of the parameters  $\beta$  are calculated. As with all nonlinear regression models, the estimated coefficients  $\beta$  have no direct interpretation. In order to make sense of the model, the results present the average marginal effects, which are defined as the change in the probability of CA coverage with respect to the variable of interest. For example, the results report the probability of CA coverage for part-time employees, relative to full-time employees.

The analysis is limited by the use of a single cross-section of data. In particular, our estimates may be biased where significant unobserved effects exist, such as the effect of employment classifications or seniority. Future research could consider the collection of longitudinal data, or quasi-experimental changes in wages policy.

One oddity might seem to be that the industry and occupation variables have two defaults, instead of the usual one. This is because of the interaction between union density at the industry level, and the dummy industry variables (and likewise, the interaction between union density at the occupational level, and the dummy occupational variables). That interaction requires an additional industry dummy variable be deleted. We have chosen default categories that are fairly small in size and fairly similar in terms of their effects. Hence in industry, 'Rental, Hiring and Real Estate

Services' and 'Other services' are the default category, collectively representing less than 7 per cent of respondents, and we call this grouping 'Rental and other services'. On occupations, our default group is the two lower-skilled blue collar categories, 'Machinery Operators' and 'Labourers', and we label them "Machinery Operators and labourers". They represent just one sixth of respondents (being two of the three smallest occupational categories) and again are fairly similar in their effects.

## 3 Findings

### 3.1 Summary

We first summarise the main findings from model 1.1. Model 1.1 examines the effect of employee and employer characteristics on the probability of being covered by a CA, relative to all other forms of pay-setting and across all employees.

Table 1 shows that one of the biggest single factors influencing collective agreement coverage is sector. Overall, public sector employees are 29.8 percentage points more likely than private sector employees to be covered by a collective agreement (CA), holding all else constant.

There was a strong relationship between union density and collective agreement coverage. After controlling for other factors, a 1 percentage point increase in union density in an industry adds 2.8 percentage points to the probability of CA coverage amongst employees in that industry. A 1 percentage point increase in union density in an occupation leads to a 1.3 percentage point increase in the probability of CA coverage in that occupation.

Industry of employment, even after controlling for the rate of unionisation and other factors, was also a significant predictor of CA-coverage. The highest positive effects on CA coverage are found in Financial and insurance services (where CA coverage is 35 percentage points higher than the reference category), and Accommodation and food services (where the effect is 20.8 percentage points). Readers should be careful in interpreting these marginal effects, particularly the large negative effects on Public administration and safety, and Electricity gas, water and waste services (both over 30 percentage points). Remember that marginal effects represent the effects after sector (which adds to CA coverage), size (see below) and industry union density, amongst other things, are controlled. So, Public administration has a high rate of CA coverage (78 per cent in bivariate EEH data—in fact, the highest of any industry), but not as high as might be expected given that it is mostly in the public sector, it is mostly large organisations and it has a high rate of union density.

Aside from the expected tendency for occupations with higher union density to also have higher CA coverage, we see that CA coverage among Sales workers was 15.8 percentage points higher, relative to the reference category, Machinery operators and labourers. The probability of CA coverage was lower for all other occupational groups.

With regard to employer size, Table 1 shows that compared with other methods of setting pay, CA agreement coverage is greater among medium/large employers. We used a dichotomous variable to measure employer size, distinguishing between employers with fewer than 20 employees (we call these 'small' employers) and those with 20 or more employees (we call these 'medium/large employers').

Casual employees were, after all other factors were controlled, 13.7 percentage points less likely to be covered by a CA than permanent or fixed term employees.

For part-time employment, the directions of effects are largely the opposite of what is seen with casual employment. That is, part-time employees were, after all other factors were controlled, 13.6 percentage points more likely to be covered by a CA than full-time employees.

Junior employees were on average 7.6 percentage points more likely to be covered by a CA than adult employees.

Finally, female employees were 1.9 percentage points less likely to be covered by a CA than men. The difference is small but statistically significant.

We present detailed findings in three separate tables, each exploring one outcome of interest at Appendix A. The discussion that follows examines each characteristic of an employee's job and its effect on CA coverage, comparing different samples of employees, and different pay-setting outcomes, as discussed above in section 2. The discussion refers to models 1.1 to 3.4 as they appear in Appendix A.

**Table 1: Marginal effects of selected explanatory variables on CA coverage (versus all other methods of wage setting), all employees, 2016**

	All employees	
	Estimate	Standard error
Public sector	29.8***	(0.8)
Industry (largest effects) (default is rental and other services)		
Mining	-17.6***	(4.3)
Manufacturing	-10.4***	(3.6)
Electricity, Gas, Water and Waste Services	-36.7***	(3.5)
Accommodation and Food Services	20.8***	(1.6)
Financial and Insurance Services	35.0***	(1.2)
Public Administration and Safety	-33.8***	(6.1)
Occupation (largest effects) (default is machinery operators and labourers)		
Manager	-24.3***	(2.0)
Professionals	-21.1***	(1.1)
Community and Personal Service Workers	-23.9***	(1.4)
Clerical and Administrative Workers	-16.4***	(1.3)
Sales Workers	15.8***	(2.6)
Casual employee	-13.7***	(0.7)
Part-time employee	13.6***	(0.7)
Female employee	-1.9***	(0.6)
Junior employee	7.6***	(1.1)
Medium/ large employer (At least 20 employees)	43.2***	(0.4)
Industry union density	2.8***	(0.4)
Occupational union density	1.3***	(0.2)

Note: \*\*\* statistically significant at the 1 per cent level.



### **3.2 Sector**

As mentioned, public sector employees are 29.8 percentage points more likely than private sector employees to be covered by a collective agreement (CA), holding all else constant (model 1.1).

This was because public sector employees are less likely to be covered by an individual arrangement (IA). Public sector employees were 46.7 percentage points more likely to be covered by a CA, relative to IAs, than private sector employees (model 3.1). However, the relative probability of public sector employees to be covered by a CA relative to an award was no different to that for private sector employees (model 2.1).

In short, the pay and conditions of public sector employees is much more likely to be covered by a regulated instrument than that of private sector employees. This is as we would expect. However, if pay and conditions are regulated, being in the public sector as opposed to the private sector does not, in itself, make it more likely that it would be a CA rather than an award that applied.

### **3.3 Industry and occupational union density**

As union density is not available in the EEH, estimates of union density by industry and occupation are derived from the ABS' Characteristics of Employment publication.<sup>2</sup>

After controlling for other factors, a 1 percentage point increase in union density in an industry adds 2.8 percentage points to the probability of CA coverage amongst employees in that industry. A 1 percentage point increase in union density in an occupation leads to a 1.3 percentage point increase in the probability of CA coverage in that occupation (model 1.1).

A positive relationship between union density and CA coverage would be expected as, even in Australia, where it is possible for CAs to be negotiated without a union, the great majority of employees covered by federal CAs are covered by CAs to which unions are a party.

This is mostly a phenomenon in the private sector, where a 1 percentage point rise in occupational union density leads to a 0.8 percentage point increase in CA coverage (model 1.3), whereas in the public sector the effect of size is near zero and insignificant (model 1.4).

Union density particularly affects the choice between awards and CAs. The higher union density in an industry or occupation, the higher is CA coverage relative to awards amongst employees in that industry or occupation (models 2.1 to 2.4). This pattern also happens at the industry level in the choice between CAs and IAs, but not at the occupation level, where results are found to be insignificant (models 3.1 to 3.4).

This may be because industry, rather than occupation, reflects employer behaviour (it is the principal economic activity of the employer, whereas occupation is based upon the principal tasks undertaken by employees at work). Unions more commonly organise along industry lines, especially since the amalgamations of the 1990s.

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<sup>2</sup> ABS, *Characteristics of Employment, Australia*, Catalogue No. 6333.0.

### **3.4 Industry**

Industries have many characteristics, not just the rate of unionisation, that may influence employer (and union) behaviour within them. So we included a series of industry dummy variables. The default or reference category was "Rental, hiring and real estate services" and "Other services", which we collectively call "Rental and other services" (representing 6.8 per cent of unweighted respondents.)

Overall, after controlling for other factors (including sector and industry union density), the highest positive effects on CA coverage are found in Financial and insurance services (where CA coverage is 35 percentage points higher than the reference category Rental and other services), and Accommodation and food services (where the effect is 20.8 percentage points) (model 1.1). Employees in Accommodation and food services were more likely to be covered by a CA when the alternative was an IA, than when the alternative was an award (24 percentage points and 9 percentage points respectively) compared to the reference group Rental and other services (model 3.1). Recall that marginal effects represent the effects after sector, size and industry union density, amongst other things, are controlled.

Most industries followed similar patterns in model 1.3 (in which the population was restricted to employees in the private sector, aside from retail and hospitality) and in model 1.1 (all employees). The exception was Health care and social assistance, where the probability of CA coverage was higher amongst private sector employees in that industry (model 1.3), and lower amongst public sector employees (model 1.4) when compared with employees in Rental and other services. As training, accreditation and registration of employees in the industry is highly regulated (eg by the Australian Health Practitioner Regulation Agency and the fifteen occupational National Boards), and public sector employers in that industry tended to set the pattern, private sector CA coverage there tended to more closely mimic arrangements for public sector employers. On the other hand, in the public sector, some health care workers may be covered by state industrial relations jurisdictions in which some 'awards' perform the function that 'agreements' perform elsewhere. This would, in part, explain the very large negative effect on this industry in model 2.4 (comparing CA and award coverage amongst public sector employees). In turn, then, overall CA coverage in Health and social assistance may be artificially low due to the role some state awards might play.

The largest negative industry effects on CA coverage are found in Electricity, gas, water and waste services (where compared with other method of setting pay, CA coverage is 36.7 percentage points lower than reference category Rental and other services), Public administration and safety (33.8 percentage points), followed by Mining (17.6 percentage points) and Transport, postal and warehousing (16.2 percentage points) (model 1.1). One factor that may be exaggerating the effects in Public administration and safety is that, as result of an internal review by the ABS of its framework, a significant proportion of employees in the NSW public sector were recoded from CAs to awards between 2014 and 2016. With the exception of Public administration and safety, there were even stronger negative effects found for these industries in model 3.1, reflecting higher probabilities of IA coverage, compared to CA coverage.

### **3.5 Occupation**

After controlling for other variables, including occupational union density, CA coverage among Sales workers was still 15.8 percentage points higher, relative to Machinery operators and labourers (model 1.1). This appeared to mainly or even exclusively occur in the retail and hospitality industries, where Sales workers were naturally very common. There, CA coverage was

38.1 percentage points higher, relative to machine operators and labourers, given the levels of union density in those occupations and other factors (model 1.2). By contrast, there was no significant effect for this occupation across other private sector industries, or in the public sector.

The effect was particularly strong when determining whether Sales workers in retail and hospitality were on a CA or on an award: model 2.2 implies that Sales workers are 44.7 percentage points more likely to be CA covered than award reliant. By contrast, in those industries the effect in determining whether Sales workers in retail and hospitality were on a CA or on an IA was statistically insignificant (model 3.2).

At the other end of the scale, the lowest rates of CA coverage, after controlling for all factors, were amongst several white-collar occupations: Managers (–24.3 percentage points, compared to the reference group Machinery operators and labourers); community and personal service workers (also –23.9 percentage points); and Professionals (–21.1 percentage points). But here there were important differences between sectors. In the private sector (excluding retail and hospitality), CA coverage of Managers was 28.0 percentage points below the reference group even after controls (model 1.3). In the public sector, there was no significant effect (model 1.4). That is, quite a number of public sector Managers were covered by collective agreements but few in the private sector were so covered.

Professionals also had higher CA coverage in the public sector (by 11.3 percentage points, compared to the reference category, even after controlling for all variables including occupational union density—model 1.4) but lower in the private sector (by 24.9 percentage points—model 1.3). This probably reflected the situation for health and education professionals, such as nurses and teachers, who had extremely high coverage by CAs in the public sector, even where quite a few workers were not union members, whereas in the private sector CA coverage was considerably less.

Indeed, for several white-collar occupations signs were positive and significant in model 1.4 (public sector) but negative and significant in model 1.3 (private sector, excluding retail and hospitality)—at least, by comparison with the reference group of Machinery operators and labourers. This probably reflected quite different interactions between occupation and CA coverage in the two sectors. That is, blue collar workers' rates of CA coverage were less determined by sector, and more determined by factors such as unionisation; whereas white collar workers' rates of CA coverage were more heavily influenced by sector—that is, the differences between the public and private sectors in terms of CA coverage was much greater for white than for blue collar occupations.

### **3.6 Employer size**

Compared with other methods of setting pay, CA agreement coverage is greater among medium/large employers (models 1.1, 2.1 and 3.1).

After controlling for other factors, CA coverage is 43.2 percentage points higher for medium/large employers than in small employers (model 1.1). The size effect is much greater in the private sector (37.1 percentage points outside retail and hospitality, as per model 1.3; 50.8 percentage points in retail and hospitality, as per model 1.2) than in the public sector (23.3 percentage points, as per model 1.4).

In retail and hospitality in particular, there is a major difference: the probability of being CA-covered is 77.6 percentage points higher for employees in a medium/large organisation than those in a small organisation (model 3.2).

### **3.7 Casual employment**

Casual employment was measured by the variable identifying whether respondents believed that relevant individuals were permanent/fixed term or casual employees. Most would have received casual loadings.

The use of casual employees is likely to be lower in firms with CAs, as many CAs are negotiated by unions who are less likely to encourage casual employment. Casual employees were, after all other factors were controlled, 13.7 percentage points less likely to be covered by a CA than permanent or fixed term employees (model 1.1). This was especially the case in retail and hospitality (where the effect size was 28.8 percentage points—model 1.2) but was also the case in the rest of the private sector (where the effect size was 11.7 percentage points—model 1.3). In the public sector, the effect was very small and insignificant (model 1.4). There is a possibility that the negative link between casual employment and CA coverage partly reflected reverse causality, if unions resisted casualization and reflected this preference in union CAs.

The difference in effect sizes between industry sectors may partly reflect that, in retail and hospitality, CA coverage tends to lead to more positions being permanent part-time or permanent full-time. It is partly also a size phenomenon (although we have a size variable, mentioned above, it is only dichotomous and fails to distinguish between, for example, medium and large employers), so perhaps large employers in this sector are both more likely to be covered by a CA and more likely to use a permanent workforce. These tendencies are apparent throughout much of the private sector but especially so in retail and hospitality, with, for example, large supermarket chains and department stores, with CA coverage, preferring permanent to casual workforces even when the majority of staff are employed part-time.

### **3.8 Part-time employment**

Part-time employees were, after all other factors were controlled, 13.6 percentage points more likely to be covered by a CA than full-time employees (model 1.1). In retail and hospitality the size of the effect was large (38.6 percentage points—model 1.2), while in the rest of the private sector it was 8.2 percentage points (model 1.3). Again, in the public sector there was no effect. That is, the effects are in mostly the opposite direction to those for casual employment.

This may at first seem counter-intuitive. However, many lower-grade employees are part-time employees. They are also, not unusually, covered by CAs. Higher grade employees tend to be full-time and tend not to be covered by CAs. They are often covered by individual arrangements. Indeed, retail employees were 'exempt' from the old Queensland Retail Industry award or a certified agreement if their weekly wage was higher than the pay rate for shop assistants by 25 per cent or more or other appropriate classification.<sup>3</sup> Under the Fair Work Act, all high income employees with a guaranteed income above a threshold are exempt from award conditions

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<sup>3</sup> R. Price (2004), *Checking out Supermarket Labour Usage: The Nature of Labour Usage and Employment Relations Consequences in a Food Retail Firm in Australia*, PhD thesis, Department of Industrial Relations, Griffith University, Brisbane, p. 93.

relevant to EEH.<sup>4</sup> Despite all the control variables we have in EEH, we do not have a variable that measures classification or seniority, so this pattern of employment will mean a strong relationship between CA or IA coverage, part-time employment and level. Hence in retail and hospitality, the effect size linked to part-time employment is much larger for the choice between CA and IA (49.1 percentage points—model 3.2) than for the choice between CA and award (29.0 percentage points—model 2.2).

This explains some, but not all, of the directions of the signs on part-time employment. It also appears to be the case that retail and hospitality firms with CAs make greater use of part-time work. Perhaps this is because of the restrictions placed on casual employment. With less ‘flexibility’ available through casual employment, they make greater use of (permanent) part-time employment. If so, it is the case only in retail and hospitality: the signs on the part-time variable in models comparing CAs and awards in the rest of the private sector, and the public sector, are near zero and non-significant.

### **3.9 Junior employees**

After controlling for other factors, on average junior employees were 7.6 percentage points more likely to be covered by a CA than adult employees (model 1.1). The effect was particularly large in the retail and hospitality sector (21.6 percentage points), and in fact the sign was reversed in the rest of the private sector, and the public sector. So quite different explanations are needed for the retail and hospitality sector, and the rest of the workforce.

Outside of retail and hospitality, junior employees appear very likely to be starting on award rates of pay. Hence in models 2.3 and 2.4, the effects are significant and negative, meaning that junior employees in some parts of the public sector, and the rest of the private sector, are more likely to be on awards relative to CAs. This is a reflection of the low starting pay and classifications of junior employees.

In retail and hospitality, however, many new employees in larger firms start on CAs. That might explain why we do not see negative effects, but it does not in itself explain why there is a large positive effect of the junior variable in model 2.2, which compares employees on CAs and awards in retail and hospitality. For this, we may also need to look at labour supply aspects. New young entrants to the labour market, often wanting part-time or casual work, might be attracted not only to work in retail and hospitality, but also to work in large enterprises with CAs in that industry sector. More accurately, it might be the case that large enterprises with CAs in retail and hospitality disproportionately offer junior rate jobs (compared to other firms in that industry sector). That would explain the size of the positive effect in model 2.2, but further research is needed to confirm or refute this hypothesis.

### **3.10 Female employees**

After controlling for other factors, female employees were 1.9 percentage points less likely to be covered by a CA than men. The difference is small but statistically significant. The largest effect was in retail and hospitality (5.1 percentage points), while it was 3.4 percentage points in the public sector and insignificant in the rest of the private sector (models 1.1 to 1.4).

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<sup>4</sup> P. Munro (2013), ‘Exempting high-income employees from modern awards’, *WorkplaceInfo*, 13 May. <http://workplaceinfo.com.au/awards/analysis/exempting-high-income-employees-from-modern-awards#.Wi92pWT1Uog>.

The overall pattern was driven by women's lower tendency to be covered by CAs rather than awards, evident in most sectors (models 2.1 to 2.4). Women were slightly but significantly more likely than men to be covered by a CA compared to an IA (model 3.1), also evident in the public sector but not elsewhere (models 3.2 to 3.4).

Bivariate analysis of EEH data shows much larger differences between men and women and, in some cases, the reverse pattern. Overall, 40 per cent of women, and 38 per cent of men, are covered by CAs, a similar difference found in the multivariate analysis. However, women's overall award coverage (29 per cent) was substantially higher than men's (20 per cent), and so in bivariate data, the share of CA employees amongst all 'pay-regulated' (CA plus award) employees was 58 per cent amongst women but 66 per cent amongst men, a difference of 8 percentage points—much higher than the 2 percentage point difference in multivariate analysis (model 2.1). It seems likely that the remaining difference is also due to structural factors not picked up by single-digit industry and occupational control variables. For example, amongst Professionals, women are a high proportion of health and education professionals (such as nurses and teachers), with high unionisation and CA coverage, but a lower proportion of other professionals (such as engineers and economists) with low unionisation and low CA coverage. Amongst Sales workers they are a high proportion of checkout operators and cashiers, with high award coverage, but a lower proportion of insurance and real estate salespeople, with high IA coverage. These structural effects, at the two or three-digit level of occupational analysis, would not be detected in the single digit analysis here.

Accordingly, it seems likely that gender differences in instrument coverage, both in bivariate analysis and in the multivariate analysis here, reflect differences in the sort of jobs women and men do and the industries in which they work, rather than any different behaviours by men and women in terms of collective negotiation or desires for representation. This would be consistent with earlier studies showing apparent gender differences in trends such as union propensity to reflect structural rather than behavioural factors.<sup>5</sup>

### **3.11 Revisiting structural change and its effect on collective agreement coverage**

In an earlier report<sup>6</sup> we considered changes in the composition of the labour force and the simulated impact that this would have on CA coverage. That analysis was based on changes in bivariate data (estimates of the industry and occupational composition, sectoral composition, etc.) of employment. We concluded that structural change in the labour market had only had a small impact on coverage estimates, with minor positive effects associated with changes in industry and occupational change, and a larger negative effect due to a shift away from public sector employment.

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<sup>5</sup> For example, P F M Grimes (1994), *The Determinants of Trade Union Membership: Evidence from Two Australian Surveys*, PhD thesis. Research School of Social Sciences, Australian National University. Canberra; D Peetz (1998), *Unions in a Contrary World: The future of the Australian trade union movement*, Cambridge University Press, Cambridge & Melbourne.

<sup>6</sup> D Peetz & S Yu (2017), *Explaining recent trends in collective bargaining*. Research Report 4/2017, Fair Work Commission, February.

Our multivariate analysis does not substantially change this conclusion. The independent effect of public sector employment (29.8 percentage points in this analysis) is somewhat less than the difference between the raw coverage rates in those sectors (41 percentage points) but that is because another part of the gap in CA coverage is explained by variation in industry and occupational union density, and union density is much higher in the public sector. A shift in employment from the public to the private sector would also have a negative impact on union density, so the structural impact on CA coverage of a decline in public sector employment would be greater than that implied by the effects reported here.

In that report, we do not estimate the 'structural' impact on CA coverage of changes in the gender composition of employment. The analysis here vindicates that position because there is little reason, from this multivariate analysis, to believe that gender has a structural impact on CA coverage. Rather, apparent gender differences in CA coverage appear to themselves be simply a reflection of compositional or structural factors. If there is a female impact on CA coverage, it is small, but most likely it is in fact non-existent, an artefact of other structural forces.

One other important aspect of that report was the link we drew between union density and CA coverage. We pointed out that, within many countries, there is a close relationship between union density and CA coverage density, and we would expect that, in Australia, an important explanatory factor in any decline in CA coverage will be the decline in union density—though we noted that it appeared to happen with considerable lags in Australia, for various reasons. The analysis here supports those observations. Variation in union density between particular occupations and, especially, between industries is an important explanatory variable in modelling CA coverage.

## 4 Conclusions

Three major factors stand out as shaping CA coverage: sector of employment, employer size, and union density. CA coverage is higher in industries and, to a lesser extent, occupations that have higher rates of union density, because unions seek to obtain collective agreement coverage as a means of consolidating decisions agreed to by managers. CA coverage is substantially higher in the public sector than the private sector, even after controlling for these differences in industry union density. It is higher in large and medium sized organisations than in smaller organisations, largely because larger organisations are easier to organise, tend to pay higher wages anyway, and face higher transaction costs through individual negotiations.

CA coverage also varies substantially between industries even after allowance is made for these factors. It varies substantially between individual occupations, probably reflecting different behavioural norms in those occupations. There are smaller differences in coverage between casual and permanent employees, between part-time and full-time employees, between junior and adult employees, that again mostly reflect different employer behaviours and norms. While gender had the appearance of an independent effect, that was probably simply because the industry and occupational control variables were not disaggregated enough to show their true effects.

## **Appendix A**

In each table, four models are presented, using different populations as per the description in section 2. That is, Table A1 compares employees on CAs with those not on CAs (models 1.1 to 1.4 denoting the various employee subsamples); Table A2 compares employees on CAs with those on awards (models 2.1 to 2.4); and Table A3 compares employees on CAs with those on individual arrangements (models 3.1 to 3.4). So, in total, twelve models are presented.



**Table A1: Probability of CA coverage vs all other methods of wage setting**

	1.1 All employees		1.2 Private sector (retail and hospitality)		1.3 Private sector (outside retail and hospitality)		1.4 Public sector	
	Est.	Std. Err	Est.	Std. Err	Est.	Std. Err	Est.	Std. Err
Public sector	29.8***	(0.8)	-	-	-	-	-	-
Industry								
Mining	-17.6***	(4.3)	-	-	-16.9***	(3.3)	#	#
Manufacturing	-10.4***	(3.6)	-	-	-10.7***	(3.1)	#	#
Electricity, Gas, Water and Waste Services	-36.7***	(3.5)	-	-	-30.1***	(1.8)	-5.5***	(2.1)
Construction	3.6	(2.5)	-	-	1.0	(2.4)	#	#
Wholesale Trade	-6.6***	(1.6)	-	-	-4.4***	(1.4)	#	#
Retail Trade	4.4**	(1.9)	-10.0***	(1.9)	-	-	#	#
Accommodation and Food Services	20.8***	(1.6)	#	#	-	-	#	#
Transport, Postal and Warehousing	-16.2***	(5.3)	-	-	-16.3***	(4.2)	#	#
Information Media and Telecommunications	2.8	(2.3)	-	-	3.7*	(2.2)	#	#
Financial and Insurance Services	35.0***	(1.2)	-	-	39.3***	(1.5)	#	#
Rental, Hiring and Real Estate Services	#	#	-	-	#	#	#	#
Professional, Scientific and Technical Services	6.4***	(1.8)	-	-	-8.5***	(1.8)	#	#
Administrative and Support Services	3.3**	(1.6)	-	-	1.4	(1.6)	#	#
Public Administration and Safety	-33.8***	(6.1)	-	-	-28.2***	(2.8)	3.4***	(1.2)
Education and Training	-7.8	(8.0)	-	-	-7.6	(7.2)	13.7***	(1.1)
Health Care and Social Assistance	1.2	(4.2)	-	-	14.7***	(4.4)	-23.9***	(1.7)
Arts and Recreation Services	8.1***	(2.5)	-	-	8.8***	(2.5)	#	#
Other Services	#	#	-	-	#	#	#	#
Occupation								
Manager	-24.3***	(2.0)	1.6	(9.4)	-28.0***	(1.1)	-2.7	(5.9)
Professionals	-21.1***	(1.1)	-23.7***	(5.4)	-24.9***	(0.9)	11.3***	(2.1)
Technicians and Trades Workers	-5.4***	(1.2)	-8.2**	(3.8)	-7.1***	(1.1)	8.8***	(1.8)
Community and Personal Service Workers	-23.9***	(1.4)	-36.3***	(3.8)	-20.2***	(1.2)	7.1**	(3.3)
Clerical and Administrative Workers	-16.4***	(1.3)	-3.5	(4.7)	-22.7***	(1.0)	13.2***	(2.1)
Sales Workers	15.8***	(2.6)	38.1***	(7.1)	-3.7	(2.6)	5.9	(5.4)
Machinery Operators	#	#	#	#	-	-	-	-
Labourers	#	#	#	#	-	-	-	-
Casual employee	-13.7***	(0.7)	-28.8***	(1.7)	-11.7***	(0.8)	-1.2	(1.7)
Part-time employee	13.6***	(0.7)	38.6***	(1.5)	8.2***	(0.8)	1.1	(1.1)
Female employee	-1.9***	(0.6)	-5.1***	(1.5)	-1.0	(0.7)	-3.4***	(0.9)
Junior employee	7.6***	(1.1)	21.6***	(1.9)	-5.1***	(1.3)	-9.4**	(4.6)
Medium/ large employer (At least 20 employees)	43.2***	(0.4)	50.8***	(1.0)	37.1***	(0.4)	23.3***	(2.5)
Industry union density	2.8***	(0.4)	-	-	2.5***	(0.4)	-	-
Occupational union density	1.3***	(0.2)	3.0***	(0.9)	0.8***	(0.2)	-0.2	(0.6)
Number of observations	52,208		6,743		35,277		10,188	

**Table A2: Probability of CA coverage vs award reliant**

	2.1 All employees		2.2 Private sector (retail and hospitality)		2.3 Private sector (outside retail and hospitality)		2.4 Public sector	
	Est.	Std. Err	Est.	Std. Err	Est.	Std. Err	Est.	Std. Err
Public sector	-0.2	(0.8)	-	-	-	-	-	-
Industry								
Mining	25.1***	(0.7)	-	-	26.3***	(1.1)	#	#
Manufacturing	4.9	(3.6)	-	-	3.8	(4.1)	#	#
Electricity, Gas, Water and Waste Services	-13.4	(11.2)	-	-	-25.4**	(12.8)	4.1**	(1.8)
Construction	15.0***	(1.6)	-	-	14.6***	(1.9)	#	#
Wholesale Trade	3.9**	(1.7)	-	-	4.7***	(1.7)	#	#
Retail Trade	-1.9	(2.0)	-9.8***	(2.0)	-	-	#	#
Accommodation and Food Services	9.3***	(1.3)	#	#	-	-	#	#
Transport, Postal and Warehousing	1.5	(6.3)	-	-	-1.3	(7.3)	#	#
Information Media and Telecommunications	13.5***	(1.6)	-	-	12.8***	(2.0)	#	#
Financial and Insurance Services	24.2***	(0.5)	-	-	26.3***	(0.6)	#	#
Rental, Hiring and Real Estate Services	#	#	-	-	#	#	-	-
Professional, Scientific and Technical Services	19.7***	(0.9)	-	-	12.3***	(2.0)	#	#
Administrative and Support Services	-0.3	(1.6)	-	-	-1.0	(1.8)	#	#
Public Administration and Safety	-29.2**	(13.1)	-	-	-42.1***	(13.4)	-6.1***	(1.3)
Education and Training	0.1	(8.7)	-	-	-4.9	(10.3)	4.9***	(1.3)
Health Care and Social Assistance	-5.0	(4.6)	-	-	7.4*	(4.2)	-35.7***	(2.0)
Arts and Recreation Services	10.3***	(1.9)	-	-	12.5***	(1.9)	#	#
Other Services	#	#	-	-	#	#	#	#
Occupation								
Manager	11.2***	(2.0)	32.2***	(5.6)	8.4***	(2.9)	6.8*	(3.6)
Professionals	6.9***	(1.1)	11.5	(12.6)	6.8***	(1.5)	12.3***	(1.8)
Technicians and Trades Workers	0.1	(1.2)	-7.0	(4.6)	0.2	(1.4)	6.9***	(1.6)
Community and Personal Service Workers	-8.6***	(2.1)	-44.9***	(6.0)	-10.0***	(2.4)	9.3***	(2.3)
Clerical and Administrative Workers	4.2***	(1.3)	7.4	(5.2)	-2.2	(1.8)	12.0***	(1.8)
Sales Workers	16.4***	(1.7)	44.7***	(7.9)	9.8***	(2.6)	7.7*	(4.0)
Machinery Operators	#	#	#	#	#	#	#	#
Labourers	#	#	#	#	#	#	#	#
Casual employee	-17.8***	(0.8)	-33.3***	(1.9)	-18.0***	(1.0)	-1.4	(1.5)
Part-time employee	4.5***	(0.7)	29.0***	(2.1)	-1.3	(0.9)	1.1	(1.0)
Female employee	-5.6***	(0.6)	-7.4***	(1.6)	-6.4***	(0.9)	-4.6***	(0.8)
Junior employee	0.2	(1.0)	20.1***	(1.9)	-16.0***	(1.8)	-10.5**	(4.5)
Medium/ large employer (At least 20 employees)	51.9***	(0.9)	58.3***	(1.5)	53.9***	(1.2)	11.2***	(2.6)
Industry union density	1.8***	(0.4)	-	-	1.8***	(0.4)	-	-
Occupational union density	0.6**	(0.2)	3.3***	(1.1)	0.6**	(0.3)	-0.4	(0.5)
Number of observations	33,736		5,307		18,804		9,625	

**Table A3: Probability of CA coverage vs individual arrangements**

	3.1 All employees		3.2 Private sector (retail and hospitality)		3.3 Private sector (outside retail and hospitality)		3.4 Public sector	
	Est.	Std. Err	Est.	Std. Err	Est.	Std. Err	Est.	Std. Err
Public sector	46.7***	(0.6)	-	-	-	-	-	-
Industry								
Mining	-31.5***	(5.2)	-	-	-28.4***	(3.4)	#	#
Manufacturing	-18.2***	(4.4)	-	-	-18.3***	(3.6)	#	#
Electricity, Gas, Water and Waste Services	-55.1***	(3.8)	-	-	-39.7***	(1.8)	-4.6***	(1.1)
Construction	-3.1	(2.9)	-	-	-5.7**	(2.8)	#	#
Wholesale Trade	-9.1***	(1.9)	-	-	-8.0***	(1.7)	#	#
Retail Trade	12.2***	(1.9)	-4.5**	(2.1)	-	-	#	#
Accommodation and Food Services	23.8***	(1.4)	#	#	-	-	#	#
Transport, Postal and Warehousing	-28.8***	(6.6)	-	-	-25.8***	(4.7)	#	#
Information Media and Telecommunications	-3.4	(2.6)	-	-	-0.8	(2.6)	#	#
Financial and Insurance Services	28.6***	(1.0)	-	-	36.6***	(1.5)	#	#
Rental, Hiring and Real Estate Services	#	#	-	-	#	#	#	#
Professional, Scientific and Technical Services	-2.6	(2.0)	-	-	-13.5***	(2.0)	#	#
Administrative and Support Services	6.4***	(1.7)	-	-	6.3***	(1.9)	#	#
Public Administration and Safety	-43.5***	(8.9)	-	-	-34.6***	(4.1)	5.5***	(0.5)
Education and Training	-16.3*	(9.6)	-	-	-14.5*	(8.4)	5.2***	(0.4)
Health Care and Social Assistance	14.9***	(4.1)	-	-	16.6***	(5.0)	4.4***	(0.4)
Arts and Recreation Services	2.7	(2.7)	-	-	3.4	(2.9)	#	#
Other Services	#	#	-	-	#	#	#	#
Occupation								
Manager	-53.4***	(1.8)	-35.4***	(13.0)	-43.2***	(1.0)	-10.4	(6.9)
Professionals	-43.5***	(1.4)	-56.2***	(7.2)	-41.1***	(1.0)	0.7	(1.2)
Technicians and Trades Workers	-16.4***	(1.5)	-16.2***	(5.3)	-16.4***	(1.3)	2.1**	(0.8)
Community and Personal Service Workers	-23.3***	(2.1)	-29.4***	(10.8)	-17.7***	(1.9)	0.3	(2.0)
Clerical and Administrative Workers	-40.0***	(1.6)	-28.5***	(6.9)	-38.1***	(1.1)	2.1*	(1.2)
Sales Workers	-9.4***	(3.3)	7.8	(10.2)	-21.5***	(2.6)	-1.5	(4.2)
Machinery Operators	#	#	#	#	#	#	#	#
Labourers	#	#	#	#	#	#	#	#
Casual employee	-7.4***	(1.0)	-0.1	(2.5)	-8.2***	(1.1)	-0.8	(1.0)
Part-time employee	18.4***	(0.8)	49.1***	(2.0)	14.4***	(1.0)	0.1	(0.7)
Female employee	1.5**	(0.7)	0.5	(1.7)	1.1	(0.8)	0.8*	(0.5)
Junior employee	15.4***	(1.3)	11.5***	(2.2)	6.0***	(2.1)	0.3	(2.1)
Medium/ large employer (At least 20 employees)	54.6***	(0.6)	77.6***	(1.8)	44.5***	(0.5)	16.4***	(2.2)
Industry union density	3.0***	(0.4)	-	-	3.0***	(0.4)	-	-
Occupational union density	0.1	(0.3)	0.9	(1.0)	-0.3	(0.3)	0.0	(0.3)
Number of observations	42,539		4,506		29,550		8,483	

## Appendix B

**Table B1: Description of EEH variables**

<b>Variable</b>	<b>Description</b>
sectpub	Categorical variable denoting sector of employment 1 = Private sector employee; 2 = Public sector employee
anzsic1	Categorical variable denoting industry of employment, classified according to 1-digit ANZSIC classification
anzsco1	Categorical variable denoting occupation of employment, classified according to 1-digit ANZSCO classification
casual	Dummy variable denoting casual employee
ftpt	Categorical variable denoting FT/PT status 1= Full time employee; 2= Part time employee
sex	Gender variable
empstat	Dummy variable for employee status. The analysis excludes all owner-managers of incorporated enterprises
empsize	Categorical variable denoting employer size 1= Employer of less than 20 employees 2 = Employer of 20 or more employees
mosp	Categorical variable denoting method of pay setting 1= Award only 2= Registered collective agreement 3= Unregistered collective agreement 4= Registered individual agreement 5= Unregistered individual arrangement
junior	Derived dummy variable denoting employee aged less than 21 years
idensity	Derived continuous variable denoting industry level union density. Data sourced from ABS cat.no. 6333.0.
odensity	Derived continuous variable denoting occupational level union density. Data sourced from ABS cat.no. 6333.0.

**Table B2: Summary data**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev</b>
Public sector	0.20	0.40
Industry		
Mining	0.03	0.17
Manufacturing	0.05	0.22
Electricity, Gas, Water and Waste Services	0.03	0.17
Construction	0.05	0.23
Wholesale Trade	0.05	0.22
Retail Trade	0.08	0.28
Accommodation and Food Services	0.05	0.21
Transport, Postal and Warehousing	0.05	0.23
Information Media and Telecommunications	0.03	0.18
Financial and Insurance Services	0.05	0.21
Rental, Hiring and Real Estate Services	0.03	0.17
Professional, Scientific and Technical Services	0.05	0.22
Administrative and Support Services	0.06	0.24
Public Administration and Safety	0.09	0.29
Education and Training	0.08	0.28
Health Care and Social Assistance	0.12	0.33
Arts and Recreation Services	0.04	0.19
Other Services	0.04	0.20
Occupation		
Manager	0.08	0.27
Professionals	0.22	0.41
Technicians and Trades Workers	0.11	0.32
Community and Personal Service Workers	0.13	0.34
Clerical and Administrative Workers	0.18	0.38
Sales Workers	0.12	0.32
Machinery Operators	0.08	0.27
Labourers	0.09	0.28
Casual employee	0.21	0.41
Part-time employee	0.37	0.48
Female employee	0.49	0.50
Junior employee	0.07	0.25
Medium/large employer (at least 20 employees)	1.83	0.38
Industry union density	14.01	9.94
Occupational union density	12.37	4.71