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What Determines Coverage by Collective Agreements or Awards?

David Peetz, Centre for Work, Organisation and Wellbeing, Griffith Business School, Griffith University, Nathan 4111, Brisbane QLD Australia
(corresponding author) Contact email: d.peetz@griffith.edu.au
Serena Yu, Centre for Health Economics Research and Evaluation, University of Technology, Sydney. PO Box 123, Broadway NSW 2007, Australia
Serena.Yu@uts.edu.au

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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. In the context of recent declines in collective agreement coverage, the purpose of this article is to examine the influence of employee and employer characteristics on collective agreement coverage. The causes of that decline are not the topic of this paper, but the determinants of collective agreement coverage are, because of the substantial effects it has. Collective bargaining is commonly a way by which employees boost their power in order to obtain higher pay and better conditions and better treatment at work and is a mechanism by which wage inequality is reduced (Jackson, A and Schellenberg, 1999; Peetz, 2006; International Labour Office, 2016). Understanding the factors that encourage it can facilitate our understanding of the factors shaping those outcomes.

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 or alternative instrument at a point in time. This paper 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 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. Some of the complex interdependencies mentioned above are first outlined in the next section, after a discussion of some relevant literature.

2. Background

There is a long history of research into the determinants of union density, but much less into the determinants of collective agreement coverage, despite the close relationship between the two.

Usually, unions are a pre-requisite for collective bargaining. In most other countries, collective agreements in employment can only be made by unions, and there is no scope for non-union employees to directly bargain with employers to create agreements that override statutory conditions without union involvement in some way. So internationally, collective agreement coverage is closely linked to union coverage: amongst countries on Jelle Visser's ICTWSS database there was, in 2012, a correlation

of r=.45 between these two variables (n=38), (based on calculations from Visser, Jelle, 2017)[1]. In the US and Canada, union density and collective bargaining coverage are almost codeterminous, as most unionised workplaces have full membership coverage and a collective agreement, while in most workplaces where unions fail to secure majority support for unionism, membership soon falls to nearly zero. Elsewhere they are not the same thing, however, and in many countries unions use extension provisions of some type to expand the coverage of collective agreements beyond the workplaces for which negotiations immediately occur. In many countries it is possible for employees to be covered by a collective agreement without being a union member. Nonetheless, within most countries, there is a close relationship between union density and CA coverage density. In Australia in 2014, only 16 per cent of employees were in a trade union. However, a much higher proportion would have been in a workplace with a union delegate because of the bias of union members, and delegates, towards larger workplaces (Morehead, Steele, Alexander, Stephen and Duffin, 1997). In 2007 the figures had been 21 and 36 per cent respectively (Considine and Buchanan, 2007).

More importantly, in Australia there is the almost unique option for employers of having a 'non-union' collective agreement. In principle, this might weaken the relationship between union coverage and collective bargaining in Australia. In practice, non-union agreements only typically account for about one in ten employees under collective agreements, so we would still expect there to be a strong link between unionism and collective bargaining. More important might be the varying strength of unions at the workplace or enterprise level. Union density is not necessarily a good indicator of union strength. A union might have members in a particular workplace or organisation, but not the bargaining power to force an agreement onto an employer. If delegates are well organised or have higher density in certain types of workplaces (say in larger workplace or the public sector) then collective agreements may be more likely there. On the other hand, non-union agreements may have quite different determinants, though there is also reason to believe that employers will seek to use union substitution devices in those workplaces that are most susceptible to unionisation. If that is the case, then many of the statistical determinants of union and non-union agreements may be quite similar.

The existence of non-union agreements is perhaps one of the less unusual aspects of the Australian system. More noteworthy is the now unique system of 'modern awards' that sets minimum rates of pay and conditions of employment in each industry, minima that vary by occupation. These awards are made by industrial tribunals—mostly the federal industrial tribunal, now called the Fair Work Commission (FWC). Though currently an administrative instrument of the FWC, in earlier times awards were the mechanism by which industrial disputes between unions and employers were settled. Then, as now, employees benefited from awards regardless of whether they were union members. While awards for the lowest classifications of unskilled workers are identical to the national minimum wage, for more skilled employees the relevant minima are higher. Collective agreements in turn must satisfy a 'better off *overall*' test (BOOT), by which employees covered by them are meant to be, in net terms, better off than they would be under the relevant award. This test is assessed by the FWC but, for union agreements, it historically relied on assurances by unions that their

members would indeed be better off—something which, in most industries, was a fair assumption, as unions used collective bargaining to improve the pay and conditions of members. Indeed, union support for the move in Australia to 'enterprise bargaining' was predicated in part on the idea that this was needed to give employees the incentive to unionise, as employees were seen as giving little credit to unions for nationally determined award wage increases.

That approach by the FWC to approving agreements was revised, however, after some major CAs in retail trade were successfully challenged on the grounds that they had breached the BOOT—that is, there were a number of employees who were worse off under the CA than they would have been under the award. It seemed that CAs may have served a different function in that industry, with one journalist arguing 'The [union]'s cosy relationship with employers might have been bad for its members, but it was advantageous for its leadership, providing it with the numbers that gave it greater say in union and party forums, greater clout in factional horsetrading and a bigger voice in parliament' (Seccombe, 2016). In the hospitality industry ('food and accommodation services') some similar issues arose, and there was high usage of non-union collective agreements at the end of the WorkChoices period (when there was no BOOT or comparable test for CAs) as employers sought to use CAs to keep unions out of their workplaces. So in Australian retail and hospitality, the determinants of collective bargaining coverage might be quite different to elsewhere.

For workers on individual agreements (IAs), pay and conditions should be no worse in any respect than under the relevant award. 'Individual flexibility arrangements' enable various working time restrictions to be circumvented in certain circumstances, but provide no leeway for cutting hourly wages below award minima. Within this constraint (or sometimes, ignoring it), IAs are typically determined unilaterally by the employer or negotiated between the employer and employee, without reference to any other party or regulator. While CAs and awards are finalised by the FWC, IAs are not. In that sense, they are the least regulated form of employment. For some highly paid employees (senior managers being an extreme example) awards might theoretically apply but in practice are irrelevant as the award pay rates are far below actual pay rates. As all employees on individual agreements must be paid at or above the award rate, then it is arithmetically inevitable that average pay under legal individual agreements will be higher than average pay under awards.

The literature identifies substantial variations in union density by industry and occupation (Visser, E J, 1991; Jackson, Andrew and Schetagne, 2004). In several countries, density is higher in blue-collar occupations than white-collar occupations (Visser, E J, 1991; Schnabel and Wagner, 2007). Density is almost everywhere higher in the public sector than the private sector (Grimes, 1994; Jackson, Andrew and Schetagne, 2004). It is lower amongst casual or temporary than among permanent workers (Australian Bureau of Statistics, 6333.0) and lower among part-time than full-time workers (Millward, 1990; Grimes, 1994). It is normally higher in large workplaces and organisations, mainly because unions find it easier to organise workers in such workplaces, but also because larger organisations tend to be more rules-based and unions may become part of the rule-making web (Visser, E J, 1991; Wooden and Balchin, 1993; Grimes, 1994; Morehead et al., 1997; Schnabel and Wagner, 2007;

Lucas, 2009). In most countries, women have been less likely to be union members than men, but the gap has been reducing in recent decades and in some countries (e.g. Sweden, the UK and Australia) union density is now higher amongst women than men (Visser, Jelle, 2006). Gender differences tended to be explained by structural factors (the types of jobs women were in, and the types of industries in which they worked) rather than attitudinal differences between men and women (Freeman and Medoff, 1984). An earlier study found that, after controlling for occupation and a range of personal and attitudinal characteristics, men were more likely to be unionised than women in Germany, Ireland and Italy, the reverse was true in Denmark, Sweden and Finland, and in more countries the gender effects lost significance (Schnabel and Wagner, 2007). Union density is also normally lowest among the youngest workers and highest in the oldest age groups (Lucas, 2009; Peetz, Price and Bailey, 2015).

As mentioned, there are few studies explicitly focused on the determinants of collective bargaining coverage. Coverage is usually higher in the public sector than in the private sector, illustrated by New Zealand's experience (Harbridge, May and Thickett, 2003). The paucity of studies on the determinants of collective agreement coverage contrasts with the considerably broader literature on the effects of collective bargaining in its various forms, with the OECD, for example, extensively reviewing the literature and investigating this issue in its 2018 *Employment Outlook* (Organisation for Economic Cooperation and Development, 2018).

3. Data and methods

This analysis uses the *Confidentialised Unit Record File* (CURF) from the 2016 EEH. The EEH is a survey of employers conducted every two years, collecting data on a nationally representative sample of their employees. The 2016 survey comprises data on around 53,000 employees, collected directly from their employers, and includes data on rate of pay, employment type, part-time status, occupation, hours paid, and method of pay-setting. A description of the variables used in the analysis is provided in the Appendix. The data was accessed using the ABS' *Remote Access Data Laboratory* (RADL). The RADL is a secure processing environment 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.

In addition to data from the EEH survey, we also use estimates of the average rate of unionisation from the ABS' *Characteristics of Employment* August 2016 catalogue. This dataset is drawn from a supplementary survey of respondents sampled as part of the ABS' monthly *Labour Force Survey*, and includes further questions on union membership and earnings. The LFS is a monthly survey of, for these purposes, employees aged 15 and over, contrasting with the EEH which is a survey of employers. The survey sample of the LFS is benchmarked to the five-yearly population census, and comprises around 26,000 households. Detailed data on labour force status, employment characteristics (including industry and occupation), and union membership status are collected by the LFS.

After excluding self-employed individuals, our main sample comprises 52,208 individuals. The unweighted data in Table 1 show that about one in five employees

observed in the sample are 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 work in the public sector, while the largest industries of employment are healthcare, public administration, and education. These unweighted sample data are slightly different from the weighted population estimates generated by the ABS.

Table 1. Summary statistics

Variable	*Mean*	*Std. Dev*
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

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

$$P(\mathrm{Y} = 1|\boldsymbol{X}) = \mathrm{f}(\alpha + \boldsymbol{\beta X})$$

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 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, in EEH data, is 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 by which unions obtain better wages and conditions and so are 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 $\boldsymbol{\beta}$ are calculated. As with all nonlinear regression models, the estimated coefficients $\boldsymbol{\beta}$ have no direct interpretation. In order to make sense of the model, the results present the average partial 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 that might strike readers is 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.

4. Findings

Within each set of explanatory variables, we discuss the findings firstly by reference to the main outcome of interest (for example, model 1.1 in Table 2, which refers to CA coverage compared to non-CA coverage for all employees), and then we dig deeper into the findings by discussing the various other comparisons and sub-samples—i.e. models 1.2 to 3.4. Models 2.1 to 3.4 are shown in tables 3 and 4. Table 3 shows equations predicting the probability of CA coverage compared to award reliance while Table 4 shows equations predicting the probability of CA coverage compared to individual arrangements.

Table 2: Probability of CA coverage vs all other methods of wage setting

Model	*1.1 All employees*		*1.2 Private sector (retail and hospitality)*		*1.3 Private sector (outside retail and hospitality)*		*1.4 Public sector*	
Average partial effect	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)	-	-
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)	-	-
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)
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	
Pseudo-R^2	0.2411		0.3229		0.2333		0.1037	

The estimates shown represent the average partial effects, which are defined as the change in the probability of CA coverage (relative to coverage by all other methods of wage setting), with respect to a change in each employee characteristic.

Default categories: Workers in rental, hiring and real estate services or 'other services', who are Machinery operators or labourers, who are male, permanent, full-time, adult employees in a small (under 20 employees) organisation.

***, ** and *: Significant at the 1%, 5% and 10% levels respectively

Table 3: Probability of CA coverage vs award reliant

Model	*2.1 All employees*		*2.2 Private sector (retail and hospitality)*		*2.3 Private sector (outside retail and hospitality)*		*2.4 Public sector*	
Average partial effect	*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)	-	-
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)	-	-
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)
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	
Pseudo-R^2	0.2112		0.2824		0.2610		0.1407	

The estimates shown represent the average partial effects, which are defined as the change in the probability of CA coverage (relative to award reliance), with respect to a change in each employee characteristic.

Default categories: Workers in rental, hiring and real estate services or 'other services', who are Machinery operators or labourers, who are male, permanent, full-time, adult employees in a small (under 20 employees) organisation.

***, ** and *: Significant at the 1%, 5% and 10% levels respectively

Table 4: Probability of CA coverage vs individual arrangements

Model	*3.1 All employees*		*3.2 Private sector (retail and hospitality)*		*3.3 Private sector (outside retail and hospitality)*		*3.4 Public sector*	
Average partial effect	*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)	-	-
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)	-	-
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)
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	
Pseudo-R^2	0.3820		0.5031		0.2973		0.1942	

The estimates shown represent the average partial effects, which are defined as the change in the probability of CA coverage (relative to coverage by individual arrangements), with respect to a change in each employee characteristic.

Default categories: Workers in rental, hiring and real estate services or 'other services', who are Machinery operators or labourers, who are male, permanent, full-time, adult employees in a small (under 20 employees) organisation.

***, ** and *: Significant at the 1%, 5% and 10% levels respectively

Sector

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 (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 more 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 ruled.

Industry and occupational union density

Estimates of union density are derived from the ABS' *Labour Force Survey* (LFS).

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 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 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 the 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). That is, holding other things constant, a higher rate of union density in an occupation does not make it more likely that an employee will be on a CA relative to an IA.

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 mostly organise along industry lines, especially since the amalgamations of the 1990s. In strongly organised industries, employers will negotiate CAs rather than IAs, either because they are forced to by collectively acting employees or as an alternative to union organisation in their particular firm (through a non-union CA). In weakly organised industries, employers will offer IAs when they choose to pay above the award.

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. As mentioned, 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 35.0 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).). In the former, this probably reflects the tendency of the big banks and insurance companies to negotiate CAs with their large workforces, covering numbers of employees that are considerably greater than the numbers of union members. In the latter, it probably reflects the tendency of employers to negotiate non-union CAs as a means of union exclusion, rather than IAs. This is reflected in the high effect on that industry variable in model 3.1: in accommodation and food services, employees were 24 percentage points more likely to be covered by a CA when the alternative was an IA, compared to in the reference group rental and other services. Readers should be careful in interpreting these figures, particularly the large negative effects on public administration and safety, and electricity gas and water (both over 30 percentage points). Remember that these figures 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 in the public sector, it is mostly large organisations and it has a high rate of union density. We suspect that there is specific employer behaviour at work here—the industry coefficients, in the end, are best interpreted as an indicator of employer agency, given that many of the key structural characteristics of an industry, such as employer size and industry union density, are controlled for in the regressions. Long delays in negotiating replacement CAs, and the frequent failure of employer-sponsored CA ballots in the Commonwealth public sector, are indicators of an employer strategy that objects to union 'intransigence' regarding trade-offs in pay or conditions in conflict with a workforce that wishes to maintain union representation to protect those conditions (Senate Education and Employment References Committee, 2016).

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. 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 for CA coverage. Consequently, private sector CA coverage in Health care and social assistance 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 sector 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 and water (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 coefficient 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. That is, employers in those industries choose to pursue IAs in preference to CAs. Mining is well known for union avoidance strategies, and they use IAs wherever possible rather than CAs (McDonald and Timo, 1996; World Competitive Practices, 1999; Hearn Mackinnon, 2007). Due to high rates of pay, award incidence in mining is low (so, there is a significant positive effect on the mining dummy variable in model 2.1, which compares employees under CAs with employees under awards). This is not the case in either of the other two industries (electricity gas and water, and transport, postal and warehousing), as the effects in model 2.1 suggest no statistically significant difference between being covered by CAs or awards.

Occupation

Aside from the expected tendency, mentioned above, 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 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). The effects here probably reflect employer behaviour: in retail, encouraging low-paid sales employees who would otherwise be on an award to negotiate union CAs that had average hourly wages fairly similar to awards; and in accommodation and food services to endorse non-union CAs that covered low-wage sales employees who again would be paid fairly similar hourly wages under the CAs as under the awards, but on this latter occasion for the purpose of union avoidance.

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 and required reasonable union density before it could be established.

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.

Another way of looking at the data is this: white collar unions in the public sector face much higher rates of 'free-riding'—people being covered by CAs without being union members—than either blue-collar unions or white-collar unions in the private sector.

Employer size

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

Size has a major impact on CA coverage. Unions find it very hard to organise workers in small firms; and even if some join, they often do not have the numbers to force the employer to negotiate a CA. Amongst larger employers, however, particularly in retail and hospitality, employers may find benefit from negotiating a CA.

CA coverage is 43.2 percentage points higher in 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 one (model 3.2).

Casual employment

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

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).

The use of casual employees is likely to be lower in firms with CAs. Even if the CAs themselves do not regulate the use of casual employees, where unions are strong enough they will tend to negotiate a CA and so the existence of a CA is an imperfect proxy for union power (imperfect because, for roughly one in ten employees covered by a CA, it is a non-union CA). Where unions are strong enough they will often attempt to discourage the use of casual employees, or employers will reduce their use of casual employees below what it might otherwise have been.

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 as a result of the negative effects of large casual workforces (Price, 2003).

In the public sector, the use of casual labour is governed more by public sector rules than by CAs, and so high or low use of casuals has no significant relationship with CA coverage.

Part-time employment

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 (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.

This may at first seem counter-intuitive. But let's think about retail and hospitality for a moment. 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. 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). Moreover, models with a term interacting part time status with casual employment status further supported this interpretation – that is, higher grade employees (most likely to be full time and permanent) were significantly less likely to be covered by a CA than permanent part-time employees (more likely to be lower grade) These results are available on request.

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, either reluctantly via CAs or voluntarily in such firms anyway. 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.

As with casual labour, in the public sector, the use of part-time labour is governed more by public sector rules than by CAs, and so high or low use of part-timers has no significant relationship with CA coverage.

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, CAs in large firms are often substitutes for awards (rather than paying well above them, as they do in other industries) and so new employees start on CAs instead of awards. 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.

Female employees

Overall, 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).

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).

Summary EEH data showed 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 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. (Grimes, 1994; Peetz, 1998).

5. Conclusions

Three major factors stand out as shaping CA coverage in Australia: 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. Yet knowing about unionism is not enough to know about CA coverage. CA coverage is substantially higher in the public sector than the private sector, even after controlling for these differences in industry union density, probably because collective agreements help implement and standardise rules of payment and behaviour that are important in bodies ultimately spending taxpayer money. 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. This in turn appears to reflect different employer strategies in those industries, That is, apart from the structural factors mentioned above and unionism

itself, employer agency plays a major role in explaining coverage by instruments. In some instances—and these tend to follow patterns within industries, so employers within an industry will adopt a 'pattern' demonstrated by other employers in the same industry—employers may choose to use individual contracts, or even non-union (or sometimes union) collective agreements as substitutes for unions, or at least for union militancy, or they may simply choose to adopt CAs because they have low transaction costs.

Coverage by CAs also 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.

Australia's unique system of industrial regulation, at least in terms of its emphasis on awards, does not appear to have an immediately obvious impact on the determinants of collective bargaining—though we must be very careful here, because so few international studies have sought to study the determinants. At least in the public sector—where our results show that Australia, like other countries, has higher density in this sector—award regulation does not appear to have been a substitute for collective bargaining.

Overall, the results are consistent with the proposition that unions use collective bargaining to strengthen the power of workers, and that, in effect, joining a union is only the first stage for an employee in boosting their power—as to entrench it they need to be in a union that can negotiate a collective agreement, and the factors that enable unions to do this are, in many cases, also the factors that most enable workers to build strength by unionising in the first place. While that may seem obvious—isn't collective bargaining what the Webbs told us unions existed for? (Webb and Webb, 1920)—it helps remind us that workers who join a union in circumstances that may otherwise be difficult are unlikely to secure the full benefits of unionism.

The flipside of this is as follows. Non-union agreement-making in Australia—another almost unique feature—is either too insignificant, or too similar to union bargaining in its coverage, to affect the results. If non-union agreement-making was fundamentally different to union collective bargaining in its coverage, the signs on the coefficients determining collective agreement coverage would be the opposite of those on the determinants of unionism after unionism was controlled in equations. We know that wage increases through non-union collective agreements are consistently lower than those achieved through union agreements (Department of Employment, 2016). There is nothing in here to suggest anything other than non-union agreement-making is simply a substitute for union collective bargaining. That is, it is used by employers as an alternative to union collective bargaining, but has the advantage of delivering more power to employers and less to employees. There is nothing here to suggest it fills a void created by the restricted coverage union collective bargaining. Overall, we can make sense of the patterns of collective agreement coverage by reference to unionism, factors that strengthen unions (size and sector), and known employer strategies regarding particular industries and occupations.

Appendix A

Table A1. Description of EEH variables

Derived variable	*Source*	*Description*
sectpub	SECTPUB variable in EEH microdata	Categorical variable denoting sector of employment 1 = Private sector employee; 2 = Public sector employee
anzsic1	ANZSIC1 variable in EEH microdata	Categorical variable denoting industry of employment, classified according to 1-digit ANZSIC classification
anzsco1	ANZSCO1 variable in EEH microdata	Categorical variable denoting occupation of employment, classified according to 1-digit ANZSCO classification
casual	TYPEEMP variable in EEH microdata	Dummy variable where 1 = casual employee 0 = permanent or fixed term employee
pt	FTPT variable in EEH microdata	Dummy variable denoting part time status 1= part time employee; 0= full time employee
sex	SEX variable in EEH microdata	Gender variable where 1 = male; 2 = female
empstat	EMPSTAT variable in EEH microdata	Dummy variable for employee status. The analysis excludes all owner-managers of incorporated enterprises
empsize	EMPSIZE variable in EEH microdata	Categorical variable denoting employer size 1= Employer of less than 20 employees 2 = Employer of 20 or more employees
mosp	MOSP variable in EEH microdata	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	AGECE variable in EEH microdata	Dummy variable where 1 = individual aged 20 and under; 0= individual aged 21 and over
idensity	ABS cat.no. 6333.0, Characteristics of employment	Derived continuous variable denoting industry level union density.
odensity	ABS cat.no. 6333.0, Characteristics of employment	Derived continuous variable denoting occupational level union density.

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Endnote

1 We have used density data from household surveys where available (n=15), otherwise union-based data (n=23) where survey data are not available.

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