



Overview of research to inform the Annual Wage Review 2017–18

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Table of contents

1	Introduction – The research program	1
2	Characteristics of workers earning the national minimum wage rate and of the low paid	2
2.1	Context	2
2.2	Data and methodology	2
2.3	National Minimum Wage workers	3
2.4	Low paid	4
2.5	Summary	4
3	The characteristics of the underemployed and unemployed	6
3.1	Context	6
3.2	Data and methodology	7
3.3	Characteristics of the underemployed and unemployed	7
3.4	The dynamics of underemployment	8
3.5	Summary	9
4	Employee and employer characteristics and collective agreement coverage	10
4.1	Context	10
4.2	Data and methodology	11
4.3	Background – findings of the first study	11
4.4	Factors associated with collective agreement coverage	11
4.5	Summary	12
5	A review of methods applied in international research on the employment effects of the minimum wage and implications for Australian research	13
5.1	Background	13
5.2	Measurement and Australia	13
5.3	Key approaches	14
5.4	Summary	15
6	Research Reference List—Annual Wage Review 2017–18	16
6.1	Australian research	16
6.2	International research	16
7	Statistical Report – Annual Wage Review 2017–18	17
7.1	Contents	17

List of figures

Figure 1: Unemployment and underemployment rates February 1978–November 2017, Persons, Australia.....	7
Figure 2: Federal collective agreement coverage, December 1991–September 2017, Australia	10

1 Introduction – The research program

Fair Work Commission staff conduct and commission research as part of the annual wage review. The research program for the *Annual Wage Review 2017–18* was finalised in a Statement by the President on 21 August 2017. The program was developed in consultation with the Minimum Wages Research Group which comprises representatives nominated by:

- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Council of Social Service
- Australian Council of Trade Unions
- Australian Government
- State and territory governments.

The 2017–18 program comprises an economic and labour market Statistical Report, a Research reference list and a series of specific Research Reports. The subjects of these reports are:

- *The characteristics of workers earning the national minimum wage and of the low paid.* This project examines the characteristics of two groups of Australian workers: the first, those receiving a rate of pay equal to the National Minimum Wage, the second a wider population of the low paid. It was undertaken by Kelvin Yuen, Grant Ellis and Lucy Nelms (Fair Work Commission).
- *The characteristics of the underemployed and unemployed.* This study has two parts. The first undertaken by David Rozenbes and Samantha Farmakis-Gamboni (Fair Work Commission) describes trends in underemployment and the characteristics associated with this state. The second, which is concerned with the dynamics of underemployment, was undertaken by Inga Lass and Mark Wooden (Melbourne Institute of Applied Economic and Social Research).
- *Explaining recent trends in collective bargaining* undertaken by David Peetz (Griffith University) and Serena Yu (University of Technology Sydney). This is the second stage of a project which commenced, and was reported on, as part of the 2016–17 research program.
- *Methods and limitations to undertaking analysis of the employment effects of minimum wage increases.* This project has two parts. The first is a review, undertaken by Jeff Borland (University of Melbourne), of methods applied internationally and in Australia, and a discussion of the issues associated with undertaking this research in Australia. This is reported on here. The second part will report on the outcomes of a roundtable meeting to consider the findings of the review paper, scheduled for early 2018.

In addition, a Research Reference List is prepared which documents Australian and international research relevant to the Annual Wage Review.

2 Characteristics of workers earning the national minimum wage rate and of the low paid

Authors: Kelvin Yuen, Grant Ellis and Lucy Nelms (Fair Work Commission).

Key Findings

- 2.1 per cent of employees paid at the adult rate were identified as National Minimum Wage (NMW) earners
- These NMW earners were disproportionately represented amongst women, young workers under the age of 21 years, part-time employees, those employed on a casual basis, employees of smaller enterprises, and workers whose wages are paid on the basis of awards only. Most NMW earners were employed in Accommodation and food services and Retail trade.¹
- Young employees paid at junior rates overwhelmingly earned less than the rate of the adult NMW.
- An estimated 14.6 per cent of adult employees earned an hourly rate less than two-thirds of median earnings. The characteristics of these employees are similar to those of NMW earners.

2.1 Context

The dual focus of this paper on both minimum wage employees and the low paid reflects the dual role of the Annual Wage Review in making the NMW order and also reviewing modern award minimum wages.

2.2 Data and methodology

The research uses two different data sets in its analysis, which is focused on describing the employment and personal characteristics of these two groups of employees, and compares this with employees overall.

- Analysis of NMW earners is undertaken using the May 2016 ABS Survey of Employee Earnings and Hours (EEH). This is an employer based survey which collects information on some 53,000 employees from 8200 employers, in all sectors other than agriculture and private households. The analysis defines a NMW earner as an employee, paid at an adult rate, whose hourly earnings were \$17.50 or less (101.2 per cent of the NMW).²
- Analysis of low-paid workers was undertaken using wave 16 of the Household Income and Labour Dynamics Australia (HILDA) survey which provides data for a sample of 18,400 Australians living in 7,600 households in 2016. A low-paid worker was defined as an adult worker paid an hourly rate below two-thirds of median hourly earnings.

¹ Data are not available for employees in agriculture and private households. The analysis of low-paid employees suggests that incidence may also be high in Agriculture, though it would not be a large proportion of overall NMW earners.

² Excluding owner-managers of incorporated enterprises, earnings based on ordinary time earnings, wage rate of casual employees discounted to account for 25 per cent casual loading.

While the EEH provides data which enables the identification of NMW workers with a high level of precision, the strength of the HILDA survey is the more complete information available on personal and family characteristics.

2.3 National Minimum Wage workers

Persons identified as NMW earners comprise both those not covered by modern awards and in receipt of the NMW, who may be on a collective agreement or individual arrangement, and those on awards which provide the rate of the NMW for some classifications. This occurs in some 45 of the 122 industry and occupational modern awards, although in most cases this rate is only paid for a limited initial period of employment.

Using the definition described above, it is estimated that 2.1 per cent of employees paid at the adult rate are NMW earners.^{3,4} When the earnings of those paid junior rates are considered, 88 per cent of these workers are paid at a rate below that of the adult NMW.

Key characteristics of NMW earners include:

- 58.7 per cent are female, with 2.3 per cent of female employees paid at adult rates being NMW earners, compared to 1.8 per cent of males. While NMW earners were present across all age groups, the rate varied by age. The highest incidence was amongst those aged 15 to 20 years where 16.8 per cent of these employees, while being paid at an adult rate, were paid the NMW. The rate drops with age, falling to 1.1 per cent for those aged 30 to 49 years, before increasing slightly to 1.5 per cent for those aged 65 years and over.
- The incidence of NMW employment was much higher for part-time workers (4.2 per cent) with these workers accounting for 77.2 per cent of all NMW earners. It is also high, at 7.8 per cent, for casual employees and at 4.2 per cent for those whose pay is set by awards.
- The payment of the NMW is more prevalent in private sector employment and amongst smaller employers. The incidence of NMW employment at 5.6 per cent in establishments with fewer than 20 employees compares with just 1.1 per cent for larger employers.
- NMW earners were disproportionately represented in a number of industries with 9.7 per cent of workers in Accommodation and food services being NMW earners, along with 4.8 per cent in Arts and recreational services, 3.8 per cent in Other services, 3.7 per cent in Wholesale trade, 3.0 per cent in Rental, hiring and real estate services and 2.9 per cent in Retail trade. Occupations with a very high concentration of NMW employment include Food preparation assistants, where 16.5 per cent were NMW earners, as are 11.8 per cent of Packers and product assemblers, and 7.0 per cent of Hospitality workers. While a slightly lower 6.1 per cent of Sales assistants and salespersons were NMW earners, this occupational group accounted for 23.7 per cent of NMW employment.

³ This group of NMW workers represent 1.9 per cent of all employees when those paid junior rates are included.

⁴ Estimates of the proportion of employees in receipt of the NMW vary, in part due to the varying margin used in studies to determine the cut-off used to define the population. Typically many studies use a larger margin of 5 or 10 per cent, in contrast to the 1.2 per cent here. These studies tend to report the proportion on the minimum wage of around 4 per cent and 7 per cent respectively.

2.4 Low paid

An estimated 14.6 per cent of adult employees are identified as being low paid using the measure of an hourly rate of pay less than two-thirds of the median earnings rate.⁵ The characteristics of these employees in many ways are similar to those of NMW earners, being disproportionately female, young, employed part-time, on a casual basis and with their pay being reliant on an award. As with NMW earners these workers are over-represented in Accommodation and food services (accounting, in this case, for 50.3 per cent of all employees), along with Retail trade where they account for over one quarter of employees. They also represent more than half of the employees in Agriculture, forestry and fishing (a sector not covered by the EEH survey used to estimate NMW earners). As with NMW employees, the incidence of low pay in the private sector and small enterprises was elevated.

The HILDA survey, used to identify this group, permits a more detailed examination of the characteristics of these employees, with this analysis indicating:

- While most low-paid employees lived in metropolitan areas, the rate of low pay was higher (16.6 per cent) in regional Australia.
- The rate of low pay was much higher (23.2 per cent) for those whose highest level of education was Year 12 or lower, and amongst those still studying.
- Low-paid employees were more likely to be working in multiple jobs and slightly less likely to be working a regular daytime schedule. They were much more likely to identify as an independent contractor, as underemployed, and as not being a member of a union.
- There was only a small variation in the incidence of low pay by country of birth – with a rate of 14.9 per cent for Australian-born, 12.9 per cent for those born in main English-speaking countries and 14.4 per cent for those born in other countries. The rate was somewhat elevated at 18.6 per cent for Indigenous employees in the sample. It was also higher, 19.5 per cent, for people with a long-term health condition, disability or impairment.
- Single persons were much more likely to be low-paid workers, with 24.6 per cent of never married persons being in receipt of low wages compared with 10.0 per cent of those in registered marriages. Amongst couples, low-paid workers were predominantly a secondary earner (62.5 per cent), with 10.3 per cent being the sole earner, and 27.3 per cent the primary earner.
- Households with a low-paid employee as the main earner were much less likely to own or be purchasing their own home, and amongst those renting, a higher proportion were in public housing.

2.5 Summary

While using a very tight definition, only 2.1 per cent of adult employees are identified as NMW workers. The characteristics of this population are not dissimilar to the 14.6 per cent of adult employees identified as being low paid. Young people and women are both disproportionately represented in these populations, and these employment arrangements are more frequent for

⁵ The Expert Panel in their 2016–17 review of the national minimum wage noted that in successive review decisions that it had been concluded that “a threshold of two-thirds of median full-time wages provides ‘a suitable and operational benchmark for identifying who is low paid’” ([2017] FWCFB 3500 at para. 53).

those employed part-time and casual, with their pay set on an award basis and to be working for small employers. There are marked concentrations by industry sector, in particular Accommodation and food services, but also Agriculture.

3 The characteristics of the underemployed and unemployed

Authors: Part 1—David Rozenbes and Samantha Farmakis-Gamboni (Fair Work Commission).
Part 2—Inga Lass and Mark Wooden (Melbourne Institute of Applied Economic and Social Research).

Key Findings

- Underemployment (that is a person in part-time employment who is wanting to work more hours) today is much more common than unemployment, and is particularly concentrated amongst women and the young.
- When compared with all other labour force states, underemployed workers had similar characteristics to the unemployed, although, when compared with all employees, they more closely resemble part-time workers who are satisfied with their working conditions.
- Analysis of year-to-year transitions indicates that after one year, 36 per cent of underemployed workers are still underemployed, 49 per cent are fully employed (either because of changes in hours or preferences) and 14 per cent are not in employment.
 - Over a longer period, 94 per cent of spells of underemployment last less than 3 years.

3.1 Context

Social inclusion through workforce participation is an objective of the *Fair Work Act 2009* (Cth), and this is identified as an objective of modern awards and the safety net of minimum wages. While unemployment clearly represents a negative outcome in this regard, a related phenomenon is underemployment, that is, persons in less than full-time employment who want to work more hours.⁶

Over recent decades, the incidence of underemployment has become much more significant in the Australian labour market in absolute terms and relative to unemployment⁷:

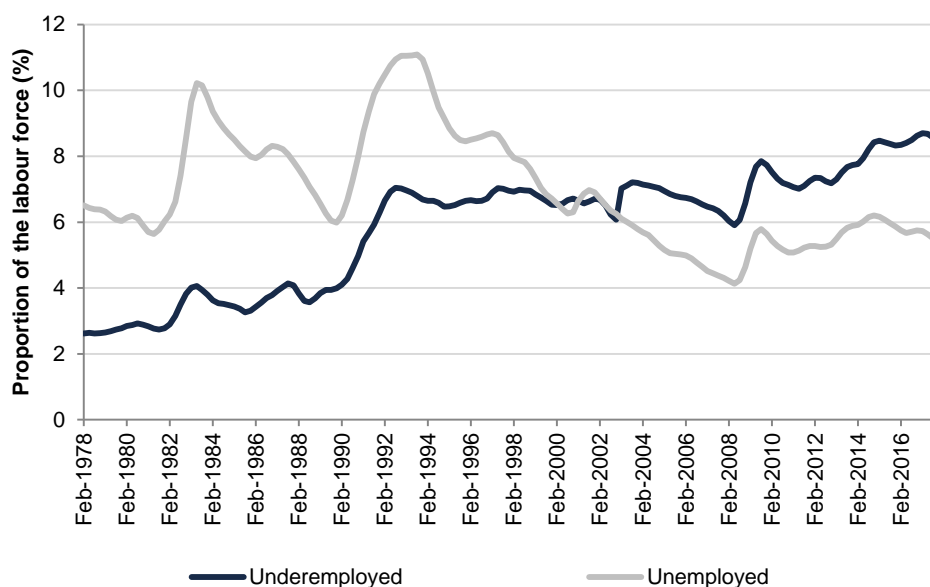
- In November 2017 it was estimated that 5.4 per cent of the labour force was unemployed and 8.4 per cent underemployed. In contrast in February 1978, while the unemployment rate was somewhat higher at 6.5 per cent of the labour force, the underemployment rate was just 2.6 per cent.
- More recently while unemployment has declined from 6.2 per cent to 5.4 per cent between November 2014 and November 2017, underemployment has remained at 8.4 per cent.

These trends are illustrated in Figure 1.

⁶ While the more formal definition of underemployment involves a test that the person is available to work the additional hours this question was not asked in HILDA until wave 10 and this concept has not been used in determining underemployment in the analysis based on this source. Unlike unemployment there is no testing in the definition of the person actively seeking employment at their desired hours.

⁷ See Figure 1 for sources.

Figure 1: Unemployment and underemployment rates February 1978–November 2017, Persons, Australia.



Note: Trend estimates shown.

Source: ABS, *Labour Force Australia November 2017*, Catalogue No. 6202.0, Table 22.

3.2 Data and methodology

The first part of the paper initially provides a review of the literature on underemployment in Australia and then presents an analysis of the characteristics of the underemployed—that is, as an employee working part-time who would prefer to work additional hours. This analysis involves the estimation of two multinomial logit models using a pooled sample of employees from multiple waves of the HILDA survey. The first model considers the characteristics of the underemployed relative to the unemployed, full-time employed and part-time employed who do not want to work more hours. The second excludes the unemployed population so as to compare the underemployed with employed persons who are working full-time and those working part-time but are satisfied with their hours of work. In both cases, the models were run separately by gender.

The second part also uses data from HILDA but focuses on the dynamics of the experience of underemployment. In addition to reporting year-to-year transition rates for the underemployed, it considers, from wave 2 onwards, the employment status of individuals identified as underemployed in the previous wave, and then constructs spells of underemployment and analyses how people exit from these (if they do). Two concepts of underemployment are used. The first, as above and as usually measured, considers part-time workers who wish to work more hours. The second is a more restricted concept of involuntary part-time workers, limited to those underemployed who want to work full-time.

3.3 Characteristics of the underemployed and unemployed

Analysis of the first model, that is using four labour market states including unemployment, indicates that while 7.3 per cent of males in the labour force were underemployed and 6.4 per cent unemployed, for women, while unemployment was a little lower at 5.8 per cent, underemployment was much higher with 13.8 per cent of women being employed part-time but wanting to work more

hours. More generally, this model suggests that the characteristics of the underemployed were in many respects, including by age, family type, being born in a non-English speaking country and being a full-time student, similar to those of the unemployed.

When compared with other employed, the second model, the paper reports that the characteristics of the underemployed were much more closely aligned with those of part-time workers who were satisfied with their hours of work. For women, some of the strong findings of difference with full-time employees related to being in a couple household with dependent children and living in a regional, but not remote, location. By industry, the analysis again showed a strong alignment between part-time work and underemployment, with both of these populations more likely to be employed in Retail trade, Accommodation and food services, Education and training, and Health care and social assistance industries. Working in a medium or large business was associated with a lower probability of being underemployed or employed part-time but satisfied with hours of work, with casual employment being associated with a higher probability of both these outcomes.

3.4 The dynamics of underemployment

Most workers who are underemployed in one year are not identified as underemployed in the following year. Although 36 per cent remain in this state almost half, 49 per cent, report being fully employed (either because of changed hours of work (26 per cent), changed preferences about their working hours (9 per cent) or a combination of these two factors (15 per cent) while 14 per cent are no longer employed—with 9 per cent still wanting employment. The rate of exit has however declined since 2008.

Where workers moved from underemployment to full employment, this was usually with the same employer. For the narrowly defined group of involuntary part-time workers (those who, while working part-time, were seeking full-time employment), a quarter remained in this state in the next year, just over a quarter (27 per cent) obtained full-time employment, 34 per cent changed their preference from wanting to work full-time and 13 per cent exited employment.

Using a more sophisticated approach based on episodes of underemployment and an event history methodology, 68 per cent of people⁸ observed entering underemployment in one year exit it in the following year, 53 per cent into full-employment⁹ and 15 per cent into non-employment. Three years after entry 94 per cent will have exited, and after 5 years 98 per cent.

Multivariate analysis of exits focused on the hazard rate of exit and consideration of positive exits (to full-employment¹⁰) and negative exits (to non-employment) indicates:

- Although there is not a significant difference in the hazard of exiting by gender, males were much more likely than women to make a positive exit.
- Partnered men had a higher hazard rate of exit to full-employment, in contrast women with a young child had a higher hazard of exiting to non-employment.

⁸ Strictly speaking the measure is that of episodes rather than individuals with an individual able to have multiple episodes.

⁹ That is being employed and not seeking to work more hours, either because of now working full-time or part-time for more hours, or because of changing preferences for working hours.

¹⁰ A person can move from being underemployed to full-employed in a number of ways. They may increase their hours of work to meet their desired level of activity, they may change their preferred hours of work to match the hours they are actually working, or their hours of work and preferred hours may both change to a new equilibrium where these hours match.

- The hazard rate shows a u-shaped function being higher for youth and older workers, with this latter group being more likely to exit to non-employment. Workers with a work-limiting health condition have a lower hazard of a positive transition and a higher exit to non-employment, with negative outcomes also more frequent for Indigenous Australians, migrants from non-English speaking countries, casual employees and the self-employed.
- Being a trade union member was associated with a higher hazard of remaining in underemployment but a particularly lower hazard of exiting into non-employment. The paper suggests that union membership, while being protective of employment, is less effective in assisting people to obtain their desired hours of employment.

A caveat on these findings, however, is that the modelling only considered episodes of underemployment and not whether, after an initial exit, a person returned to this state.

3.5 Summary

The phenomenon of underemployment has become much more significant over recent decades and since 2000 has been experienced by a higher proportion of the labour force than unemployment. It is an outcome which is more frequently experienced by women and young persons, as well as groups such as those with a health condition, Indigenous Australians and persons from non-English speaking countries who are frequently associated with labour market disadvantage, along with industry sectors which exhibit other characteristics such as low rates of pay.

For most people who experience underemployment it appears to be a relative short-term experience, although for some exit is to a state of non-employment and for others it is because of a change in their preferred working hours.

4 Employee and employer characteristics and collective agreement coverage

Authors: David Peetz (Griffith University) and Serena Yu (University of Technology Sydney)

Key Findings

- The three principal factors associated with collective agreement coverage in 2016 are:
 - Sector of employment (higher in the public sector).
 - Employer size (higher for those employed by larger enterprises).
 - The rate of unionisation, with higher coverage associated with higher rates of unionisation.

4.1 Context

This study extends analysis presented by the same two authors as part of the 2016–17 research program.¹¹

The focus on collective bargaining recognises the obligation under the *Fair Work Act 2009* (Cth) for the Fair Work Commission to take account of a need to encourage collective bargaining (s.134(b)). Notwithstanding this, as documented in the authors' previous paper, the estimated coverage of federal collective agreements has slumped from a high of 28.8 per cent in December 2010 to 17.5 per cent in September 2017 (see Figure 2).

Figure 2: Federal collective agreement coverage, December 1991–September 2017, Australia



Source: Department of Jobs and Small Business, *Trends in Federal Enterprise Bargaining*, June 2017, Trends Historical Table; and ABS, *Labour Force, Australia, Detailed, Quarterly, November 2017*, Catalogue No 6291.0.55.003, Table 13.

¹¹ Peetz, David & Serena Yu (2017), *Explaining recent trends in collective bargaining*, Fair Work Commission Research Report 4/2017, February.

4.2 Data and methodology

This paper is based on data from the 2016 ABS Survey of Employee Earnings and Hours, complemented by estimates of the unionisation rate, at the 1-digit ANZSCO and 1-digit ANZSIC levels, from the 2016 ABS Characteristics of Employment Survey.¹²

The analysis is undertaken through a series of probit models considering the probability of an employee (excluding owner managers of incorporated enterprises) respectively having their pay set through a collective agreement relative to all other forms of wage setting, or having their pay set through a collective agreement relative to being award reliant, or relative to the use of an individual agreement. For each of these approaches, in addition to a model for all employees, separate models are run for: private sector employees in the retail and hospitality sectors; for all other private sector employees; and for public sector employees. The results are given as mean marginal effects.

4.3 Background – findings of the first study

The earlier research report noted that the initial decline in coverage of collective agreements over the period 2010 to 2014 was due to a decline in non-union agreement coverage, and speculated that this may be a return to 'normal' after the Work Choices era. In contrast, the subsequent decline, in addition to being stronger, is due to a decline in union agreement coverage with non-union coverage remaining stable, albeit at a low level. The report considered this more recent decline was likely to be a result of declining unionisation and also presented international data which identified a very strong and positive relationship over time between union density and collective agreement coverage in 8 of the 11 countries reported on, with the other 3 countries having a weaker, but still positive, association.

Other factors identified in the study as having a potentially contributing role were structural changes, especially the relative decline in the size of the public sector, with changes at the industry and occupational level only playing a minor role. More specific issues, associated with particular industrial relations matters, were also identified in particular industries, including Retail trade and Public administration and safety.

4.4 Factors associated with collective agreement coverage

In this study of employment arrangements as of May 2016, the authors report that:

- Relative to all other forms of pay-setting, public sector employees are 29.8 percentage points more likely than those in the private sector to be covered by a collective agreement. The difference between sectors is even more marked when the model is restricted to individual and collective agreements, where public sector employees are 46.7 percentage points more likely to be covered by a collective agreement. A higher level of coverage was also associated with the size of the employer, in particular in the private sector. Indeed in the Retail and hospitality sectors collective agreement coverage was 50.8 percentage points higher in larger enterprises (20 employees or more) relative to small employers, and 37.1 per cent outside of this sector.
- There is a strong positive association between union density (measured at both an industry and occupational level) and the incidence of collective agreements. In the model including all

¹² ABS, *Characteristics of Employment, Australia, August 2016*, Cat No 6333.0.

methods of setting pay, a 1 percentage point increase in union density in an industry is associated with a 2.8 percentage point increase in the probability of collective agreement coverage of employees and 1 percentage point increase in union density in an occupation, with a 1.3 percentage point increase in the probability of coverage. This effect is driven by the private sector, with no significant relationship in public sector employment and appears to, in particular, be associated with the probability of being on a collective agreement relative to an award.

- The authors report that this finding reflects the link they found in their earlier study, as well as noting that the relationship involved some lags.
- Employment in the Financial and insurance services industry and the Accommodation and food services industry are both associated with a much higher probability of collective agreement coverage, relative to the base industry of Rental and other services, while a much lower probability is associated with employment in the Electricity, gas, water and waste and Public administration and safety industries. While being employed in Health care and social assistance is associated with an increased likelihood of collective agreement coverage for private sector employees, it was associated with a reduced likelihood for those in the public sector.
- Quite a complex pattern of associations is seen at the occupational level. The overall analysis of this concludes that collective agreement coverage of white collar workers was in large part associated with whether these were public or private employees. In contrast, coverage of blue-collar workers tended to be more determined by factors such as unionisation.
- Part-time employees were 13.6 percentage points more likely to be covered by a collective agreement than those working full time, with this effect being driven almost wholly by the private sector. Casual employees were 13.7 percentage points less likely to be covered than a permanent or fixed term employee. Again this effect is largely restricted to the private sector.
- By gender, there was only a small, but significant difference in terms of overall coverage, with women being 1.9 percentage points less likely to be covered by a collective agreement than men. While this shows that gender had an effect on the probability of collective agreement coverage, the authors noted that this appeared to be more a reflection of the relative concentrations of men and women by industry and occupation rather than different behaviour by gender.

4.5 Summary

The analysis concludes by identifying three elements as being the main determinants of collective agreement coverage of employees:

- Whether they are public or private employees, with higher rates in the public sector.
- The size of the employer, with larger employers having a higher rate of coverage.
- A strong and positive association between the rate of unionisation and the likelihood of coverage by a collective agreement.

5 A review of methods applied in international research on the employment effects of the minimum wage and implications for Australian research

Author: Jeff Borland (Department of Economics, University of Melbourne).

Key Findings

- The employment effect of minimum wages has been subject to considerable research and a range of techniques have been developed to identify this relationship.
 - Most frequently, these use a form of difference-in-difference analysis based on a ‘natural experiment’ where one group can be seen as having been ‘treated’ by obtaining an increase in the minimum wage, while another group is not affected by the change and can act as a ‘control’. The effect is then measured by the difference in the change through time for the treated group compared with the change through time for the control group.
- Analyses of the effect face a number of constraints. Some relate to data, others to the construction of control and treatment populations, and others conceptually around the time for effects to be manifest, and the generalisability of findings.
- Australian research has been more limited because of the institutional setting and data limitations.

5.1 Background

The employment impact of minimum wages is one of the most contested aspects of wages policy in the literature. In this context, the paper had as its objective to provide ‘background for considering the potential for extra research on this topic in Australia’. Specifically the paper:

- Discusses the reasons why research on this subject in Australia is difficult.
- Reviews seven main approaches used in studies, providing in each case:
 - Examples of studies using the technique, including, where possible, Australian examples.
 - A discussion of the data needs and the limitations of the approach.
- A discussion of general issues to be considered in approaching this type of analysis.
- Two appendices, one providing a summary of the Australian data sources which may be used for these studies, and the other explaining the difference-in-difference methodology used in most of the analyses.

Given the role of this paper as a background to a roundtable discussion it also presents a checklist of issues to be considered in planning any analytical projects looking at this question.

5.2 Measurement and Australia

The institutional structure of wage-setting in Australia makes the measurement of minimum wage effects difficult. Three contributory factors are identified. The first is the plethora of minimum wage rates, compounded by the absence in data of sources of information which would enable the identification of the actual minimum rate which a person is being paid. The second is the extent to which increases in minimum wage rates tend to spill over to workers being paid above the

minimum. The third is the limited role of the NMW as a paid wage in Australia, compared with its form and incidence in many other countries.

These limitations are compounded by significant limitations in the data available for analysis. While this paper identifies 12 different data sources, ranging from household and employer surveys to administrative records, each of these have limited utility, including infrequency, non, or limited collection of earning arrangements (including means of identifying hourly rates/ordinary time earnings), non-identification of wage-setting arrangements and limited scope).

5.3 Key approaches

Central to the ability to analyse the impact of a change in the minimum wage on employment is to be able to identify the ‘treatment effect’ of the wage increase.¹³ This is usually done by considering the employment outcomes of a group of workers subject to the change with a control group who are not affected. This can be done in an absolute way—identifying one population which has had an increase and one which has not, or having populations where the proportion of the population subject to the change varies, and is known. These forms of identification then allow for analysis using a difference-in-difference technique, effectively considering the difference between any change in the level of employment of the group who experience an increase in their wage with the change in the level of employment of those who do not.¹⁴ Approaches discussed in the paper include identification based on time, geography, position in the wages distribution, combined geography and position in the wages distribution, occupation and industry establishment and age.

However, in all cases, these approaches have limitations. Some of these are forced on the analysis by limitations in the data which is being used, in other cases they arise because of the challenges in appropriately identifying treatment and control populations (especially where there are spill-over effects) and in the additional controls needed to ensure that simply the impact of the minimum wage is being measured. In addition, many of the studies focus only on some particular subgroups, for example specific industries or age groups. A consequence of this is that a question as to the extent to which these findings can be extrapolated, say, to minimum wage employees as a whole, needs to be considered.

This concern is one of the questions as to the homogeneity of the employment effect which the paper identifies as a general concern in these studies. Other matters noted include the actual nature of the effect on employment which is being identified (especially when the increase may not be uniform across the population, or fully implemented); the nature of the employment effect; given the potential of a minimum wage increase to have employment effects at the extensive margin (whether or not a person is employed) and at the intensive margin (the number of hours they are employed for); and concerning the time period over which the impact is studied. This measurement time period question recognises that in some cases a change in the wage may be anticipated, or alternatively, that any employment impact may take time to manifest, for example as firms change their method of production, substituting capital for labour, or even with the entry and exits of establishments. The paper further observes that it is not unusual for studies to have quite large confidence intervals around their estimated impacts, and that while frequently these generate a

¹³ These approaches are often considered to represent ‘natural experiments’.

¹⁴ While these analyses typically use a difference-in-difference approach, in some circumstances, different analytical techniques are applied. The paper gives some examples of other approaches including time series regression and the use of regression discontinuity approaches.

finding that a null impact cannot be rejected, caution should be exercised in simply disregarding the potential of the presence of a sizeable impact within this confidence interval.

5.4 Summary

Identification of any potential employment effect of changes in the minimum wage is important information in wage-setting decisions. The existence of an effect, and its magnitude is however highly contentious and has been the subject of extensive study. This research effort has given rise to a large number of different techniques.

The author suggests a checklist of issues to be considered in this type of research. This comprises the following questions:

- For what group of workers should the analysis be undertaken?
- Can treatment and control groups be identified?
- How should differences in labour market conditions between the treatment and control groups be controlled for?
- What other explanatory variables for employment should be included?
- Are changes to the minimum wage exogenous to labour market conditions?
- How should the employment outcome be represented?:
 - (i) What measure of employment—for example, persons employed or hours?;
 - (ii) How should the impact on employment be specified—for example, level or growth rate?
- What should be the time period for which the employment effect of a change in the minimum wage is examined?
- What method will be used to calculate standard errors?
- What approach will be taken to report the findings?
- How representative will the findings be?

6 Research Reference List—Annual Wage Review 2017–18

The Research Reference List includes citations for Australian and international literature, relevant to the minimum wages and modern awards objectives, published in the preceding year.

6.1 Australian research

- The national economy
 - Economic indicators (7 References)
 - Labour market indicators (17 References)
- Social inclusion through increased workforce participation (5 References)
- Relative living standards and the needs of the low paid (6 References)
- Equal remuneration for work of equal or comparable value (3 References)
- Junior employees, employees to whom training arrangements apply and employees with disability (2 References)
- The need to encourage collective bargaining (1 Reference)

6.2 International research

The 25 identified items in the international literature include 7 studies related to the UK minimum wage, as well as specific studies relating to the US, New Zealand, Canada and cross national studies. An emergent theme in the literature is the relationship between technology and automation, and wages and employment. Papers by international organisations included a review of gender equality by the OECD, minimum wages and youth by the International Labour Organisation (ILO) and on the challenges of sustainable growth by the International Monetary Fund (IMF).

7 Statistical Report – Annual Wage Review 2017–18

The statistical report is prepared by the staff of the Fair Work Commission. It is regularly updated over the period of the Annual Wage Review to incorporate new data as it becomes available. A final updated version is published on the Commission website.

While a high proportion of the data is drawn from Australian Bureau of Statistics publications, the report also uses Government Budget estimates and forecasts, along with forecasts from the IMF and Reserve Bank of Australia, along with business surveys, Fair Work Commission staff modelling, and a range of other sources.

7.1 Contents

The report covers a wide set of economic, labour market and social statistics, encompassing:

- Economic growth;
- Productivity;
- Business competitiveness and viability;
- Inflation;
- Wages;
- Labour market;
- Award reliance;
- Relative living standards;
- Real wages and the cost of living;
- Expenditure patterns of low-paid workers;
- Indicators of financial stress;
- Enterprise bargaining;
- Equal remuneration;
- Forecasts;
- Costs of child care services;
- Minutes of the Monetary Policy Meetings of the Reserve Bank Board (links only); and
- Business surveys.