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Does Raising the Minimum Wage Help the Poor?

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ABSTRACT

What is the impact of raising the minimum wage on family incomes? Analysing the characteristics of low wage workers, I find that those who earn near-minimum wages are disproportionately female, unmarried and young, without post-school qualifications and overseas born. About one-third of near-minimum wage workers are the sole worker in their household. Due to low labour force participation rates in the poorest households, minimum wage workers are most likely to be in middle-income households. Using various plausible parameters for the effect of minimum wages on hourly wages and employment, I estimate the impact of a minimum wage rise on inequality.

JEL Codes: J23, J31, J38, D31

Keywords: Minimum wages, employment, wages, earnings, income distribution

1. Introduction

Minimum wages are sometimes promoted as a valuable tool in the battle against poverty. Yet the effect of minimum wages on the income distribution depends crucially upon who earns minimum wages. If minimum wage earners are disproportionately teenagers from affluent families then a minimum wage rise will have less of an impact on poverty than if minimum wage earners are mostly lone parents.

Understanding the distribution of minimum and subminimum wage earners is also important for knowing what impact an increase in the minimum wage might have on inequality. While there is no disputing the fact that an increase in the wage floor reduces inequality among those who keep their jobs, it is possible that minimum wages also have disemployment effects. If these effects are sufficiently large, then it is conceivable that an increase in the minimum wage might actually reduce the total market income received by low-wage workers. The focus of this paper will be to analyse the demographic characteristics of minimum wage workers, and how such workers are distributed across rich and poor families.

The impact of a minimum wage rise on social welfare of low-income households depends on the distribution of minimum wage earners across rich and poor households, the elasticity of hourly wages with respect to the minimum wage for minimum wage earners in rich households, the elasticity of employment with respect to the minimum wage for minimum wage earners in rich households, the elasticity of hourly wages with respect to the minimum wage for minimum wage earners in poor households, and the elasticity of employment with respect to the minimum wage for minimum wage earners in poor households.

If we make the simplifying assumption that the hourly wage and employment elasticities are the same for minimum wage earners in rich and poor households, then the total impact on social welfare can be summed up by just three parameters: (i) the distribution of minimum wage earners across rich and poor households; (ii) the elasticity of hourly wages with respect to the minimum wage; and (iii) the elasticity of employment with respect to the minimum wage. This paper focuses on estimating the

first of these parameters: the distribution of minimum wage earners across rich and poor households.

Relatively little has been written about the relationship between minimum wages and family incomes in Australia. Richardson and Harding (1999) use data from the 1994-95 Income Distribution Survey to analyse the family characteristics of low-wage workers, and reject the suggestion that they are tightly clustered at either end of the household income distribution: "Low wage workers are not predominantly the sons and daughters of the affluent middle class.... Nor are they predominantly hard pressed household heads struggling to put food on the table to feed their families. There are some of each of these groups, but they are relatively small in number." They find that the typical low wage worker "works full-time, is of prime age, with no formal education qualifications, probably married and disproportionately female. One third have dependent children." Richardson (1998) uses the 1989-90 Survey of Income and Housing Costs, and concludes that most low wage workers are in households in the bottom half of the income distribution.

Outside Australia, several studies have estimated the impact of minimum wages on family incomes. Just prior to the introduction of the United Kingdom minimum wage, Metcalf (1999) estimated that most of the impact would be on middle-income households, due to low labour-force participation rates in poor households (however, he also noted that if the sample was confined to working households, most of the impact would be on the poorest). For Brazil, Neumark, Cunningham and Siga (2003) found no evidence that raising the minimum wage boosted the incomes of poor families. And lastly, Neumark, Schweitzer and Wascher (1998) used variation in state minimum wages across the US, and concluded that higher minimum wages have a negative impact on the incomes of poor families, which they attributed to the negative effects on employment outweighing the positive impact on hourly wages.

In this study, I use household surveys over the period 1994-2003 to estimate the characteristics of low-wage workers and their distribution across family types. To presage my results, I find that low-wage and minimum-wage workers are more likely to be female, unmarried, without qualifications and overseas-born. Due to low labour

force participation rates by poor households, the typical minimum-wage worker is likely to live in a middle-income household.

The remainder of this paper is organized as follows. Section 2 outlines the legal operation of Australian minimum wages, and the data to be used. Section 3 identifies the demographic characteristics of those workers who earn minimum wages. Section 4 estimates the distribution of minimum wage earners by family incomes. Section 5 estimates the impact of a minimum wage rise on inequality given various plausible elasticities, and the final section concludes.

2. Background and Data

Relative to other nations, Australian minimum wages are high. The Australian federal minimum wage is 58% of full-time median weekly earnings, as compared with 45% in the United Kingdom and 34% in the United States.[1] Relative to median earnings, the UK Low Pay Commission (2003) found that Australia's minimum wage was the second-highest among 12 developed countries, with only France having a higher wage floor. Assuming a similar distribution of hourly wages in these countries, this suggests that the Australian minimum wage will potentially affect more workers than the minimum wage in the UK or the US.

The operation of Australian minimum wages is also notoriously complex. The Australian federal minimum wage is set by the Australian Industrial Relations Commission (AIRC) through a process of arbitration, and affects not only those at the bottom, but also workers further up the wage distribution.[2] Whether an employee is covered by the federal minimum depends upon whether he or she is within Federal industrial jurisdiction. Such jurisdiction extends to all employees in Victoria, the Australian Capital Territory, and the Northern Territory (and hence all are covered by the federal minimum wage). In the remaining five states, whether an employee is

[1] These estimates are from 2002, based on data in Low Pay Commission (2003). The Commission presents two estimates for Australian median wages, one derived from a labour force survey, and another derived from an enterprise survey. I use the labour force survey estimate, on the basis that it is most directly comparable with median earnings figures from the US Current Population Survey and the UK Labour Force Survey.

[2] Several other countries – including Belgium, Greece, and the Scandinavian countries – have minimum wages that are set in a similar manner.

within the federal industrial jurisdiction depends upon a number of factors, including the employee's industry, and whether the employing company has operations in multiple states. However, even if employees are not covered by the federal minimum wage, they will typically be within state jurisdiction. In recent years, state industrial tribunals have tended to adopt the federal minimum wage, with only a brief delay.

Another complicating factor is the presence of youth wages. Workers aged under 21 may be paid between 50% and 90% of the minimum. However, since the precise scale varies from industry to industry, it is not possible to assign an age-specific minimum wage to those aged under 21.

In order to estimate who earns minimum wages, it is necessary to use a dataset that contains information on individuals' earnings and hours, demographic characteristics, and household characteristics. For these purposes, I use seven Income Distribution Surveys conducted by the Australian Bureau of Statistics.[3] These cover the financial years 1994-95, 1995-96, 1996-97, 1997-98, 1999-2000, 2000-01 and 2002-03.[4] These surveys contain detailed information on demographics, individual and family income, employment status, weekly earnings and weekly hours (from which it is possible to construct hourly wages).[5] Table 1 presents summary statistics.

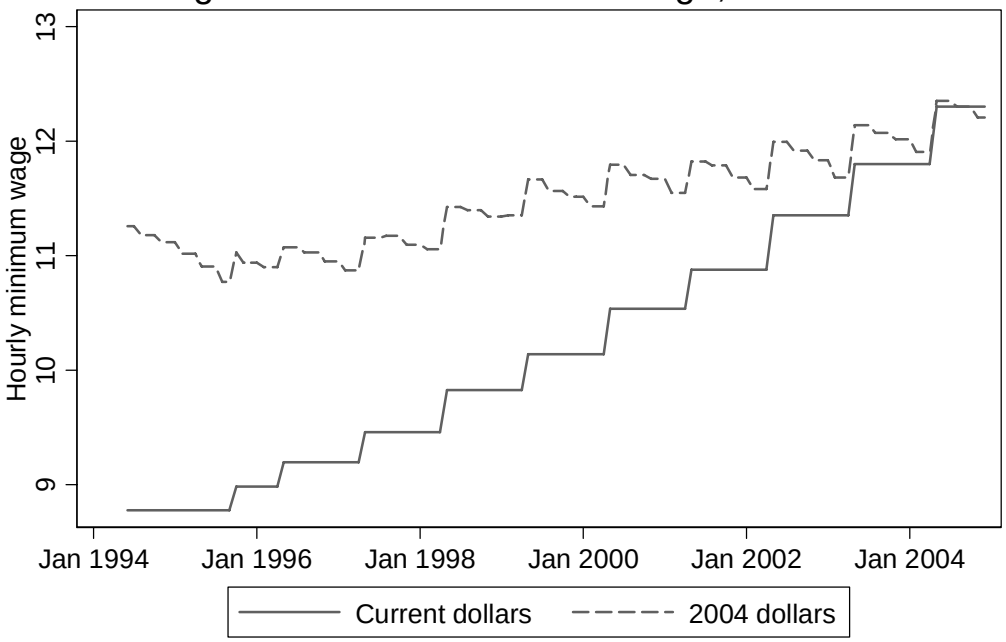
[3] Another possible dataset would have been the Household, Income and Labour Dynamics in Australia (HILDA) survey, conducted in 2001-03. However, an advantage of the Income Distribution Surveys is that they allow comparison over a longer time period.
[4] The survey was not conducted in 1998-99 or 2001-02.
[5] For 2000-01 and 2002-03, weekly hours are collapsed into two-hour bands, and I code hours at the midpoint of the band.

Table 1: Summary Statistics			
Variable	**Mean**	**SD**	**N**
Female	0.508	0.500	100267
Married	0.603	0.489	100267
No qualifications	0.046	0.209	100267
Still at school	0.120	0.325	100267
Higher degree	0.288	0.453	100267
Other qualifications	0.546	0.498	100267
Age	42.485	17.334	100267
Overseas born	0.268	0.443	100267
Employed	0.589	0.492	100267
Hours	35.992	12.315	50526
Hourly wage (employed only)	16.202	8.228	50526
Weekly earnings (zero if not employed)	303.040	408.390	100267
Hourly minimum wage	9.532	0.632	100267

Following convention, what I refer to as the minimum wage was the Metals C14 award until 1996, and the 'Living Wage' from 1997 onwards. Australian minimum wages are generally expressed in terms of the wage paid for a 38-hour week, and I convert this to an hourly wage. Figure 1 depicts the 40 percent rise in the nominal value of the federal minimum wage that occurred over the period 1994-2004 (from \$8.77 to \$12.30), which equates to a 15 percent rise in the real value of the federal minimum wage (from \$10.76 to \$12.30).[6]

[6] For deflation purposes, I use a consumer price index that excludes mortgage interest payments and taxation. This CPI is selected since it does not take account of changes in interest rates and tax reforms. Most importantly, since consumers and businesses were largely compensated for the rise in prices that occurred with the introduction of the Goods and Services Tax on 1 July 2000, it is necessary to use a CPI that is purged of the GST effect.

Figure 1: Federal Minimum Wage, 1994-2004



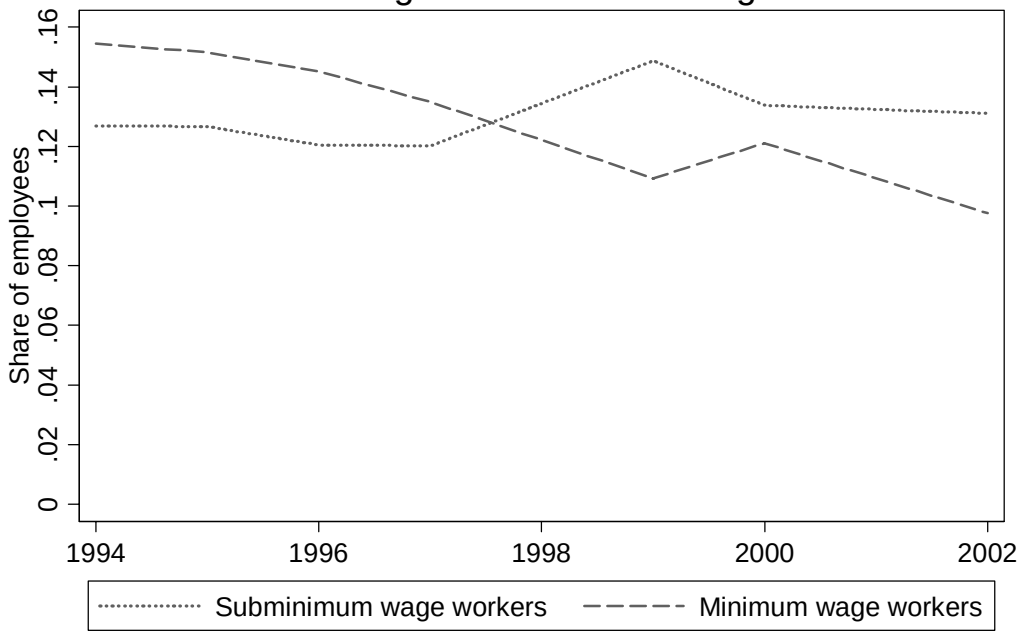
1994-1996: C14 Metal Industry Award under Accord VII. 1997-2004: Federal Minimum Wage.

In what follows, I assign each individual the federal minimum wage that prevailed in December of the financial year in which the survey was conducted (for example, those surveyed in 2002-03 are assigned the federal minimum wage prevailing in December 2002). I then define subminimum wages as those whose hourly wage is below the federal minimum wage, but more than half the federal minimum.[7] Those with hourly wages below the federal minimum wage may be covered by state jurisdiction, or may be on federal youth wages. Alternatively, they may be covered by the federal minimum wage, but employed illegally, or they may have misreported hours or earnings. I also define a category of 'minimum wage workers', as those earning above the minimum wage by a margin of up to $2 per hour.

Figure 2 shows how the proportion of the workforce earning near-minimum wages changed over the period 1994-2002. During this period, the fraction of the labour force earning subminimum wages stayed steady at around 13 percent; but the proportion earning up to $2 over the minimum fell from 15 percent to around 10 percent.

[7] 3% of workers reported hourly wages below half the federal minimum wage. These are omitted on the basis that they are likely to involve misreported hours or earnings.

Figure 2: Proportion of the Workforce Earning Near-Minimum Wages



In what follows, the characteristics of subminimum and minimum wage workers are compared with two groups: the adult population, and the employed population. Which is the more appropriate comparison group depends in part on whether minimum wages are regarded chiefly as an employment policy or an antipoverty policy. In some instances, I also present a third specification – working-age adults – which is conceptually midway between using all adults and all workers.

3. Demographic Characteristics of Minimum Wage Earners

What are the demographic characteristics of those who earn minimum and subminimum wages? To answer this question, I create two indicator variables, one of which denotes whether an individual earns subminimum wages, and the other which denotes whether he or she earns minimum wages (as defined above). Where Z is a vector of demographic characteristics, and δ_t is a survey-specific fixed effect, I use a probit regression to estimate:

$$P(\text{Earns subminimum wage})_i = F(Z_i) + \delta_t + \varepsilon_i \quad (1)$$

$$P(\text{Earns minimum wage})_i = F(Z_i) + \delta_t + \varepsilon_i \quad (2)$$

The results are shown in Table 2, with the regressions estimated for the employed population (columns 1 and 2), and for all adults (columns 3 and 4). To make the results more readily interpretable, subminimum wage workers are excluded when focusing on minimum wage workers.

Columns 1 and 2 of Table 2 indicate that women, young workers, and those without post-school qualifications (the excluded education category) are more likely to be earning just below or above the minimum wage. These findings are similar to those of Richardson and Harding (1999) using just the 1994-95 survey, However, in contrast to Richardson and Harding, I observe that unmarried workers are more likely to earn minimum wages than married workers (although the coefficient on the Female*Married term is positive, it is still smaller than the Married coefficient).

Conditional on being in the workforce, adults with dependent children are slightly more likely to earn subminimum wages, but no more likely to earn minimum wages. As Figure 2 showed, older workers are less likely to earn the minimum wage than younger workers. Overseas born workers are also more likely to earn minimum wages. This may be due to labour market discrimination, but it is also possible that the overseas born variable is capturing factors – such as English proficiency and education quality – that are not directly measured in the surveys.

The last two columns in Table 2 compare subminimum and minimum wage workers to the entire population. While the coefficients in columns 1 and 2 are driven only by the relative position of different workers in the wage distribution, those in columns 3 and 4 coefficients are driven by two effects – the probability of being in the workforce, and (conditional on being in the workforce) the probability of earning low wages. Because those with children and those born overseas are less likely to be in the workforce, the sign on these coefficients in columns 3 and 4 is reversed. Similarly, because married workers are more likely to be in the workforce, this coefficient is now indistinguishable from zero.

Table 2: Who earns the minimum wage?

	(1)	(2)	(3)	(4)
Dependent Variable:	**Subminimum wage worker**	**Minimum wage worker**	**Subminimum wage worker**	**Minimum wage worker**
Sample:	**Employed**	**Employed**	**All**	**All**
Female	0.004	0.029***	0.002	0.010***
	[0.003]	[0.004]	[0.002]	[0.002]
Married	-0.030***	-0.037***	-0.002	-0.002
	[0.004]	[0.005]	[0.002]	[0.002]
Has Children	0.018***	-0.001	-0.004**	-0.014***
	[0.004]	[0.005]	[0.002]	[0.002]
Female*Married	0.024***	0.022***	-0.001	0
	[0.005]	[0.006]	[0.002]	[0.003]
Female*Has Children	0.013**	0.005	0	-0.010***
	[0.006]	[0.006]	[0.002]	[0.003]
Still at school	0.030***	-0.061***	-0.027***	-0.045***
	[0.009]	[0.007]	[0.001]	[0.001]
University degree	-0.058***	-0.095***	-0.020***	-0.033***
	[0.002]	[0.002]	[0.001]	[0.001]
Other qualifications	-0.027***	-0.048***	-0.006***	-0.011***
	[0.002]	[0.003]	[0.001]	[0.001]
Age	-0.084***	-0.055***	-0.035***	-0.016***
	[0.003]	[0.003]	[0.001]	[0.001]
Age^2	1.855***	1.174***	0.809***	0.398***
	[0.070]	[0.076]	[0.021]	[0.027]
Age^3	-0.129***	-0.081***	-0.061***	-0.034***
	[0.006]	[0.006]	[0.002]	[0.002]
Overseas born	0.010***	0.018***	-0.003***	0
	[0.003]	[0.003]	[0.001]	[0.001]
Time indicators	Yes	Yes	Yes	Yes
Observations	58716	52308	100267	93859
Pseudo R^2	0.22	0.09	0.16	0.09
Observed Prob.	0.11	0.12	0.06	0.07

Note: Omitted education group is workers with no qualifications. Coefficients are marginal probabilities from a probit model. Robust standard errors in parentheses. Age^2 is divided by 1000. Age^3 is divided by 10000. Workers with wages less than half the minimum wage are omitted from the calculations. Subminimum wage workers are excluded from columns 2 and 4. Children are defined as dependents aged under 15.

The results from Table 2 suggest two demographic factors that are worth exploring further: age effects and family structure effects.

In Figure 3, I plot the age distribution of subminimum and minimum wage workers against two comparison groups – the adult population and the employed population. Subminimum and minimum wage workers tend to be younger than both the

population and the workforce. While the median age of adults is 42, and the median age of those employed is 37, the median age of subminimum wage workers is 21 (interquartile range: 18–37), and the median age of minimum wage workers is 32 (interquartile range: 23–42). Teenagers comprise 41% of subminimum wage workers and 9% of minimum wage workers; while those aged 15-24 account for 57% of subminimum wage workers and 32% of minimum wage workers.

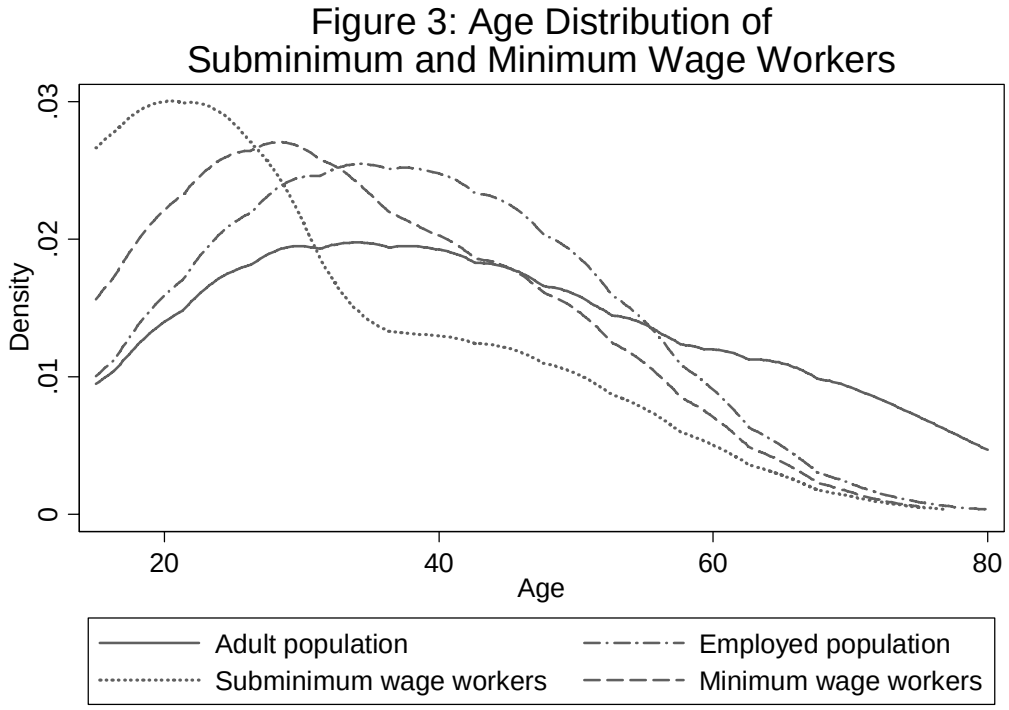
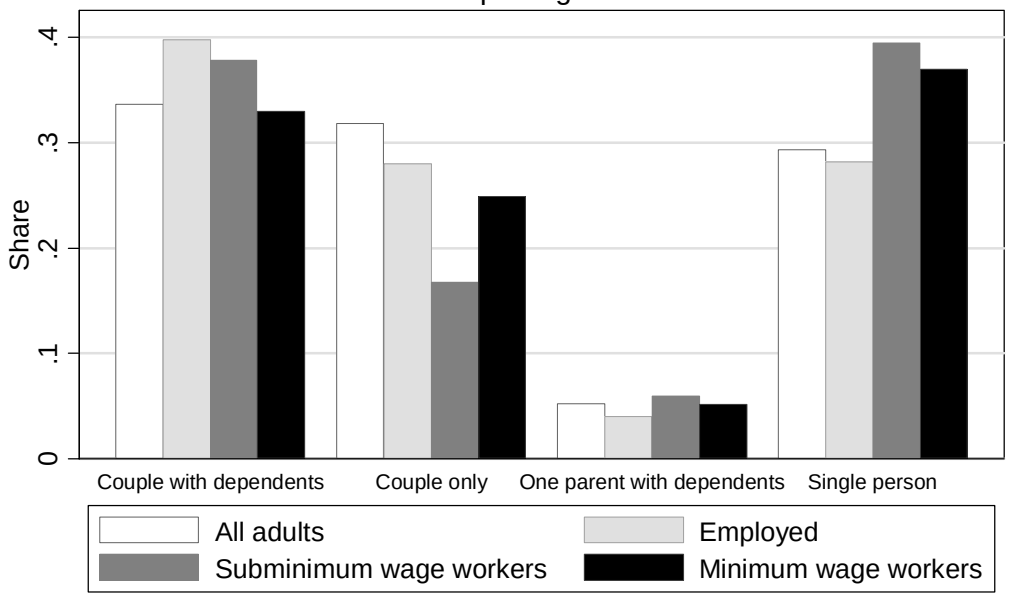


Figure 4 shows how subminimum and minimum wage workers are spread across family types. Families are divided into four basic types: couples with dependents, couples only, single parents with dependents, and single person households.

As compared with the full adult population, subminimum wage workers are overrepresented among couples with dependents, while both subminimum wage workers and minimum wage workers are overrepresented among single person households. Both subminimum and minimum wage workers are underrepresented in couple-only households.

As compared with the employed population, subminimum wage workers are still overrepresented among single person households, but are underrepresented among couples with dependents and couple-only households.

Figure 4: Family Types of
Subminimum and Minimum Wage Workers
Sample: Aged 15+



Is the typical subminimum and minimum wage worker is the sole breadwinner in their household? One way of answering this question is to estimate the number of wage-earners in the household of the typical minimum wage worker. About one-third – 38% of subminimum wage workers, and 33% of minimum wage workers – are the sole employed person in their household. The remaining two-thirds are in multiple-earner households.

Restricting the sample to subminimum and minimum wage workers in multiple-earner households, I rank household members from the highest hourly wage to the lowest hourly wage. In such cases, only 30% subminimum wage workers and 42% of minimum wage workers are the highest-earning workers in their households. In cases where subminimum and minimum wage workers are in multiple-earner households, most are so-called ‘secondary earners’.

4. Family income of minimum wage earners

Another way of asking the question 'who gets minimum wages?' is to consider the relationship between family income and hourly wages. To do this, I calculate the equivalized family income for each individual by dividing total annual post-tax family income from all sources by the square root of the number of family members. For each year, I then calculate where each individual falls on the family income distribution. This is then compared to the individual's position on the hourly wage distribution. Results are shown by quintiles, with the bottom hourly wage quintile approximately corresponding to subminimum and minimum wage earners.

Table 3 shows the results from this exercise. As might be expected, individuals in poor families are disproportionately likely to be out of the labour force. Correspondingly, most of those who are not working are in a family that is in one of the bottom two quintiles. *If* individuals from poor households are in the labour force, there is a greater than 50% chance that they will be in the bottom quintile of hourly wage earners. But because most of those in the poorest households are out of the labour force, the bottom quintile of hourly wage earners is less skewed towards poor households than might be expected. The median low-wage worker is in a middle-income households, and only slightly more low-wage earners are found in bottom 40% households than in top 40% households.

Note that the results in Panel A include retirees, and it might be argued – on the basis that minimum wages are only intended to have an effect on working-age households – that these individuals should be excluded from the analysis. Panel B therefore restricts the sample to individuals aged 55 and under. This has only a small impact on the distribution, with the fraction of low-wage workers in the poorest families rising from 19 percent to 23 percent. Lastly, Panel C further restricts the sample by excluding households in which no adult is employed (note that this does not require that the respondent themselves be employed). In this specification, 35 percent of low-wage workers are in the poorest families, and 25 percent are in the second-poorest quintile

of families, placing the median low-wage worker is in the second quintile of the family income distribution.[8]

Table 3: Distribution of hourly wages and family income

Panel A: Aged 15 and over

		Equivalized family income quintile					
		1	**2**	**3**	**4**	**5**	**Total**
	Not employed	32.76	32.98	17.48	9.65	7.13	**100**
	1	19.26	20.18	26.35	20.13	14.09	**100**
Hourly	**2**	7.62	14.44	32.33	27.53	18.09	**100**
Wage	**3**	5.55	9.92	24.73	34.96	24.83	**100**
quintile	**4**	3.20	5.38	17.92	33.70	39.80	**100**
	5	2.43	2.71	11.30	24.13	59.42	**100**

Panel B: Aged 15-55

		Equivalized family income quintile					
		1	**2**	**3**	**4**	**5**	**Total**
	Not employed	40.09	26.77	15.19	10.14	7.81	**100**
	1	23.33	27.80	21.64	16.00	11.24	**100**
Hourly	**2**	9.45	23.77	31.12	21.53	14.13	**100**
Wage	**3**	6.86	17.60	27.21	27.96	20.37	**100**
quintile	**4**	4.03	11.01	19.25	32.85	32.87	**100**
	5	2.88	5.47	14.08	24.42	53.14	**100**

Panel C: In a household with at least one employed person

		Equivalized family income quintile					
		1	**2**	**3**	**4**	**5**	**Total**
	Not employed	26.26	28.59	18.82	14.43	11.90	**100**
	1	34.53	24.64	17.56	13.99	9.28	**100**
Hourly	**2**	17.63	26.29	25.83	18.48	11.78	**100**
Wage	**3**	12.15	20.06	27.10	23.26	17.43	**100**
quintile	**4**	6.64	14.21	20.45	30.27	28.44	**100**
	5	4.32	7.86	14.52	24.31	49.00	**100**

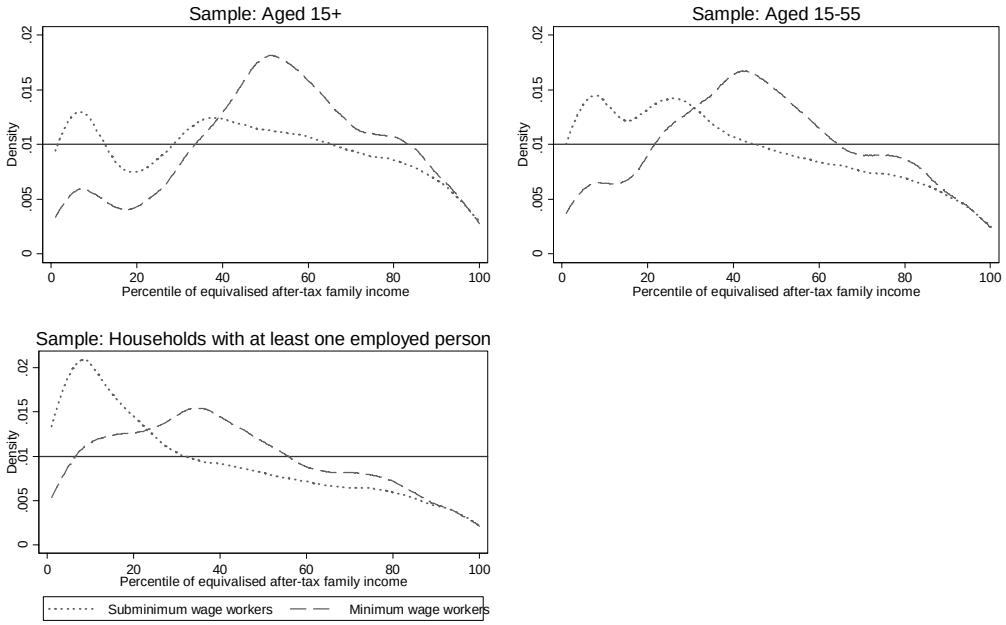
Note: Family income is the family's total post-tax income in the previous financial year, equivalized by dividing by the square root of the number of family members. Workers with wages less than half the federal minimum wage are omitted from the calculations. Note that in Panel C, it is not necessary that the respondent be employed, only that some member of his or her family is employed.

Figure 5 carried out a similar exercise, now focusing separately on workers who earn subminimum or minimum wages (roughly equivalent to those in the bottom quartile of the hourly wage distribution). Three comparisons are presented in Figure 5 – comparing near-minimum wage workers to the entire adult population, comparing them to the adult population aged 15-55, and comparing them to households where at

[8] For all specifications shown in Table 3, weighting by the number of hours worked makes no substantive difference to the results.

least one person is employed. In each case, a horizontal line at 0.01 denotes the distribution of the comparison population, which is, by construction, uniform.

Figure 5: Family Income Distribution of Subminimum and Minimum Wage Workers

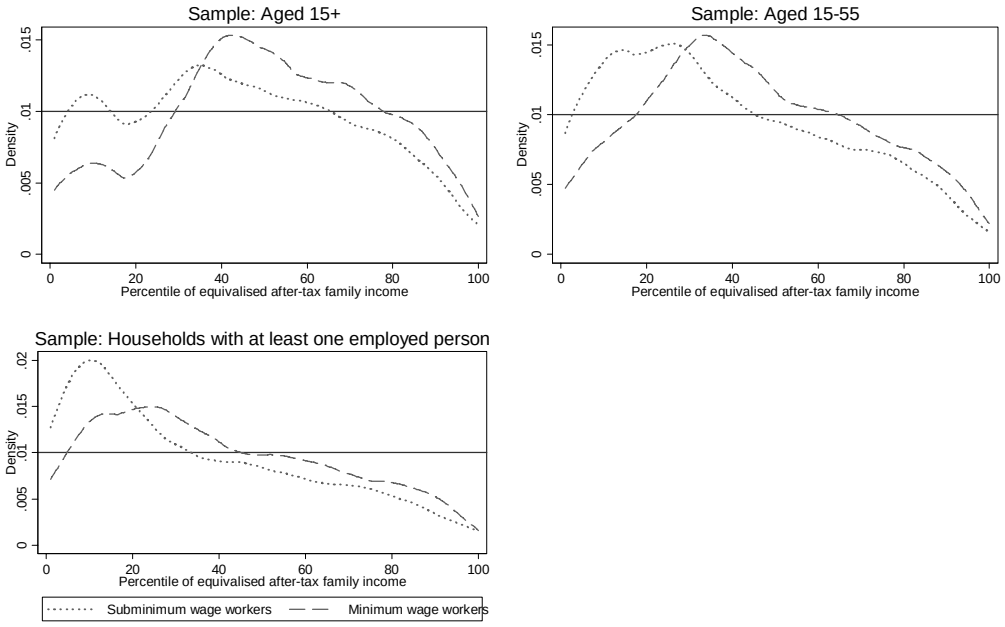


As with the results shown in Table 3, Figure 5 indicates that low labour force participation rates among poor households means that subminimum and minimum wage workers tend to be clustered around the middle of the family income distribution. The median subminimum wage worker is at the 44th percentile of the entire adult distribution, the 35th percentile of the distribution of adults aged 15-55, and the 27th percentile among working households. The median minimum wage worker is at the 54th percentile of the entire adult distribution, the 46th percentile of the distribution of adults aged 15-55, and the 39th percentile of working households.

Figure 6 shows the most recent year, 2002-03. Recall that since the fraction of those earning near-minimum wages fell in this year (Figure 2), one might expect those still earning subminimum and minimum wages to be lower in the family income distribution than in previous years. Figure 6 shows this to be the case, though the difference is not more than a few percentile ranks. In 2002-03, the median subminimum wage worker is at the 42nd percentile of the entire adult distribution, the

34th percentile of the distribution of adults aged 15-55, and the 26th percentile of working households. The median minimum wage worker is at the 51st percentile of the entire adult distribution, the 43rd percentile of the distribution of adults aged 15-55, and the 36th percentile of working households.

Figure 6: Family income distribution of Subminimum and Minimum Wage Workers (2002-03)



5. How Does Raising the Minimum Wage Affect Inequality?

A final consideration is how raising the minimum wage might affect inequality. As noted in section 1, if we assume that elasticities do not vary across family income groups, there are three relevant parameters in determining the impact of a minimum wage rise on the distribution of incomes: the hourly wage elasticity, the employment elasticity, and the distribution of minimum wage earners across households.

While there is a robust debate in the Australian literature over the elasticities, most estimates of the hourly wage elasticity lie between 0 and 1, while most estimates of the labour demand elasticity (extensive and intensive margins combined) lie between

0 and -1.[9] The effect of a 10 percent increase in the minimum wage is therefore approximately bounded by the status quo (no effect), and the following three scenarios:

(i) **ε(Wage)=1 & ε(LD)=0:** Hourly wages of minimum wage workers rise by 10 percent, no effect on employment of minimum wage workers. This might occur if minimum wage industries are characterized by monopsonistic hiring.

(ii) **ε(Wage)=0 & ε(LD)=-1:** Hourly wages of minimum wage workers do not rise, employment of minimum wage workers falls by 10 percent. This might occur if workers are heterogeneous and are always paid their marginal product.

(iii) **ε(Wage)=1 & ε(LD)=-1:** Hourly wages of minimum wage workers rise by 10 percent and employment of minimum wage workers falls by 10 percent

Using data from the 2002-03 survey, it is therefore possible to estimate the effect on inequality under each of these four scenarios, by estimating the baseline income distribution, and then simulating the effect of giving minimum wage workers a 10 percent pay rise, firing a random 10 percent of minimum wage workers, or both. I then estimate the impact on the distribution of hourly wages, the distribution of individuals' weekly earnings, and the distribution of equivalized post-tax family income.

In carrying out such an exercise, the question naturally arises as to how zero wages or incomes should be treated, given that most inequality measures ignore zero values. If under a particular simulation a worker loses his or her job, should her wage/earnings be taken into account in calculating the inequality measure? I opt here for a halfway solution, in which those who are simulated to have lost their jobs are coded to have zero hourly wages (which are then ignored in calculating hourly wage inequality), but

[9] In Australia, the leading estimates of the elasticity of labour demand with respect to the minimum wage are Daley et al 1998 (-2.0 to -5.0 for teenagers); Leigh 2003, 2004a (-0.3 for all persons, -1.0 for persons aged 15-24); Harding and Harding 2004 (-0.2 for all persons); Mangan and Johnston 1999 (0 to -0.3 for teenagers); Junankar, Waite and Bellchamber 2000 (zero for teenagers). I am not aware of any estimates of the elasticity of hourly wages with respect to the Australian minimum wage. Neumark, Schweitzer and Wascher 2004 estimate that the elasticity of minimum wage workers' hourly wages with respect to the US minimum wage is 0.8.

weekly earnings of $0.001 (which are then taken into account for the purposes of calculating weekly earnings inequality).

Table 4 shows the effects on the distribution of individuals' hourly wages, individuals' weekly earnings, and equivalized total pre-tax family income (including non-wage income). Panel A uses the gini coefficient, the most commonly-used measure of income distribution, which is most sensitive to movement around the mode of the distribution. Panel B uses the Atkinson index, with an inequality aversion parameter of 1, which is more sensitive to the bottom of the distribution. Panel C estimates the share of observations that fall below half the median, a commonly used estimate of relative poverty. For specifications (ii) and (iii), in which a randomly selected 10 percent of minimum wage workers lose their jobs, estimates are averaged over 50 replications of the simulation.

Table 4: How does the minimum wage affect inequality?
Simulated 10 percent minimum wage rise under various elasticity assumptions

	(1) **Individuals' Hourly Wages**	(2) **Individuals' Weekly Earnings**	(3) **Equivalized Pre-Tax Family Income**
Panel A: Gini Coefficient			
Status Quo	0.250	0.338	0.376
(i) ε(Hourly Wage)=1 & ε(LD)=0	0.239	0.330	0.374
(ii) ε(Hourly Wage)=0 & ε(LD)=-1	0.247	0.349	0.381
(iii) ε(Hourly Wage)=1 & ε(LD)=-1	0.237	0.342	0.379
Panel B: Atkinson Index (e=1)			
Status Quo	0.097	0.216	0.228
(i) ε(Hourly Wage)=1 & ε(LD)=0	0.088	0.207	0.227
(ii) ε(Hourly Wage)=0 & ε(LD)=-1	0.095	0.404	0.270
(iii) ε(Hourly Wage)=1 & ε(LD)=-1	0.087	0.398	0.269
Panel C: Share Below Half the Median (Relative Poverty Line)			
Status Quo	0.051	0.173	0.217
(i) ε(Hourly Wage)=1 & ε(LD)=0	0.035	0.163	0.223
(ii) ε(Hourly Wage)=0 & ε(LD)=-1	0.049	0.186	0.220
(iii) ε(Hourly Wage)=1 & ε(LD)=-1	0.033	0.177	0.224

Notes:
1. ε(Hourly Wage) denotes the elasticity of hourly wages with respect to the minimum wage, for minimum wage workers; ε(LD) denotes the elasticity of labour demand with respect to the minimum wage, for minimum wage workers.
2. Minimum wage workers are defined as those earning under the minimum wage, and up to $2 over the minimum wage.
3. The treatment of zero incomes differs between column 1 and columns 2 and 3. For example, if a simulated individual loses her job, her hourly wage is recoded to zero (and she is therefore

excluded from the hourly wage inequality calculations). But her weekly income is recoded to $0.001, so she is included in the hourly wage inequality calculation.
4. In column 3, family income is equivalized by dividing by the square root of the number of family members.
5. In all estimates, the unit of observation is the individual.
6. Simulations (ii) and (iii) involve randomly firing 10 percent of minimum wage workers, so estimates are based on 50 replications of the simulation.

Under all scenarios and inequality measures, an increase in the minimum wage reduces hourly wage inequality (recall that zero hourly wages are ignored). Even in the event that an increase in the minimum wage has only a disemployment effect, and has no impact on hourly wages, it will still have the effect of reducing hourly wage dispersion among those who remain employed.

For individual weekly earnings, the impact differs substantially across the various scenarios. If raising the minimum wage induces a large hourly wage response and no employment response (scenario i), then the distribution of weekly earnings will become slightly more equal. However, if it induces no hourly wage response and a large employment response (scenario ii), the distribution will become much more unequal. In the event that raising the minimum wage induces a large response in both hourly wages and employment (scenario iii), then the disemployment effect will overwhelm the hourly wage effect. The results for scenario (iii) make intuitive sense: since firings have a much larger impact on the income distribution than modest wage rises. The extent of the rise in inequality under the third scenario depends on the inequality parameter used. Under the gini and the relative poverty measure, the rise is only modest, but the Atkinson index, which is more sensitive to the bottom of the distribution, rises from 0.216 to 0.398.

Lastly, I estimate the impact on equivalized pre-tax income. Because this is estimated at the household level (and includes non-wage income), the impact of the minimum wage on income inequality is more muted than on hourly wage inequality or earnings inequality. However, the patterns mostly remain the same: using the gini or the Atkinson index, inequality falls under the first scenario, and rises under the second and third scenarios. Interestingly, when relative poverty is used as the benchmark, income inequality rises under *all* scenarios, reflecting the fact that few households in the bottom quartile of the family income distribution benefit from a minimum wage rise.

6. Conclusion

Those who earn near-minimum wages in Australia are disproportionately female, unmarried and young, without post-school qualifications and overseas born. The age distribution of subminimum wage workers peaks around 21, while the age distribution of minimum wage workers peaks around 32. Across family types, subminimum and minimum wage workers are overrepresented in single-person families, and underrepresented in couple-only households. About one-third of subminimum and minimum wage workers are the sole breadwinner in their household.

Not surprisingly, there is a positive correlation between hourly wages and size-equivalized family incomes. If a poor family has an adult in the labour force, that person is very likely to be earning low wages. However, due to low labour force participation rates in the poorest families, the median subminimum and minimum wage worker resides in a middle-income family. This remains true if the sample is restricted to working-age families, though if it is restricted to families with an adult in the workforce, subminimum and minimum wage workers are further towards the bottom of the family income distribution.

These findings have implications for the impact of minimum wage changes on the distribution of income. Simulating the effect of a minimum wage rise on the distribution of income assuming a large positive hourly wage elasticity and a zero labour demand elasticity, earnings inequality and income inequality fall. Assuming a zero hourly wage elasticity and a large negative labour demand elasticity, earnings inequality and income inequality rise. And assuming a large positive hourly wage elasticity and a large negative labour demand elasticity, simulations also suggest that earnings inequality and income inequality will rise.

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