Public–Private Sector Wage Differentials in Australia*

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Abstract

This paper examines wage differentials between public sector and private sector workers in Australia. After controlling for observed characteristics and unobserved individual heterogeneity, we show that on average workers in the public sector earn about 5.1% percent more hourly wages than in the private sector, and the public sector wage premium is slightly higher for females than males. Using a panel data quantile regression model with fixed effects, we show that the positive wage effects of public sector employment are heterogeneous, with comparatively larger impact at the lower end of the wage distribution than at other parts. We also find evidence of heterogeneity in the public sector wage premiums by qualification, time period and state/territory.

JEL classification: J31; J45

Keywords: Public sector; private sector; wage gap

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1 Introduction

The public–private sector pay gap has captured rising attention from researchers during the last two decades (Poterba and Rueben, 1994; Borland *et al.*, 1998; Mueller, 1998; Blackaby et al.,1999; Melly, 2005; Lucifora and Meurs, 2006; Christopoulou and Monastiriotis, 2013; Lausev, 2014; Nikolic, 2014). Existing studies generally find that on average, there is a public sector wage premium when compared to the private sector. This premium is also found to be higher among females than among males.

A few studies have investigate the earnings differentials between the public sector and the private sector in Australia. Borland *et al.* (1998) show that full-time male employees in the public sector earn about 10–15% more weekly earnings than their counterparts in the private sector. Female public sector employees are found to earn around 20–25% higher earnings when compared with female private sector employees. Their decomposition analysis suggests that the mean earnings differentials can be fully explained by the public–private sector differences in individual characteristics and job characteristics, indicating that there is no public sector earnings premium in Australia. In contrast, after accounting for differences in observed characteristics, Vella (1993) finds evidence of a significance wage premium for female public sector employees when compared with their private sector counterparts.

Birch (2006) shows that the average earnings of men working in the public sector are larger than the earnings of men employed in the private sector. Using a quantile regression approach by Koenker and Bassett (1978), Birch (2006) finds that the public sector wage premium varies considerably along the full earnings distribution, with low-paid male workers having the largest wage advantage from the public sector employment. However, employment in the public sector is found to have a negative impact on the wages of high-paid male workers. Unlike previous Australian studies, Cai and Liu (2011) find a significant negative sectoral effect for males but a positive wage premium for females after controlling for observed individual and job characteristics in the OLS estimations. This study also utilises cross sectional quantile regressions to examine whether the sectoral wage effect varies along the wage distribution. They find that female public sector employees

are paid more than their private sector counterparts from the bottom part to the 80th percentile of the wage distribution. However, for males, the public sector wage premium decreases monotonically and are negative for the top half of the distribution. Their quantile decomposition analysis show that a substantial proportion of the sectoral wage gap is attributable to the observed differences in productively-related characteristics between the two sectors.

The large public sector premiums at the lower end of the wage distribution, as found in existing studies, may imply that the low-skill public sector workers are overpaid. Noting that there are several explanations for this finding, Siminski (2013) tests whether the public sector wage premium varies with skill in Australia. Using a quasi-differenced GMM panel data model, this paper identifies public–private sector differences in returns to unobserved skill and also decomposes the wage gap into a part explained by differences in returns to observed and unobserved skills and another part attributable to differences in their stock. Siminski (2013) finds no evidence that the public sector wage premium varies with skill. This study also estimates the average premium to be 6% for women and statistically insignificant (4%) for men.

Using data from the 14 waves (2001–2014) of the longitudinal Household, Income and Labour Dynamics in Australia (HILDA) Survey, this paper investigate empirically the wage differentials between the public sector and the private sector in Australia. This paper is similar to Birch (2006) and Cai and Liu (2011) in the sense that we all focus on the sectoral wage effects over the full wage distribution. However, unlike Birch (2006) and Cai and Liu (2011), we utilise the panel aspects of the HILDA data, which allows us to deal with the correlation between sector choice and unobserved heterogeneity by controlling for individual fixed effects. This aspect of our contribution is important particularly as it enhances our ability to provide our results with a causal interpretation. Specifically, we employ both the widely used fixed effects (FE) panel approach and a panel data quantile regression model with fixed effects (QR–FE) recently developed by Canay (2011).

Our OLS estimates indicate that on average public sector employees earn 7.4% more hourly wages than those in the private sector. FE estimates also show that working in the

public sector confers a wage premium, which are smaller than OLS estimates in term of magnitude, especially for women. This suggests that ignoring unobserved heterogeneity overstates the public sector wage premium. On average, FE panel estimation shows that public sector employment offer a wage premium in the magnitude of 5.1%. Women employed in the public sector earns 5.5% more wages than their counterparts in the private sector, which is slightly lower than the rate for males (4.6%).

We also estimate the sectorial wage effects using conventional quantile regression (QR) and quantile regression with fixed effects (QR–FE). As opposed to the average case, the QR–FE estimates show that the positive wage effects of public sector employment are heterogeneous, with larger impact at the lower end of the wage distribution. For example, working in the public sector has over double the positive impact at the 10th percentile than at the 90th. Similar to Birch (2006) and Cai and Liu (2011), the QR result at the 90th percentile also show that employment in the public sector has a negative impact on the wages of high-paid male workers. However, after accounting for the individual unobserved fixed effects, the QR–FE estimate shows that public sector employment has a positive effect at the 90th percentile of male workers' wage distribution. The comparison between the QR and QR–FE estimates for males at the 90th percentile indicate that highly-paid employees in the private sector have better unobserved characteristics such as individual ability than their counterparts in the public sector. This is an aspect that has not been taken into account in the cross sectional modelling by Birch (2006) and Cai and Liu (2011). In addition, the extent of heterogeneity in public sector premiums seem larger for males than for females.

The remaining paper is organized as follows. Section 2 describes the data and presents summary statistics. Section 3 discusses the empirical approach. Section 4 presents the estimation results and Section 5 concludes.

2 Data and descriptive statistics

2.1 Data and variables

HILDA is the first and only large-scale, nationally representative household panel survey in Australia. Starting from 2001, HILDA annually collects rich information on people's demographics, labour market outcome, life event, health and well-being. In this study, we use the 14 waves of HILDA from 2001 to 2014.

Individuals reported to work for six different types of employers in HILDA: (i) private sector "for profit" organisation; (ii) government business enterprise or commercial statutory authority; (iii) other commercial; (iv) private sector "not-for-profit" organisation; (v) other government organisation, such as a public service department, local councils, schools and universities; (vi) other non-commercial. We consider (i) and (iv) as the private sector, and (ii) and (v) as the public sector. Those reporting employers to be (iii) or (vi), which only account for around 0.6% of observations, are dropped due to the insufficient information to make the distinction between the public and private sectors. We focus on employees aged between 21 and 65, and we drop observations with missing information on core variables (summarised in Table 1). Our final sample consists of 88,610 observations for 16,624 persons.

Descriptive statistics by sector are reported in Table 1. Among the 88,610 observations, 28% (=24,911/88,610) of them are public sector employees and 72% (=63,699/88,610) are working in the private sector. Wages are obtained through dividing weekly earnings by weekly working hours. To enhance their comparability across waves, wages are converted to 2014 Australian dollars using national consumer price indexes. Table 1 shows that public sector workers earn about 18% (=3.47–3.29) more hourly wages than those working in the private sector. When compared with private sector workers, public sector workers are older and less likely to be a male. They are also better educated. For example, 49% of public sector workers have a university degree while the rate is only 24% in the private sector. In addition, public sector employees are 6 percentage points more likely to be legally married or in a de facto relationship.

Table 1: Summary statistics

	All		Public		Private	
	Mean	SD	Mean	SD	Mean	SD
Hourly wage (in 2014 AUD)	31.54	21.83	35.01	19.19	30.18	22.63
Log hourly wage	3.34	0.46	3.47	0.41	3.29	0.47
Age	39.56	11.62	42.20	11.05	38.53	11.68
Male	0.50	0.50	0.41	0.49	0.54	0.50
Education						
Year 12 or below	0.36	0.48	0.23	0.42	0.41	0.49
Certificate/diploma	0.33	0.47	0.28	0.45	0.35	0.48
University degree	0.31	0.46	0.49	0.50	0.24	0.43
Married	0.70	0.46	0.74	0.44	0.68	0.47
Long-term health condition	0.16	0.36	0.17	0.37	0.15	0.36
Born overseas	0.21	0.40	0.18	0.39	0.21	0.41
Living in a major city	0.66	0.47	0.64	0.48	0.67	0.47
Occupation						
Managers	0.11	0.32	0.09	0.28	0.13	0.33
Professionals	0.26	0.44	0.46	0.50	0.19	0.39
Technicians and trades workers	0.12	0.33	0.06	0.24	0.15	0.35
Community and personal service work	0.11	0.31	0.15	0.36	0.09	0.28
Clerical and administrative workers	0.17	0.37	0.17	0.38	0.17	0.37
Sales workers	0.07	0.26	0.01	0.09	0.10	0.30
Machinery operators and drivers	0.07	0.25	0.02	0.16	0.08	0.28
Labourers	0.09	0.28	0.04	0.19	0.10	0.31
State of residence						
New South Wales (NSW)	0.29	0.46	0.29	0.45	0.29	0.46
Victoria (VIC)	0.25	0.43	0.23	0.42	0.26	0.44
Queensland (QLD)	0.21	0.41	0.20	0.40	0.22	0.41
South Australia (SA)	0.09	0.28	0.09	0.28	0.09	0.28
Western Australia (WA)	0.09	0.29	0.08	0.28	0.09	0.29
Tasmania (TAS)	0.03	0.17	0.03	0.18	0.03	0.17
Northern Territory (NT)	0.01	0.10	0.02	0.13	0.01	0.09
Australian Capital Territory (ACT)	0.02	0.15	0.05	0.22	0.01	0.11
Observations	*88,610*		*24,911*		*63,699*	

Note: Data Source: HILDA 2001–2014.

Table 2: Public-private sector logarithmic wage gap by gender and state/territory

	Australia	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
All	0.18	0.19	0.13	0.18	0.19	0.15	0.27	0.28	0.25
Male	0.17	0.15	0.12	0.17	0.18	0.13	0.26	0.33	0.24
Female	0.23	0.26	0.18	0.23	0.23	0.22	0.30	0.27	0.27

Table 2 reports the public–private sector log wage gap by gender and state/territory. Males earn about 17% more hourly wages in the public sector than in the private sector, while women earn 23% more in the public sector. In terms of states/territories, the public-private sector wage differentials are much higher in Tasmania, Northern Territory and the Australian Capital Territory than in New South Wales, Queensland and South Australia. Victoria and Western Australia have the lowest public–private sector wage gaps among the eight Australian states/territories.

2.2 Raw distributional wage differential between the public sector and the private sector

Table 1 shows that the average wage gap is 18% between the public sector and the private sector. To describe the distributional differences in sectorial wage distributions, we present the kernel density estimates of logarithmic hourly wages by gender in Figure 1, from which we can see the contrasted wage distributions between the two sectors. The two-sample Kolmogorov-Smirnov test strongly rejects the null hypothesis at conventional significance levels that the logarithmic hourly wages in the two sectors come from the same distribution for each gender.

To give a clearer picture of distributional wage gaps between the two sectors, we plot the raw log wage differential at each percentile in Figure 2. For example, at the 10th percentile, we see a log wage gap of 0.200, which means that the wage at the 10th percentile of the distribution in the public sector is 20% higher than that at the same percentile of wage distribution in the private sector. The log wage gap between the public sector and the private sector is found to be uneven throughout the price distribution. It increases slowly from the bottom end to the 40th percentile, and then remains relatively stable between the 40th and 60th percentile. The price gap declines rapidly from the 60th percentile to the top end. Comparing distributional patterns between males and females, we find that the public–private sector wage gaps are higher for males than for females before the 40th percentile. However, from the 40th to the top percentiles, the sectoral wage gaps are much larger for females. These observations indicate the gender differences in distributional

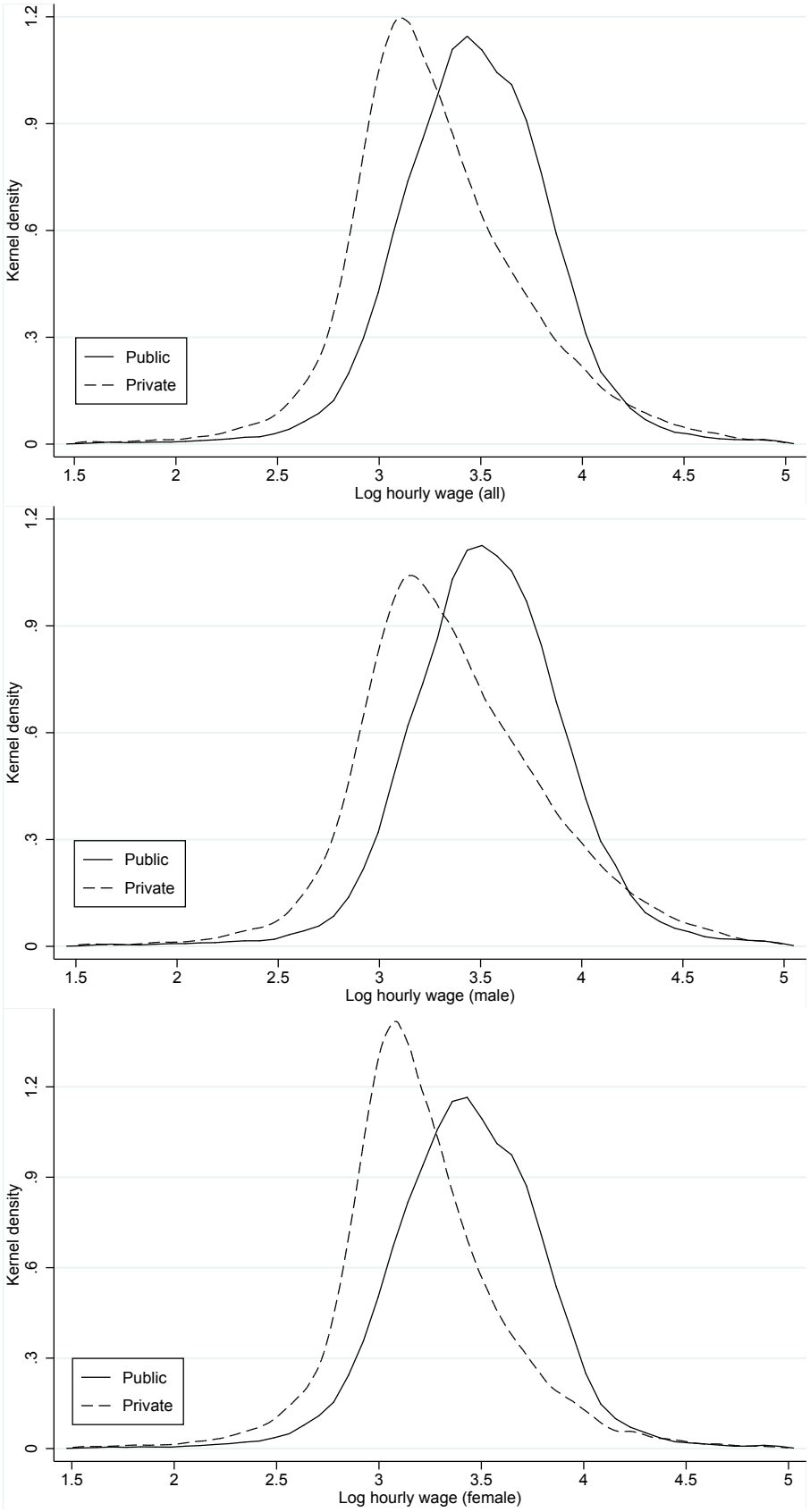

Figure 1: Kernel density estimates of logarithmic hourly wages

sectoral wage differentials in Australia.

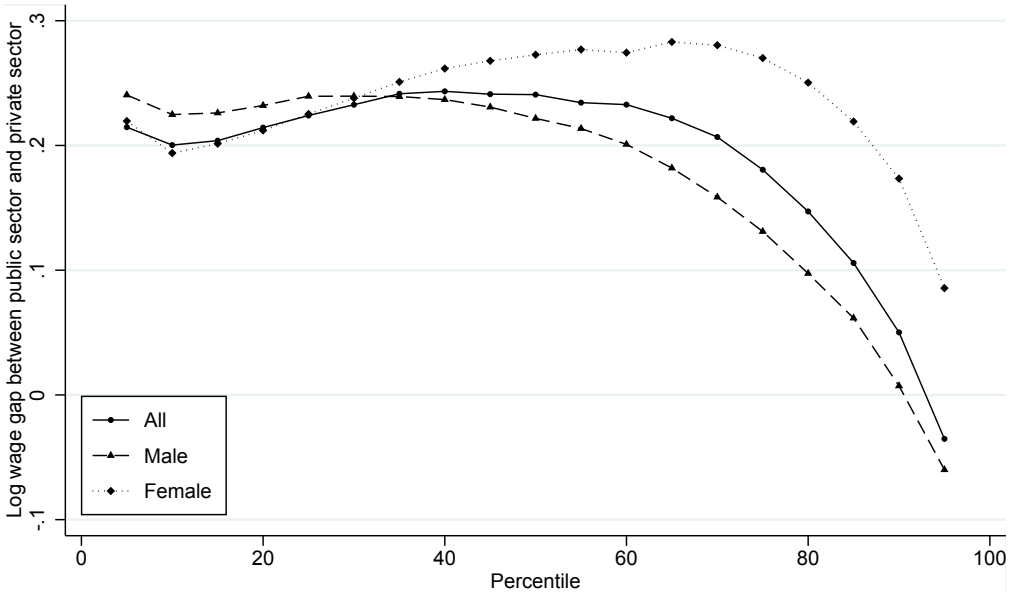

Figure 2: Public–private sector logarithmic hourly wage gap by percentile

3 Empirical methodology

We assume that wages can be described by the following equation

$$Logwage_{it} = Public_{it}\beta + X'_{it}\gamma + u_i + \epsilon_{it} \tag{1}$$

where $Logwage_{it}$ denotes logarithmic hourly wages. $Public_{it}$ is the core variable of interest, which is a binary variable equal to one if an individual is employed in the public sector and zero otherwise. X_{it} is a vector of control variables. u_i denotes the unobserved individual heterogeneity, and ϵ_{it} is the idiosyncratic error term. The coefficient of $Public_{it}$, β, measures the average effect of working in the public sector on hourly wages. We estimate equation (1) with fixed effects (FE) panel estimation, which has an advantage over OLS estimation in dealing with the bias due to unobserved heterogeneity u_i.

To investigate the heterogeneity in the effects of working in the public sector on the full wage distribution, we utilise the panel data quantile regression model with fixed effects (QR–FE) developed by Canay (2011). The approach considers and models individual fixed

effects as location shift variables. Canay (2011) shows that the QR–FE approach can be implemented using the following two-stage estimations.

First, estimate equation (1) with FE panel regression to obtain consistent estimates of coefficients ($\widehat{\beta}$, $\widehat{\gamma}$), and then calculate the unobserved fixed effect for each individual as

$$\widehat{u}_i = \frac{1}{T}\sum_{t=1}^{T}(Logwage_{it} - Public_{it}\widehat{\beta} - X'_{it}\widehat{\gamma}) \tag{2}$$

Second, estimate the conditional quantile regression model of Koenker and Bassett (1978), using ($\widehat{Logwage}_{it}$=$Logwage_{it}$−$\widehat{u}_i$) as the dependent variable. Namely, we solve the following minimization problem

$$(\widehat{\beta}_\tau, \widehat{\gamma}_\tau) = arg\min_{(\beta_1,\gamma_\tau)} \frac{1}{NT}\sum_{i=1}^{N}\sum_{t=1}^{T}[\rho_\tau(\widehat{Logwage}_{it} - Public_{it}\beta_\tau - X'_{it}\gamma_\tau)] \tag{3}$$

where $\rho_\tau(u)$=$u[\tau - I(u<0)]$ and I is an indicator function. The estimated coefficient $\widehat{\beta}_\tau$ measures the effect of public sector employment on the τ-th percentile of the hourly wage distribution.

Unlike our approach, some studies such as Cai and Liu (2011) use mean or quantile decomposition methods to disentangle the raw public–private sector wage gaps into two components: (i) a composition effect explained by the differences in observed characteristics between the two sectors; and (ii) a coefficient effect that is attributable to the differential returns to observed characteristics. Fortin (2008) discusses that the coefficient of the public sector dummy in the pooled (public and private) wage regression is tantamount to the coefficient effect in a mean decomposition when the estimates from the pooled regression are used as the reference wage structure. Simply put, the coefficient of the public sector dummy can also inform us of the magnitude of the coefficient effect obtained in a decomposition analysis. In addition, decomposition methods generally ignore the endogeneity of sector selection and wage gaps that are due to unobservables such individual ability are generally (mistakenly) attributed to the coefficient effect. Using the FE and QR–FE estimations, the coefficient of the public sector dummy is equivalent to the coefficient effect but the

endogeneity due to sector selection and unobservables has already been addressed.

It should be noted that the empirical approaches discussed above ignore the sample selection problem, in which case the work choice decisions can be different for public and private sector workers. We opt to ignore this problem, for two reasons. First, accounting for the selection problem requires the availability of an exclusion restriction that affects labour force participation decisions but not the wages. However, such a credible exclusion is not available in our data.[1] Second, to the best of our knowledge, there is no econometric method available that allows us to estimate the fixed effects quantile regression model and addresses the sample selection problem at the same time.

4 Results

4.1 Mean regression results

Table 3 reports the pooled OLS and FE panel estimates of β in equation (1), with standard errors being clustered at the individual level.[2] Consistently with the literature we include among the control variables the following variables: age, age squared, education dummies (year 12 or below, certificate/diploma, university degree), a married dummy, a binary variable indicating whether having a long-term health condition, whether born overseas, a dummy variable indicating whether living in a major city or not and occupation dummies (summarised in Table 1). State of residence dummies and year dummies are also included.

Table 3: Mean public sector wage premiums

	All	Male	Female
OLS	0.074***	0.047***	0.098***
	(0.006)	(0.011)	(0.007)
FE	0.051***	0.046***	0.055***
	(0.007)	(0.011)	(0.008)
Observations	*88,610*	*44,482*	*44,128*

Note: Standard errors clustered at the individual level are reported in parentheses. *** $p<0.01$.

The OLS estimates indicate that on average public sector employees earn 7.4% more

[1] Readers are referred to Siminski (2013) for a discussion on this issue.

[2] Full regression results are available upon request.

hourly wages than those in the private sector, which accounts for about 41% of the raw wage gap between the public sector and the private sector in Australia. Consistent with Borland and Gregory (1999), the public sector wage premium appears higher among females than among males (9.8% *v.s.* 4.7%). FE estimates also show that working in the public sector confers a wage premium. However, this significant relationship is smaller in magnitude than OLS estimates, especially for the pooled sample and for the sample of women. This suggests that ignoring unobserved heterogeneity overstates the public sector wage premium. On average, women in the public sector earns 5.5% more wages than women in the private sector, and this rate is slightly lower than that for males (4.6%).

4.2 Quantile regression results

Table 4 displays the results obtained using conventional quantile regression (QR) for cross sectional data (which does not control for unobserved individual heterogeneity), and the results obtained using the quantile regression with fixed effects (QR–FE) at the 10th, 25th, 50th, 75th and 70th percentiles of the hourly wage distribution. Comparing the QR results and the QR–FE results, we find that ignoring the unobserved individual fixed effects overstates the distributional positive impact of working in the public sector on wages at the lower half of the wage distribution.

Table 4: Public sector wage premiums across the wage distribution

	QR			QR–FE		
	All	Male	Female	All	Male	Female
Q10	0.136***	0.142***	0.132***	0.069***	0.080***	0.060***
	(0.008)	(0.012)	(0.009)	(0.004)	(0.006)	(0.006)
Q25	0.129***	0.124***	0.134***	0.064***	0.067***	0.063***
	(0.005)	(0.009)	(0.007)	(0.002)	(0.004)	(0.003)
Q50	0.104***	0.083***	0.115***	0.053***	0.053***	0.053***
	(0.005)	(0.009)	(0.006)	(0.001)	(0.002)	(0.001)
Q75	0.050***	–0.006	0.087***	0.045***	0.042***	0.047***
	(0.007)	(0.011)	(0.008)	(0.002)	(0.004)	(0.003)
Q90	–0.009	–0.090***	0.050***	0.024***	0.018***	0.032***
	(0.009)	(0.017)	(0.011)	(0.004)	(0.006)	(0.005)
Observations	*88,610*	*44,482*	*44,128*	*88,610*	*44,482*	*44,128*

Note: Standard errors clustered at the individual level are reported in parentheses. *** $p<0.01$.

As opposed to the average case, the QR–FE estimates show that the positive wage ef-

fects of public sector employment are clearly heterogeneous, with larger impact at the lower end of the wage distribution. For example, working in the public sector has over double the positive impact at the 10th percentile than at the 90th. Namely, public sector employment benefits strongly the low wage earners. It is quite clear that a focus on the average effect will obscure the heterogeneity in the effects of working in the public sector over the full wage distribution. In addition, the extent of heterogeneity in public sector premiums seem larger for males than for females, when using $Q90$–$Q10$ and $Q75$–$Q25$ (interquartile range) as measures. Similar to Birch (2006) and Cai and Liu (2011), the QR result at the 90th percentile also shows that employment in the public sector has a negative impact on the wages of high-paid males workers. However, after accounting for the individual unobserved fixed effects, the QR–FE estimate show that public sector employment has a positive effect at the 90th percentile of male workers' wage distribution. The comparison between the QR estimate and the QR–FE estimate at the 90th percentile indicate that highly-paid employees in the private sector have better unobserved characteristics such as individual ability than their counterparts in the public sector.

4.3 Subgroup results

Table 5 displays the public sector premiums by qualification (year 12 or below, certificate/diploma, university degree). The average public sector wage premium is the highest among those with a certificate or diploma, and is the lowest among those with a university degree. Women benefit slightly more from working in the public sector than men. In terms of distributional patterns, employment in the public sector bring more relative wage advantage to workers at the lower end of the wage distribution than at other parts. Moreover, for each qualification, the extent of heterogeneity in the sectoral wage effects are larger for males than for females.

Table 6 shows the estimation results by period. We have conducted the regression using HILDA waves 1–7 and waves 8–14 separately. We find that the public sector wage premiums are higher during 2008–2014 than in 2001–2007, for each gender. A possible explanation is that the global financial crisis (GFC) more severely affected the private

Table 5: Public sector wage premiums by qualification (FE and QR–FE estimates)

	Year 12 or below			Certificate/diploma			University degree		
	All	Male	Female	All	Male	Female	All	Male	Female
Mean	0.053***	0.052**	0.054***	0.068***	0.058***	0.075***	0.028***	0.025	0.031**
	(0.012)	(0.021)	(0.014)	(0.012)	(0.016)	(0.017)	(0.011)	(0.018)	(0.013)
Q10	0.058***	0.063***	0.063***	0.078***	0.089***	0.062***	0.071***	0.081***	0.057***
	(0.009)	(0.017)	(0.009)	(0.008)	(0.009)	(0.011)	(0.007)	(0.011)	(0.009)
Q25	0.060***	0.059***	0.062***	0.070***	0.069***	0.071***	0.064***	0.066***	0.061***
	(0.004)	(0.006)	(0.005)	(0.004)	(0.005)	(0.006)	(0.004)	(0.006)	(0.005)
Q50	0.055***	0.054***	0.057***	0.054***	0.054***	0.054***	0.048***	0.044***	0.050***
	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)
Q75	0.052***	0.049***	0.054***	0.049***	0.046***	0.055***	0.031***	0.026***	0.037***
	(0.004)	(0.007)	(0.005)	(0.004)	(0.005)	(0.006)	(0.004)	(0.006)	(0.004)
Q90	0.032***	0.019**	0.041**	0.036***	0.030***	0.047***	0.007	0.006	0.014*
	(0.007)	(0.010)	(0.009)	(0.008)	(0.011)	(0.011)	(0.007)	(0.013)	(0.008)
Observations	*31,699*	*15,218*	*16,481*	*29,490*	*17,216*	*12,274*	*27,421*	*12,048*	*15,373*

Note: Standard errors clustered at the individual level are reported in parentheses. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

sector, which gives the public sector additional wage advantage during 2008–2014. The wage effects of working in the public sector are heterogeneous in both time periods, with relatively larger impact on low wage earners.

Table 6: Public sector wage premiums by period (QR and QR–FE estimates)

	2001–2007			2008–2014		
	All	Male	Female	All	Male	Female
Mean	0.039***	0.050***	0.032***	0.055***	0.058***	0.053***
	(0.010)	(0.017)	(0.012)	(0.010)	(0.016)	(0.012)
Q10	0.059***	0.068***	0.049***	0.072***	0.085***	0.067***
	(0.007)	(0.011)	(0.009)	(0.006)	(0.008)	(0.008)
Q25	0.060***	0.068***	0.052***	0.065***	0.062***	0.070***
	(0.004)	(0.006)	(0.005)	(0.003)	(0.004)	(0.005)
Q50	0.050***	0.051***	0.046***	0.057***	0.051***	0.061***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Q75	0.040***	0.040***	0.037***	0.048***	0.044***	0.052***
	(0.003)	(0.005)	(0.005)	(0.003)	(0.004)	(0.004)
Q90	0.023***	0.028***	0.019**	0.028***	0.017**	0.039***
	(0.005)	(0.008)	(0.008)	(0.006)	(0.008)	(0.007)
Observations	*39,095*	*19,721*	*19,314*	*49,575*	*24,761*	*24,814*

Note: Standard errors clustered at the individual level are reported in parentheses. ** $p<0.05$; *** $p<0.01$.

The GFC response evidence suggests that the competition for public sector workers happens. Comparing the occupational structure between the public and private sectors offers one possible explanation: 45% of all public sector employees are professionals against 16% of private sector employees. The high level of public sector to public sector job mobility may indicate competition for workers between different parts of the public sector, which may be the result of highly transferable skills between similar organisations in the public sector. The GFC evidence also shows that the public sector responded more slowly to the GFC, but its response caught up with the private sector relatively quickly.

The FE and QR–FE estimation results for each state/territory are shown in Table 7. The average public sector premiums are the highest in SA and TAS. The premiums are relatively lower but are still statistically significant in NSW, VIC, QLD and WA. We do not find significant evidence of a wage advantage of working in the public sector in NT and ACT, probably due the much smaller sample sizes in the two territories. Looking at the gender results, we find statistically significant result in NSW that on average working

in the public sector brings higher wages to men than in the private sector (8.2%). We find no evidence of a public sector wage premium in the other seven states/territories. In contrast, for women, significant public sector premiums can be found in NSW, VIC, QLD, SA, WA and TAS, but not in NT and ACT. Consistent with results in Tables 4–6, the distributional patterns in Table 7 generally indicate a comparatively larger public sector wage premium at the lower part of wage distribution.

When public sector pay is compared with private sector pay in the same jurisdiction, SA and TAS pay premiums that are above the national average premium while VIC in particular pays a premium that is well below this average. Those states (SA and TAS) that have the lowest private sector wages also have the lowest public sector wages and also pay the highest public sector premium (9.3% and 10.5%).

There is a case that those that are less prosperous (SA, TAS) have to pay more, relative to their private sectors, to attract the quality of worker that is needed. SA and TAS pay a low wage compared with other public sectors, but a high wage relative to their private sectors. They do so in an environment where their private sector pay is relatively low. It is likely that part of the market that they are competing with to obtain and retain their public sector workforce is not the local private sector labour market, but the local and national public sector market for the skills they want, e.g. for police, teachers, nurses, prison officers. Victoria is the outlier. It has relatively low pay compared both with other jurisdictions and with its own private sector. We note that it also has the most female-intensive public sector workforce. While this might explain part of the VIC low public sector wage, the difference in female-intensity is not large enough to be the whole explanation.

We have presented evidence that the jurisdictions do pay at different rates to attract the same quality of labour. The key evidence is the public sector premium identified in the FE and QR–FE estimations. The evidence supports the view that the states compete for workers in two labour markets simultaneously. One is the national labour market for public sector workers. In this case they must pay attention to the pay of comparable public sector workers in other jurisdictions. The other is the local labour market. In this case, they must pay attention to the pay of private sector workers in their own state. We suggest

Table 7: Public sector wage premiums by state/territory (FE and QR–FE estimates)

		NSW	VIC	QLD	SA	WA	TAS	NT	ACT
All	Mean	0.063***	0.024*	0.041***	0.093***	0.047**	0.105***	0.025	0.021
		(0.013)	(0.013)	(0.014)	(0.022)	(0.023)	(0.033)	(0.052)	(0.043)
	Q10	0.072***	0.067***	0.042***	0.104***	0.081***	0.095***	0.081**	0.079***
		(0.008)	(0.009)	(0.009)	(0.014)	(0.015)	(0.025)	(0.036)	(0.029)
	Q50	0.055***	0.050***	0.054***	0.053***	0.050***	0.063***	0.052***	0.059***
		(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.008)	(0.017)	(0.012)
	Q90	0.031***	0.022***	0.022***	0.030**	0.021	0.037	0.020	–0.011
		(0.007)	(0.008)	(0.009)	(0.012)	(0.014)	(0.026)	(0.030)	(0.028)
Observations		*26,034*	*22,399*	*18,774*	*7,077*	*7,956*	*2,721*	*867*	*2,152*
Male	Mean	0.082***	0.014	0.025	0.045	0.020	0.105	0.021	0.035
		(0.021)	(0.025)	(0.020)	(0.036)	(0.041)	(0.066)	(0.060)	(0.064)
	Q10	0.090***	0.071***	0.055***	0.117***	0.093***	0.114***	0.157***	0.114**
		(0.012)	(0.013)	(0.013)	(0.014)	(0.027)	(0.034)	(0.056)	(0.064)
	Q50	0.057***	0.047***	0.053***	0.046***	0.049***	0.063***	0.064**	0.052**
		(0.003)	(0.004)	(0.005)	(0.007)	(0.009)	(0.013)	(0.027)	(0.021)
	Q90	0.036***	0.023	0.013	0.002	0.017	0.011	0.070*	–0.038
		(0.011)	(0.015)	(0.012)	(0.018)	(0.011)	(0.035)	(0.042)	(0.035)
Observations		*13,094*	*11,013*	*9,515*	*3,872*	*4,130*	*1,291*	*428*	*1,139*
Female	Mean	0.050***	0.031**	0.054***	0.116***	0.065**	0.111***	0.024	0.048
		(0.015)	(0.015)	(0.020)	(0.025)	(0.029)	(0.039)	(0.077)	(0.052)
	Q10	0.062***	0.065***	0.033***	0.094***	0.069***	0.119***	–0.009	0.030
		(0.011)	(0.013)	(0.012)	(0.019)	(0.019)	(0.031)	(0.139)	(0.037)
	Q50	0.054***	0.051***	0.056***	0.060***	0.050***	0.057***	0.030	0.062***
		(0.003)	(0.004)	(0.004)	(0.006)	(0.006)	(0.010)	(0.027)	(0.016)
	Q90	0.032***	0.025**	0.041**	0.046***	0.018	0.044	0.001	–0.009
		(0.009)	(0.010)	(0.013)	(0.018)	(0.017)	(0.028)	(0.032)	(0.026)
Observations		*12,940*	*11,386*	*9,259*	*3,835*	*3,826*	*1,430*	*439*	*1,013*

Note: Standard errors clustered at the individual level are reported in parentheses. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

that the ACT and the NT be treated as special cases, but for different reasons. The ACT public sector has a high proportion of Commonwealth public sector workers and these seem to be relatively high quality and high paid. To include them confounds the story for the states. The NT is remote and exceptional in other ways. It is also small, so we think the broader story is best seen if we focus on the main game and note the distinctive nature of the NT.

5 Conclusion

This paper estimates the wage differentials between the public sector and the private sector in Australia. After controlling for observed characteristics and unobserved individual heterogeneity using fixed effects panel estimations, we show that on average workers in the public sector earn about 5.1% percent more hourly wages than in the private sector, and the public sector wage premium is slightly higher for females (5.5%) than males (4.6%). We show that by ignoring unobserved heterogeneity the OLS estimates overstate the positive wage impact of working in the public sector.

As opposed to the average case, when using a panel data quantile regression model with fixed effects, we show that the positive wage effects of public sector employment are clearly heterogeneous, with larger impact at the lower end of the wage distribution. We find that a focus on the mean will obscure the heterogeneity in the sectoral wage effects over the full wage distribution. We show that the finding in Birch (2006) and Cai and Liu (2011) that employment in the public sector has a negative impact on the wages of high-paid males workers is confounded by unobserved individual heterogeneity. Our QR–FE estimate show that public sector employment has a positive effect at the 90th percentile of male workers' wage distribution, indicating that highly-paid employees in the private sector have better unobserved characteristics such as individual ability than their counterparts in the public sector, and this is an aspect that has been ignored in previous studies such as Birch (2006) and Cai and Liu (2011). We also find evidence that the extent of heterogeneity in public sector premiums is larger for males than for females, suggesting that these premiums are a more important factor contributing to wage inequality among male employees than for

their female counterparts.

We also show that the average public sector wage premium is the highest among those with a certificate or diploma, and is the lowest among those with a university degree. We find that the public sector wage premiums are higher during 2008–2014 than in 2001–2007. Furthermore, the average public sector premiums are the highest in SA and TAS. The premiums are relatively lower but are still statistically significant in NSW, VIC, QLD and WA. We do not find significant evidence of a wage advantage of working in the public sector in NT and ACT. The distributional results from these subgroup analysis all indicate a comparatively larger public sector wage premium at the lower part of wage distribution than at other parts.

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