

The Gender Pay Gap in New Zealand

Gail Pacheco

Associate Professor - Economics

Director, NZ Work Research Institute

Auckland University of Technology

William (Bill) Cochrane

University of Waikato

Research Associate NZ Work Research Institute (AUT)

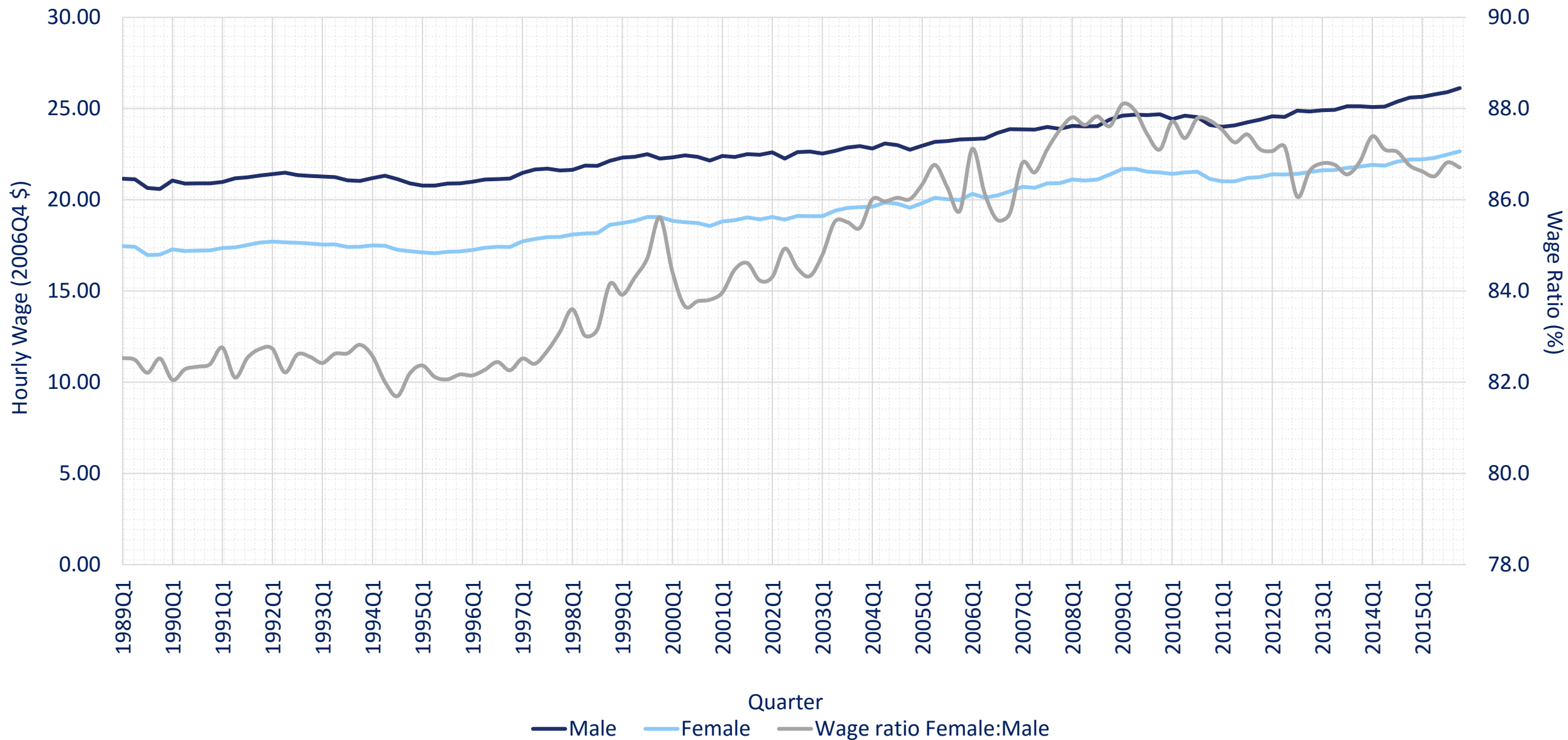
Introduction

- Our presentation today will look at some work Gail Pacheco and I have been doing on the gender pay gap in New Zealand,
- The existence of such a gap is not particularly controversial though its magnitude is often contested,
- Some argue that the gap is largely due to differences in the attributes between men and women (the gap vanishing when these are accounted for) while others see the gap being driven by structural and societal factors ,
- While the gender pay gap can be conceptualized in various ways – are we talking differences in hourly, weekly or annual income for instance – we are interested here in the difference between male and female hourly rates of pay.
- Our reasons for selecting this are largely related to the hourly rate being the simplest and lowest level at which the gender pay gap can be observed.

SNZ Disclaimer

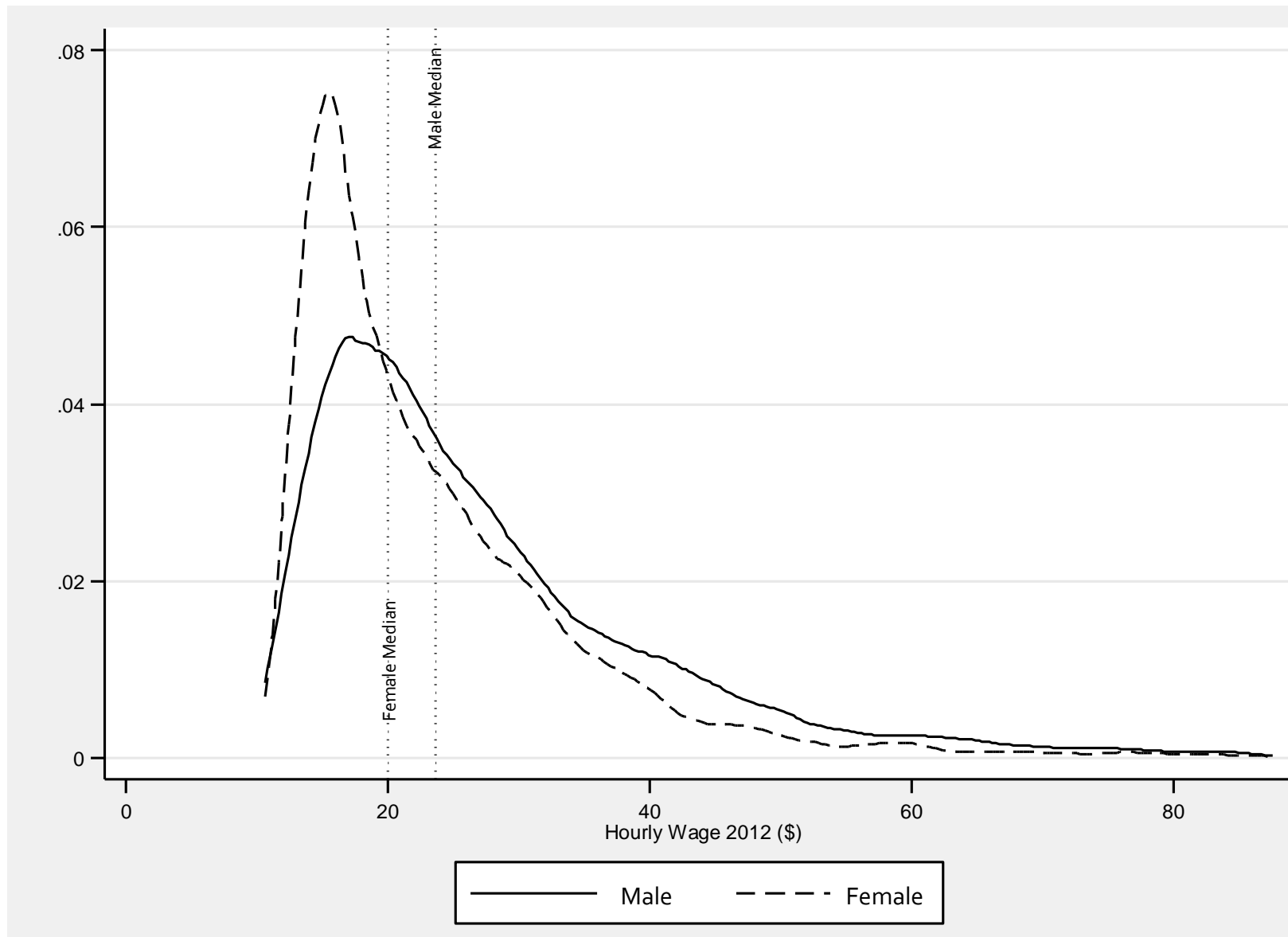
- Access to the data used in this study was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975.
- The results presented in this study are the work of the author, not Statistics NZ

Average Hourly Earnings by Sex (Quarterly, 1989-2015)



Source: Earnings and Employment Survey, SNZ CPI adjusted to 2006Q4 \$

Wage Distribution by Gender



Data Used

- The data used here is drawn from two related sources,
- Firstly the data on the characteristics and wage rate of individuals is drawn from the 2012 wave of the Survey of Working life (SOWL),
- The SOWL is run as a supplement to the Household Labour Force Survey (HLF) and collects information about people's employment conditions, working arrangements, and quality of working life,
- Secondly the HLF itself provide a range of variables such as household type and number of children at various ages that were used in the selection models I will discuss later.
- With the exception of the Heckman selection models our data was restricted to those who reported a wage in the SOWL, removing the self-employed, employers and unpaid workers. This left an n of around 10000.

Table 1: OLS (percentage penalty)

Model	All Controls	Personal	Personal+Occ	Personal+Ind	Personal+Occ+Ind
Gender (Female=1)	-9.16***	-15.08***	-13.10***	-12.47***	-10.67***
Age	3.00***	4.70***	4.10***	3.70***	3.30***
Age Squared	-0.03***	-0.05***	-0.04***	-0.04***	-0.03***
Part Time Worker	-4.53***				
Temporary Worker	-2.71*				
Tenure (weeks)	0.00***				
Tenure Squared	0.00**				
Union Member	4.10***				
Ethnicity: Maori	-3.19***	-6.11***	-3.48***	-5.54***	-3.41***
Ethnicity: Pacific	-10.61***	-11.98***	-7.68***	-12.73***	-8.92***
Ethnicity: Asian	-13.67***	-16.55***	-13.88***	-15.22***	-13.46***
Ethnicity: MELAA	-12.75***	-15.39***	-12.42***	-13.71***	-11.24***
Ethnicity: Other	-3.60*	-5.38*	-3.86*	-5.06*	-3.78*
Qual: Post-graduate	31.10***	52.50***	31.70***	47.10***	30.50***
Qual: University	20.00***	37.40***	21.20***	31.60***	19.20***
Qual: Post-school	1.70	3.30**	0.40	3.70***	1.40
Qual: Lower school	-5.56***	-10.05***	-6.61***	-8.36***	-5.49***
In NZ 5 yrs or less	1.50				
In NZ 6-10 yrs	3.50*				
In NZ 10+ years	2.90**				

* p<.05; ** p<.01; *** p<.001, Occupation and Industry Dummies Excluded For Clarity

The Oaxaca Decomposition

- A commonly used method to examine the difference between outcomes for various groups is what is known in the literature as the Blinder-Oaxaca decomposition,
- The three fold Oaxaca Decomposition decomposes the wage gap into three components; Endowments (what would happen if women had the same characteristics as men), Coefficients (what would happen if women had the same returns to characteristics as men) and interaction term that measures the simultaneous effect of differences in endowments and coefficients,
- The two fold Oaxaca Decomposition divides the wage gap into “explained” – the portion accounted for by group differences in wage determinants and a residual (unexplained) part that cannot be accounted for by such differences.
- The “unexplained” part is often used as a measure for discrimination however it also subsumes the effects of group differences in unobserved predictors.

Table 2: Threefold Oaxaca Decomposition

Model	All Controls	Personal	Personal+Occ	Personal+Ind	Personal+Occ+Ind
Male \$	24.73***	24.64***	24.63***	24.64***	24.63***
Female \$	21.56***	21.48***	21.48***	21.48***	21.48***
Difference %	-14.70***	-14.70***	-14.70***	-14.70***	-14.70***
Endowments %	-5.00***	2.50***	-0.30	-0.30	-3.40***
Coefficients %	-9.90***	-17.80***	-15.40***	-15.10***	-12.90***
Interaction %	0.60	0.10	1.00	0.70	1.70

* p<.05; ** p<.01; *** p<.001, Occupation and Industry Dummies Excluded For Clarity

Table 3: Twofold Oaxaca Decomposition

Model	All Controls	Personal	Personal+Occ	Personal+Ind	Personal+Occ+Ind
Male \$	24.73***	24.64***	24.63***	24.64***	24.63***
Female \$	21.56***	21.48***	21.48***	21.48***	21.48***
Difference %	-14.7***	-14.7***	-14.7***	-14.7***	-14.7***
Explained %	-4.2***	2.58***	0.4	-0.4	-2.4***
Unexplained %	-10.1***	-17.8***	-15.1***	-14.2***	-11.9***

* p<.05; ** p<.01; *** p<.001, Occupation and Industry Dummies Excluded For Clarity

The Selection Problem

- The selection problem arises frequently in labour market research, simply but some outcome of interest (say wages) is only observed for those who participate in waged labour. As this group maybe a select group a selection bias will be introduced into the estimation,
- An intuitively appealing approach to this problem is to deduct the impact of the selection effect prior to running the decomposition – often via the Heckman selection model,
- In the case of the gender gap we are considering here it may well be that women in the labour force constitute such a select group hence we re- estimate the Oaxaca decompositions with a correction for selectivity bias,
- The terms included in the selection equation were the age, age squared, whether a person was a sole parent with dependent child, whether the person was in a couple with a dependent child, the number of children under 6 and the number of children between 6 and 16.

Table 4: Threefold Oaxaca with Selection

Model	All Controls	Personal	Personal+Occ	Personal+Ind	Personal+Occ+Ind
overall					
Male \$	24.73***	24.64***	24.63***	24.64***	24.63***
Female \$	21.57***	21.49***	21.49***	21.49***	21.49***
Difference %	-14.60***	-14.70***	-14.60***	-14.70***	-14.60***
Adjusted					
Male \$	24.73***	24.64***	24.63***	24.64***	24.63***
Female \$	19.97***	20.82***	20.87***	20.20***	20.35***
Difference %	-23.80***	-18.30***	-18.00***	-22.00***	-21.10***
Endowments %	-5.10***	2.55***	-0.30	-0.40	-3.40***
Coefficients %	-18.70***	-21.50***	-18.90***	-22.40***	-19.20***
Interaction%	0.73	0.06	0.95	0.70	1.81*

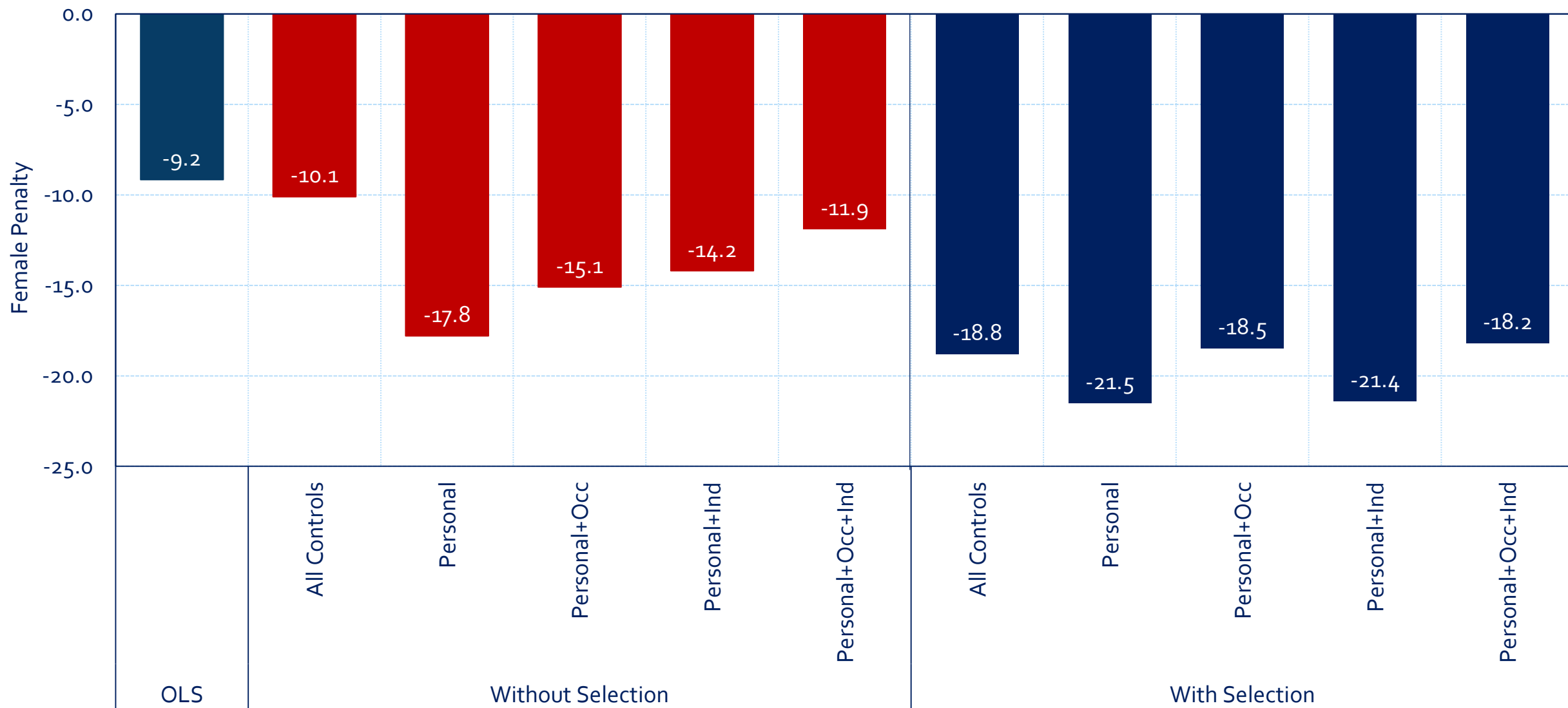
* p<.05; ** p<.01; *** p<.001, Occupation and Industry Dummies Excluded For Clarity

Table 5: Twofold Oaxaca with Selection

Model	All Controls		Personal		Personal+Occ		Personal+Ind		Personal+Occ+Ind	
Overall										
Male \$	24.73	***	24.64	***	24.63	***	24.64	***	24.63	***
Female \$	21.57	***	21.49	***	21.49	***	21.49	***	21.49	***
Difference %	-14.6	***	-14.7	***	-14.6	***	-14.7	***	-14.6	***
Adjusted										
Male \$	24.73	***	24.64	***	24.63	***	24.64	***	24.63	***
Female \$	19.97	***	20.82	***	20.87	***	20.20	***	20.35	***
Difference %	-23.80	***	-18.30	***	-18.00	***	-22.00	***	-21.10	***
Explained %	-4.20	***	2.60	***	0.40		-0.40		-2.40	***
Unexplained %	-18.80	***	-21.50	***	-18.50	***	-21.4	***	-18.20	***

* p<.05; ** p<.01; *** p<.001, Occupation and Industry Dummies Excluded For Clarity

Summary of Results



Extensions to this Work

- Firstly we intend to devote some more time to the selection model used in the “Oaxaca with selection” model as the pay gap estimated using maximum likelihood appears high,
- Next we intend to use a technique called Propensity Score Matching (PSM) to estimate the gender pay gap, PSM attempts to create quasi-experimental conditions from non-experimental data by comparing observationally similar treated and non-treated individuals,
- Very tentative results for PSM are presented in the next slide,
- The other issue we intend to address is whether or not the gender pay gap is consistent across the wage distribution i.e. is the gap (as a percentage of the female wage) the same, say, at the 25th percentile of the wage distribution as it is at the 75th,
- This latter extension will be achieved using a quantile decomposition – effectively running a decomposition at various points in the wage distribution.

Tentative PSM Results: Average Treatment Effect (ATE)

Model	N	ATE (% <u>Penalty</u>)	95 % Conf. Interval	
All	10000	9.2***	7.5	10.8
Personal	10000	9.8***	8.3	11.2
Occupation	10000	10.7***	9.3	12.1
Industry	10000	9.0***	7.4	10.7
Personal + Industry + Occupation	10000	9.2***	7.5	10.8

* p<.05; ** p<.01; *** p<.001, Occupation and Industry Dummies Excluded For Clarity

Conclusion

- Our work thus far, in keeping with the vast majority of the existing literature, finds evidence of a significant difference between male and female hourly rates of pay i.e. women suffer a wage penalty in the labour market,
- While our work is still in its preliminary stages we find evidence of this gap being in the 10-20 percent range with our current preferred estimates being closer to 10 than 20 percent,
- We are confident that our final results will sustain the finding of a significant gender pay gap and, while adding precision, subsequent estimation of the size of this gap will remain in the range found here.