Assignment 3 - Applied Econometrics - ECON6645

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Justin Desrosier

Question 1

Table 1: Summary Statistics

	n	Mean	Median	Min	Max
Group 1 (Female==0)					
Respondent's Wage Before Deductions	9,115	33.55	28	10	482
Number of years of schooling completed by person	9,114	13.75	14	0	20
Number of years of work experience	7,399	21.61	22	0	49
Number of employees at person's place of work	8,813	259.26	72	1	1,269
Respondent is Unionized	8,966	0.38	0	0	1
Respondent is a Manager	7,660	0.28	0	0	1
Respondent is Married	9,087	0.60	1	0	1
Group 2 (Female==1)					
Respondent's Wage Before Deductions	8,534	26.51	23	10	425
Number of years of schooling completed by person	8,530	14.14	14	0	20
Number of years of work experience	7,151	18.04	18	0	47
Number of employees at person's place of work	8,296	261.68	69	1	1,269
Respondent is Unionized	8,437	0.45	0	0	1
Respondent is a Manager	7,312	0.21	0	0	1
Respondent is Married	8,525	0.58	1	0	1
Total					
Respondent's Wage Before Deductions	17,649	30.15	25	10	482
Number of years of schooling completed by person	17,644	13.94	14	0	20
Number of years of work experience	14,550	19.86	20	0	49
Number of employees at person's place of work	17,109	260.44	70	1	1,269
Respondent is Unionized	17,403	0.42	0	0	1
Respondent is a Manager	14,972	0.25	0	0	1
Respondent is Married	17,612	0.59	1	0	1

Table 1 displays the summary statistics for our primary variable of interest, wage. The variable *Firm size* as the Number of employees at person's place of work has a continuous value computed from discrete firms size categories. The computation method used (exception: top-coded category) was midpoint and quantile methods using a uniform distribution. The top-coded category continuous value was derived only as the expected value. The table also shows the summary values for the total dataset as well as for our groups of interest. Female respondents will be our primary focus for analysis of wage discrimination stemming from an inherent trait.

Table 2 consists of the coefficients from a regression of respondent's wages on education and experience as well as the additional control variables, firm size, belonging to a union, being a

manager, and being married. Model (1) was regressed only for respondents who indicated that their gender was not female, and (2) for female using linear regression.

From these regressions we can develop an understanding of the different parameter estimates associated with wages for each of the two groups. Education, work experience, firm size, being a manager, and being married were found to be associated with higher expected earning for the non-females. At the same time, being a member of a union was associated with higher wage returns for females than it was for non-females.

For all regions being a non-female was associated with higher expected wages, although, there was variation in the magnitude of difference. Females in working in the Prairies could expect to make $1.53 more than if they were working in Ontario, meanwhile their non-female counterparts could expect a wage increase of $6.43, a difference of $4.90. When considering the difference in wages between the two groups for Atlantic Canada compared to the reference category, Ontario, it was only $0.35. We can conclude that dynamics of the gender wage gap is similar in Ontario and Atlantic Canada since the decline in average wages is approximately the same for both groups.

Table 3 displays the output from a Blinder-Oaxaca Decomposition. The first section of the table shows the average wages for the two groups, $33.58 and $26.77 for non-females and females respectively. The Difference in averages for this sample is $6.81. For the Explained and Unexplained rows, these numbers represent the proportion of the Difference that can be explained by the parameters and the proportion that cannot. Using the coefficient estimates in the second section of table 3, we can determine how much of the gap is attributable to each component. In other words, the explained difference in wage, on average for this sample, is %10 attributable to favourable characteristics regarding wage yield, while %90 is associated with gender discrimination, assuming no omitted variable bias.

The wage gap between females and non-females consists of both statistically significant explained and unexplained elements. The primary reason for the explained wage gap is the number of years of work experience that non-females have in the sample. Females are known to take more total maternity leave during their career and therefore have less total work experience which contributes to a lower average wage.

The unexplained portion of the wage gap is primarily attributed to years of education, firm size, and the regional categorical variable for the Prairies. For years of education, non-females with the average non-female level of education, have an associated $2.15 increase in wage for an additional year of schooling more than females with the same level of education. Living in the prairies is also associated with an increase in the unexplained portion of the wage gap. Non-females in the prairies tend to earn $0.85 more than their female counterparts with identical wage related characteristics.

In particular, it is estimated that females with a number of years of work experience equal to the average number of years for non-females, have an associated $0.77 raise in wages for 1 additional year of work experience. At the same time, non-females at the average level of work experience have an associated $1.36 return on an additional year of experience.

Table 2: Linear Regression

Dependent variable: Respondent's Wage Before Deductions	(1) Group 1 (Not Female)	(2) Group 2 (Female)
Number of years of schooling completed by person	1.973***	1.821***
	(0.190)	(0.121)
Number of years of work experience	0.338***	0.269***
	(0.0356)	(0.0239)
Number of employees at person's place of work	0.00869***	0.00546***
	(0.00118)	(0.000653)
Respondent is Unionized	0.804	2.914***
	(0.838)	(0.478)
Respondent is a Manager	9.378***	6.851***
	(1.058)	(0.758)
Respondent is Married	2.071*	1.103*
	(0.938)	(0.512)
Region		
Atlantic Canada	-2.788**	-2.441***
	(0.972)	(0.587)
Quebec	-3.058**	-1.348*
	(0.937)	(0.635)
Prairies	6.430***	1.527*
	(1.564)	(0.695)
British Columbia	2.879	0.809
	(1.495)	(1.022)
Constant	-8.191**	-8.722***
	(2.672)	(1.921)
N	5690	5727

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Oaxaca-Blinder Decomposition

Dependent variable: Respondent's Wage Before Deductions		
	Overall	Observations
Group 1 (Not Female)	33.58*** (0.46)	5690
Group 2 (Female)	26.77*** (0.28)	5727
Difference	6.81*** (0.54)	
Explained	0.68** (0.23)	
Unexplained	6.13*** (0.51)	
	Explained	**Unexplained**
Number of years of schooling completed by person	-0.49** (0.15)	2.15 (3.18)
Number of years of work experience	0.77*** (0.11)	1.36 (0.86)
Number of employees at person's place of work	0.05 (0.06)	0.93* (0.39)
Respondent is Unionized	-0.14** (0.05)	-0.74 (0.34)
Respondent is a Manager	0.42*** (0.10)	0.73 (0.38)
Respondent is Married	0.04 (0.02)	0.57 (0.63)
Region		
Atlantic Canada	0.02 (0.01)	-0.02 (0.08)
Quebec	0 (0.02)	-0.46 (0.31)
Prairies	0.01 (0.01)	0.85** (0.30)
British Columbia	0.01 (0.01)	0.24 (0.21)

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$