IS THE EDUCATIONAL ATTAINMENT OF WOMEN CLOSING THE GENDER WAGE GAP?

Reginald Acquah

University of Alberta

Abstract

The study estimated the effect of education on the gender wage gap using the Oaxaca-Blinder decomposition technique. The data used for this study is from the Canadian censuses in 2006 and 2016 and the National Household Survey (NHS) 2011. Subsamples of employment income which captured wages in 2005, 2010 and, 2015 of people aged between 25 and 64 who worked full time and full year during the reference period. The total wage gap was 0.249, 0.316, and 0.311 in 2005, 2010, and 2015 respectively. Between 80% to 87% of the wage difference was accounted for by wage discrimination. Educational attainment as a wage determining factor had a weakening effect on the wage gap. The wage gap was reduced by 3.7%, 4.1%, and 5.1% by educational attainment in 2005, 2010 and 2015 respectively. It reduced wage discrimination from 20% in 2005 to 22% in 2015.

Keywords: Gender wage gap; education; wage discrimination.

Introduction

The economics literature implies that investment in a person's human capital results in higher wages. A key method to invest in human capital is education. Therefore, both genders should expect to earn the same wage if they have the same level of education. However, there is evidence of wage discrimination between males and females, which is a result of the concentration of women in lower-paying jobs and not unequal pay for equal work. (Oaxaca, 1973).

There has been a dramatic reversal of male-female proportions in Canadian Universities according to Canadian censuses from 1971. The proportion of male university graduates between 25 to 29 years old fell from 68% to 54% in 1971 and 1981 censuses respectively. By 1991, females had a slight majority of 51% of graduates. In the 21st century, female graduates have become a visible majority of graduates with 58% and 60% of all graduates in 2001 and 2006 censuses respectively. (Frenette & Zeman, 2007). Accordingly, if women were earning less than men due to their concentration in lower-paying jobs, with their increasing enrolment in tertiary education, we expect females to move onto a higher wage bracket as the theory suggests.

The purpose of this study was to find the significance of the increasing educational attainment of women on changes it has on the gender wage gap. Also, to determine how important education is in reducing gender wage discrimination in the labor market. To achieve our purpose, a regression-based decomposition model is used in our study. We found that increasing educational attainment has an impact on reducing gender wage gap and wage discrimination. The rest of the text structure is as follows: literature review, data, methodology, results and conclusion

Literature Review

Gender wage gap studies have numerous literatures on labor economics. Most of which employ the Oaxaca-Blinder decomposition technique (Oaxaca, 1973) and (Blinder, 1973). This technique is of importance because it separates wage disparities into explained and unexplained parts. Human capital models predict that differences in educational attainment among groups mainly explain the changes in relative earnings (Carnoy, 1996). However, most literature argues that occupational and industry have a more significant effect on the gender wage gap than the level of education (Blau & Kahn, 2017).

(Bobbitt-Zeher, 2007) used data from the National Educational Longitudinal Survey to measure educational variables on the gender wage gap. In the study, the author found that, on average, a college-educated male in the mid-20s earns about $7,000 more annually than a college-educated female. It further finds that a male with similar educational characteristics (fields of study, educational credentials, and scores on standardized tests) as a female will earn about $4,400 annually more than a female counterpart. However, in the study, gender differences in work-related factors accounted for much of the wage gap than educational differences. (Blau & Kahn, 2017) corroborates that occupation and industry is a much important part of the gender wage gap than the human capital variables.

The findings of a sample of seven articles that focus on the educational attainment on race and gender wag gap by (Carnoy, 1996) concludes that increasing the supply of the educationally disadvantaged group increases the probability that wage differences will decline. However, labor market conditions can adversely affect the underprivileged groups, thereby equalizing access to equal quality education is not enough to close the wage gap. (Carnoy, 1996) further finds that if

relative differences in returns on education are small, increasing the educational attainment of women will have a significant effect on reducing the gender wage gap.

Using data from the European Community Household Panel (ECHP) (Mussida & Picchio, The Gender Wage Gap by Education in Italy, 2012) estimated wage distribution by taking advantage of the simulation algorithms developed by (Mussida & Picchio, Gender wage gap: A semi-parametric approach with sample selection correction, 2011) to derive counterfactual distributions and decompose the gender wage gap. They found that low educated women suffer the most wage discrimination. Furthermore, women that have the same characteristics as men would suffer significant wage discrimination when corrected for non-random selection into full-time employment and on educational levels.

The empirical analysis by (Pitts & Kroncke, 2014) using the National Longitudinal Survey of Youth for American youth unveils that between 1984-2007, returns to education remained unchanged for young men; however, for women, it declined significantly. Therefore, earnings differential between similar young men and women increased among those that earned a bachelor's degree but worst among young men and women without a college degree. Accordingly, it suggests that the gender wage gap becomes smaller as educational attainment increases

Unlike most literature, we study the gender wage gap using regression-based decompositions. (Black, Haviland, Sanders, & Taylor, 2008) used the National Survey of College Graduates and employed a nonparametric matching analysis for their empirical study of wage disparity by segregating highly educated women into four groups — non-Hispanic white, Black, Hispanic, and Asian. They find that non-Hispanic white men with a college education earn approximately 30 more than their female counterparts. Pre-market factors such as the highest degree and field of study accounted for between 44 and 73 percent of the gender wage gap among English speaking

men and women. Furthermore, when they focus on women with work experience like male counterparts, it accounted for between 54 and 99 percent of the gender wage disparity.

Previous literature suggests that in the 1990s, gender differences in educational attainment explain insignificant differences in the gender gap earnings. However, the improvement in the educational attainment of women in recent years will help shrink the earnings gap overtime (Christie & Shannon, 2001). This paper, therefore, is to examine whether the increasing female educational attainment has helped shrink the gender wage gap in recent times.

Theory

Theory suggests that there will be a single wage in an economy if workers share the same labor market characteristics, and they have no restrictions in entry and exit of firms a competitive labor market. However, the theory of compensation differentials suggests that wages will differ among labor because workers differ in their skills, and jobs vary by the amenities they offer (Borjas, 2013). Each worker has a unique set of acquired skills and abilities. These skills and abilities possessed by workers are acquired mainly through education.

Highly educated labor earns more than less-educated workers. Education increases earnings in two ways: it increases the productivity of labor and education serves as a signal of a worker's innate ability (Borjas, 2013). Another reason for wage differences can be attributed to reward for risk-taking, hours worked, and job experience. Women typically work in less risky jobs and have fewer labor hours. Traditionally, women leave the workforce temporarily when pregnant and to take care of children. Consequently, women have less experience because of fewer labor hours. Also, they will take up low paying jobs, which can give them the flexibility they require (Kessler, 2016).

Wage Discrimination is another reason for the wage gap. The sources of wage discrimination are from the employer, an employee, or a customer (Borjas, 2013). Racial and gender differences may arise even in the absence of prejudice when membership in a particular group (for example, being a black woman) carries information about a person's skills and productivity (Borjas, 2013). In a monopsony labor market where there exists only one buyer of labor, wage discrimination is more prevalent in an environment where labor mobility is rigid. Employers discriminate against women because of their less sensitivity to pay relative to men (Ransom & Oaxaca, 2005).

Empirical Method

The study estimated the effect of education on the gender wage gap using the Oaxaca-Blinder decomposition technique (Oaxaca, 1973) and (Blinder, 1973). We specified the logarithm of annual wages for males and females separately as a linear function of educational attainment, the field of study, personal characteristics (marital status, language, visible minority, and citizenship), age-group, industry and occupation. The following three equations illustrate the Oaxaca-Blinder decomposition.

$$lnW_{mi} = X_{mi}\beta_m + \mu_{mi} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

$$lnW_{fi} = X_{fi}\beta_f + \mu_{fi} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

$$lnW_m - lnW_f = \left(X_m - X_f\right)\beta_m + X_f\left(\beta_m - \beta_f\right) \dots\dots\dots\dots (3)$$

Where W is the average yearly wages, X is a vector of wage-determining explanatory variables, β is the vector of coefficients obtained by regressing the log-wage on the variables in X and, whereas m and f subscripts denote male and female respectively. Equations (1) and (2) are OLS regressions for males and females respectively. Equation (3) uses the Oaxaca-Blinder decomposition for mean effects. The technique does so by partitioning the mean differences between males and females on

each explanatory variable. The first part in equation (3) measures the explained differences in mean wage. The second part of the equation (3) measures the unexplained differences in mean wage. The unexplained part is due to discrimination in the labor market, also, explanatory variables not included in the model (Card & Krueger, 1992).

Our choice of econometric model is based on the literature of wage inequality. A standard technique among scholars of wage gap is the Oaxaca-Blinder decomposition technique (Oaxaca, 1973) and (Blinder, 1973). Accordingly, our choice of explanatory variables is guided by studies of (Christie & Shannon, 2001) and (Blau & Kahn, 2017). They both include industry and occupational dummies because occupation and industry have a more significant effect on the gender wage gap than the level of education.

Data

The data used for this study is from the Canadian censuses in 2006 and 2016 and the National Household Survey (NHS) 2011[1]. For this study will refer to NHS 2011 as the 2011 census. Subsamples of employment income which captured wages in 2005, 2010 and, 2015 of people aged between 25 and 64 who worked full time and full year during the reference period in other to eliminate issues of formal education[2]. Also, we consider the detailed educational attainment information of our sample. The availability of data on earnings and level of education is a significant reason for using census data for the study. The other merits of the census data are the large sample size, and consequent increased statistical reliability of the results, and the detailed data on personal characteristics it contains.

[1] The data for all the years was extracted from ODESI database

[2] Full time workers worked for at least 30 hours per week for more than 49 weeks. Participants are grouped into four age class; 25-34, 35-44, 45-54, and, 55-64.

The public-use version of the Census and NHS microdata file contains seven education variables in 2016 and 2011. There are six education variables in the 2006 census microdata file. For our study are interested in two of the education variables. "Highest certificate, diploma or degree," which describes the highest educational attainment with 13 categories. Table 2 reported shares of full-time workers that fall into each category for males and females in each census year. The second education variable used was "Major field of study (based on the CIP Canada 2000)" for those with post-secondary education. The primary field of study is essential because it gives labor different opportunities in the market, which subsequently influences earnings. Table 3 reported the shares of the field of study for males and females in each census year as well.

We have a total of 468,635, 615,316, and 662,684 observations dropped after trimming for the focused age group that worked full-time for 2005, 2010, and 2015 respectively. The wage variable is the gross logarithmic annual wage[3]. A total of 175,429, 32,644 and, 27,068 Observations were dropped for 2005, 2010, and 2015 respectively because they were unrealistic – less than 1000 and missing values. In other to avoid the omitted variable problem, we include work-related variables – industry[4] and occupational[5] dummies. Also, we add control variables to account for the province or territory of current residency and personal characteristics (citizenship, marital status, language, and visible minority). These variables were included based on the literature of the wage gap. Table 1 presents descriptive statistics for all the variables by each census year.

[3] Wage refers to gross wages and salaries before deductions for such items as income tax, pensions and Employment Insurance.

[4] Industry classification is based North American Industry Classification System (NAICS), Canada. There are 19 dummies for 2011 and 2016. In 2006 we have 20 dummies because Finance and insurance/ Management of companies and enterprises are separated in this year.

[5] Occupational dummies are 10 for each year. This is based on the National Occupational Classification for Statistic (NOCS)

From Table 2, three categories accounted for the larger share of educational attainment for both sexes: High school graduate, non-university certificate (1 year to 2 years), and bachelor's degree accounted for about 60% of women and 53% of men in 2015. This pattern of women more likely to have a diploma, non-university certificate (1 year to 2 years), or bachelor's degree than men is consistent in 2006 and 2011 census years. Men are more likely to have a trades certificate than women. The share of a male in post-graduate levels degree declined in 2015 while the female share has increased through the census years. Until 2015, it was more like for a male to have a post-graduate degree than female: 7.4% and 7.3% for females and males respectively in 2015 from 6.5% of females and 7.4% of males in 2010. Degree in medicine, dentistry, veterinary medicine, or optometry accounted for the smallest share of educational attainment for both males and females. The margin was nearly the same for both male and female shares in the medical sciences accounting for not more than 0.5% for both sexes. The total share of men with at least a bachelor's degree decreased from 54% in 2005 to 48% in 2015 whiles share of women increased to 52% in 2015 from 46% in 2005. It indicates that women attained higher education than men by 2015. In Table 3, we report the field of study for those with post-secondary education. The larger share of females is "education," "business, management and public administration," "social and behavioral sciences and law," and "health, parks, recreation and fitness" combined. These accounted for about 75% of the female sample against less than 35% of males in all the years. The field of study dominated by men in all three years was "Architecture, engineering, and related technologies." About 40% of the male sample is in this field, with just 3.6% of females. The second most common degree for men was "business, management and public administration." The structure of male and female proportions in the various field of study has remained relatively stable from 2005 to 2015.

Table 1: Descriptive Statistics Summary

	Observations	Mean	Median	Std Dev	Min	Max
2006 Census						
Age Group	200,412	2.36	2	0.99	1	4
Citizenship	196,685	1.23	1	0.49	1	3
Educational Attainment	199,555	5.37	6	3.38	1	13
Field of Study	200,412	8.58	8	3.86	1	13
Gender	200,412	0.44	0	0.50	0	1
Industry	199,134	10.83	10	5.55	1	20
Language	200,412	1.53	1	0.83	1	4
Marital Status	200,412	2.52	2	1.03	1	5
Occupation	198,385	4.72	4	2.89	1	10
Province	200,412	36.01	35	12.64	10	60
Visible Minority	200,412	0.14	0	0.34	0	1
Wage	200,412	54,193.01	44,000	57,913.42	1,000	1,226,490
2011 Census						
Age Group	239,052	2.43	2	1.04	1	4
Citizenship	237,056	1.28	1	0.54	1	3
Educational Attainment	237,769	5.76	6	3.40	1	13
Field of Study	237,629	8.30	8	3.85	1	13
Gender	239,052	0.48	0	0.50	0	1
Industry	236,441	53.55	53	19.28	11	91
Language	239,052	1.54	1	0.84	1	4
Marital Status	239,052	2.27	2	1.05	1	6
Occupation	233,937	4.61	4	2.76	1	10
Province	239,052	36.22	35	12.73	10	60
Visible Minority	239,052	0.17	0	0.38	0	1
Wage	239,052	59,676.15	49,000	56,452.01	1,000	1,074,400
2016 Census						
Age Group	216,177	2.46	2	1.07	1	4
Citizenship	216,177	1.27	1	0.54	1	3
Educational Attainment	216,177	5.75	6	3.41	1	13
Field of Study	216,177	8.38	8	3.84	1	13
Gender	216,177	0.47	0	0.50	0	1
Industry	216,177	10.81	11	5.06	1	19
Language	216,000	1.52	1	0.83	1	4
Marital Status	216,177	2.24	2	1.01	1	6
Occupation	216,177	4.66	5	2.75	1	10
Province	216,177	36.37	35	12.63	10	70
Visible Minority	216,177	0.18	0	0.39	0	1
Wage	216,177	67,308.51	55,000	68,898.07	1,000	1,236,606

To get an impression of the importance of the level of education on the wage gap, we looked at the female to male ratio of their average wages across each level of education and field of study for each year: this is represented in Table 4 and Table 5 for educational attainment and field of study, respectively.

In Table 4, we reported average earnings and the ratio of female-male average wages by educational attainment of full-time workers. Moving down Table 1, we observed that average wages increased for all census years and gender: on average men and women with no certificate, diploma or degree earned $51,608 and $32,172 respectively in 2015[6]. With a doctorate, the average earnings for men and women more than doubled to $127,469 and $100,405, respectively, in 2015. This helicopter view shows that earnings increased with the level of education. The ratio for the total sample in 2005 and 2015 was 0.693 whereas in 2010 the ratio for the total sample was higher at 0.703[7]: earnings were relatively the same for males and females in 2010 than it was in 2005 and 2015. There is a consistency in all years that females with Registered Apprenticeship certificate have lower wages than their male counterparts: 0.533 in 2005, 0.531 in 2010 and 0.483 in 2015. Likewise, men and women with PhDs tend to have the closest wage throughout the years: 0.747 in 2005, 0.749 in 2010, and 0.788 in 2015. The ratio for females and males with a degree in the medical sciences was low: about 0.57 in all years. Apart from people with PhDs, the mismatch in average wages for people with master's degrees was also relatively small: it had a ratio of 0.700 in 2005 and 2010, 0.694 in 2015.

[6] 2006 figures reflect wages in 2005; 2011 figures reflect wages in 2010; 2016 figures reflect wages in 2015.
[7] The ratio ranges between 0 to 1: the closer it is to 1 the more equal wages between male and female are on the other hand, if ratio is closer to 0 then male wages a higher than female wages.

Table 2: Educational attainment of full-time workers

Highest Educational Attainment	2006 Census				2011 Census				2016 Census			
	Women		Men		Women		Men		Women		Men	
	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.
No certificate, diploma or degree	8.3	7,262	11.7	13,169	6.6	7,423	9.3	11,642	5.8	5,959	9.1	10,371
High school diploma or equivalent	24.6	21,353	23.0	25,869	21.8	24,727	21.8	27,210	22.2	22,734	24.0	27,341
Trades certificate or diploma (other than apprenticeship)	6.3	5,506	8.9	10,015	5.8	6,549	7.3	9,136	4.7	4,837	6.7	7,627
Registered Apprenticeship certificate	1.7	1,511	6.9	7,717	1.8	1,986	7.7	9,572	1.2	1,222	7.9	8,998
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	4.0	3,452	1.7	1,967	3.7	4,171	1.7	2,170	4.7	4,811	2.5	2,872
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	12.7	11,080	9.4	10,629	12.9	14,596	9.7	12,026	13.3	13,662	9.7	11,089
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	9.6	8,331	9.3	10,522	9.9	11,228	9.6	12,014	9.6	9,857	8.9	10,162
University certificate or diploma below bachelor level	5.9	5,121	4.3	4,860	5.8	6,518	4.3	5,350	3.5	3,591	2.4	2,698
Bachelor's degree	18.1	15,728	15.9	17,845	21.4	24,227	18.0	22,459	24.6	25,184	19.4	22,050
University certificate or diploma above bachelor level	3.0	2,633	2.2	2,494	3.4	3,888	2.6	3,184	2.4	2,419	1.6	1,797
Degree in medicine, dentistry, veterinary medicine or optometry	0.3	265	0.4	430	0.4	458	0.5	634	0.4	455	0.4	499
Master's degree	4.8	4,200	5.1	5,768	5.9	6,644	6.1	7,577	6.7	6,873	6.2	7,001
Earned doctorate degree	0.6	533	1.2	1,295	0.7	762	1.3	1,618	0.7	740	1.2	1,328
Total		86,975		112,580		113,177		124,592		102,344		113,833

Table 3: Field of study of post-secondary graduates

Field of Study	2006 Census				2011 Census				2016 Census			
	Women		Men		Women		Men		Women		Men	
	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.	Per (%)	Obs.
Education	10.7	6,260	3.7	2,718	10.3	8,337	3.5	3,017	9.6	7,040	2.9	2,239
Visual and performing arts, and communications technologies	2.9	1,722	2.8	2,099	3.1	2,472	3.0	2,557	3.4	2,488	3.0	2,268
Humanities	5.4	3,170	3.8	2,845	5.8	4,706	4.0	3,416	5.4	3,941	3.6	2,769
Social and behavioral sciences and law	13.1	7,680	7.0	5,193	13.2	10,728	7.4	6,310	15.1	11,131	7.4	5,646
Business, management and public administration	30.7	18,009	17.6	13,002	29.4	23,848	18.3	15,625	28.7	21,132	18.2	13,888
Physical and life sciences and technologies	3.1	1,843	3.8	2,844	3.5	2,823	4.0	3,424	3.7	2,701	3.8	2,884
Mathematics, computer and information sciences	4.1	2,420	6.2	4,610	3.4	2,728	6.8	5,812	2.8	2,074	7.1	5,434
Architecture, engineering, and related technologies	3.6	2,094	41.8	30,973	3.6	2,938	39.3	33,681	3.5	2,543	40.4	30,738
Agriculture, natural resources and conservation	1.3	771	3.0	2,252	1.3	1,074	2.9	2,466	1.2	853	2.5	1,912
Health, parks, recreation and fitness	20.6	12,105	4.5	3,333	21.9	17,758	4.9	4,226	22.1	16,291	4.6	3,467
Personal, protective and transportation services	4.4	2,609	5.6	4,184	4.4	3,567	5.9	5,070	4.7	3,457	6.4	4,876
Other fields of study	0.0	14	0.0	9	0.0	12	0.0	1	0.0	0	0.0	0
Total		58,697		74,062		80,991		85,605		73,651		76,121

We reported in Table 5 average earnings by field of study. The highest paying field of study for men is business, management and public administration for all the years. For females, the most paying field was physical and life sciences and technologies in 2005. However, in 2010 and 2015, the highest paying field was architecture, engineering, and related technologies for females. Men in visual and performing arts, and communications technologies consistently received the lowest average wages in all the years. Also, women in personal, protective and transportation services earned the lowest average wages in all the years. The female-male ratio is above 0.8 in all the years for education, visual and performing arts, and communications technologies, and architecture, engineering, and related technologies: indicating an equal proportion of wages for men and women. There is a high mismatch for people in business, management and public administration and personal, protective and transportation services: ratios for these fields are about 0.56 for all years.

Table 4: Average earnings by educational attainment of full-time workers

Highest Educational Attainment	2006 Census			2011 Census			2016 Census		
	Women	Men	Ratio	Women	Men	Ratio	Women	Men	Ratio
No certificate, diploma or degree	$27,827	$44,333	0.628	$30,338	$46,689	0.650	$32,172	$51,608	0.623
High school diploma or equivalent	$35,832	$51,913	0.690	$38,936	$55,816	0.698	$42,845	$62,263	0.688
Trades certificate or diploma (other than apprenticeship)	$31,427	$49,670	0.633	$34,827	$52,455	0.664	$35,937	$59,387	0.605
Registered Apprenticeship certificate	$31,725	$59,528	0.533	$35,245	$66,431	0.531	$38,226	$79,079	0.483
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	$37,764	$54,859	0.688	$41,844	$62,208	0.673	$44,049	$71,939	0.612
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	$40,441	$59,345	0.681	$44,073	$65,323	0.675	$49,154	$75,581	0.650
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	$44,734	$62,577	0.715	$48,599	$68,137	0.713	$54,824	$78,254	0.701
University certificate or diploma below bachelor level	$47,508	$66,540	0.714	$52,312	$72,393	0.723	$57,947	$80,394	0.721
Bachelor's degree	$56,015	$81,804	0.685	$61,737	$89,096	0.693	$67,870	$101,584	0.668
University certificate or diploma above bachelor level	$59,471	$87,577	0.679	$64,632	$88,338	0.732	$74,345	$110,404	0.673
Degree in medicine, dentistry, veterinary medicine or optometry	$77,185	$134,634	0.573	$80,670	$140,091	0.576	$83,919	$140,394	0.598
Master's degree	$68,183	$97,386	0.700	$73,364	$104,735	0.700	$82,191	$118,457	0.694
Earned doctorate degree	$75,651	$101,300	0.747	$88,976	$118,755	0.749	$100,405	$127,469	0.788
Total	$43,315	$62,472	0.693	$48,859	$69,512	0.703	$54,568	$78,763	0.693

Ratio: Women's average wage as a share of men's average wage

Earnings figures reflect that of the preceding year

Table 5: Average earnings by field of study

Field of Study	2006 Census			2011 Census			2016 Census		
	Women	Men	Ratio	Women	Men	Ratio	Women	Men	Ratio
Education	$53,617	$63,726	0.841	$59,997	$73,530	0.816	$66,887	$80,344	0.833
Visual and performing arts, and communications technologies	$39,883	$48,289	0.826	$43,409	$52,076	0.834	$47,490	$57,465	0.826
Humanities	$48,269	$65,302	0.739	$53,003	$68,028	0.779	$57,362	$72,381	0.792
Social and behavioral sciences and law	$49,377	$80,671	0.612	$54,979	$89,075	0.617	$60,598	$102,280	0.592
Business, management and public administration	$47,337	$85,365	0.555	$53,254	$92,675	0.575	$61,520	$107,679	0.571
Physical and life sciences and technologies	$53,769	$84,065	0.640	$59,499	$88,592	0.672	$68,213	$96,164	0.709
Mathematics, computer and information sciences	$50,799	$66,663	0.762	$58,393	$72,620	0.804	$68,260	$86,034	0.793
Architecture, engineering, and related technologies	$52,303	$65,217	0.802	$60,780	$73,153	0.831	$71,881	$85,287	0.843
Agriculture, natural resources and conservation	$42,713	$56,071	0.762	$47,574	$63,370	0.751	$54,178	$73,614	0.736
Health, parks, recreation and fitness	$48,162	$73,430	0.656	$53,049	$82,239	0.645	$57,749	$86,730	0.666
Personal, protective and transportation services	$31,042	$52,980	0.586	$35,358	$60,090	0.588	$38,667	$69,095	0.560
Other fields of study	$48,929	$57,667	0.848	$71,391	$19,000	3.757	$0	$0	-
Total	$48,013	$69,520	0.691	$53,620	$77,043	0.696	$59,998	$88,390	0.679

Ratio: Women's average wage as a share of men's average wage

Earnings figures reflect that of the preceding year

Results

The technique of Oaxaca-Blinder decomposition technique (Oaxaca, 1973) and (Blinder, 1973) follows that we first estimate the logarithm of annual wages as a linear function of educational attainment, the field of study, personal characteristics (marital status, language, visible minority, and citizenship), age-group, industry and occupation dummies.

Table 6: Education and Age coefficient estimates from 2015 regression

	Male		Female	
	Coef.	t-stats	Coef.	t-stats
Education[8]:				
High school diploma or equivalent	0.098	12.1	0.065	7.2
Trades certificate or diploma (other than apprenticeship)	-0.112	-6.3	-0.272	-17.3
Registered Apprenticeship certificate	0.041	2.3	-0.25	-11.1
Non-university certificate of 3 months to less than 1 year	-0.065	-3.2	-0.229	-15.0
Non-university certificate of 1 year to 2 years	-0.003	-0.2	-0.117	-8.9
Non-university certificate of more than 2 years	0.047	2.8	-0.005	-0.3
University certificate or diploma below bachelor level	0.063	3.1	0.024	1.5
Bachelor's degree	0.217	14.0	0.191	15.8
University certificate or diploma above bachelor level	0.251	11.1	0.251	14.2
Medical Sciences	0.4	10.7	0.109	3.3
Master's degree	0.305	17.6	0.299	21.3
Earned doctorate degree	0.495	19.7	0.668	24.3
Field of Study[9]:				
Education	0.176	8.3	0.219	16.3
Visual and performing arts, and communications technologies	-0.012	-0.6	0.108	6.7
Social and behavioral sciences and law	0.141	8.7	0.183	16.3
Business, management and public administration	0.263	17.9	0.275	25.6
Physical and life sciences and technologies	0.101	5.4	0.175	11.4
Mathematics, computer and information sciences	0.217	12.9	0.268	15.5
Architecture, engineering, and related technologies	0.282	19.2	0.284	17.2
Agriculture, natural resources and conservation	0.101	4.8	0.101	4.2
Health, parks, recreation and fitness	0.21	10.3	0.282	23.2
Personal, protective and transportation services	0.277	15.9	0.239	15.1
Age Group[10]:				
35-44 years	0.218	37.6	0.187	32.7
45-54 years	0.287	49.7	0.278	49.3
55-64 years	0.211	33.5	0.237	37.5

[8] The default category for Education is No certificate, diploma or degree.
[9] The default category for Field of Study is Humanities.
[10] The default category for Age Group is 25-34 years.

We did the estimation in all years separately for both males and females between the ages of 25-65 that worked full time. In table 6, we reported the results of coefficients for the education-related and age variables for the 2016 census. The complete output is provided in the Appendixes A1, A2, and A3.

The regression results are standard. Wages are lowest for visible minorities, non-citizens, and people without the knowledge of any official language (English or French) for both genders. Wages were lowest for the younger age group (25-34 years) and had a diminishing property as a person becomes older. Management occupations were the highest paying occupation for both sexes. Followed by management occupations are health occupations then occupations in applied sciences for men and flipped for women. The worst paying jobs were occupations in art, culture, recreation, and sport for both males and females. Mining, quarrying, and oil and gas extraction is the best paying industry, followed by utilities. The lowest paying industry is accommodation and food services related. The pattern of industry coefficients is similar for both genders.

For education-related variables, we used a person with no certificate, diploma, or degree as our reference. Men or women with less than secondary education shockingly earn higher than the categories with post-secondary education but no degree. Doctorates were the most top earners for men then followed by medical sciences (medicine, dentistry, etc.) and master's degree holders. For women, the highest returns were for PhDs, Master's degrees, then medical sciences. Humanities were the default group for the field of study. Architecture, engineering, and related technologies were the highest paying field for both males and females. Humanities were the worst paying field for women and fine arts, and communications technologies for men. Test for joint significance of the educational attainment variables suggests that they contribute to explaining wages of both

genders[11]. Also, joint significance of field of study suggests that they explain wages for both males and females in 2015[12]. These results were similar to the 2011 and 2006 census years.

Table 7: Oaxaca decomposition of the gender wage gap

	2015	2010	2005
Total Gap	**0.311**	**0.316**	**0.294**
Explained;			
Total Explained Gap	**0.06**	**0.042**	**0.045**
Educational Attainment	-0.016	-0.013	-0.011
Field of Study	0.013	0.006	0.006
Industry	0.055	0.052	0.049
Occupation	0.01	-0.005	0.003
Age	-0.004	-0.003	-0.003
Language	0.003	0.003	0.002
Visible Minority	0.001	0	0
Province	0.002	0.001	0.001
Citizen	-0.001	-0.001	-0.001
Marital Status	-0.002	-0.002	0
Unexplained;			
Total Unexplained Gap	**0.251**	**0.274**	**0.249**
Educational Attainment	-0.069	-0.053	-0.059
Field of Study	0.033	0.026	0.023
Industry	-0.159	-0.104	0.103
Occupation	0.065	0.043	0.001
Age	0.006	0.002	-0.034
Language	-0.011	-0.011	-0.007
Visible Minority	-0.022	-0.02	-0.015
Province	0.067	0.06	0.018
Citizen	0.018	-0.003	-0.012
Marital Status	0.052	0.036	-0.149
Constant	0.272	0.296	0.388

Gap values for Educational Attainment, Field of Study, Industry, Occupation are derived by adding values from Appendix A1

Table 7 reports the Oaxaca-Blinder decomposition for all census years. The total wage gap was 0.249, 0.316, and 0.311 in 2005, 2010, and 2015 respectively. For 2015, 0.06 (19.3%)[13] of the log-

[11] The F-statistics for joint test of educational attainment variables in 2015 is *F(12,113685) = 172.07* for male and *F(12,102195) = 404.98* for females.

[12] The F-statistics for joint test of field of study variables in 2015 is *F(10,113685) = 87.48* for male and *F(10,102195)=57.91* for females.

[13] The percentages are calculated by dividing total explained gap or total unexplained gap by the total gap in Table7

wage gap is explained by the average differences in wage determining factors between males and females. 0.251 (80.7%) of the difference in earnings is due to unexplained labor characteristics: the unexplained portion is partly due to discrimination. In 2010, 0.042 (13%) of the wage gap as a result of explained labor market characteristics, and the remaining 0.274 (87%) is due to discrimination in the labor market. 0.044 (15%) of wage differences in 2005 is attributed to the average differences in wage determining characteristics, and the remaining 0.249 (85%) is partly attributed to discrimination.

Educational attainment explains the second most significant proportion of the wage gap after an industry for all census years. The field of study and occupation have a similar magnitude on the wage gap. However, in 2015 field of study was more important in explaining the wage differences. A visible minority had little or no effect in explaining the wage gap. Age and knowledge of official language were important in explaining the wage gap as well.

The proportions of the unexplained wage gap with the highest diminishing effect were industry, and then educational attainment comes second. Field of study, occupation, and province were the factors that accounted for an increasing wage gap due to discrimination in 2010 and 2015. Industry, the field of study, and province accounted for the largest part of discrimination in 2005.

Educational attainment had the most considerable weakening effect on the explained and unexplained portion of the total wage gap for all census years[14]. The weakening effect means that educational attainment was reducing the overall wage gap in each census year: In 2005 it reduced the wage gap by 3.7%, 4.1% and 5.1% was reduced in 2010 and 2015 respectively: the observation

[14] The negative values of explained and unexplained wage gap reduce the total wage gap and vice versa

suggests that wage gap is being closed by educational attainment over the years. Other factors that had a weakening effect are age, citizenship, and marital status.

The absolute magnitude of the weakening effect that educational attainment had on an unexplained portion increased from 20% in 2005 to 22% in 2015. It was unlikely for wage discrimination to occur between a woman and a man with the same education. The chance of this unlikeliness has increased over the year. Also, the industry's weakening effect increased by 86% from 2005 to 2015. The level of wage discrimination in the same industry between a male and female was prevalent in 2005. However, in 2010 and 2015, wage discrimination is unlikely to happen within the industry.

Conclusion

A previous study on gender wage gap in Canada (Christie & Shannon, 2001) found that wage differences decreased from 0.434 in 1985 to 0.387 in 1990. In our study, wage gap declined further to 0.294 in 2005 but increased to 0.316 in 2010. In 2015. However, in 2015 it declined again to 0.311. However, a greater proportion of the wage gap was due to discrimination in the labor market in favor of men. Between 80% to 87% of the wage difference was accounted for by wage discrimination. Wage gap has declined beyond the projections of 0.350 by (Christie & Shannon, 2001) and we expect the gap to close further in the future.

In Canada, the share of women with higher education have surpassed that of men. The total share of men with at least a bachelor's degree decreased from 54% in 2005 to 48% in 2015 whiles share of women increased to 52% in 2015 from 46% in 2005. Educational attainment as a wage determining factor has shown to have a weakening effect on the wage gap with its effect on the wage increasing over time. The wage gap was reduced by 3.7%, 4.1%, and 5.1% by educational

attainment in 2005, 2010 and 2015 respectively. Interestingly, educational attainment severed as a factor that reduced wage discrimination in the labor market. It reduced wage discrimination by 20% in 2005, 17% in 2010, and 22% in 2015

These findings suggest that increasing educational attainment of women is important in closing the gender wage gap. Also, in order to address wage discrimination, it is important for women to attain higher education. It is therefore important to inspire women to access higher education through scholarships and funding policies. These and other motivational packages will not only reduce the wage gap but also it will ameliorate gender wage discrimination in the labor market. It is important to note that if women enroll more into STEM programs it has likelihood to reduce the wage gap faster. Therefore, future studies will have to analyze the importance of increasing enrollment of women into STEM programs on the gender wage gap.

Appendix

Appendix A1: OLS regression for 2006 Census

2006 Census				
Variable Label	Male		Female	
	Coef.	t-stats	Coef.	t-stats
Education[1]:				
High school diploma or equivalent	0.106	14.757	0.129	16.322
Trades certificate or diploma (other than apprenticeship)	-0.039	-2.365	-0.066	-4.374
Registered Apprenticeship certificate	0.053	3.133	-0.037	-1.873
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	-0.071	-3.408	0.011	0.655
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	0.051	3.236	0.094	6.818
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	0.112	7.083	0.205	14.467
University certificate or diploma below bachelor level	0.103	6.043	0.23	15.67
Bachelor's degree	0.243	16.357	0.393	30.215
University certificate or diploma above bachelor level	0.285	14.433	0.442	25.952
Degree in medicine, dentistry, veterinary medicine or optometry	0.534	14.114	0.383	10.259
Master's degree	0.331	19.798	0.504	32.739
Earned doctorate degree	0.531	21.728	0.567	19.697
Field of Study[2]:				
Education	0.111	5.667	0.047	3.423
Visual and performing arts, and communications technologies	-0.044	-2.214	-0.015	-0.873
Social and behavioral sciences and law	0.104	6.582	0.053	4.325
Business, management and public administration	0.184	12.9	0.134	11.731
Physical and life sciences and technologies	0.112	6.148	0.035	2.037
Mathematics, computer and information sciences	0.15	8.964	0.148	9.328
Architecture, engineering, and related technologies	0.191	13.519	0.11	6.52
Agriculture, natural resources and conservation	0.032	1.615	-0.005	-0.194
Health, parks, recreation and fitness	0.152	8.13	0.204	16.5
Personal, protective and transportation services	0.182	10.501	0.107	6.539
Industry[3]:				
Mining and oil and gas extraction (21)	0.855	40.844	0.638	16.884
Utilities (22)	0.699	29.059	0.601	15.852
Construction (23)	0.287	14.587	0.239	7.212
Manufacturing (31-33)	0.481	25.533	0.318	10.623
Wholesale trade (41)	0.404	20.619	0.321	10.519
Retail trade (44-45)	0.123	6.289	-0.015	-0.489
Transportation and warehousing (48-49)	0.345	17.53	0.279	8.953
Information and cultural industries (51)	0.516	23.503	0.409	13.08
Finance and insurance (52)	0.596	28.043	0.358	12.008
Real estate and rental and leasing (53)	0.201	8.372	0.151	4.581

Professional, scientific and technical services (54)	0.341	17.126	0.258	8.619
Management of companies and enterprises (55)	0.659	9.828	0.447	6.902
Administrative and support, waste management and remediation	0.079	3.788	0.04	1.294
Educational services (61)	0.243	10.659	0.228	7.446
Health care and social assistance (62)	0.201	9.046	0.13	4.381
Arts, entertainment and recreation (71)	0.092	3.522	0.018	0.525
Accommodation and food services (72)	-0.162	-7.411	-0.215	-7.037
Other services (except public administration) (81)	0.138	6.651	0.01	0.326
Public administration (91)	0.518	26.689	0.432	14.574
Occupation[4]:				
B Business, finance and administrative occupations	-0.344	-43.098	-0.304	-43.339
C Natural and applied sciences and related occupations	-0.181	-21.862	-0.114	-9.427
D Health occupations	-0.265	-20.935	-0.197	-22.321
E Occupations in social science, education, government serv.	-0.213	-11.722	-0.145	-10.548
F Occupations in art, culture, recreation and sport	-0.5	-28.85	-0.421	-28.684
G Sales and service occupations	-0.342	-45.749	-0.448	-57.757
H Trades, transport and equipment operators and related	-0.342	-46.948	-0.402	-23.53
I Occupations unique to primary industry	-0.54	-31.25	-0.834	-25.045
J Occupations unique to processing, manufacturing and utilities	-0.385	-39.219	-0.434	-32.507
Age Group[5]:				
35-44 years	0.171	30.441	0.194	35.174
45-54 years	0.225	38.299	0.271	47.924
55-64 years	0.16	22.555	0.248	34.569
Personal:				
French Only	-0.106	-14.259	-0.12	-17.519
Bilingual	-0.023	-4.057	0.018	3.403
Other language	-0.229	-7.263	-0.187	-6.423
Visible Minority	-0.187	-24.8	-0.076	-10.401
Citizenship	0.003	15.61	0.002	13.383
Marital Status	-0.073	-14.361	-0.063	-12.382
Province	-0.062	-27.922	-0.003	-1.37
Constant	10.527	454.04	10.139	311.937
Observations	109,157		84,376	
R-Squared	0.228		0.3	

[1] The default category for Education is No certificate, diploma or degree.
[2] The default category for Field of Study is Humanities.
[3] The default category for Industry is Agriculture, forestry, fishing and hunting
[4] The default category for Occupation is Management occupations
[5] The default category for Age Group is 25-34 years.

Appendix A2: OLS regression for 2011 Census

2011 Census				
Variable Label	Male		Female	
	Coef.	t-stats	Coef.	t-stats
Education[1]:				
High school diploma or equivalent	0.11	14.274	0.118	13.432
Trades certificate or diploma (other than apprenticeship)	-0.069	-4.235	-0.08	-5.132
Registered Apprenticeship certificate	0.051	3.137	-0.038	-1.895
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	-0.056	-2.697	-0.026	-1.594
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	0.034	2.169	0.053	3.766
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	0.075	4.821	0.164	11.411
University certificate or diploma below bachelor level	0.105	6.201	0.214	14.147
Bachelor's degree	0.25	17.215	0.375	28.464
University certificate or diploma above bachelor level	0.246	12.896	0.419	24.71
Degree in medicine, dentistry, veterinary medicine or optometry	0.519	14.828	0.437	12.517
Master's degree	0.338	20.625	0.45	29.276
Earned doctorate degree	0.566	23.575	0.61	21.413
Field of Study[2]:				
Education	0.13	6.873	0.08	6.089
Visual and performing arts, and communications technologies	-0.011	-0.598	-0.007	-0.435
Social and behavioral sciences and law	0.13	8.584	0.076	6.43
Business, management and public administration	0.216	15.826	0.155	13.905
Physical and life sciences and technologies	0.089	5.083	0.005	0.324
Mathematics, computer and information sciences	0.156	9.773	0.149	8.94
Architecture, engineering, and related technologies	0.206	15.198	0.136	8.195
Agriculture, natural resources and conservation	0.05	2.605	0.005	0.205
Health, parks, recreation and fitness	0.142	7.626	0.175	14.261
Personal, protective and transportation services	0.22	13.347	0.16	9.912
Industry[3]:				
21 Mining, quarrying, and oil and gas extraction	0.863	40.787	0.884	22.609
22 Utilities	0.698	28.71	0.817	20.7
23 Construction	0.271	13.59	0.39	11.263
31-33 Manufacturing	0.378	19.496	0.471	14.543
41 Wholesale trade	0.343	17.114	0.481	14.7
44-45 Retail trade	0.046	2.301	0.117	3.691
48-49 Transportation and warehousing	0.271	13.487	0.431	12.946
51 Information and cultural industries	0.44	19.822	0.482	14.329
52 Finance and insurance/55 Management of companies	0.515	24.124	0.508	15.936
53 Real estate and rental and leasing	0.13	5.442	0.31	8.946

54 Professional, scientific and technical services	0.338	16.75	0.381	11.912
56 Administrative and support, waste management	0.012	0.579	0.155	4.707
61 Educational services	0.229	10.495	0.417	12.969
62 Health care and social assistance	0.107	4.739	0.245	7.76
71 Arts, entertainment and recreation	0.017	0.647	0.16	4.494
72 Accommodation and food services	-0.241	-10.971	0.009	0.287
81 Other services (except public administration)	0.108	5.124	0.1	3.078
91 Public administration	0.475	24.11	0.583	18.429
Occupation[4]:				
B Business, finance and administrative occupations	-0.352	-44.374	-0.354	-48.719
C Natural and applied sciences and related occupations	-0.195	-23.871	-0.136	-10.805
D Health occupations	-0.095	-4.851	-0.144	-13.759
E Occupations in social science, education, government serv.	-0.252	-21.591	-0.263	-28.645
F Occupations in art, culture, recreation and sport	-0.546	-33.467	-0.485	-33.81
G Sales and service occupations	-0.387	-51.844	-0.573	-72.439
H Trades, transport and equipment operators and related	-0.359	-49.169	-0.394	-21.264
I Occupations unique to primary industry	-0.567	-33.152	-0.705	-20.174
J Occupations unique to processing, manufacturing and utilities	-0.416	-39.242	-0.522	-32.935
Age Group[5]:				
35-44 years	0.223	39.611	0.192	33.815
45-54 years	0.279	50.429	0.282	50.923
55-64 years	0.199	31.138	0.226	34.537
Personal:				
French Only	-0.148	-18.907	-0.136	-18.945
Bilingual	-0.055	-9.962	-0.004	-0.735
Other language	-0.143	-5.169	-0.134	-5.067
Visible Minority	-0.166	-23.526	-0.042	-5.881
Citizenship	-0.079	-16.128	-0.077	-15.365
Marital Status	0.02	9.122	0.004	2.235
Province	0.004	21.578	0.002	12.51
Constant	10.423	453.96	10.127	296.191
Observations	120,176		109,002	
R-Squared	0.229		0.269	

[1] The default category for Education is No certificate, diploma or degree.

[2] The default category for Field of Study is Humanities.

[3] The default category for Industry is Agriculture, forestry, fishing and hunting

[4] The default category for Occupation is Management occupations

[5] The default category for Age Group is 25-34 years.

Appendix A3: OLS regression for 2016 Census

2016 Census				
Variable Label	Male		Female	
	Coef.	t-stats	Coef.	t-stats
Education[1]:				
High school diploma or equivalent	0.098	12.08	0.065	7.212
Trades certificate or diploma (other than apprenticeship)	-0.112	-6.288	-0.272	-17.319
Registered Apprenticeship certificate	0.041	2.317	-0.25	-11.068
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	-0.065	-3.232	-0.229	-14.992
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	-0.003	-0.203	-0.117	-8.925
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	0.047	2.819	-0.005	-0.348
University certificate or diploma below bachelor level	0.063	3.138	0.024	1.499
Bachelor's degree	0.217	13.967	0.191	15.81
University certificate or diploma above bachelor level	0.251	11.14	0.251	14.214
Degree in medicine, dentistry, veterinary medicine or optometry	0.4	10.663	0.109	3.349
Master's degree	0.305	17.572	0.299	21.328
Earned doctorate degree	0.495	19.666	0.668	24.293
Field of Study[2]:				
Education	0.176	8.335	0.219	16.286
Visual and performing arts, and communications technologies	-0.012	-0.609	0.108	6.662
Social and behavioral sciences and law	0.141	8.731	0.183	16.251
Business, management and public administration	0.263	17.888	0.275	25.563
Physical and life sciences and technologies	0.101	5.38	0.175	11.418
Mathematics, computer and information sciences	0.217	12.892	0.268	15.467
Architecture, engineering, and related technologies	0.282	19.212	0.284	17.158
Agriculture, natural resources and conservation	0.101	4.792	0.101	4.202
Health, parks, recreation and fitness	0.21	10.284	0.282	23.173
Personal, protective and transportation services	0.277	15.912	0.239	15.072
Industry[3]:				
21 Mining, quarrying, and oil and gas extraction	1.213	59.176	1.332	37.491
22 Utilities	1.039	43.602	1.243	32.116
23 Construction	0.564	31.68	0.719	24.153
31-33 Manufacturing	0.679	39.047	0.838	30.571
41 Wholesale trade	0.693	37.963	0.897	31.846
44-45 Retail trade	0.386	21.849	0.477	18.027
48-49 Transportation and warehousing	0.593	32.488	0.785	27.523
51 Information and cultural industries	0.774	37.338	0.917	31.245
52 Finance and insurance/55 Management of companies	0.893	46.017	0.956	35.669
53 Real estate and rental and leasing	0.447	18.817	0.636	20.417
54 Professional, scientific and technical services	0.616	33.69	0.741	27.497
56 Administrative and support, waste management	0.339	17.426	0.53	18.886
61 Educational services	0.465	22.923	0.795	29.322
62 Health care and social assistance	0.412	19.441	0.615	23.239
71 Arts, entertainment and recreation	0.273	10.557	0.486	15.218
72 Accommodation and food services	0.108	5.39	0.346	12.624
81 Other services (except public administration)	0.36	18.301	0.439	15.853
91 Public administration	0.751	41.597	0.965	36.108
Occupation[4]:				
B Business, finance and administrative occupations	-0.285	-33.921	-0.313	-43
C Natural and applied sciences and related occupations	-0.14	-16.687	-0.107	-8.193
D Health occupations	-0.084	-3.999	-0.137	-12.981

E Occupations in social science, education, government serv.	-0.141	-13.292	-0.279	-31.508
F Occupations in art, culture, recreation and sport	-0.544	-30.011	-0.593	-36.513
G Sales and service occupations	-0.403	-51.618	-0.544	-70.219
H Trades, transport and equipment operators and related	-0.283	-37.754	-0.428	-21.048
I Occupations unique to primary industry	-0.176	-9.861	-0.363	-8.851
J Occupations unique to processing, manufacturing and utilities	-0.314	-29.828	-0.485	-30.423
Age Group[5]:				
35-44 years	0.218	37.608	0.187	32.68
45-54 years	0.287	49.707	0.278	49.252
55-64 years	0.211	33.5	0.237	37.513
Personal:				
French Only	-0.164	-19.423	-0.138	-18.103
Bilingual	-0.047	-8.25	-0.002	-0.344
Other language	-0.218	-6.955	-0.221	-7.3
Visible Minority	-0.169	-23.973	-0.048	-7.007
Citizenship	-0.089	-17.881	-0.097	-19.361
Marital Status	0.026	11.492	0.002	1.18
Province	0.004	22.857	0.002	13.85
Constant	10.151	483.635	9.937	339.722
Observations	113,745		102,255	
R-Squared	0.243		0.287	

[1] The default category for Education is No certificate, diploma or degree.

[2] The default category for Field of Study is Humanities.

[3] The default category for Industry is Agriculture, forestry, fishing and hunting

[4] The default category for Occupation is Management occupations

[5] The default category for Age Group is 25-34 years.

Appendix B1: Detailed Oaxaca decomposition of the gender wage gap for 2016 and 2011

	2016 Census				2011 Census			
Difference	0.311				0.316			
Total explained	0.06				0.042			
Total unexplained	0.251				0.274			
Variable Name	Explained		Unexplained		Explained		Unexplained	
	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats
HDGREE2	0.002	8.671	-0.008	-2.596	0	0.699	-0.002	-0.535
HDGREE3	-0.002	-7.193	0	-0.096	-0.001	-4.281	0	0.255
HDGREE4	0.004	4.961	0	-0.014	0.004	5.075	0	0.296
HDGREE5	0.002	5.435	0	0.147	0.001	2.317	-0.001	-0.835
HDGREE6	-0.001	-2.475	-0.005	-1.827	-0.002	-4.529	-0.002	-0.657
HDGREE7	-0.001	-4.913	-0.01	-4.617	-0.001	-3.513	-0.009	-3.618
HDGREE8	-0.002	-8.69	-0.003	-4.19	-0.003	-10.605	-0.005	-4.03
HDGREE9	-0.016	-20.298	-0.029	-6.034	-0.012	-17.171	-0.023	-5.333
HDGREE10	-0.003	-11.352	-0.003	-5.124	-0.003	-11.482	-0.005	-5.829
HDGREE11	0	-0.25	0.001	1.601	0	3.202	0	1.148
HDGREE12	-0.002	-5.279	-0.01	-6.652	0.001	1.54	-0.006	-4.262
HDGREE13	0.003	9.971	-0.002	-3.969	0.003	12.236	0	-0.964
CIP1	-0.008	-14.3	0.001	1.402	-0.005	-8.676	0.003	2.373
CIP2	0	0.037	-0.001	-1.258	0	1.138	0	-0.153
CIP4	-0.006	-9.897	0.003	2.09	-0.004	-8.227	0.003	2.186
CIP5	-0.017	-20.153	0.011	3.592	-0.014	-16.514	0.009	2.765
CIP6	0	-1.453	0.001	1.781	0	2.47	0.002	3.104
CIP7	0.005	14.559	0.002	2.07	0.003	10.612	0.001	0.785
CIP8	0.061	24.417	0.01	3.243	0.044	17.114	0.008	2.647
CIP9	0	2.991	0.001	2.966	0	1.168	0.001	1.495
CIP10	-0.024	-16.754	0	0.253	-0.02	-14.098	-0.003	-1.524
CIP11	0.002	9.065	0.005	5.559	0.002	8.735	0.002	2.532
NAICS2	0.022	28.193	-0.001	-2.378	0.015	23.772	-0.001	-0.873
NAICS3	0.01	20.474	-0.001	-3.486	0.007	17.477	-0.001	-2.08
NAICS4	0.048	24.26	-0.006	-3.044	0.021	12.365	-0.005	-2.37
NAICS5	0.07	28.417	-0.013	-2.877	0.039	16.636	-0.008	-1.763
NAICS6	0.024	23.6	-0.008	-3.759	0.013	14.889	-0.007	-2.666
NAICS7	-0.008	-11.268	-0.01	-1.679	-0.001	-2.327	-0.008	-1.299
NAICS8	0.028	23.382	-0.007	-3.379	0.014	12.52	-0.006	-2.912
NAICS9	0.007	11.428	-0.003	-2.297	0.002	7.453	-0.001	-0.697
NAICS10	-0.026	-22.909	-0.005	-1.252	-0.017	-17.252	-0.001	-0.158
NAICS11	0.001	3.003	-0.002	-2.963	0	2.875	-0.003	-2.835
NAICS12	0.007	9.426	-0.008	-2.066	0.004	8.735	-0.003	-0.739
NAICS13	0.001	4.635	-0.006	-3.385	0	2.378	-0.004	-2.461
NAICS14	-0.035	-22.428	-0.024	-4.766	-0.017	-12.589	-0.015	-2.852
NAICS15	-0.091	-20.361	-0.031	-3.229	-0.03	-7.139	-0.018	-1.91
NAICS16	0	-1.124	-0.002	-3.215	0	-1.448	-0.002	-2.227
NAICS17	-0.003	-7.563	-0.011	-4.152	0.002	5.035	-0.011	-4.039
NAICS18	-0.002	-4.95	-0.003	-1.353	0	-2.787	0	0.089
NAICS19	0.002	2.021	-0.018	-3.855	0	-0.327	-0.01	-1.946

NOCS2	0.053	46.9	0.007	3.007	0.07	53.203	0.002	0.686
NOCS3	-0.016	-22.348	0	0.423	-0.019	-26.718	-0.002	-1.95
NOCS4	0.01	9.896	0.006	4.801	0.011	10.937	0.004	3.704
NOCS5	0.019	28.908	0.018	10.989	0.021	28.425	0.002	1.054
NOCS6	0.002	5.138	0.001	1.715	0.003	10.253	-0.001	-2.052
NOCS7	0.027	32.256	0.023	10.946	0.019	23.453	0.033	13.985
NOCS8	-0.067	-41.817	0.003	2.473	-0.082	-45.542	0	-0.215
NOCS9	-0.003	-9.291	0.001	2.562	-0.012	-21.8	0.001	1.954
NOCS10	-0.015	-32.099	0.006	8.312	-0.016	-32.225	0.004	4.893
AGEGRP2	0.001	3.002	0.008	4.12	0.001	2.666	0.008	3.511
AGEGRP3	-0.005	-9.411	0.003	1.132	-0.005	-9.702	-0.001	-0.349
AGEGRP4	0	-0.569	-0.005	-2.808	0.001	1.986	-0.005	-2.427
KOL2	0.003	12.948	-0.003	-3.069	0.003	12.949	-0.001	-1.014
KOL3	0	0.797	-0.008	-4.758	0	-1.315	-0.01	-6.024
KOL4	0	0.218	0	-0.601	0	1.318	0	-0.187
VISMIN	0.001	2.72	-0.022	-12.047	0	-0.939	-0.02	-11
PR	0.002	7.855	0.067	7.1	0.001	6.591	0.06	5.748
Citizen	-0.001	-4.195	0.018	1.924	-0.001	-4.206	-0.003	-0.245
MarStH	-0.002	-8.754	0.052	8.091	-0.002	-6.587	0.036	4.982
Constant			0.272	4.733			0.296	4.996
Observations		216,000				229,178		

Variable names correspond to variable labels in Appendix A2 and A3

Appendix B2: Detailed Oaxaca decomposition of the gender wage gap for 2006 census

2006 Census				
Difference	0.294			
Total explained	0.045			
Total unexplained	0.249			
Variable Name	Explained		Unexplained	
	Coef.	t-stats	Coef.	t-stats
HDGREE2	-0.002	-7.825	-0.005	-2.099
HDGREE3	-0.001	-2.991	0.002	0.942
HDGREE4	0.003	5.327	0.001	0.814
HDGREE5	0.001	1.722	-0.002	-2.835
HDGREE6	-0.003	-6.952	-0.004	-1.843
HDGREE7	0	-1.644	-0.009	-4.17
HDGREE8	-0.003	-10.776	-0.006	-5.179
HDGREE9	-0.007	-12.021	-0.025	-7.08
HDGREE10	-0.003	-10.442	-0.004	-5.527
HDGREE11	0	2.556	0.001	1.664
HDGREE12	0.001	3.152	-0.008	-6.985
HDGREE13	0.003	11.665	0	-0.613
CIP1	-0.004	-7.708	0.004	3.448
CIP2	0	1.592	-0.001	-0.993
CIP4	-0.003	-6.509	0.003	2.175
CIP5	-0.013	-14.6	0.007	2.23
CIP6	0	4.053	0.002	2.884
CIP7	0.002	9.373	0	0.302
CIP8	0.044	17.133	0.006	1.98
CIP9	0	0.626	0.001	1.329
CIP10	-0.021	-17.571	-0.002	-1.455
CIP11	0.001	6.871	0.003	3.128
NAICS2	0.014	24.112	0.002	2.966
NAICS3	0.007	17.499	0.001	1.565
NAICS4	0.018	13.531	0.001	0.435
NAICS5	0.051	21.849	0.018	3.223
NAICS6	0.013	16.768	0.003	1.453
NAICS7	-0.002	-4.102	0.014	2.848
NAICS8	0.015	15.752	0.002	1.099
NAICS9	0	0.972	0.003	2.146
NAICS10	-0.021	-20.687	0.015	4.397
NAICS11	0	2.432	0.001	0.86
NAICS12	0.003	6.543	0.005	1.66
NAICS13	0	-1.072	0	2
NAICS14	0	-0.696	0.001	0.8
NAICS15	-0.016	-13.22	0.004	0.905
NAICS16	-0.034	-10.642	0.016	2.187
NAICS17	0	-1.683	0.001	1.332
NAICS18	0.003	6.998	0.003	1.193
NAICS19	0	-2.222	0.005	2.603
NAICS20	-0.002	-2.839	0.008	1.832

NOCS2	0.074	53.166	-0.009	-3.488
NOCS3	-0.016	-25.572	-0.002	-2.61
NOCS4	0.028	25.945	-0.005	-3.092
NOCS5	0.007	15.39	-0.003	-3.202
NOCS6	0.003	9.192	-0.002	-2.768
NOCS7	0.011	15.876	0.018	8.552
NOCS8	-0.077	-48.963	-0.002	-1.612
NOCS9	-0.011	-22.927	0.003	4.791
NOCS10	-0.016	-30.123	0.003	2.909
AGEGRP2	-0.001	-1.68	-0.007	-2.941
AGEGRP3	-0.006	-12.036	-0.015	-5.736
AGEGRP4	0.004	11.339	-0.012	-8.329
KOL2	0.002	9.257	0.001	1.461
KOL3	0	0.832	-0.008	-5.32
KOL4	0	1.705	0	-0.958
VISMIN	0	2.252	-0.015	-9.832
PR	0.001	7.469	0.018	2.012
CITIZEN	-0.001	-3.559	-0.012	-1.24
MARST	0	2.831	-0.149	-20.879
Constant			0.388	7.584
Observations		193,533		

Variable names correspond to variable labels in Appendix A1

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