

Increasing Earnings Inequality and the Gender Pay Gap in Canada: Prospects for Convergence[†]

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Abstract. This paper retraces the evolution of Canadian women's labour force participation and of the gender earnings ratio across the generations to understand better the prospects for gender convergence in pay. Using data from the public use Labour Force Surveys (LFS), as well as administrative annual earnings data from the Longitudinal Workers Files (LWF), the paper assesses the role of increasing top earnings inequality in the persistence of the gender pay gap. Having identified a growing role for the under-representation of women among top earners, the paper then performs an evaluation and critical analysis of existing gender equality policies, centered on horizontal occupational gender segregation, and discusses alternative policies for the future.

Résumé. Cet article retrace l'évolution de la participation des femmes au marché du travail canadien et celle du rapport des salaires femmes-hommes à travers les générations afin de mieux comprendre les perspectives de convergence de ces salaires. En utilisant les données à usage public des Enquêtes sur la Population Active (EPA), ainsi que les données administratives sur les gains annuels des Fichiers de Données Longitudinales sur la Main-d'Oeuvre (FDLMO), l'article évalue le rôle de l'augmentation des inégalités de hauts revenus dans la persistance de l'écart salarial entre les sexes. Ayant identifié l'impact croissant de la sous-représentation des femmes aux échelons supérieurs de salaires dans l'écart salarial moyen entre les sexes, cet article effectue une évaluation et analyse critique des politiques publiques de parité salariale existantes axées sur la ségrégation occupationnelle horizontale entre hommes et femmes et suggère des politiques alternatives pour l'avenir.

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1. Introduction

One of the most remarkable labour market developments in the second half of the twentieth century has been the dramatic increase in women's labour force participation, as shown in Figure 1. The strong growth in female labour force participation (LFP) among workers aged 25 to 64 of more than 1% a year in this period has, however, been replaced in the 2000s by a significant leveling-off in Canada as a whole.¹ Figure 1 singles out the province of Quebec which introduced a subsidized universal child-care program in 1997 and saw more continuous growth in female LFP.² The figure also shows a substantial convergence of the labour force participation between men and women, as the divergence therein narrowed from more than 40 percentage points in the late 1970s to single digits in the 2010s. It might be natural to anticipate a steady gender convergence in pay given this longstanding gender convergence in labour force participation.

[Insert Figure 1]

The goal of the current paper is to document the gender convergence in pay in Canada and assess the prospects for future progress. Of particular concern are the presence of strong cohort effects and persistent gender-specific life-cycle effects, overall increasing wage and earnings inequality, and public policies that focus on peculiar dimensions of gender inequality, thus leaving open the possibility of unintended consequences. The paper discusses the convergence in pay measured primarily by the female-male differences in average pay, although the discussion will suggest that this measure may miss some critical dimensions of gender disparities in earnings.³ Indeed, new reporting requirements, implemented in the United Kingdom in April 2018, ask firms with more than 250 employees to post six (6) measures of the gender pay gap: the mean and median gender pay gap, the mean and median bonus gender pay gap, the proportion of males and females receiving a bonus payment, and the proportion of males and females in each pay quartile. In Canada, the gender pay ratio remains the primary indicator of labour market gender disparities for advocates and policymakers.

Therefore understanding the sources of the average gender pay gap is essential to

¹ Starting at age 25 avoids problems linked to full-time/part-time students who take-on jobs not representative of their long term career prospects. Individuals between the ages of 15 and 24 are thus excluded.

² More precisely, for Canada as a whole, while female LFP grew at a rate of 0.6% over the entire period, that rate was twice as high at 1.1% from 1976 to 1996, and down to 0.3% from 1997 to 2017. In Quebec, that rate was at 1.2% from 1976 to 1996, and continued at 0.6% from 1997 to 2017, twice the rate of Canada as a whole. Note that the slightly higher female LFP rate in 2017 in Quebec than in Canada (78.9% vs 77.4%) is not found in the "employed at work" numbers (65.8% vs 65.7%) and could be related to differences in maternity leaves policies ("employed, not at work", but still "in the labor force") discussed in Section 4.

³ Gender differences in pay are usually reported in one of two ways, reflecting a "glass half-full" or "glass half-empty" perspective. The "gender pay ratio" refers to women's average pay expressed as a percentage of men's average pay. The "gender pay gap" is the difference between women's and men's average pay expressed as a percentage of men's average pay; it is equal to 100 minus the ratio. Alternatively, median pay can be used instead of average pay; pay here refers to hourly wages or annual earnings.

devise policies that achieve greater effectiveness toward the goal of shrinking that gap. As the accounting identity presented below will suggest, at least three-quarters of the average gap originate among the top 10% of earners. Thus policies that target gender disparities in pay originating from horizontal segregation, such as comparable worth or pay equity policies, will have limited effectiveness when the more important source of the gap comes from vertical segregation.⁴ To facilitate discussions and replications, most of the analysis draws on data from the public use files of Statistics Canada's Labour Force Surveys (LFS) and makes extensive use of data visualization to illustrate the trends. Some analyses focusing on top earners appeal to data sources where the representation of these high incomes individuals is superior to that of the LFS, namely Statistics Canada's confidential Longitudinal Workers Files (LWF).

In Section 2, the paper begins by setting up the stage for a more nuanced view of the gender pay gap in Canada than is generally portrayed in the public debate, by considering generational and life-cycle issues. The analysis shows that, by 2010, improvements in the gender pay gap associated with the 1960s Women's Revolution had largely been exhausted. In Section 3, the paper turns to a new accounting identity, as well as simulation exercises, to assess the impact of the under-representation of women among top earners on the gender pay gap. This section shows that this impact has been increasing over time in Canada, as well as in Sweden and the United Kingdom. In light of the deepening consequences of vertical segregation, Section 4 evaluates the effectiveness of existing pay equality policies at closing the gender pay gap. It provides the first short-run and long-run evaluation, using a differences-in-differences framework, of the policies implemented in the 2000s in the province of Quebec.⁵ These include the well-known subsidized day-care policy that began in 1997, a pay equity policy actually implemented in the private sector in 2001, and extensions to parental leaves introduced in 2006. The analysis shows that the family-friendly policies have been relatively more effective than the pay equity policy, whose effectiveness appears increasingly limited by design.⁶ In Section 5, the paper concludes by reviewing alternative policies, including some of the more novel policies implemented in Europe, and identifying areas for

⁴ The terminology "horizontal segregation" refers to gender segregation across different types of occupations (e.g., teacher vs. engineer) requiring similar levels of education, as well as potentially similar levels of job characteristics (skills, effort, responsibilities, and working conditions) used to evaluate the "comparable worth" of occupations. By contrast, "vertical segregation" refers to occupational gender segregation across different levels of the job ladder in the organization, perhaps in the same realm of expertise (e.g., assistant teacher vs. teacher vs. school principal), but likely requiring different levels of education. The use of the word "segregation" refers to "de facto" segregation, the fact that women and men are often observed in different occupations, not to "de jure" segregation. For example, pay equity policies distinguish "predominantly female job classes" from "predominantly male job classes".

⁵ Van Audenrode, Paradis, and Lafeuille (2008) perform an analysis of the Quebec pay equity law up to 2005. They include comparisons with Ontario and with British Columbia, but do not perform a formal differences-in-differences analysis.

⁶ By design, pay equity policies pertain to horizontal segregation aiming to redress pay in predominantly female occupations, but do not address gender disparities arising across firms/industries or from vertical segregation within firms. Section 4 shows that the wage benefits from pay equity have been tapped and a dis-explaining role of occupations appears to be growing over time.

future research.

2. Women's Labour Market Decisions across the Generations and over the Life-Cycle

2.1 Trends in Labour Supply

According to the Mincer-Polachek hypothesis (1974), gender differences in experience and labour force attachment are the key determinants of the gender wage gap, consistent with the human capital model. In this model, given the almost complete closing of the gender gap in educational attainment, further closing of the gender pay gap would be contingent on the extent to which labour market experience also converged across genders. Blau and Kahn (2017) have indeed found that declining gender differences in labour experience in the United States accounted for 18-31% of wage convergence between men and women over the 1980-2000 period. The human capital model also predicts the typical pattern of experience(age)-earnings profiles over the life-cycle: after a steep climb following labour market entry, earnings should level off during middle-ages and then decline as labour market experience depreciates closer to retirement age.⁷

[Insert Figure 2]

It is, therefore, useful to understand women's historical prospects for the accumulation of labour force experience over the life-cycle across birth cohorts in this context. Goldin and Katz (2002) and Bailey (2006) point out to fundamental changes in women's LFP emanating from the Women's Liberation Movement of the 1960s and the introduction of the "Pill" as a reliable contraceptive. Figure 2 displays the female LFP by birth cohorts distinguishing the pre-Pill birth cohorts (the mid-1950s and earlier) from subsequent cohorts.⁸ As underlined by Bailey (2006) for the United States, the life-cycle participation pattern of women from the 1940-45 birth cohort, for example, in Figure 2 is hump-shaped.⁹ This pattern reflects the fact that, for most women from earlier generations, motherhood and homemaking were their primary "career". They often entered the labour market after having raised their children and retired from secondary careers that had offered little upward mobility, earlier than subsequent generations. By contrast, the labour force participation of women from the 1959-65 birth cohort, for example, in Figure 2 is much more constant over the life-cycle, more like men's. These post-Pill women acquired higher education in greater numbers (Goldin, Katz, and Kuziemko, 2006) and, at age 25, were participating in the labour market at rates approaching

⁷ See Beaudry and Green (2000) for an analysis of the age-earnings profiles of Canadian men across cohorts and education level.

⁸ The numbers "30" in the figure indicate the year the cohort members were 30 years old on average.

⁹ The trends are smoothed as three-years moving averages, except for the first and last years which are two-years moving averages. Because the age variable is available in 5-years categories in the public use LFS files, attrition in the older age group leads to a misleading upward bend in LFP. Only the younger of the oldest category are observed in the later years. This upward bend is an artifact of the data construction under these constraints and should be disregarded.

80% since the 1990s.¹⁰ Therefore, the gradual convergence between men and women labour force participation in Figure 1 masks the more dramatic shifts across the generations from hump-shaped patterns of female LFP to more linear ones, illustrated in Figure 2.¹¹

[Insert Figure 3]

The generational progress shown at the extensive margin in Figure 2 is also found at the intensive margin in Figure 3, which displays the gender gap in weekly hours of work, focusing only on women who supply positive hours to the labour market. Here at the intensive margin, increases in the gender ratio of weekly hours of work across cohorts appear more pronounced than the life-cycle changes. The gender ratio in hours of work among the pre-Pill cohorts is below 80%; among recent cohorts, the gender weekly hours ratio exceeds 85%. Some of the acceleration in the overall ratio in the late 1990s is coming from the fact that 1921-1939 cohorts reached retirement age. The life-cycle profiles of the gender ratio in hours of work nevertheless show substantial reductions around childbearing ages, but a consistent rebound at older ages for the baby-boom generations (1946-53, 1954-58, 1959-65).¹² The still sizeable differences in weekly hours of work across genders imply that the comparison of hourly wages across gender is needed to avoid confounds from labour supply issues.

2.2 *Trends in Gender Earnings Ratio*

Despite more sustained labour force participation and labour supply, illustrated in Figures 2 and 3, women from the post-Pill generations naturally withdraw from the labour market for childbirth and childcare. These withdrawals may lead to earning losses larger than those associated with interruptions in the accumulation of on-the-job human capital as predicted by a simple reduction in labour market experience. By allowing women to return to the same employer, maternity leaves are intended to minimize earnings losses from childbearing. However, depending on the length of the absence from work, many mothers may face delays or miss altogether some promotion opportunities. Others return to work on a part-time basis or in positions that offer more flexible work hours. These labour market interruptions imply that the age-earning profiles of mothers will likely show an earnings dip around childbearing ages with differential rebounds depending on the length of the maternity leaves, the age of childbearing, and the conditions of their return to work.

A growing body of literature studying the impact of children on mothers' earnings has indeed found large and persistent negative effects on labour market outcomes, often

¹⁰ Fortin (2015) also documents the decline in traditional gender roles attitudes—men as breadwinners and women as homemakers—across cohorts; noting however that this decline stabilized in the mid-1990s in the United States.

¹¹ Goldin and Mitchell (2017) document a similar shift in life-cycle patterns across cohorts by for the United States.

¹² There are differences in access to contraceptive technology (the Pill and abortions) from the early baby boom cohort (1946-53) to the middle baby boom cohort (1954-59), and to the late boomers (1959-65) that warrant these distinctions.

using employer-employee databases.¹³ While each study emphasizes a particular aspect of the employment relationship and work-life balance, in the end, the findings offer a consensus. Following childbirth, mothers are less likely to further their educational attainment. They often move to part-time work or a more flexible schedule, to family-friendly, less profitable, and lower paying firms, and are less likely to be promoted. Recent papers (Lucifora, Meurs, and Villarz, 2017; White, 2018) focusing on internal labor markets have also shown that employers often view part-time employees as less committed to the organization, and give them lower performance assessments and bonuses.

[Insert Figure 4]

Figure 4 displays the evolution of the gender ratios of hourly wages (Panel A) and of average annual earnings (Panel B) by synthetic birth cohorts over the years for which the data is available.¹⁴ The previous discussion lets us anticipate distinct generational patterns as well as life-cycle effects. Indeed the hourly wages gender ratios show parallel improvements across cohorts with the profiles of younger cohorts reaching increasingly higher ratios. Some positive selection into the labour market among women aged 50 to 64 from the pre-Pill cohorts also appears to be at play.¹⁵ The gender differences in hours of work from Figure 3 let us anticipate a much less favorable gender ratio in annual earnings than in hourly wages. In addition, annual earnings include bonuses from which mothers may benefit less. In fact, although the earnings trends also show distinct improvements across the generations, there is a dramatic decline in the gender ratio in annual earnings after age 30 consistent with the recent literature documenting the career costs of children.

Note that the possible confusion between cross-sectional improvements and cohorts effects is not new. Borjas (1985) pointed out that the improvements in the relative earnings of immigrants had been wrongly interpreted as favorable economic integration effects (Chiswick, 1978), whereas they actually emanated from differences across cohorts in origin countries, as well as positive selection into the host country of remaining older cohorts. Here some of the rapid improvements in the gender pay ratio at the aggregate level, in the first decade of the observation period, seem to arise from the negative selection into retirement of the pre-Pill generations. Mulligan and Rubinstein (2008) have argued that the closing of the US gender pay gap, from 1975 to 2000, was due mainly to changing selection of women

¹³ For the United States, Wilde, Batchelder, and Ellwood (2010); for Italy: Del Bono and Vuri (2011); for Germany: Fitzenberger, Sommerfeld, and Steffes (2013), Adda, Dustmann, and Stevens (2017); for Spain: Fernández-Kranz and Rodríguez-Planas (2011); for Austria: Frühwirth-Schnatter, Pamminer, Weber, and Winter-Ebmer (2016); for Portugal: Card, Cardoso and Kline (2016); for Sweden: Angelov, Johansson, and Lindahl (2016), Hotz, Johansson, and Karimi (2017); for Denmark: Kleven, Landais, and Sogaard (2018).

¹⁴ Hourly wage data was collected from 1997 onwards in the LFS. The annual earnings data is available from LWF from 1978 to 2015 from three different waves. See Boniskowska, Drolet, and Fortin (2018) for details. The LWF earnings profiles displayed are computed as three-years moving averages.

¹⁵ The wages and earnings of women from pre-Pills cohorts who entered the labour market as secondary earners are likely lower than those of women from the same cohorts who entered life-long careers. The former are also likely to retire earlier (negative selection into retirement) and the later stays in the labour market longer (positive selection into the labour market). A formal test of this hypothesis would require historical panel data.

into the labour market. Instead, one could understand this “changing selection” in terms of changing attachment to the labour market across cohorts.

In summary, some of the recent improvements in the overall gender pay ratio have arisen in part because of the negative selective attrition into retirement of cohorts (1935-39 and 1940-45) with historically lower labour force attachment and substantially lower cohort-specific gender pay ratio. Given that the gender pay ratio among the baby boom generations is more similar to that of recent cohorts, it is fair to say that by 2010, the improvements in the gender pay gap that arise from generational composition effects associated with the 1960s Women’s Revolution have largely been exhausted. Improvements along the life-cycle as the baby-boom generations reach their peak earnings years should be a more promising avenue along which to expect further closing of the pay gap. That is, notwithstanding glass ceiling issues, which are discussed next.

3. Increasing Earnings Inequality and the Gender Pay Gap

Another remarkable labour market development of the past decades has been the rapid rise in wage and earnings inequality, initially associated with the 1980s’ computerization and skill-biased technological change. Several papers (Blau and Kahn, 1992, 1994; Fortin and Lemieux, 2000) have explored the consequences of rising wage dispersion (increased variance) for the gender pay gap. When residual inequality experienced substantial increases in the 1980s, Blau and Kahn (1997) coined the term “swimming upstream” to characterize women’s pursuit of pay equality in the face of countervailing currents. The interaction between wage inequality and the gender pay gap can also work its way through the gender differences in hours noted above. Kuhn and Lozano (2008) have first shown that increases in long hours of work (>48 hours a week) among highly educated highly paid older men was greatest in detailed occupations and industries with larger increases in residual wage inequality. Given the high penalty for flexibility in some high wage occupations, Goldin (2014) further conjectures that rewards to working long hours are an obstacle for the gender gap in pay to vanish. Cortes and Pan (2016) find that highly competitive jobs (O*NET characteristics) also have long hours, putting mothers at particular disadvantage. The goal of this section is to ascertain the extent to which recent increases in top earnings inequality have produced similar countervailing currents toward the closing of the gender pay gap.

In the twenty-first century, prominent studies of increasing inequality (e.g., Piketty and Saez, 2003, 2013; Saez and Veall, 2005) have focused on top earners implicating globalization forces and increases in the size of the financial sector. One goal of this ambitious research agenda was to make it clear that the top 0.1% was leading the increases in earnings inequality. Although increases in the income share of the top 1% in Canada have not been as dramatic as in the United States, these increases have been sizeable. From 8.1% in 1990, the income share of Canada’s top 1% climbed to 12.1% in 2006 but was down at 11.2% in 2015

(Statistics Canada, 2017). Although women have made steady inroads into the top 1%, in 2015, they accounted for only 23.2% of the top 1% of tax filers by contrast with 52.1% of the bottom 99% of tax filers. The underrepresentation of women among top earners implies that increases in top earnings inequality will disproportionately accrue to men. It is, therefore, conceivable that the recent increases in top incomes (increased skewness) have led to countervailing effects similar to the 1980s increases in residual wage inequality. These increases could account for the slower progress in the gender pay gap and the growth in the share of the gap unexplained by traditional factors in the 2000s.

[Insert Figure 5]

Figure 5 displays the densities of real hourly wages (\$2010) of men and women separately for the beginning and end five years periods for which data is available.¹⁶ Vertical lines in the figure indicate the threshold of the top 10%, top 1% and top 0.1% of all wage earners (men and women combined).¹⁷ The analysis of wages in levels rather than in logarithms emphasizes the top, which is muted in the literature using the logarithm of wages or earnings.¹⁸ In Panel A, the (transparent) density (and histogram) of male hourly wages combining five years of LFS data from 1997 to 2011 is superimposed on the (solid) density (and histogram) of female wages. Panel B displays similar densities for the more recent 2013-2017 period. The figure illustrates the differences in shapes between the female and male distributions. The distributions of women’s wages show substantially higher mass in the lower tail, among minimum wage earners, something that is referred to as a “sticky floor” phenomenon. Men’s wages shows more mass in the upper tail, including an extended right skew where women are essentially absent, a phenomenon called the “glass ceiling” effect.

How does the fact that men and women are distributed differently across the wage distribution affects the average gender pay gap? How do increases in skewness, arising from increasing top earnings inequality, affect the lack of progress in this gap? These questions are studied first using a straightforward accounting identity based on a partition of the wage distribution of men and women combined.

Letting $S_{gj} = N_{gj}/N_g$ is the distributional share of group $g = f, m$ in each partition $j = 1, \dots, 4$ of the distribution of men and women combined, we can write the gender specific average pay \bar{Y}_g as the weighted sum of the gender specific average in each partition, $\bar{Y}_g = \sum_j S_{gj} \bar{Y}_{gj}$. Substituting this expression into the gender pay gap

¹⁶ Hourly wages are adjusted for inflation using monthly CPI data from CANSIM Table 326-0020.

¹⁷ Because wages are top-coded in the LFS and because top earners are likely under-represented in the survey, the top earnings thresholds computed from these data are lower than the thresholds computed using Longitudinal Administrative Databank (LAD) or LWF data, for example. Using five years of data helps to obtain a sufficient number of top earners. Some low wage trimming has also been applied; observations with wages are less than half the minimum wages have been excluded. As before, workers aged 15 to 24, and self-employed workers are excluded.

¹⁸ This departs from the traditional literature on glass ceiling effects (Albrecht, Björklund, Vroman, 2003; Arulampalam, Booth, and Bryan, 2007). The later computes the (log) earnings differences between women and men in top centiles of the gender-specific distributions, but does not link these differences to the average gap.

$$\bar{Y}_m - \bar{Y}_f \equiv \sum_j S_{mj} \bar{Y}_{mj} - \sum_j S_{fj} \bar{Y}_{fj} = \sum_{j=1}^4 (S_{mj} \bar{Y}_{mj} - S_{fj} \bar{Y}_{fj}) \quad (1)$$

we can then compute the portion of the pay gap attributable to each partition:

$$\Delta_j = (S_{mj} \bar{Y}_{mj} - S_{fj} \bar{Y}_{fj}) / (\bar{Y}_m - \bar{Y}_f), j = 1, \dots, 4, \quad (2)$$

Table 1 reports the numbers used in the computation of this accounting identity. Following the literature on top incomes, three thresholds of the distribution of men and women combined (corresponding to the three vertical dashed lines in Figure 5) are used to partition the distribution of wages into four percentile groupings: the bottom 90%, the next 9%, the next 0.9% and the top 0.1%. In each panel of Table 1, one for each of two time periods, the first four rows correspond to a percentile grouping, the fifth row totals the numbers reported in each column. For each percentile groupings, the proportions of men and of women, S_{gj} , are reported in columns (1) and (3), and the respective average gender-specific wage, \bar{Y}_{gj} , in each partition in column (2) and (4), for $g = m, f$. The contribution of each centile groupings, $j = 1, \dots, 4$, to the gender pay gap, $(S_{mj} \bar{Y}_{mj} - S_{fj} \bar{Y}_{fj})$, also expressed as a portion of the total gap Δ_j , are presented in column (5). The gender ratios, $\bar{Y}_{fj} / \bar{Y}_{mj}$, in each partition are reported in column (6).

The numbers in column (3) show that women are over-represented in the bottom 90% and under-represented in the other percentile groupings, although over time their proportion has more than doubled in the next 0.9% and top 0.1%, and has increased by close to one percentage point in the next 9%. The proportion of men in these three percentile groupings has decreased, but average wages among these top earners have increased. Thus, as a percentage of the gender pay gap, the contribution of the top 1% to the average gender pay gap has increased from 18% to 20%, contributing almost as much as the bottom 90% in the mid-2010s. The contribution of the entire top decile to the gender pay gap has increased from 73% to 79%.¹⁹ In other words, further improvements in the top decile will be four times more important to the closing of the gender gap than improvements in the bottom 90%. It is noteworthy that the gender ratio in the bottom 90% is already five percentage points higher than the overall gender pay ratio.

Using data from the Canadian LWF (1978-2015), Bonikowska, Drolet, and Fortin (2018) go further back in time. They show that the contribution of the top decile (the sum of the next 9%, next 0.09% and top 0.1%) to the gender ratio in average earnings has increased even more dramatically over time. More precisely, this contribution increased from 60% in 1980, to 72% in 1990, to 81% in 2000 and 86% in 2015.

Fortin, Bell, and Boehm (2017) use another strategy to study the consequences of the underrepresentation of women among earners in the top decile for the overall gender annual earnings gap. Using administrative data from Canada, Sweden, and the United Kingdom,

¹⁹ These numbers are computed by adding the third and fourth rows to obtain the top centile, and adding the second row to cover the entire top decile.

they construct counterfactuals asking, “what if women were represented in the above top centile groupings of the earnings distribution of men and women combined in the same way men are?”²⁰ They find the counterfactual earnings gender ratios are more favourable, increasingly so over time, than the actual ratios by 14 to 25 percentage points.²¹ More precisely in Canada, the share of the gap accounted for by gender disparities across the centile groupings grew from 46 % in 1983 to 58% of the earnings gap in 2010, corresponding to 19 out of 33 percentage points in that year. In Sweden, a similar share grew from 45% in 1990 to 54% of the gap in 2010 (14 out of 26 percentage points). In the United Kingdom, these gender disparities also account for a growing share, from 48% in 1999 to 53% in 2015, of the gap (18 out of 34 percentage points).

Both approaches show that the under-representation of women among top earners accounts for a growing portion of the gender gap over time. This is noteworthy in the literature on gender wage differentials, which has seen the share explained by traditional factors dwindle. In a recent review for the United States, Blau and Kahn (2017) study the gender wage gap using an extensive set of explanatory factors, including human capital variables, occupation, industry, private/public sector and union coverage dummies. They find that despite a decline in the unexplained gap—from 0.341 log points in 1980 to 0.197 log points in 2010—, as the gap declined, the unexplained share went up from 71% in 1980 to 85% in 2010. For Canada, Baker and Drolet (2010) also reports an increase, from 1981 (61%) to 2008 (85%), in the share of gap that is unexplained by education, occupation and industry, amidst some progress in the unexplained gap from 0.163 log points in 1981 to 0.141 log points in 2008. Baker and Drolet (2010) explain that in many dimensions, such as education, women increasingly have an advantage over men. Because women’s wages have not seen commensurate increases, these factors have negative explanatory power (dis-explain) towards the gap. They argue that most significant exception to this is the industrial distribution of employment in which men maintain a significant advantage.

Schirle (2015) also finds that in most provinces more than half of the private sector gender pay gap in 2014 remains unexplained; although, for most provinces, the industrial composition is the most significant single explanatory factor. However, Bonikowska, Drolet, and Fortin (2018) show that industrial composition captures a mixture of vertical and horizontal segregation. For example, workers in sectors such Finance, Insurance, and Real Estate and Professional, Business and Management Services are over-represented in the top

²⁰ The choice of top centile groupings is used to ask whether glass-ceiling effects can hinder improvements in the average gender pay gap. However, it is important to note that a more general counterfactual asking “what if the representation of women across all centiles or deciles of the combined earnings distribution was the same as men’s” would explain away all average gender differences in earnings.

²¹ For the three countries under study, Fortin, Bell, and Boehm (2017) conduct such counterfactual analyses on annual earnings, which encompass more components of earnings including bonuses and performance pay but confound the issue of gender differences in labour supply. The gender ratios in annual earnings are therefore lower (in the 62-74% range in 2010) than with those computed on hourly wages.

decile of the earnings distribution whereas workers in the Retail Trade and Personal Services sectors are over-represented in the bottom 90%.

The next section turns to running horse races between traditional explanatory factors and the new proxy of vertical segregation. First, an assessment of differences across provinces of the impact of pay equity laws will be useful to understand the effect of horizontal occupational gender segregation on the pay gap.

4. Accounting for the Gender Pay Gap and the Impact of Gender Equality Public Policies

Analyses of the gender pay gap that account for the underrepresentation of women among top earners (Fortin, Bell, and Boehm, 2017; Bonikowska, Drolet, and Fortin, 2018; and Table 1 above) suggest that moving forward, further reduction in the gap will primarily have to come from an increased representation of women among top earners. In light of these results, it is appropriate to revisit the potential effectiveness of existing Canadian public policies aimed directly at improving gender equality in pay. This begins with a broad discussion of the purview of these policies in relation to gender disparities in the occupational and industrial composition of employment. It is followed by a triple differences evaluation of Quebec's gender equality and family friendly policies implemented in the 2000s. Finally, a set of Oaxaca-Blinder decompositions is used to dig deeper into the results of this evaluation and highlight the potential areas for further improvements.

4.1 Purview of Pay Equity Policies

The more common policies to improve gender equality in pay focus on within-job-establishment pay disparities, promoting "equal pay for equal work", or on within-establishment disparities, promoting "equal pay for work of equal value" also called comparable worth or pay equity. These policies essentially work on pay disparities at similar hierarchical levels within an organization, essentially targeting horizontal gender segregation, but leaving aside segregation across hierarchical levels.

Pay equity (comparable worth) laws have been implemented in the public sector of six provinces, as well as the federal jurisdiction, and have been extended to the private sector of Canada's two most populous provinces (Ontario and Quebec) in the 1990s.²² Pay equity legislation addresses gender pay differentials resulting from horizontal occupational gender segregation in a within-establishment setting. These initiatives are designed to eliminate any wage gap between predominantly female job classes and predominantly male job classes.

²² Provinces with pro-active public sector pay equity legislation include Manitoba, New Brunswick, Nova Scotia, and PEI. The federal jurisdiction will move to pro-active legislation in 2019. The Pay Equity Act of Quebec was passed into law on November 20, 1996, but most employers with 10 or more employees in Quebec had a period of five years to comply, i.e. by November 20, 2001.

Pay equity laws work with the concept of compensating wage differentials, evaluating jobs along four or five characteristics (such as skills or qualifications, physical and mental effort, responsibility, and working conditions). The idea is to estimate the returns to these characteristics from a sample of predominantly male job classes and use the estimated returns to predict what should be the pay in comparable predominantly female job classes. The rationale for the comparison between predominantly male and predominantly female job classes was supported by findings of a negative relationship between the gender composition of occupations and log wages in the United States (Macpherson and Hirsch, 1995).²³ For Canada, Baker and Fortin (2001) find weaker support for this rationale as the estimates of the female penalty on female wages are smaller and generally not statistically significant. Baker and Fortin (1999) reconcile the Canada-U.S. differences in the effect of gender composition on female wages. They show that workers in predominantly female “public good” sectors, such as secondary teachers and nursing assistants rank higher in Canada than in the United States, reducing the negative effect of the femaleness of occupations north of the border.

In summary, the case that lower relative female wages (by comparison with male wages) arise mostly in predominantly female job classes is not so strong in Canada; thus a remedy based on this rationale is not well targeted. Further, because pay equity laws are not set up to address pay differentials resulting from vertical segregation in a within-establishment setting and even less from industrial segregation, their overall impact on the gender pay gap is mitigated in the presence of such segregation.

4.2 Differences-in-Differences Analyses

Before turning to a more formal analysis of the impact of gender equality policies, it is useful to compare provincial trends in gender hourly wage ratios. In Panel A of Figure 6, the trends in the two provinces that have implemented pay equity legislation in their private sector are compared to those in British Columbia and the remaining provinces as “other.” Ontario implemented its law before 1997, and the first awards in Quebec were distributed after November 20, 2001, indicated by the vertical line. British Columbia is the only province for which the assumption of common trends (with Quebec) in gender ratios before that date cannot be rejected.²⁴ As shown in Panel B, the average male wages in these three provinces display moderate continuous growth, as wages there have been less affected by the resources

²³ Macpherson and Hirsch (1995) report that the estimated penalty for American females in 1988 is -0.119 and for males -0.0989.

²⁴ See footnote 18 for details on the data. The time trends in the gender ratios in Quebec, Manitoba, and BC are not statistically different from zero prior to 2002. The time trends stand at -0.0019 (0.0014) in Quebec, and 0.0049 (0.0028) in BC, but the time interaction with Quebec in a regression including these two provinces is not statistically significant. The trend in Ontario is significantly negative at -0.0046 (0.0006), and, in terms of point estimates, is closer to that of Quebec. From 2002 onwards, the trends in Quebec, 0.0041 (0.0004), Ontario, 0.0042 (0.0005), and Manitoba, 0.0035 (0.0010), are similar.

boom of the mid-2000s than in other provinces. These large positive shocks to male wages make these other provinces less attractive choices of control groups and reinforce the choice of British Columbia as a preferred control. Panel B also shows that although the average wages of women in Quebec are lower than that of their counterparts in all other provinces, there has been more convergence over time in average female wages across provinces, than for average male wages.

[Insert Figure 6]

As discussed in Fortin and Lemieux (2015), in the mid-2000s the growth of the extractive resource sector bolstered average wages in Newfoundland, Saskatchewan and Alberta, with some sizeable spillover effects in the Maritimes and Manitoba. While these wage impacts were relatively higher for young and less educated males, we find substantial spillover effects that may account for the faster average growth in female wages in these provinces than in Quebec and Ontario, as shown in Figure 6b. This discussion underscores the importance of controlling for determinants of wages, in particular industrial sectors, as discussed by Baker and Drolet (2010) and Schirle (2015).

Baker and Fortin (2004) conducted a detailed evaluation of the impact of the 1987 Ontario pay equity law. We focused on workers who should have directly benefited from the law, that is, female workers in predominantly female jobs comparing wage gains across establishments of different sizes progressively covered by the law, also comparing Ontario (treated) with Quebec (control). While we found some positive effects of the law on the wages of women in some occupations, such as clerical occupations in large establishments, these wage gains were not shared widely. We thus concluded that a few years after the awards, the law had not contributed to shrinking the gender pay gap in the province. More precisely, we found the relative effect of the law on the overall gender log wage gap, estimated with an interaction between gender, Ontario, and year of awards, to be 0.003 with a standard error of (0.011). Nevertheless, in the comparisons below, some specifications exclude Ontario to provide a cleaner control group without private sector pay equity legislation.

Here, a first approach to evaluate the impact of Quebec's gender equality policies is to estimate a triple differences (DDD) model where a first difference compare male and female log real hourly wages to get at the gender pay gap in percentage terms. A second difference compares the "before" the actual implementation of the law (1997-1999) to a short-term "after" (2003-2005) and a long-term "after" (2014-2016).²⁵ The third difference comes from the comparison of Quebec with other provinces, first with British Columbia (as a preferred control), second with all provinces, and third with a similar comparator group omitting

²⁵ In the 2017 public use files of the LFS, changes in the occupation codes (NOCS-21) could be cross-walked to the former (NOCS-47). Therefore, this part of the analysis finishes in 2016.

Ontario.²⁶ Alternatively, the triple differences estimator can be interpreted as the difference between the differences-in-differences (DD) (relative wage changes over time between jurisdictions implementing the law and those who did not) for the treated group, women, and the differences-in-differences for a placebo or control group, men, who were not targeted by the law. The validity of the triple-differences approach thus depends on the assumption that men are unaffected by other shocks during the period of study. The absence of large shocks to men's wages is another argument that makes British Columbia a more appropriate control jurisdiction.

It is important to note that this approach will bundle together the Quebec pay equity policy with its other family-friendly policies. First, a subsidized childcare system was introduced in 1997 (before the pay equity awards came into effect), but it became progressively available to a larger number of families over time (Haeck, Lefebvre, and Merrigan, 2015). Second, in 2006, Quebec introduced its own maternal and paternal leave policy. The Quebec Parental Insurance Plan (QPIP) introduced an exclusive paternity leave (five weeks of paid leave for the father to use or lose), a 32 weeks parental leave to be shared by the parents, in addition to an 18 weeks maternity leave. These rules imply that a maternal leave could be extended up to 50 weeks. As noted in the discussion above on the career costs of children, these family-friendly measures are likely consequential for the labour supply of women (Baker, Gruber, and Milligan, 2008; Lefebvre and Merrigan, 2008), but also for their ability to return to full-time work after childbirth and their subsequent level of pay.

The estimating equation for the DDD strategy is the following:

$$\ln(w_{it}) = \alpha_0 + \alpha_1 \textit{After} * \textit{Female} * \textit{Quebec} + \alpha_2 \textit{After} * \textit{Female} + \alpha_4 \textit{After} * \textit{Quebec} + \alpha_5 \textit{Female} + \alpha_6 \textit{Quebec} + \alpha_7 \textit{After} + \mathbf{X}'_{it} \boldsymbol{\beta} + \delta_t D_t \quad (3)$$

where $\ln(w_{it})$ denote the logarithm of real hourly wages of individual i at time t , the first seven variables are dummies variables capturing what their names indicate. A vector of explanatory variables, \mathbf{X}_{it} , includes demographics (age, marital status, number of children in five age categories), job status (part-time status, union coverage, and tenure), eleven industry and forty-seven occupations categories, and ε_{it} are the error terms.²⁷ The parameter of interest is α_1 which captures the relative changes in wages in female wages versus male wages in Quebec versus the control provinces. A tighter treatment would focus, as in Baker and Fortin (2004), only on employees in predominantly female jobs (no senior managers) working in establishments of sufficient size to be covered by the law.

²⁶ Attempts to use a synthetic cohorts approach gave too much weight to PEI, a province where the gender pay gap has turned positive in 2017, and whose industrial structure is not comparable to Quebec. British Columbia is not ideal because of its smaller manufacturing sector and larger construction sector, but the results are robust to alternative controls.

²⁷ Individuals in the base or omitted group are married or co-habitants with no kids, high school dropout, 30 to 34 years old, working full-time as sales person (24 in NOCS47) in the retail trade (27 in NAICS43) with no union coverage.

The results of the estimation strategy are presented in Table 2.²⁸ Columns (1) to (3) compare the before 1997-1999 period to the 2003-2005 period, while columns (4) to (5) use 2014-2016 as the after period, and therefore bundles the potential impact of the parental leave policy. The adjusted penalty faced by women in Quebec in comparison to other provinces in the “before” period is obtained by adding $\alpha_3 + \alpha_5$ and ranges from -0.14 to -0.16 across specifications. This corresponds to an adjusted gender ratio of about 0.85, whereas the unadjusted ratio in Figure 6 was around 0.82. The short-term (arguably cleaner) effect of Quebec’s pay equity law is given by α_1 in columns (1) to (3), with column (1) using the preferred control; it is not statistically significant, but has a negative point estimate.

This result of a null impact of the pay equity law may appear puzzling to its proponents, but is not so different from what Baker and Fortin (2004) find in their analysis of 1987 Ontario pay equity law. The Quebec pay equity law targets predominantly female job classes for adjustments in compensation, which should comprise not only base salary but also pension plans where applicable.²⁹ The law gives employers up to four years to complete the payment of these adjustments after their pay equity review. Although economic theory offers little guidance on how firms should proceed to meet pay equity adjustments, it is conceivable that workers in predominantly male job classes (such as managerial positions), including women in these jobs, fall behind in years where adjustments in compensation are directed at predominantly female job classes.³⁰ The relative contribution of predominantly female vs. male job classes to the gap is explored in more details below. In a simple time difference framework, Van Audenrode, Paradis, and Lafeuille (2008) attribute to the pay equity law a more favorable but still meager $\frac{3}{4}$ to 1 percentage point out of a two-percentage points decline in the average hourly wage gender gap between 1997 and 2005.³¹

On the other hand, the longer-term impact of Quebec’s gender equality policies, as of 2014-16 reported in columns (4) to (6), shows a weakly significant but more positive impact ranging from two to four percentage points, depending on the control groups. In column (5) and (6), this doubles the relative wage gains shared by all women, α_2 , equal to 0.026 reported in the second row. The robustness of the total effect, $\alpha_1 + \alpha_2$, across control provinces indicates that the explanatory variables help capture other provincial differences. However, it is difficult to know from the results which gender equality policy has the most important

²⁸ The eleven industry categories regroup categories from the NAISC 43 as in Bonikowska, Drolet, and Fortin (2017). Robust standard errors clustered at the provincial level are displayed in parentheses below the estimated coefficients.

²⁹ The Pay Equity Commission may also require that pay equity adjustments be paid retroactively to the date where the inequity was created and in some cases to target dates set in the legislation. Adjustments have to be paid to active employees as well as previously employed individuals in some cases. The Hay Group (2014) advise acquiring firms to exercise due diligence verifying any pay equity liabilities in their acquisition decisions.

³⁰ A similar argument could account for the negative point estimates, α_4 , for men in Quebec “After” the law in columns (4) to (6). But these estimates are not statistically significant.

³¹ Another difference between the study of Van Audenrode, Paradis, and Lafeuille (2008) and the current study is that young workers age 15 to 24 are not included here. This limits the confounding effect of increases in minimum wages, which affects a larger number of women than men. From 1997 to 2005, minimum wages in nominal terms increased by 11.5 percentage points in Quebec, 8 percentage points in Ontario and 13.5 percentage points in BC.

impact, perhaps the stronger enforcement of pay equity laws in recent years, perhaps the longer-term effects of increased childcare spaces or increased maternity leave generosity.

4.2 Oaxaca-Blinder Type Decompositions

To better understand the mechanisms at play, a second approach performs some Oaxaca-Blinder (OB) decompositions, which run horse races between the different explanatory factors, comparing the before and after periods across provinces. The “regression-compatible” approach, suggested in Fortin (2008), is employed to maintain compatibility with Table 2. A specification similar to equation (3) is estimated separately for Quebec, Ontario, British Columbia, and the remaining provinces together for each of the three periods; therefore the dummies “After” and “Quebec” and their interactions are not included in the pooled regression,

$$\ln(w_i) = \gamma_0 + \gamma_1 \text{Female} + \mathbf{X}'_i \boldsymbol{\beta}^* + \varepsilon_i . \quad (4)$$

This regression-compatible decomposition assumes that the pooled wage structure $\boldsymbol{\beta}^*$ would prevail in the absence of discrimination that is, under the assumption that the female dummy captures the discriminatory penalty. Along with pooled equation (4), gender-specific regressions (without the gender dummy) are estimated, yielding estimated female returns $\hat{\boldsymbol{\beta}}_f$ and male returns $\hat{\boldsymbol{\beta}}_m$. Let $\bar{\mathbf{X}}'_f$ and $\bar{\mathbf{X}}'_m$ denote the average of the female and male characteristics. The idea is to construct two counterfactual average log wages, the average log wages that women would have earned at the pooled returns, $\bar{\mathbf{X}}'_f \hat{\boldsymbol{\beta}}^*$, and the average log wages that men would have earned at the pooled returns, $\bar{\mathbf{X}}'_m \hat{\boldsymbol{\beta}}^*$. After subtracting and adding these counterfactual wages to the male-female average log wage difference, the decomposition is written as

$$\overline{\ln w_m} - \overline{\ln w_f} = (\bar{\mathbf{X}}'_m - \bar{\mathbf{X}}'_f) \hat{\boldsymbol{\beta}}^* + [\bar{\mathbf{X}}'_m (\hat{\boldsymbol{\beta}}_m - \hat{\boldsymbol{\beta}}^*) - \bar{\mathbf{X}}'_f (\hat{\boldsymbol{\beta}}_f - \hat{\boldsymbol{\beta}}^*)]. \quad (5)$$

The results of this decomposition are illustrated in Figure 7 for the three largest provinces separately and the remaining provinces together, for each period indicated by its starting year. Model 1 in Panel A, C, D, and F uses the same explanatory variables as in Table 2; Model 2 in Panel B, D, F and G adds the centile groupings used in Table 1, as a proxy of vertical segregation.³² To avoid leading zeros, the dependent variable “log wages” is multiplied by 100 and therefore the gender pay gap is in log points. The unadjusted or raw log wage gap is equal to the total length of the bars, shrinking over time from 19-22 log points to 15-18 log points.

The log wage gap adjusted for differences in male and female characteristics evaluated at pooled prices—the term in brackets in equation (5)—correspond to the (light gray) longer

³² Table A1 report the detailed numbers behind Figure 7 along with standard errors.

part of the bar “Unexplained” by gender differences in characteristics. Like in Blau and Kahn (2017) and Baker and Drolet (2010), the share of the unexplained gap as a proportion of the raw gap has grown over time. This result is illustrated here by the fact that the corresponding (light gray) part has shrunk less over time than the total length of the bars. Importantly and perhaps more clearly seen in Table A1, before 2014-16 the adjusted log wage gaps in Quebec are generally larger (not always with statistical significance) than the adjusted log wage gaps in Ontario and British Columbia. This helps explain the absence of significant effects of Quebec’s policies before 2014-16 found in Table 2, despite apparent more favorable raw gender ratios in this province illustrated in Figure 5. The other portions of the bars correspond to the first term of equation (4) summed over the relevant explanatory variables that is, the male-female average differences in characteristics evaluated at the pooled returns.

[Insert Figure 7]

As found in other studies (e.g., Blau and Kahn, 2017; Baker and Drolet, 2010), the explanatory power of education has gone negative as the women’s education level exceeds that of men. The sum of gender mean differences in education categories, $\bar{E}_{.j}, j = 1, \dots, 5$, evaluated at pooled returns, $\sum_{j=1}^5 (\bar{E}_{mj} - \bar{E}_{fj}) \hat{\beta}_{E,j}^*$, is negative, thus the corresponding portion of the bars extends below zero in most panels.³³ Another shared trend is the shrinking of the portion of the gap explained by gender differences in employment status, which includes part-time status, union coverage, and tenure. As explained in Section 2, women’s labour force attachment has grown over time and is more similar to men’s among recent cohorts of women.

A striking difference across the provinces is the fact that the explanatory power of occupations has gone negative —like that of education — in Quebec in the “After” time periods. It is possible that the pay equity legislation, which works on equalizing pay between comparable predominantly female and predominantly male occupational wages, is modifying the wage structure. The fact that gender differences in occupations are dis-explaining the gender pay gap rather than just shrinking over time (as job status does) requires closer inspection. The contribution of occupation classes, $\bar{O}_{.j}, j = 1, \dots, 47$, will turn negative when the value (at pooled returns) of gender differences in female occupations, $\sum_{\{j:\bar{o}_{mj} < \bar{o}_{fj}\}} (\bar{O}_{mj} - \bar{O}_{fj}) \hat{\beta}_{O,j}^*$, exceeds the value (at pooled returns) of gender differences in male occupations, $\sum_{\{j:\bar{o}_{mj} \geq \bar{o}_{fj}\}} (\bar{O}_{mj} - \bar{O}_{fj}) \hat{\beta}_{O,j}^*$. Focusing on Model 1 for the 2014-16 period, the contribution of occupations stands at -1.5 log points in Quebec and 1.4 log points in Ontario, while it is much larger at 4.6 log points in BC and 4.7 log points in the other provinces. However, there is relatively little difference across provinces in the contribution of female occupations: -12.4 in Quebec, -11.8 in Ontario, -12.1 in BC,

³³ For the sum to be negative, it has to be the case that the returns $\hat{\beta}_{E,j}^*$, where $\bar{E}_{fj} > \bar{E}_{mj}$, are sufficiently large to offset to exceed the positive terms arising at levels of education where $\bar{E}_{fj} < \bar{E}_{mj}$.

and -12.3 in the other provinces in log points.³⁴ The larger interprovincial differences come from the contribution of male occupations: 10.9 log points in Quebec, 13.2 log points in Ontario, 16.8 log points in BC, and 17 log points in the other provinces. It would thus appear the Quebec pay equity law has exhausted its potential to narrow the overall gender pay gap; other explanatory factors, besides predominantly female job classes, have to be considered.

The results of Figure 7 speak to the growing importance of industry as an explanatory factor over time, as suggested by Baker and Drolet (2010) and Schirle (2015). For example, focusing again on Model 1 in the 2014-16 period, the positive contribution of predominantly male Mining, Oil & Gas, Utilities, and Construction sectors account for 2.1 log points in Quebec and Ontario, 2.5 log points in BC, but it stands at 5.5 log points in the other provinces. It is partly offset by the negative contribution of the predominantly female sectors of Educational, Health Care, and Social Assistance Services, which ranges from -1.4 log points in Quebec to -2.5 log points in the other provinces. Another less discussed offsetting sector is the Finance, Insurance, and Real Estate sectors, which holds more promise for female gains. Indeed, Bonikowska, Drolet, and Fortin (2018) report that, in the 2011-2015 period, this sector employed 23.6% and 42.8% of the women in the next 0.9% and top 0.1%, respectively, of the annual earnings distribution of men and women combined. Among top earners, the Mining, Oil & Gas, Utilities, and Construction sectors was a strong second employing 12.8% and 11.2% of the women in the next 0.9% and top 0.1%.³⁵ Meanwhile, the corresponding proportions for Health Care and Social Assistance Services were 8.3% and 2.5%, and for Educational Services the percentage in the next 0.9% was 2.4% and the percentage in the top 0.1% was too small to report.

Given the substantial impact of vertical segregation on the gender pay gap discussed in Section 3, the OB decompositions in Model 2 include centile groupings to run a horse race between this (admittedly imperfect) proxy and the other factors considered above. With an explanatory power in the 2 to 5 log points range (see Table A1) the centile groupings show that improvement in the representation of women in top jobs has a substantial potential to reduce the gap further. The growing importance of this factor over time for Canada as a whole, discussed in Section 3, is seen only among other provinces, which include the extractive resource provinces of Newfoundland, Saskatchewan and Alberta, along with the Maritimes and Manitoba, provinces that have seen significant spillovers on wage levels

³⁴ Female occupations, $\{j: \bar{O}_{mj} < \bar{O}_{fj}\}$, and male occupations, $\{j: \bar{O}_{mj} \geq \bar{O}_{fj}\}$, in this computation are defined on the basis of the Quebec proportions in order to compare the same occupations across provinces. The Ontario and BC an important advantage in male occupations comes mostly from Managerial occupations (NOCS1-4), and Occupations in the Natural and Applied Sciences (NOCS11 and 12), while there is also an important BC-Quebec advantage in Construction and Transportation Trades (NOCS33 and NOCS39).

³⁵ For men, the Mining, Oil & Gas, Utilities, and Construction sectors is a stronger employer of top earners, employing 22.4% and 16.9% of the men in the next 0.9% and top 0.1%. However, the Finance, Insurance, and Real Estate sectors is also where most male top earners are found at 18.7% and 36.2% in the next 0.9% and top 0.1%, respectively.

(Fortin and Lemieux, 2015). This geographical concentration is in line with the above discussion of a growing presence of top earners in the Mining, Oil & Gas, Utilities, and Construction sectors (Bonikowska, Drolet, and Fortin, 2018).

In summary, the results of Table 2 and Figure 7 call into question the ability of gender equality policies based on comparable worth principles to close the gender pay gap. Other measures are needed to address the obstacles that women face as they attempt to move up the echelons of organizations into traditionally predominantly male jobs. The traditionally predominantly female sectors of Educational, Health Care, and Social Assistance Services offer comparatively little opportunities for women to move into the top 1% of earners. Subsidized childcare and parental leaves have proven to be implementable in Quebec and should be extended to other jurisdictions as part of the family-friendly policies that help “level the playing field.”

5. Novel Initiatives and Prospects for Continued Convergence

In the title words of Groshen (1991) “The structure of the female/male wage differential: Is it who you are, what you do, or where you work?”, pay equity principles rely exclusively on a narrow definition of the second source of “what you do” of earnings differentials. Pay equity does not address potential inequities between men and women’s pay for women who do not work in predominantly female jobs, and therefore it is not surprising that their impact on the overall gender pay gap is limited. Gender differences between occupation groups are the “what you do,” but the “who you are” and “where you work” are also implicated in the gender wage gap. Pay equity laws are not the panacea that they often touted to be (e.g., Chicha, 2006). They may introduce procedural fairness in the pay-setting process, at least for those targeted by the law. However, pay equity laws could evolve into more encompassing strategies, involving less micro-management of the pay structure.

The “Equal Pay Label” initiatives implemented in several European countries in the 2010s are inclusive of all employees, irrespective of the maleness or femaleness of their job, and may have some potential. These initiatives also use regression-aided programs to help companies evaluate their firm-level adjusted female penalty. They started in Switzerland (Logib-CH) in 2006, quickly spread to Germany (Logib-D) in 2009, were transformed into “equal pacE” in 2013, and extended to Finland, Flemish-Belgium/the Netherlands, France, Poland and the United Kingdom.³⁶ The initiative is presented as a web tool to help companies voluntarily identify the causes of a potential gender pay gap that may exist at the company level.

³⁶ The Logib-D web tool was a substantial enhancement of the Swiss original version Logib-CH, which was initially based on Excel. The current “equal pacE” is publicized as a web tool-based equal gender pay analysis for a competitive Europe. Some of the regressors used to estimate the adjusted the female penalty are similar to the job characteristics used in pay equity evaluations, others includes echelons within the firm.

Evaluations of the first Swiss initiative are still at early stages. There a firm-level adjusted female penalty of less than a tolerance level of 5% with p-value 0.05 (accounting for age, education, training, and other job characteristics) would lead to “Equal Pay” certification, which intended to give firms a competitive edge and the profile to attract the best employees.³⁷ Vaccaro (2017) use a difference-in-discontinuity design where firm size (50 workers) delimits which were subject or not to random checks, to study its impact. She finds that the introduction of this Swiss policy decreased the unexplained wage gap by 3.5 percentage points at firms with 50 workers, while the raw gap declined by 1.5 points on average. Felfe, Trageser and Iten (2015) report more modest improvements over time in the adjusted female penalty, which decreased from around 11 log points in 2000-02 to 9 log points in 2010-12 in the private sector for the country as a whole (p. 34).

One important advantage of “Equal Pay Label” type of policies is that all women (except senior management) are included in the analysis, and that reverse discrimination (male penalty) could be detected, but there are some disadvantages. First, like pay equity, these policies are within-firm measures and do not address gender differentials arising from industry composition. A second disadvantage is that it is unclear how progress is achieved and whether it is widely shared. Reducing gender differentials at higher echelons (reducing vertical segregation) may be a more effective way to reduce a firm-specific penalty than equalizing pay at lower ranks. The fact that the current “equal payE” is publicized as a web tool-based for firms to gain a competitive advantage calls into question whether these tools are used to help contain the wage bill. This preoccupation may also apply to the application of pay equity, which is often implemented with the help of pay consultants who may assist employers in revising their entire pay structure. Thus, these types of policies should include a detailed empirical evaluation requirement to study not only how they work, but what their outcomes are.³⁸ Many countries have constructed administrative employer-employee databases that could be used for that purpose. It is perplexing that pay setting policies implemented in many countries include an empirical evaluation requirement, while it has not been the case in Canada.³⁹ It would be beneficial to include such requirements in upcoming legislation.

Third, the effectiveness of voluntary measures is naturally doubtful and therefore audit studies of the implementation of the tools may be needed. Alternatively, as mentioned in the introduction, the United Kingdom saw the first implementation of their gender pay gap web reporting measure in April 2018. Firms with more than 250 employees have to publicize not only the mean and median gender pay gap, but also the mean and median bonus gender pay

³⁷ Felfe, Trageser and Iten (2015) note the arbitrariness of the 5% level for the adjusted penalty. In other contexts, a statistically significant penalty has been judged discriminatory.

³⁸ There are many Swiss studies on the application of the policy but they do not go far enough to answer the questions of who gets the pay equality awards.

³⁹ Rather than been mandated by lawmakers, the Van Audenrode, Paradis, and Lafeuille (2008) study was sponsored by the “Ordre des conseillers en ressources humaines et en relations industrielles agréés” (ORHRI) of Quebec.

gap, the proportion of males and females receiving a bonus payment, and the proportion of males and females in each pay quartile (ACAS, 2017). Disclosing bonuses and female representation in the upper quartile of the firm is helpful to determine the extent of vertical segregation and its potential impact on gender differentials. It will be interesting to see what the impact of this web disclosure strategy will be.

To promote female representation at the higher echelons of the firm, in recent years many countries have implemented female quotas or disclosure rules about diversity on the board of directors of firms on public stock exchanges. Short of calling for gender quotas, the Canadian Securities Administrators of seven provinces and territories implemented “comply-or-explain” female representation rules on January 1, 2015 (CSA, 2015). These rules require companies listed on their stock exchanges to disclose how many women they have on their boards and in their executive ranks. A year later, many companies had shown bare “technical compliance” with the reporting rules, which was deemed “simply not good enough” by Howard Wetston, the Ontario Securities Commission chair (MacFarland, 2015).

Fortin, Bell, and Boehm (2017) study the impact of quotas and disclosure rules on female representation on boards of directors and in senior management in a differences-in-differences framework. We consider the experience of a dozen of countries who had introduced regulatory quotas for female directors on corporate boards and of another seven countries who passed regulatory disclosure rules regarding the percentage of women at different levels of the organization.⁴⁰ The changes over time, from 2006 to 2014, in female shares of board members and senior management, were compared to similar changes in comparable countries.⁴¹ The results showed that the board quotas were effective towards their intended objective of increasing the female representation on boards by about 40%, and that disclosure rules were half as effective.

On the other hand, we found no evidence of trickle-down effects of these policies on the share of women in senior management. Similarly using employer-employee data from Norway, an early adopter of quotas, Bertrand, Black, Jensen, and Lleras-Muney (2018) find that the quotas increased representation of women among the top five highest earners, but have no effect at other points in the distribution or on the gender pay gap. Moreover, the authors found no clear impact of the reform on highly qualified women whose qualifications mirror those of board members but who were not appointed to boards.

More research is needed on pro-active means to increase female representation at higher echelons. Beyond the hindering role of family responsibilities, on which there is much

⁴⁰ By 2014, a dozen of countries had implemented or were in the process of implementing board quotas: Australia, Austria, Belgium, Denmark, France, Greece, Israel, Italy, Malaysia, the Netherlands, Norway, and Spain. Seven countries, Finland, Hong Kong, Japan, New Zealand, Poland, Turkey, and the United Kingdom, has put in place disclosure rules.

⁴¹ The countries included as controls were Canada, Chile, the Czech Republic, Egypt, Germany, Hungary, Indonesia, Ireland, Mexico, Morocco, Peru, Portugal, Philippines, Russia, Shanghai-China, South Africa, Sweden, Switzerland, Thailand, South Africa, and the United States. The analysis also included country-fixed effects.

active research as pointed out earlier, a new research agenda on the impact of sexual harassment on the job as impediment has risen to prominence with the #MeToo movement. Studies of the impact of sexual harassment on women's ability to move up the ranks are still at an early stage. For example, Chen and Sethi (2016) show that previous clap down helps new entrants. If we are the dawn of a new Women's Revolution Movement, its battles and benefits will rest with the next generation.

References

- Advisory, Conciliation and Arbitration Service (ACAS), 2017, *Managing gender gap reporting*. Government Equalities Office. London, UK. Accessed April 24, 2018.
http://www.acas.org.uk/media/pdf/m/4/Managing_gender_pay_reporting_04_12_17.pdf
- Adda, J., Dustmann, C., Stevens, K., 2017. The career costs of children. *Journal of Political Economy*, 125 (2), 293–337.
- Albrecht, J., Björklund, A., Vroman, S., 2003. Is there a glass ceiling in Sweden? *Journal of Labor Economics*, 21(1), 145–177.
- Angelov, N., Johansson, P., Lindahl, E., 2016. Parenthood and the gender gap in pay. *Journal of Labor Economics*, 34(3), 545–579.
- Arulampalam, W., Booth, A. L., Bryan, M.L., 2007. Is there a glass ceiling over Europe? Exploring the gender pay gap across the wage distribution. *Industrial and Labor Relations Review*, 60(2), 163–186.
- Bailey, M.J., 2006. More power to the pill: the impact of contraceptive freedom on women's life cycle labor supply. *Quarterly Journal of Economics*, 121(1), 289–320.
- Baker, M., Drolet, M., 2010. A new view of the male/female pay gap. *Canadian Public Policy*, 36(4), 429–464.
- Fortin, N.M., 1999. Women's wages in women's work: A US/Canada comparison of the roles of unions and "public goods" sector jobs. *American Economic Review*, 89(2), 198–203.
- , 2001. Occupational gender composition and wages in Canada, 1987–1988. *Canadian Journal of Economics*, 34(2), 345–376.
- , 2004. Comparable worth in a decentralized labour market: the case of Ontario. *Canadian Journal of Economics*. 37(4), 850–878.
- Gruber, J., Milligan, K., 2008. Universal child care, maternal labor supply, and family well-being. *Journal of Political Economy*. 116(4), 709–745.
- Beaudry, P., Green, D. A., 2000. Cohort patterns in Canadian earnings: assessing the role of skill premia in inequality trends. *Canadian Journal of Economics*, 33(4), 907–936.
- Bertrand, M., Black, S.E., Jensen S., Lleras-Muney, A. 2018. Breaking the glass ceiling? The effect of board quotas on female labour market outcomes in Norway. *Review of Economic Studies*, 86(1), 191–239.
- Blau, F.D., Kahn, L.M., 1992. The gender earnings gap: learning from international comparisons. *American Economic Review*, 82(2), 533–538.
- , 1994. Rising wage inequality and the US gender gap. *American Economic Review*, 84(2), 23–28.
- , 1997. Swimming upstream: Trends in the gender wage differential in the 1980s. *Journal of Labor Economics*, 15(1), 1–42.
- , 2017. The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, 55(3), 789–865.
- Bonikowska, A., Drolet, M., Fortin, N.M., 2018. Earnings Inequality and the Gender Pay Gap in Canada: The Role of Women's Under-representation Among Top Earners. Mimeo prepared for Economic

Insights, Statistics Canada.

Borjas, G.J., 1985. Assimilation, changes in cohort quality, and the earnings of immigrants. *Journal of Labor Economics*, 3(4), 463–489.

Canadian Securities Administrators (CSA). 2015. Multilateral staff notice 58-307: Staff review of women on boards and in executive officer positions – Compliance with NI 58-101 disclosure of corporate governance practice.

Card, D., Cardoso, A.R., Kline, P., 2016. Bargaining, sorting, and the gender wage gap: Quantifying the impact of firms on the relative pay of women. *Quarterly Journal of Economics*. 131(2), 633–686.

Chicha, M.T., 2006. A comparative analysis of promoting pay equity: models and impacts. ILO.

Chiswick, B.R., 1978. The effect of Americanization on the earnings of foreign-born men. *Journal of Political Economy*, 86(5), 897–921.

Chen, D.L. and Sethi, J., 2016. Insiders and Outsiders: Does Forbidding Sexual Harassment Exacerbate Gender Inequality? Mimeo. Toulouse School of Economics.

Cortes, P., Pan, J., 2016. When Time Binds: Returns to Working Long Hours and the Gender Wage Gap among the Highly Skilled (No. 9846). IZA Discussion Papers.

Del Bono, E., Vuri, D., 2011. Job mobility and the gender wage gap in Italy. *Labour Economics*. 18(1), 130–142.

Felfe, C., Trageser, J. and Iten, R., 2015. Etude des analyses appliquées par la Confédération pour évaluer l'égalité des salaires entre femmes et hommes. Bureau fédéral de l'égalité entre femmes et hommes. Zurich, Switzerland.

Fernández-Kranz, D., Rodríguez-Planas, N., 2011. The part-time pay penalty in a segmented labor market. *Labour Economics*. 18(5), 591–606.

Fitzenberger, B., Sommerfeld, K., Steffes, S., 2013. Causal effects on employment after first birth — A dynamic treatment approach. *Labour Economics*. 25, 49–62.

Fortin, N.M., 2008. The gender wage gap among young adults in the United States the importance of money versus people. *Journal of Human Resources*, 43(4), 884–918.

———, 2015. Gender Role Attitudes and Women's Labor Market Participation: Opting-Out, AIDS, and the Persistent Appeal of Housewifery,” *Annals of Economics and Statistics*, 117-118, Special Issue on the Economics of Gender, 379–401.

———, Lemieux, T., 2000. Are women's wage gains men's losses? A distributional test. *American Economic Review*, 90(5), 456–460.

———, 2015. Changes in wage inequality in Canada: An interprovincial perspective. *Canadian Journal of Economics*, 48(2), 682–713.

Frühwirth-Schnatter, S., Pamminger, C., Weber, A., Winter-Ebmer, R., 2016. Mothers' long-run career patterns after first birth. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 179(3), 707–725.

Goldin, C. 2014. A grand gender convergence: Its last chapter. *American Economic Review*, 104(4), 1091–1119.

———, Katz, L.F., 2002. The power of the Pill: Oral contraceptives and women's career and marriage

decisions. *Journal of Political Economy*, 110(4), 730–770.

———, Kuziemko, I. 2006. "The homecoming of American college women: The reversal of the college gender gap." *Journal of Economic Perspectives*, 20(4), 133–156.

———, Mitchell, J. 2017. The New Lifecycle of Women's Employment: Disappearing Humps, Sagging Middles, Expanding Tops, *Journal of Economic Perspectives* 31(1), 161–182.

Groshen, E.L. 1991. The structure of the female/male wage differential: Is it who you are, what you do, or where you work? *Journal of Human Resources*, 26(3), 457–472.

Haeck, C., Lefebvre, P. and Merrigan, P. 2015. Canadian evidence on ten years of universal preschool policies: The good and the bad. *Labour Economics*, 36, 137–157.

Hotz, V. J., Johansson, P. and Karimi, A. 2017. Parenthood, family friendly firms, and the gender gaps in early work careers. No. w24173. National Bureau of Economic Research, MA.

Kleven, H.J., Landais, C., Sogaard, J.E., 2018. Children and gender inequality: Evidence from Denmark. No. w24219. National Bureau of Economic Research, MA.

Kuhn, P., and Lozano, F. 2008. The Expanding Workweek? Understanding Trends in Long Work Hours among US men, 1979-2004. *Journal of Labor Economics*, 2008, 26(2), 311–343.

Lefebvre, P. and Merrigan, P. 2008. Child-care policy and the labor supply of mothers with young children: a natural experiment from Canada. *Journal of Labor Economics*, 26(3), 519–548.

Lucifora, C., Meurs, D., and Villarz, E. (2017) Children, Earnings and Careers in an Internal Labor Market. An Event Study. Paper presented at SOLE 2018.

Macpherson, D.A. and Hirsch, B.T., 1995. Wages and gender composition: why do women's jobs pay less?. *Journal of Labor Economics*, 13(3), 426–471.

MacFarland, Janet (2015) "OSC Rebukes Firms for Lack of Action on Gender-Diversity Rules," *The Globe and Mail*, June 16 2015.

Mincer, J., Polachek, S. 1974. Family investments in human capital: Earnings of women. *Journal of Political Economy*, 82(2, Part 2), 76–110.

Mulligan, C.B., Rubinstein, Y., 2008. Selection, investment, and women's relative wages over time. *Quarterly Journal of Economics*, 123(3), 1061–1110.

Pay Equity Commission, 2011. *An Overview of Pay Equity in Various Canadian Jurisdictions*. Queen's Printer for Ontario.

Piketty, T., Saez, E., 2003. Income Inequality in the United States, 1913-1998. *Quarterly Journal of Economics*, 118 (1), 1–41.

———, E., 2013. Top incomes and the great recession: Recent evolutions and policy implications. *IMF Economic Review*, 61(3), 456–478.

Saez, E. Veall, M.R., 2005. The evolution of high incomes in Northern America: lessons from Canadian evidence. *American Economic Review*, 95(3), 831–849.

Schirle, T., 2015. The gender wage gap in the Canadian provinces, 1997-2014. *Canadian Public Policy*, 41(4), 309–319.

Statistics Canada. 2017. High-income trends among Canadian tax filers, 2015. *The Daily*, November 15, 2017.

Vaccaro, G., 2017. Using econometrics to reduce gender discrimination: Evidence from a differences-in-discontinuity design. Paper presented at IZA conference.

Van Audenrode, M.C., Paradis, P.E., Lafeuille, M.-H. 2008. Analyse de l'impact économique de la loi sur l'équité salariale, Groupe Analyse : Montreal.

White, R. 2018. There and Back Again – The performance evaluation effects of going to and returning from part-time status, Paper presented at SOLE 2018.

Wilde, E.T., Batchelder, L. Ellwood, D.T., 2010. The mommy track divides: The impact of childbearing on wages of women of differing skill levels (No. w16582). National Bureau of Economic Research, MA.

TABLE 1

Impact of Men's and Women's Percentile Distribution on Gender Wage Differentials

	(1)	(2)	(3)	(4)	(5)	(6)
	Men		Women		Contribution to the Gender Pay Gap	Gender Ratio
	Proportion	Average Wage	Proportion	Average Wage		
A: 1997-2001						
Bottom 90%	0.8641	21.14	0.9387	18.06	1.31	27%
Next 9%	0.1191	41.97	0.0583	40.89	2.61	54%
Next 0.9%	0.0134	60.00	0.0028	59.16	0.64	13%
Top 0.1%	0.0033	75.39	0.0002	70.33	0.24	5%
Total	1.0000	24.32	1.0000	19.51	4.81	100%
B: 2013-2017						
Bottom 90%	0.8710	23.14	0.9264	20.87	0.82	21%
Next 9%	0.1139	48.81	0.0687	47.68	2.28	59%
Next 0.9%	0.0119	70.93	0.0042	70.46	0.55	14%
Top 0.1%	0.0032	88.23	0.0007	85.45	0.23	6%
Total	1.0000	26.85	1.0000	22.96	3.88	100%

NOTE: Average wages in \$2010. The contribution to the gender pay gap is computed as the difference between the product of col. 1 times col.2 minus the product of col. 3 times col. 4. The counterfactual average female wages is computed as the sum of the product of the proportion of men (col. 1) times the average females wages (col. 4) in each centile groupings

TABLE 2

Impact of Quebec's Gender Equality Policies on Log Hourly Wages

	(1)	(2)	(3)	(4)	(5)	(6)
After period:	2003-2005			2014-2016		
Female* Quebec*After	-0.012 (0.002)	-0.002 (0.005)	-0.011* (0.004)	0.043* (0.004)	0.020* (0.006)	0.026* (0.010)
After*Female	0.023* (0.001)	0.014* (0.005)	0.023*** (0.004)	0.005 (0.003)	0.026*** (0.005)	0.025* (0.010)
Female*Quebec	0.008 (0.001)	0.021 (0.010)	0.035* (0.013)	0.007 (0.002)	0.019 (0.009)	0.031* (0.012)
After*Quebec	0.059* (0.002)	0.012 (0.011)	0.013 (0.023)	0.054* (0.002)	-0.035 (0.042)	-0.085 (0.065)
Female	-0.165* (0.006)	-0.168*** (0.010)	-0.186*** (0.012)	-0.157* (0.012)	-0.162*** (0.008)	-0.173*** (0.014)
Quebec	-0.152** (0.001)	-0.072* (0.025)	-0.039 (0.048)	-0.150** (0.001)	-0.068* (0.026)	-0.033 (0.049)
After	-0.073 (0.016)	-0.018 (0.012)	-0.024 (0.024)	-0.017 (0.009)	0.074 (0.040)	0.119 (0.066)
Control Provinces:						
British Columbia	Yes	Yes	Yes	Yes	Yes	Yes
Ontario	No	Yes	No	No	Yes	No
Other Provinces	No	Yes	Yes	No	Yes	Yes
R-square	0.49	0.48	0.47	0.48	0.49	0.48
No.of observations	804807	2914163	1989985	687859	2460554	1711702

NOTE: The dependent variables is the log hourly wages. The "before" period is 1997-99. Explanatory variables include tenure as a continuous variable, dummies for part-time status and union coverage, plus 8 age, 4 marital status, 5 children, and 7 education classes, 11 industry, 47 occupation categories, as well as year dummies. Standard errors clustered at the provincial level are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

TABLE A1

Regression-Compatible OB Decompositions of Gender Log Wage Differentials

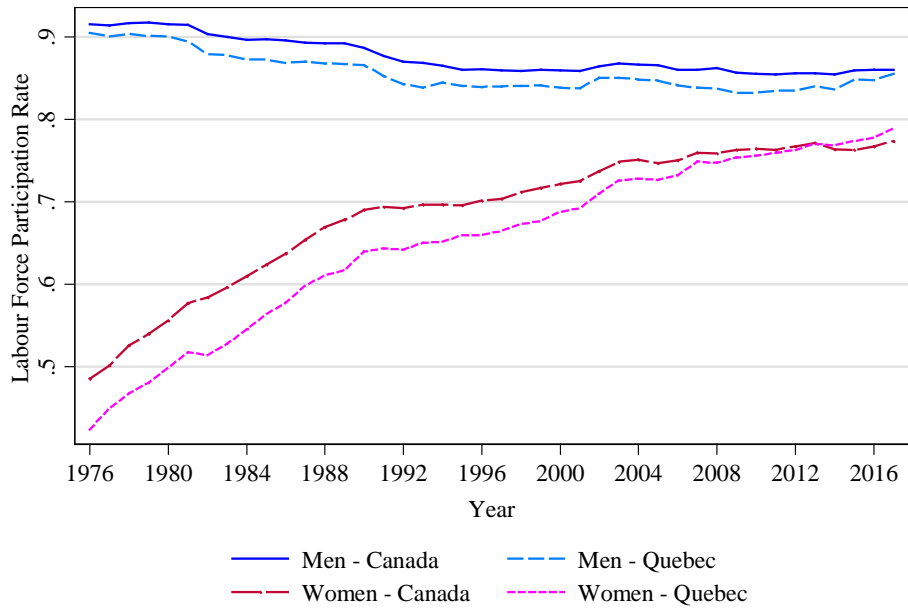
Explained by:	Model 1			Model 2		
	1997-99	2003-05	2014-16	1997-99	2003-05	2014-16
A. Quebec: Raw Log	19.184	16.614	10.618	19.184	16.614	10.618
Wage Gap ($\times 100$)	(0.172)	(0.173)	(0.208)	(0.192)	(0.195)	(0.234)
Centile Groupings				3.740	3.105	1.943
				(0.065)	(0.065)	(0.072)
Demographics	-0.123	-0.204	-0.209	-0.115	-0.108	-0.141
	(0.028)	(0.023)	(0.027)	(0.022)	(0.019)	(0.023)
Education	-0.524	-0.398	-0.455	-0.517	-0.439	-0.391
	(0.038)	(0.022)	(0.024)	(0.026)	(0.019)	(0.020)
Employment Status	1.806	1.452	0.377	2.022	1.687	0.493
	(0.067)	(0.061)	(0.062)	(0.061)	(0.057)	(0.060)
Industry	1.528	1.940	2.086	1.359	1.612	1.547
	(0.086)	(0.096)	(0.127)	(0.074)	(0.085)	(0.111)
Occupation	0.871	-1.492	-1.503	1.063	-0.873	-0.800
	(0.139)	(0.160)	(0.195)	(0.122)	(0.137)	(0.169)
Total Explained	3.559	1.297	0.295	7.550	4.985	2.650
	(0.166)	(0.165)	(0.195)	(0.167)	(0.169)	(0.198)
Total Unexplained	15.626	15.317	10.323	11.634	11.629	7.968
	(0.209)	(0.210)	(0.246)	(0.182)	(0.185)	(0.216)
B. Ontario: Raw Log	21.790	20.512	14.998	21.790	20.512	14.998
Wage Gap ($\times 100$)	(0.130)	(0.137)	(0.181)	(0.142)	(0.151)	(0.200)
Centile Groupings				4.856	4.669	3.632
				(0.056)	(0.059)	(0.076)
Demographics	-0.073	-0.06	-0.119	-0.017	-0.004	-0.072
	(0.019)	(0.019)	(0.024)	(0.015)	(0.016)	(0.018)
Education	-0.177	-0.139	-0.278	-0.228	-0.176	-0.228
	(0.026)	(0.012)	(0.016)	(0.016)	(0.010)	(0.013)
Employment Status	3.319	2.398	0.462	3.222	2.319	0.55
	(0.053)	(0.049)	(0.056)	(0.047)	(0.045)	(0.050)
Industry	1.606	1.500	1.595	0.835	0.911	0.792
	(0.066)	(0.076)	(0.100)	(0.056)	(0.064)	(0.085)
Occupation	1.589	2.397	1.441	2.036	2.715	1.942
	(0.102)	(0.120)	(0.157)	(0.086)	(0.098)	(0.130)
Total Explained	6.264	6.096	3.101	10.703	10.434	6.615
	(0.121)	(0.127)	(0.165)	(0.125)	(0.131)	(0.171)
Total Unexplained	15.526	14.417	11.897	11.086	10.079	8.384
	(0.151)	(0.161)	(0.207)	(0.129)	(0.136)	(0.175)

NOTE: Entries are the male-female differences in the explanatory variables multiplied by the corresponding pooled coefficients. Demographics include plus 8 age, 4 marital status, 5 children categories; education includes 7 education classes; job status include tenure, part-time and union coverage status; industry include 11 categories, and occupation 47 categories. Selected centiles are computed on Canadian real hourly wages grouping: bottom 90%, next 9%, next 0.9%, top 0.1%. Standard error are in parentheses.

TABLE A1 (ctd.)

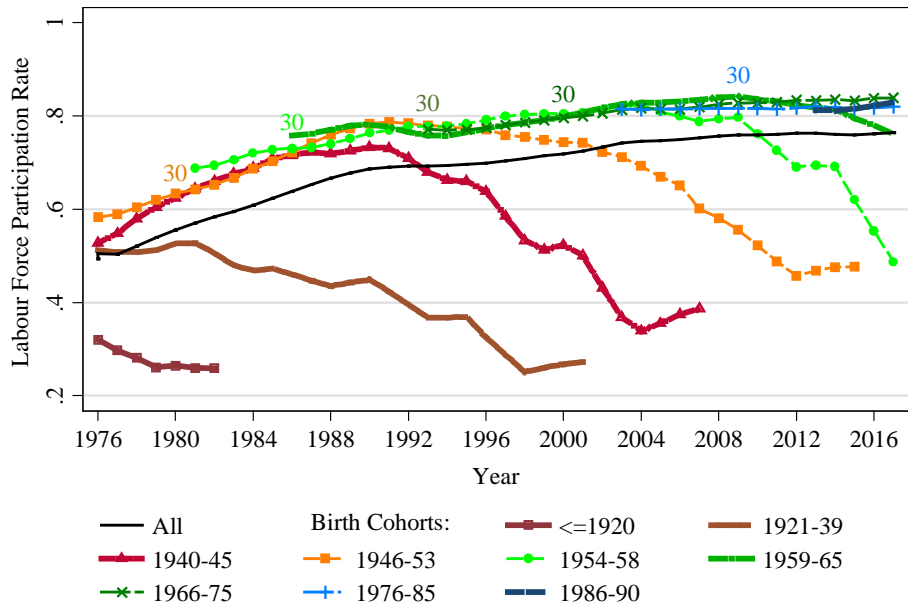
Explained by:	Model 1			Model 2		
	1997-99	2003-05	2014-16	1997-99	2003-05	2014-16
C. BC Raw Log	22.220	18.747	18.860	22.22	18.747	18.86
Wage Gap ($\times 100$)	(0.231)	(0.235)	(0.261)	(0.240)	(0.251)	(0.290)
Centile Groupings				4.547	3.050	4.010
				(0.096)	(0.093)	(0.104)
Demographics	-0.098	0.040	0.015	-0.077	0.042	0.020
	(0.033)	(0.030)	(0.034)	(0.028)	(0.026)	(0.030)
Education	-0.162	-0.098	-0.059	-0.199	-0.153	-0.043
	(0.037)	(0.019)	(0.020)	(0.025)	(0.017)	(0.017)
Employment Status	2.907	1.92	0.245	2.847	1.931	0.228
	(0.098)	(0.092)	(0.090)	(0.091)	(0.085)	(0.084)
Industry	1.041	0.568	2.337	0.672	0.162	1.531
	(0.122)	(0.126)	(0.155)	(0.106)	(0.110)	(0.135)
Occupation	3.489	2.446	4.636	4.058	3.316	4.481
	(0.185)	(0.200)	(0.243)	(0.161)	(0.170)	(0.211)
Total Explained	7.177	4.876	7.173	11.847	8.348	10.227
	(0.217)	(0.219)	(0.246)	(0.222)	(0.225)	(0.251)
Total Unexplained	15.043	13.871	11.687	10.373	10.399	8.633
	(0.265)	(0.274)	(0.322)	(0.231)	(0.241)	(0.282)
D. Other Provinces Raw	26.141	22.51	19.558	26.141	22.51	19.558
Log Wage Gap ($\times 100$)	(0.136)	(0.138)	(0.170)	(0.132)	(0.133)	(0.160)
Centile Groupings				4.728	4.268	5.178
				(0.043)	(0.047)	(0.063)
Demographics	-0.226	-0.275	-0.17	-0.137	-0.168	-0.075
	(0.018)	(0.017)	(0.018)	(0.016)	(0.014)	(0.014)
Education	-0.58	-0.494	-0.372	-0.597	-0.486	-0.281
	(0.024)	(0.014)	(0.016)	(0.018)	(0.012)	(0.012)
Employment Status	1.779	0.902	-0.053	1.792	0.935	0.023
	(0.050)	(0.042)	(0.043)	(0.047)	(0.039)	(0.038)
Industry	3.425	3.696	4.41	2.571	2.566	2.447
	(0.073)	(0.080)	(0.106)	(0.065)	(0.068)	(0.084)
Occupation	3.229	2.668	4.708	3.505	3.287	5.301
	(0.107)	(0.119)	(0.149)	(0.097)	(0.100)	(0.121)
Total Explained	7.627	6.497	8.524	11.861	10.404	12.593
	(0.123)	(0.121)	(0.142)	(0.123)	(0.121)	(0.141)
Total Unexplained	18.514	16.013	11.035	14.28	12.106	6.965
	(0.151)	(0.151)	(0.185)	(0.134)	(0.130)	(0.150)

NOTE: Entries are the male-female differences in the explanatory variables multiplied by the corresponding pooled coefficients. Demographics include plus 8 age, 4 marital status, 5 children categories; education includes 7 education classes; job status include tenure, part-time and union coverage status; industry include 11 categories, and occupation 47 categories. Selected centiles are computed on Canadian real hourly wages grouping: bottom 90%, next 9%, next 0.9%, top 0.1%. Standard error are in parentheses.



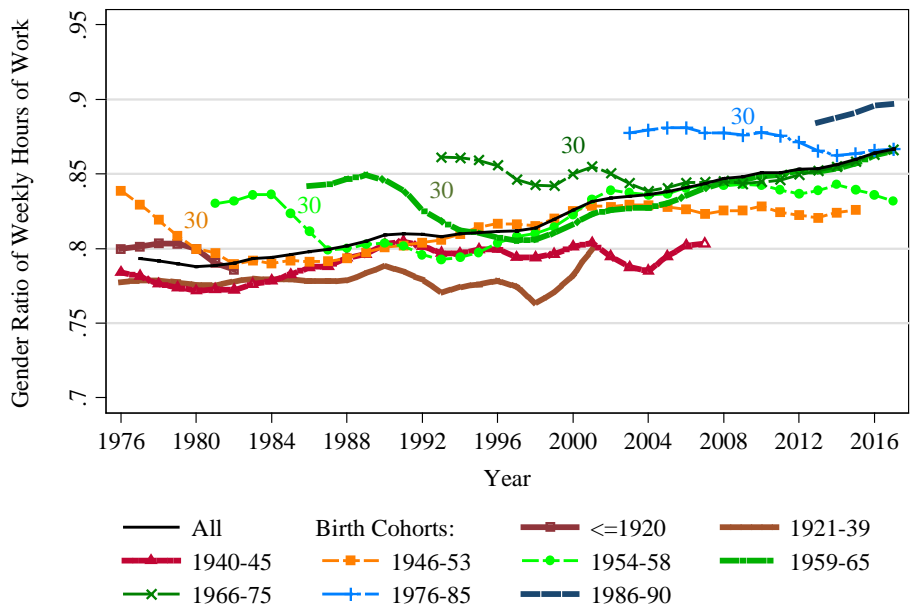
Data Source: Public Use Labour Force Surveys, Individuals aged 25 to 64, 1976-2017.

FIGURE 1
Labour Force Participation among 25 to 64 year olds by Gender and Jurisdiction



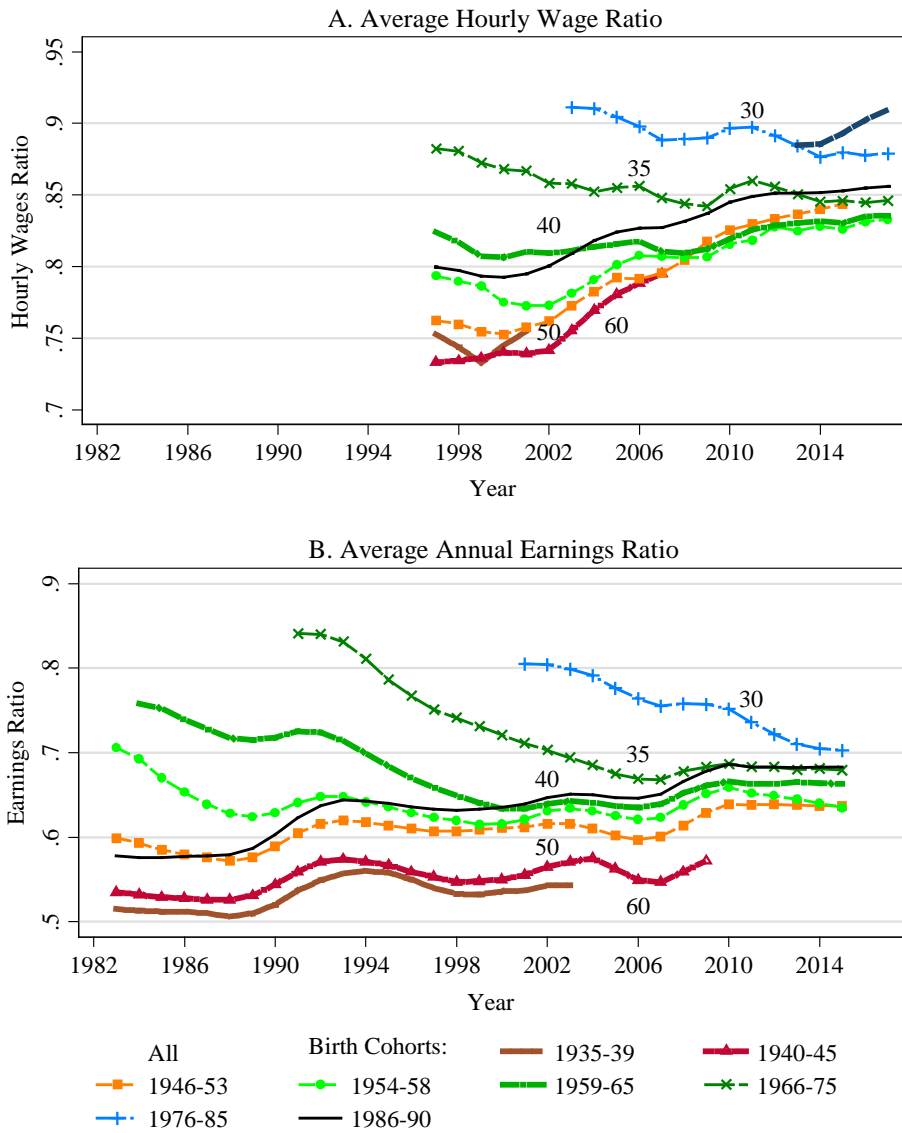
Data Source: Public Use Labour Force Surveys, Individuals aged 25 to 64, 1976-2017.

FIGURE 2
Women's Labour Force Participation by Synthetic Birth Cohorts



Data Source: Public Use Labour Force Surveys, Individuals aged 25 to 64, 1976-2017.

FIGURE 3.
Gender Ratio in Usual Weekly Hours of Work by Synthetic Cohorts



Data Source: A, Public Use LFS, 1997-2017; B, LWF, 1983-2015; Individuals aged 25 to 64.

FIGURE 4
Gender Pay Ratio by Synthetic Cohorts

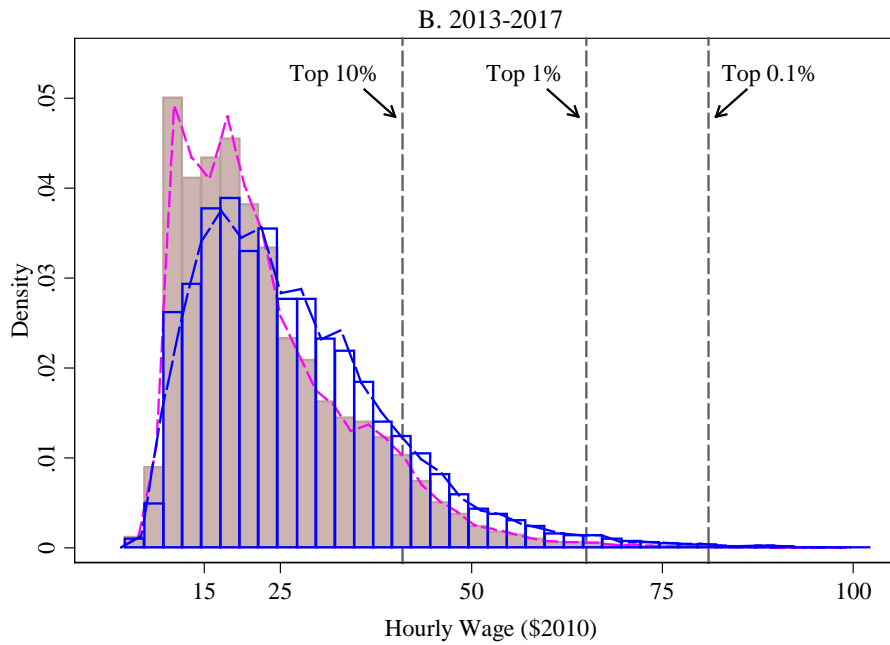
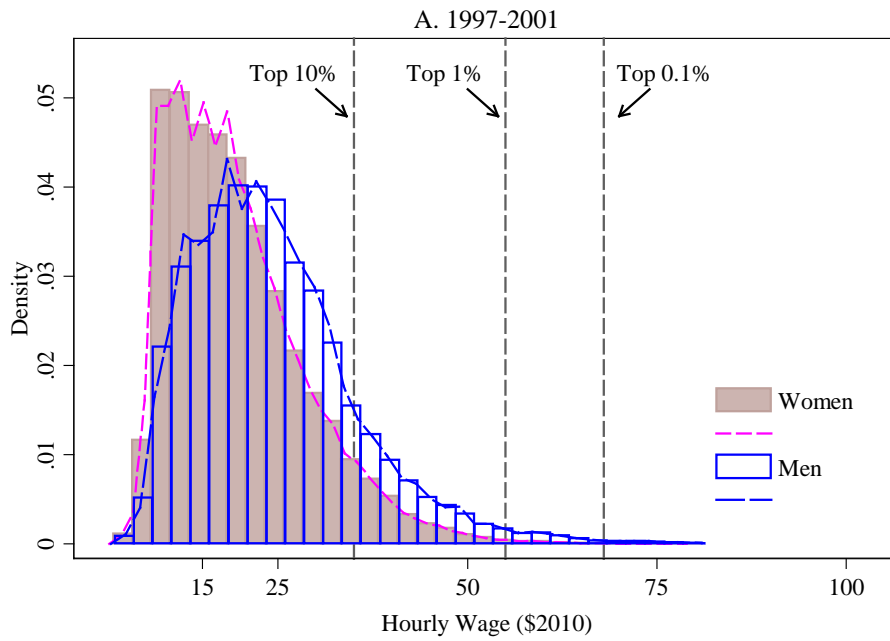
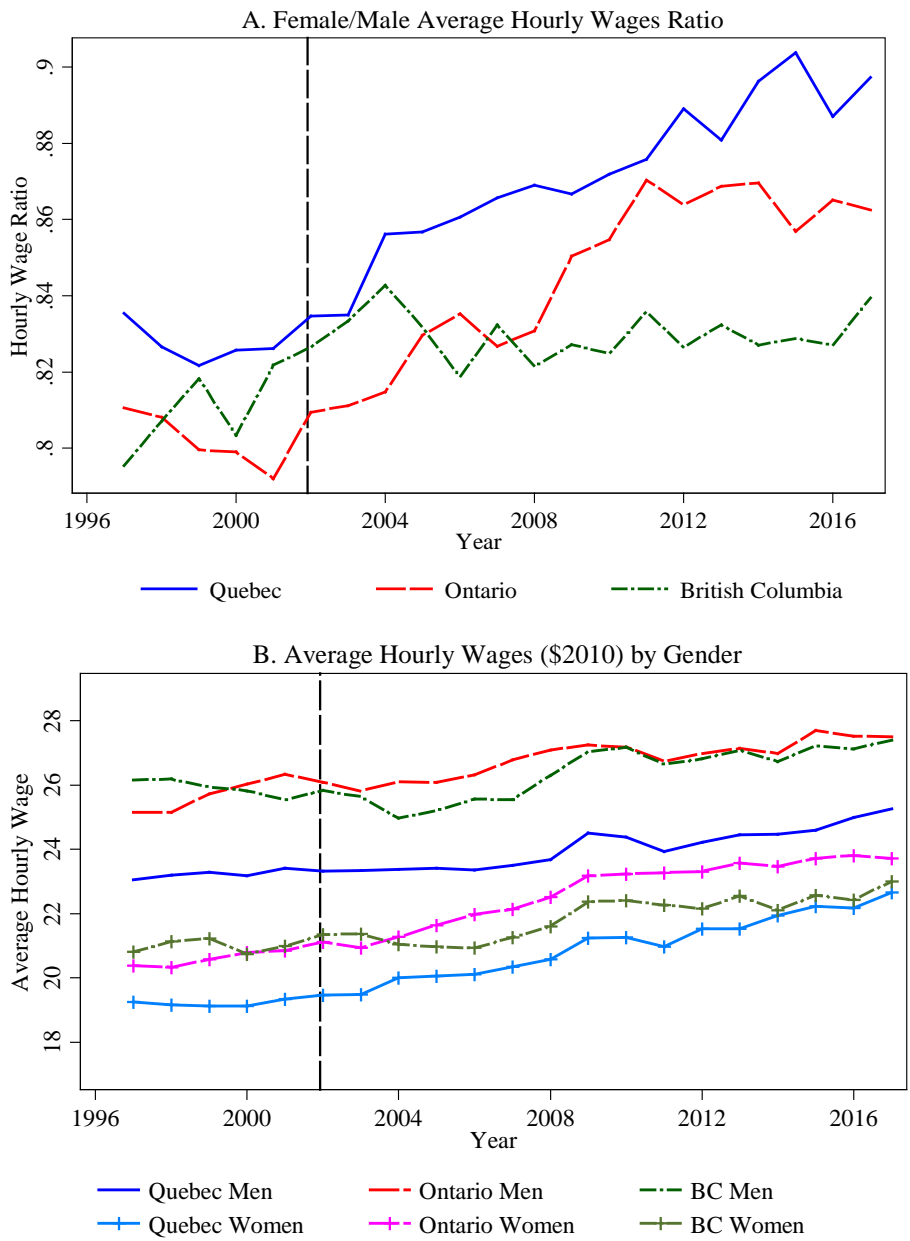


FIGURE 5.
Density of Hourly Wages (\$2010) by Gender and Overall Threshold of Top Earners



Data Source: Public Use LFS, 1997-2017, Individuals aged 25 to 64.

FIGURE 6. Evolution of Provincial Gender Wage Ratios and Average Hourly Wages

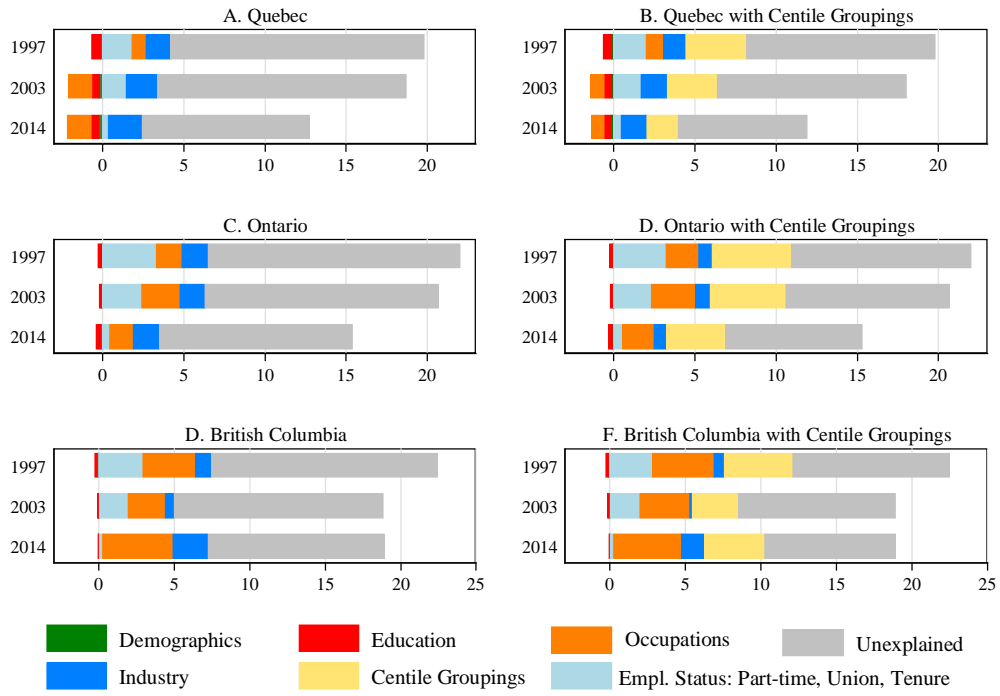


FIGURE 7.
Regression-Compatible OB Decompositions of Gender Log Wage Differentials