Earnings Inequality and the Gender Pay Gap

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Earnings Inequality and the Gender Pay Gap

with the collaboration of Marie Drolet and Aneta Bonikowska

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Gender Gap in Top Jobs
Gender Gap in Top Jobs
Earnings Inequality in Top Incomes

The New Gilded Age

U.S. distribution of wealth

Top 0.01 percent of families: 11.1%
Top 0.1-0.5 percent: 10.4%
Top 0.01-0.1 percent: 18.3%
90-99 percent: 11.1%
99-99.9 percent: 5.5%
99.9% - 100%: 4.4%

The ultra-rich

16,000 families possess $6 trillion in assets—equal to the total wealth of the bottom two-thirds of American families.

Top 1%
$1,019,089

Top 0.1-0.5%
$161,139

Top 0.01-0.1%
$28,020,020

Top 0.01%
$23,846,950

Bottom 90%
$29,840

Inflation and a bear market in stocks in the ’70s hurt the ultrawealthy...

but they’ve since regained ground with a market rally and low inflation that boosts bond values

Depression, New Deal

Share of wealth owned by the richest 0.01 percent of Americans

1910: 12%
2012: 4%

Graphic by Bloomberg Businessweek; data: Saez, Zucman 2014

Average income per family
Distributed by income group

2010 data includes capital gains. Source: Emmanuel Saez, University of California Berkeley
Earnings Inequality in Top Incomes

FIGURE 1 Income share of the top 1%, 0.1%, and 0.01%, Canada, 1920–2009; United States, 1920–2010
NOTE: Canadian results are by taxfiler; United States results are by family.

Source: Veall (2012)
Increasing Earnings Inequality in Top Incomes and the Gender Pay Gap

• Apply the approach used in the analysis of earnings inequality in top incomes (developed by Thomas Piketty, Emmanuel Saez, and co-authors), as well as reweighing techniques à la DiNardo, Fortin and Lemieux (1996) [DFL] to the analysis of the gender pay gap

• Use all earnings data from the Canadian Longitudinal Worker Files (LWF, 1983-2010) supplemented by hourly wage data from the Labour Force Survey (LFS, 1997-2015)
  – Because couples file their income taxes separately, all earnings for T4 returns are available separately by gender in Canada
Increasing Earnings Inequality in Top Incomes and the Gender Pay Gap

• Questions of interest:

1) What are the consequences of the under-representation of women in top jobs for the overall gender pay gap?

2) How is it contributing to the slowdown in the convergence of female/male pay?

3) What public policies and firm practices are effective to improve this under-representation?
Canadian Data

**Longitudinal Worker File (LWF)**
- LWF is a 10% random sample of all Canadian workers
- Years: 1983-2010
- Integrates data from the T1 and T4 files of Canada (CRA) and the LEAP (Statistics Canada)
- Annual earnings from all jobs, include bonuses, honorariums, etc.
- Selected if > half of minimum wage earnings equivalent
- Select workers age 25 to 64

**Labour Force Survey (LFS) Public Use**
- Monthly survey on approximately 100,000 individuals rotating 6-months panel sample design
- Years: 1997-2015
- Hourly wage of employees from main job
- Selected if > half the minimum wage
- Select workers age 25 to 64
## Canadian Data

### Longitudinal Worker File (LWF)
- No self-employment income
- No labour supply information
- Top coded at P99.99 \(\approx\) $2,000,000 in 1983 to \(\approx\)$10,000,000 in 2000
- Available covariates: union coverage, age, industry
- CPI adjusted to 2010$CAN

### Labour Force Survey (LFS) Public Use
- No self-employment income
- Number of weeks worked unavailable
- Top-coding (P99.9) from \(\approx\)$95/hour in 1997 \(\approx\)$125/hour in 2015
- At 2080 (=52wk*40hrs) hrs/year, from $200,000 to $260,000
- Available covariates: age, union, education, occupation, industry, firm size, etc.
Trends

1) Evolution of female/male labour force participation
   a) Extensive margin (LFP)
   b) Intensive margin (hours of work)

2) Evolution of female/male average wage and earnings ratios

3) Evolution of female shares across top percentiles of the overall distribution of wage and earnings

4) Counterfactuals with alternative simulations
Steep Growth in Women’s Labour Force Participation* Followed by a Leveling-Off

Canadian Labour Force Participation Rate - Ages 25 to 64


*Labour force participants include employed (at work or on-leave) and unemployed individuals
Decline in LFP after the Great Recession in the US

Figure 3: Trends in Female and Male Labor Force Participation Rates, 1947-2014
(age 16 and over)


Source: Blau and Kahn (2016)
The Women’s Liberation Movement of the 1960s and The “Pill”

• Goldin and Katz (2002) and Bailey (2006) point out to important changes in women’s LFP occurring in the 1960’s

• Women born after the mid-1950s had access to reliable contraception

• More likely to pursue higher education and enter life-long careers

• Accompanied by a decline in traditional gender roles attitudes which stabilized in the mid-1990s in the U.S. (Fortin, 2015)

• Before married women were more likely ‘secondary workers’ who entered the labour market when kids were in school

• Mulligan and Rubinstein (2013) argue that the closing of the gender pay gap is largely due to changing selection of women into the labour market
Generational Effects in the Growth of Women’s LFP

Women's Labour Force Participation by Synthetic Birth Cohort

Source: Fortin, Drolet and Bonikowska (2016), LFS public use files, ages 25 to 64 year
Generational Effects in the Growth of Women’s LFP

Women’s Labour Force Participation by Synthetic Birth Cohort

Source: Fortin, Drolet and Bonikowska (2016), LFS public use files, ages 25 to 64 year
Continued Gender Convergence?

- According to the Mincer-Polachek hypothesis (1974), gender differences in experience and labour force attachment are the key determinants of the gender wage gap.
- Blau and Kahn (2016) found that declining gender differences in experience in the United States accounted for 18-31% of wage convergence between men and women over the 1980-2000 period.
- Going forward, Goldin (2014) suggested that the impact of work force interruptions for family responsibilities should be understood in the context of temporal flexibility (or the lack thereof) in impacting the gender wage gap.
Less Convergence in Gender Gap in Hours

Gender Ratio in Average Total Weekly Hours by Synthetic Birth Cohort

Source: Fortin, Drolet and Bonikowska (2016), LFS data, ages 25 to 64 year, employed with positive hours of work, usual hours from all jobs
Gender Gap in Hours and Increasing Earnings Inequality in Top Incomes

• Kuhn and Lozano (2008) had shown 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.

• Pointing to some 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 (2015) find that highly competitive jobs (O*NET characteristics) also have long hours.

• Cortes and Pan (2016) find that across countries long hours lowers the share of married women in corresponding occupations.
Trends

1) Evolution of female/male labour force participation
   a) Extensive margin (LFP): substantial convergence
   b) Intensive margin (hours of work): less convergence

2) Evolution of female/male “raw” wage and earnings ratios: Continuing progress?

3) Evolution of female shares across top percentiles of the overall distribution of wage and earnings

4) Counterfactuals with alternative simulations
What is the ratio of women’s to men’s earnings on average in Canada?

Source: Drolet (2011) 25 to 54 year olds, various data sources.
What is the ratio of women’s to men’s earnings on average in Canada?

- **“Hourly Wage” ratio** ≈ 85% is the preferred measure to consider whether employers treat women fairly and should be used in statements such as “women earn 85 cents out of every $1 men earn”
- **“Annual Earnings” ratio** ≈ 65% mixes the number of hours worked with how much is earned by hour provides a better measure of the welfare of women
- More women work part-time, many women working full-time full-year work less hours a week than men (clerical vs. industrial workers)
- But the “All Annual Earnings” measure is the only one available for the very top income groups
What is the ratio of women’s to men’s earnings on average in Canada?

• The focus of all annual earnings can also be justified by the less favorable gender earnings ratios found by Frenette (2014) over the life-cycle

• In terms of the present value of total cumulative earnings (1991-2000) from the LWF (combined with the 1991 Census), they are even lower

  ➢ **PV Cumulative Earnings ratio** ≈ 57% for university graduates and college graduates, ≈ 53% for high school graduates
Generational Effects in the Gender Pay Gap

Gender Gap in Hourly Wages by Synthetic Birth Cohort

Source: Fortin, Drolet and Bonikowska (2016), LFS data, ages 25 to 64 year, hourly wage on the main job
Generational Effects in the Gender Pay Gap

Source: Fortin, Drolet and Bonikowska (2016), LWF data, ages 25 to 64 year, 3-year moving average annual earnings from all jobs
### Slowdown of the Progress in Gender Pay Ratio

#### Longitudinal Worker File (LWF)

<table>
<thead>
<tr>
<th>Annual Earnings</th>
<th>Start</th>
<th>End</th>
<th>%Δ</th>
<th>%Δ/ year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983-1996</td>
<td>0.58</td>
<td>0.64</td>
<td>9.8</td>
<td>0.8</td>
</tr>
<tr>
<td>1997-2010</td>
<td>0.63</td>
<td>0.67</td>
<td>6.2</td>
<td>0.5</td>
</tr>
</tbody>
</table>

#### Labour Force Survey (LFS)

<table>
<thead>
<tr>
<th>Hourly Wage</th>
<th>Start</th>
<th>End</th>
<th>%Δ</th>
<th>%Δ/ year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-2010</td>
<td>0.81</td>
<td>0.85</td>
<td>5.0</td>
<td>0.4</td>
</tr>
<tr>
<td>2011-2015</td>
<td>0.86</td>
<td>0.85</td>
<td>-0.3</td>
<td>-0.1</td>
</tr>
</tbody>
</table>
Standard Decomposition of the Gender Pay Gap

- The Oaxaca-Blinder decomposition starts with gender-specific OLS regressions of individual characteristics on (log) wages:
  \[ Y_g = X'_g \beta_g + \varepsilon_g, \ g = m, f \]
- Constructs a counterfactual wage such as “what would be the average wage of women if they had the same characteristics as men”
  \[ \bar{Y}_f^m = X'_m \beta_f = \text{quantities}_m \times \text{price}_f \]
- Divides the average gender pay gap into “explained” and “unexplained” part
  \[ \bar{Y}_m - \bar{Y}_f = (Y_f^m - \bar{Y}_f) + (\bar{Y}_m - Y_f^m) = (X'_m - X'_f)\beta_f + X'_m (\beta_m - \beta_f) \]
  explained
  unexplained
Gender Pay Gap Largely “Unexplained” by Human Capital Variables

• For the United States, Blau and Kahn (2016) using human capital variables, including actual experience from the PSID, find a notable decline in the unexplained gap—from 0.341 log points in 1980 to 0.197 log points in 2010.

• But as a share of the gender gap in both years, the unexplained portion is actually a larger share of gap in 2010 (85%) than in 1980 (71%).

• For Canada, Baker and Drolet (2010) also report some progress in the unexplained gap from 0.163 log points in 1981 to 0.141 log points in 2008.

• But this represents an increase, from 1981 (61%) to 2008 (85%), in the share of gap that is unexplained by education, occupation and industry.
Table 4: Decomposition of Gender Wage Gap, 1980 and 2010 (PSID)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Log Points</td>
<td>Percent of Gender Gap Explained</td>
</tr>
<tr>
<td>Education Variables</td>
<td>0.0129</td>
<td>2.7%</td>
</tr>
<tr>
<td>Experience Variables</td>
<td>0.1141</td>
<td>23.9%</td>
</tr>
<tr>
<td>Region Variables</td>
<td>0.0019</td>
<td>0.4%</td>
</tr>
<tr>
<td>Race Variables</td>
<td>0.0076</td>
<td>1.6%</td>
</tr>
<tr>
<td>Total Explained</td>
<td>0.1365</td>
<td>28.6%</td>
</tr>
<tr>
<td>Total Unexplained Gap</td>
<td>0.3405</td>
<td>71.4%</td>
</tr>
<tr>
<td>Total Pay Gap</td>
<td>0.4770</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

A. Human Capital Specification

Notes: Sample includes full time nonfarm wage and salary workers age 25-64 with at least 26 weeks of employment. Entries are the male-female differential in the indicated variables multiplied by the current year male log wage coefficients for the corresponding variables. The total unexplained gap is the mean female residual from the male log wage equation.

Source: Blau and Kahn (2016)
Gender Pay Gap Largely “Unexplained” by Human Capital Variables

• Baker and Drolet (2010) explain that in many dimensions, such as education, women increasingly have an advantage over men.
• But because women’s wages have not seen commensurate increases, these are countervailing factors to explain the gap.
• They argue that most significant exception to this is the industrial distribution of employment in which men maintain a significant advantage.
Industry Composition Largest Single Explanatory Factor* in the Private Sector

- Yet, Schirle (2015) finds that in most provinces more than half of the gap is unexplained.

Source: Schirle (2015), LFS 2014, hourly wages of private sector full-time employees, ages 25-59
* with the exception of Manitoba
Trends

1) Evolution of female/male labour force participation
   a) Extensive margin (LFP)
   b) Intensive margin (hours of work)

2) Evolution of female/male average wage and earnings ratios:
   Slower progress in recent years, share of the gap unexplained has increased, industry may remain a potent explanatory variable

3) Evolution of female shares across top percentiles of the overall distribution of wage and earnings

4) Counterfactuals with alternative simulations
Increasing Earnings Inequality and the Gender Pay Gap

• When residual inequality experienced stupendous 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.

• Have recent increases in top incomes lead to similar effects, therefore accounting for the slower progress in the gender pay and growing unexplained (by traditional factors) share?

• To the extent that some of the increases in top incomes are associated with excesses in rent seeking, curtailing those excesses would slow the countervailing currents
Soaring Top Incomes in the United States

Top 10% Pre-tax Income Share in the US, 1917-2013

Source: Piketty and Saez, 2003 updated to 2013. Series based on pre-tax cash market income including realized capital gains and excluding government transfers.
Mostly among the top 1%

Decomposing Top 10% into 3 Groups, 1913-2013

Source: Piketty and Saez, 2003 updated to 2013. Series based on pre-tax cash market income including realized capital gains and excluding government transfers.
Gender Gap in Top Incomes

• Follow Guvenen, Kaplan, and Song (2014) in using the thresholds of the wage and earnings distribution for men and women combined.

• Depart from the traditional literature on the glass ceiling which compares the pay gap at percentiles of the gender-specific distributions.

• Depart from most of the literature which uses the logarithm of wages or earnings in order to emphasize the top end.

• Allow for the construction of counterfactuals to study the under-representation of women in top income groups.

• Study the role of industrial segregation within income groups.
Thresholds of Top Incomes - 2010

Longitudinal Worker File (LWF)    Labour Force Survey (LFS)

Annual Earnings for all jobs       Hourly wages on the main job
1) Top 0.1% > $662,860              1) Top 0.1% > $66  ( $128,705)
2) Top 1% > $206,785                2) Top 1% >$53    ($116,922)
3) Top 10% > $92,000               3) Top 10% >$35   ($80,352)

at 2080 hours
Larger Increases for Top Incomes!

Canadian All Earnings Trends

Source: Fortin, Drolet and Bonikowska (2016), LWF 1983-2010, 25-64 years old, Annual earnings from all jobs
Larger Increases for Top Earners!

Canadian All Earnings Trends

Source: Fortin, Drolet and Bonikowska (2016), LWF 1983-2010, 25-64 years old, Annual earnings from all jobs
Source: Lemieux and Riddell (2015), LAD data
Gender Differences in Hourly Wage Distributions

Source: Fortin, Drolet and Bonikowska (2016), LFS 1997-2015, 25-64 years old, Hourly wage from the main job
Source: Fortin, Drolet and Bonikowska
Slower Convergence in Share of Women among Top Earners

Share of Women in Selected Percentiles of Hourly Wages

Source: Fortin, Drolet and Bonikowska (2016), LFS 1997-2015, 25-64 years old, Hourly wages from the main job
Slower Convergence in Share of Women among Top Earners

Source: Fortin, Drolet and Bonikowska (2016), LWF 1983-2010, 25-64 years old, Annual earnings from all jobs
Under-representation of women in top jobs makes for a less favorable overall gender pay ratio

Source: Fortin, Drolet and Bonikowska (2016), LFS 1997-2015, 25-64 years old, Hourly wages from the main job
Under-representation of women in top jobs slows progress in the overall gender pay ratio

Source: Fortin, Drolet and Bonikowska (2016), LWF 1983-2010, 25-64 years old, Annual earnings from all jobs
Trends

1) Evolution of female/male labour force participation
   a) Extensive margin (LFP)
   b) Intensive margin (hours of work)

2) Evolution of female/male average wage and earnings ratios:

3) Evolution of female shares across top percentiles of the overall distribution of wage and earnings

4) Counterfactuals with alternative simulations
   a) Using male shares in selected percentile earnings
   b) Using male industrial distribution
Counterfactual Gender Pay Gaps and Reweighting

• Kline (2011) shows that the counterfactual (letting $D_i = 1$ denote male),

$$
\mu_0^1 = E[X_i|D_i = 1]'\beta^0
$$

can be computed from an OB regression

$$
\mu_0^1 = E[X_i|D_i = 1]' \times E[X_iX_i'|D_i = 0]^{-1}E[X_iX_i'|D_i = 0]
$$

• Or using reweighting à la DFL

$$
\mu_0^1 = E[w(X_i)Y_i|D_i = 0] \quad \text{where} \quad w(X_i) \equiv \frac{P(X_i|D_i=1)}{P(X_i|D_i=0)} = \left(\frac{1-\pi}{\pi}\right)\frac{e(X_i)}{1-e(X_i)}
$$

with $\pi \equiv P(D_i = 1)$ and $e(X_i) = P(D_i = 1|X_i)$, under the assumptions of

common support $e(X_i) < 1$ and conditional independence $(Y_i^1, Y_i^0) \perp D_i | X_i$
Counterfactual Gender Pay Gaps and Reweighting

• The sample analogues are: \( \pi = \frac{N_1}{N} \) and \( \left(1 - \frac{\pi}{\pi}\right) = \frac{N_0}{N_1} \)

• If \( X_i \) is a \( j \)-category variable, \( e(X_{ij}) = \frac{N_{1j}}{N_j} \) and \( \frac{e(X_i)}{1-e(X_i)} = \frac{N_{1j}}{N_{0j}} \),

• So that reweighing observations requires only the ratio of shares in each \( j \)-category:
  \[ w(X_{ij}) = \frac{N_0}{N_1} \ast \frac{N_{1j}}{N_{0j}} = \frac{S_{1j}}{S_{0j}} \]
  where \( S_{1j} \) is the share of group 1 in category \( j \)

• With conditional means, the overall mean is \( \overline{Y}_0 = \sum_i S_{0j} \overline{Y}_{0j} \), so that
  \[ \overline{Y}_0 = \sum_j S_{1j} \sum_i \frac{S_{0j}}{S_{0j}} \overline{Y}_{0j} = \sum_j S_{1j} \sum_i \overline{Y}_{0j} \]
If the proportion of women across professorial ranks was identical to men, the overall counterfactual average female salary would be:

\[\frac{51.8}{100} \times 146048 + \frac{30.7}{100} \times 114595 + \frac{17.6}{100} \times 99709 = 128259.3\]

and the overall ratio would be \(\frac{128382}{134955} \times 100 = 95\%\)

- The salary gap explained by rank is \(128259.3 - 120623.1 = 7636.2\)
- More than 53\% of the gap is accounted for by the gender differences in the proportion of faculty members across rank.


<table>
<thead>
<tr>
<th>Variables:</th>
<th>Model 1</th>
<th>% of gap</th>
<th>Model 2</th>
<th>% of gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Gender Salary Differentials</td>
<td>14332.24 ***</td>
<td></td>
<td>14332.24 ***</td>
<td></td>
</tr>
<tr>
<td>Accounted for by differences in characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professorial Rank</td>
<td>7636.226 ***</td>
<td>53.28%</td>
<td>6647.376 ***</td>
<td>46.38%</td>
</tr>
<tr>
<td>CRC, DUP</td>
<td></td>
<td></td>
<td>546.2663 *</td>
<td>3.81%</td>
</tr>
<tr>
<td>Years in Rank</td>
<td></td>
<td></td>
<td>1180.126 **</td>
<td>8.23%</td>
</tr>
<tr>
<td>Departmental Dummies</td>
<td></td>
<td></td>
<td>3093.223 **</td>
<td>21.58%</td>
</tr>
<tr>
<td>Total Explained</td>
<td>7636.226 ***</td>
<td>53.28%</td>
<td>11466.99 ***</td>
<td>80.01%</td>
</tr>
<tr>
<td>Total Unexplained</td>
<td>6696.018 ***</td>
<td>46.72%</td>
<td>2865.253 ***</td>
<td>19.99%</td>
</tr>
</tbody>
</table>

Note: Using female coefficients. *** p<0.01, ** p<0.05, * p<0.1 See UBC (2011) for alternative specifications.

- The more complete specification accounts for 80% of the gap, 46% of which from vertical segregation and 22% from horizontal segregation.
- This leaves an unexplained gender gap of 2.2% of average professorial salary.
If the shares of women in percentiles grouping* were the same as men’s, the gap in annual earnings would be 20 point lower.

*percentiles grouping: bottom 90%, next 9%, next 0.9%, top 0.1%

Source: Fortin, Drolet and Bonikowska (2016), LWF 1983-2010, 25-64 years old, Annual earnings from all jobs
If the shares of women in percentiles grouping* were the same as men’s, the gap would be 6-9 points lower.


*percentiles grouping: bottom 90%, next 9%, next 0.9%, top 0.1%
## O-B Decomposition in LFS 1997 and 2015

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Model 1</th>
<th>% of gap</th>
<th>Model 1</th>
<th>% of gap</th>
<th>Model 2</th>
<th>% of gap</th>
<th>Model 2</th>
<th>% of gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounted for by differences in characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected Centiles</td>
<td>0.83***</td>
<td>17.9%</td>
<td>1.67***</td>
<td>42.4%</td>
<td>0.77***</td>
<td>19.1%</td>
<td>1.46***</td>
<td>37.1%</td>
</tr>
<tr>
<td>Demographics (age, marital status, kids)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.04***</td>
<td>0.8%</td>
<td>0.00***</td>
<td>0.0%</td>
<td>0.01***</td>
<td>0.2%</td>
<td>0.00***</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.17***</td>
<td>-3.6%</td>
<td>-0.54**</td>
<td>-13.8%</td>
<td>-0.05***</td>
<td>-1.3%</td>
<td>-0.10***</td>
<td>-2.6%</td>
</tr>
<tr>
<td>Part-time, Union, Tenure</td>
<td>0.40***</td>
<td>10.0%</td>
<td>-0.01***</td>
<td>-0.2%</td>
<td>0.22***</td>
<td>5.6%</td>
<td>0.32***</td>
<td>8.2%</td>
</tr>
<tr>
<td>Industry</td>
<td>0.22***</td>
<td>5.6%</td>
<td>0.32***</td>
<td>8.2%</td>
<td>0.19***</td>
<td>4.8%</td>
<td>0.07***</td>
<td>1.8%</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.01**</td>
<td>0.2%</td>
<td>0.03***</td>
<td>4.8%</td>
<td>0.01**</td>
<td>0.2%</td>
<td>0.03***</td>
<td>0.7%</td>
</tr>
<tr>
<td>Province</td>
<td>0.03***</td>
<td>4.8%</td>
<td>0.01**</td>
<td>0.2%</td>
<td>0.03***</td>
<td>0.7%</td>
<td>0.01**</td>
<td>0.2%</td>
</tr>
<tr>
<td>Total Explained</td>
<td>0.71***</td>
<td>15.2%</td>
<td>1.16***</td>
<td>29.5%</td>
<td>1.55***</td>
<td>38.6%</td>
<td>1.77***</td>
<td>45.1%</td>
</tr>
<tr>
<td>Total Unexplained</td>
<td>3.95***</td>
<td>84.8%</td>
<td>2.77***</td>
<td>70.5%</td>
<td>3.11***</td>
<td>77.1%</td>
<td>2.16***</td>
<td>54.9%</td>
</tr>
</tbody>
</table>

Note: Entries are male/female differences in the explanatory variables multiplied by the corresponding female coefficients. All variables, except tenure are categorical. There are 4 marital status and 7 education classes, 11 industry, 47 occupation

Source: Fortin, Drolet and Bonikowska (2016), LFS 1997-2015, 25-64 years old, Hourly wages on the main job
Impact of Under-Representation in Top Jobs

- Over time, the under-representation of women in top jobs accounts for a growing share of the gender gap
  - from 19% in 1997 to 37% in 2015, after accounting for the usual list of factors (education, occupation, industry, etc.)
- Even against industry and occupation, it is the most significantly explanatory factor
- It substantially reduces the unexplained portion of the gender gap which had been growing over time in a puzzling way.
Industry Composition by Gender (LFS)

A. 1997-2002

- Health Care/Soc. Ass.
- F.I.R.E.
- Education
- Retail Trade
- Other Services
- Prof/Scien/Manag Serv.
- Public Admin
- Agri/Fish/Forest
- Manufacturing
- Transp/WholeS/WhareH.
- Ext. Resources/Const.

B. 2011-2015

- Health Care/Soc. Ass.
- Education
- F.I.R.E.
- Retail Trade
- Other Services
- Public Admin
- Prof/Scien/Manag Serv.
- Agri/Fish/Forest
- Transp/WholeS/WhareH.
- Manufacturing
- Ext. Resources/Const.

Source: Fortin, Drolet and Bonikowska (2016) computation, LFS 1997-2015, 25-64 years old
Industry Composition by Gender and Selected Centiles

<table>
<thead>
<tr>
<th>Industry</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: 1997-2002</td>
<td>Bottom 90%</td>
<td>Bottom 90%</td>
</tr>
<tr>
<td>Agri/Fish/Forest</td>
<td>2.1</td>
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</tr>
<tr>
<td>Ext. Resources/Const.</td>
<td>11.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>26.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Transp/WholeS/Whare§</td>
<td>13.6</td>
<td>5.5</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>9.1</td>
<td>11.9</td>
</tr>
<tr>
<td>F.I.R.E.</td>
<td>3.7</td>
<td>8.9</td>
</tr>
<tr>
<td>Prof/Scien/Manag Serv.</td>
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<td>7.9</td>
</tr>
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<td>Education</td>
<td>4.7</td>
<td>9.9</td>
</tr>
<tr>
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<tr>
<td>Other Services</td>
<td>11.4</td>
<td>14.5</td>
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<tr>
<td>Public Admin</td>
<td>6.8</td>
<td>6.7</td>
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<table>
<thead>
<tr>
<th>Industry</th>
<th>Next 9%</th>
<th>Next 0.9%</th>
<th>Top 0.1%</th>
<th>Next 9%</th>
<th>Next 0.9%</th>
<th>Top 0.1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri/Fish/Forest</td>
<td>0.8</td>
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<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
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<tr>
<td>Manufacturing</td>
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<td>19.9</td>
<td>23.0</td>
<td>5.4</td>
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<td>5.0</td>
<td>0.3</td>
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<tr>
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<td>3.8</td>
<td>2.5</td>
<td>1.7</td>
<td>1.1</td>
</tr>
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<td>F.I.R.E.</td>
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<td>12.1</td>
<td>8.0</td>
<td>14.2</td>
<td>14.0</td>
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<tr>
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<td>15.7</td>
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<td>40.6</td>
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<tr>
<td>Health Care/Soc. Ass.</td>
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<td>3.1</td>
<td>3.2</td>
<td>19.1</td>
<td>7.6</td>
<td>12.2</td>
</tr>
<tr>
<td>Other Services</td>
<td>8.2</td>
<td>8.8</td>
<td>7.7</td>
<td>7.4</td>
<td>10.9</td>
<td>12.9</td>
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<td>Public Admin</td>
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<td>9.2</td>
<td>6.0</td>
<td>10.3</td>
<td>7.6</td>
<td>4.8</td>
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</table>

Source: Fortin, Drolet and Bonikowska (2016) computation, LFS 1997-2015, 25-64 years old
### Industry Composition by Gender and Selected Centiles

<table>
<thead>
<tr>
<th>Industry Category</th>
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<th></th>
<th></th>
<th></th>
<th>Women</th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bottom 90%</td>
<td>Next 9%</td>
<td>Next 0.9%</td>
<td>Top 0.1%</td>
<td>Bottom 90%</td>
<td>Next 9%</td>
<td>Next 0.9%</td>
<td>Top 0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B: 2011-2015</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Agri/Fish/Forest</td>
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<td>0.3</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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</tr>
<tr>
<td>Ext. Resources/Const.</td>
<td>14.5</td>
<td>14.5</td>
<td>12.9</td>
<td>17.3</td>
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<td>3.5</td>
<td>5.8</td>
<td>2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>20.3</td>
<td>13.7</td>
<td>15.7</td>
<td>12.1</td>
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<td>4.3</td>
<td>5.2</td>
<td>8.5</td>
<td></td>
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<tr>
<td>Transp/WholeS/Whareļ</td>
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<td>9.2</td>
<td>10.3</td>
<td>9.0</td>
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<td>3.5</td>
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<td>12.1</td>
<td>3.5</td>
<td>4.3</td>
<td>2.5</td>
<td></td>
<td></td>
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<td>9.0</td>
<td>12.4</td>
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<td></td>
<td></td>
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<tr>
<td>Prof/Scien/Manag Serv.</td>
<td>9.1</td>
<td>14.1</td>
<td>19.9</td>
<td>18.1</td>
<td>8.8</td>
<td>7.4</td>
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<td>13.5</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>9.0</td>
<td>10.5</td>
<td>26.1</td>
<td>21.1</td>
<td>25.0</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>3.6</td>
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<td>3.0</td>
<td>22.1</td>
<td>24.7</td>
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<td>12.3</td>
<td></td>
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<td>Other Services</td>
<td>11.7</td>
<td>7.2</td>
<td>7.9</td>
<td>6.3</td>
<td>13.9</td>
<td>5.5</td>
<td>6.2</td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Admin</td>
<td>6.3</td>
<td>14.0</td>
<td>8.2</td>
<td>8.1</td>
<td>6.8</td>
<td>13.2</td>
<td>15.6</td>
<td>10.7</td>
<td></td>
<td></td>
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</tbody>
</table>

Source: Fortin, Drolet and Bonikowska (2016) computation, LFS 1997-2015, 25-64 years old
What if women worked in the same industrial sectors as men?

Gender Ratio in Average Hourly Wages by Selected Percentiles

What if women worked in the same industrial sectors as men?

Similar Impact of Industrial Composition on the Annual Earnings Ratio

Gender Ratio in Annual Earnings by Selected Percentiles

Source: Fortin, Drolet and Bonikowska (2016) Computation, LWF 1991-2010, 25-64 years old, Annual earnings from all jobs
Similar Impact of Industrial Composition on the Annual Earnings Ratio

Gender Ratio in Annual Earnings by Selected Percentiles

Source: Fortin, Drolet and Bonikowska (2016) Computation, LWF 1991-2010, 25-64 years old, Annual earnings from all jobs
Impact of Industrial Composition

• Although issues of common support limit the analysis for the top 1% and 0.1%, overall women’s own choice of industrial sectors seem appropriate.

• Among the top 9%-1%, women would almost reach parity if they worked in the same industrial sectors as men, but in the bottom 90% would do worse.

• Largely due to the health care sector, which is a well-paying sector in the bottom 90%, but less so in the next 9% (among the salaried workers we observe).

• It could be arguably different if we included self-employment income.
Bottom-Line

• Looking back at the transformation of women’s work in Canada over the 20\textsuperscript{th} century, Fortin and Huberman (2002) had argued that the decline in vertical segregation had contributed more to the improvement of women’s labour market outcomes than changes in horizontal segregation.

• With increasing earnings inequality in top incomes, further improvements in vertical segregation, “more women in top jobs” will be likely be even more important for further decline in the gender pay gap in the 21\textsuperscript{st} century

• But unlike in the 20\textsuperscript{th} century, further educational attainment alone will not yield those changes!
Public Policy and Gender Pay Differentials

• Gender pay differentials “within” occupation
  ➢ “Equal Pay for Equal Work”
• Gender pay differentials across “comparable” occupations, resulting from horizontal segregation, are the focus of
  ➢ “Pay Equity” policies, implemented in the private sector of Canada’s two most populous provinces: Ontario (1996) and Quebec (2001)
• Gender pay differentials arising from the potential obstacles that women face climbing (or not) the job ladder (vertical segregation)
  ➢ “Employment Equity”, enacted in the Federal jurisdiction in principle could address disparities across the job ladder.
More Women in Tops Jobs! What to Do?

• In recent years, many countries have pushed for more general gender equality in decision-making with bolder moves.
  ➢ Both in the political sphere and on corporate boards.
• Many European countries implemented female quotas on the board of directors of firms on public stock exchanges.
• Some emerging countries are doing the same.
Quotas for corporate boards

Women’s work around the world

Since Norway instituted a gender quota for its corporate boards in 2003, more than a dozen countries have followed suit, and others are considering similar measures.

Countries that have instituted or are considering legal quotas for female board members*

<table>
<thead>
<tr>
<th>Country</th>
<th>Year law passed or put into effect</th>
<th>Quota deadline</th>
<th>Quota (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td></td>
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<td>33</td>
</tr>
<tr>
<td>Norway</td>
<td></td>
<td>No deadline</td>
<td>40</td>
</tr>
<tr>
<td>Israel</td>
<td></td>
<td>No deadline</td>
<td>50</td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td>No deadline</td>
<td>40</td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
<td>No deadline</td>
<td>30</td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td>No deadline</td>
<td>At least one woman</td>
</tr>
<tr>
<td>Austria</td>
<td></td>
<td>No deadline</td>
<td>25</td>
</tr>
<tr>
<td>Belgium</td>
<td></td>
<td>No deadline</td>
<td>20</td>
</tr>
<tr>
<td>France</td>
<td></td>
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<tr>
<td>Italy</td>
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<td>No deadline</td>
<td>30</td>
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<tr>
<td>Malaysia</td>
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<td>At least one woman</td>
</tr>
<tr>
<td>India</td>
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<td>No deadline</td>
<td>At least one woman</td>
</tr>
<tr>
<td>UAE</td>
<td></td>
<td>No deadline</td>
<td>40</td>
</tr>
<tr>
<td>Denmark</td>
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<td>No deadline</td>
<td>40</td>
</tr>
<tr>
<td>Brazil</td>
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<td>40</td>
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<tr>
<td>Canada</td>
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</tr>
<tr>
<td>South Africa</td>
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<td>50</td>
</tr>
</tbody>
</table>

*Note: Applies to all or a subset of listed, non-listed, and government-owned companies
Sources: Deloitte’s Women in the Boardroom 2013 survey; Bertrand et al., 2014 (Norway); National (UAE); Spiegel Online (Germany)
More Women in Tops Jobs! What to Do?

• Short of calling for gender quotas, the Canadian Securities Administrators of seven provinces and territories (CSA, 2015) implemented “comply-or-explain” female representation rules on January 1, 2015 (Shecter, 2014; McFarland, 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.

• But many companies have shown bare `technical compliance’ with the reporting rules introduced last year and it is "simply not good enough," says Howard Wetston, the Ontario Securities Commission chair.
Women on Boards and Employment Share


Sources: GMI, European PWN, Deloitte (2015), World Bank Indicators
Women on Boards and Employment Share


Sources: GMI, European PWN, Deloitte (2015), World Bank Indicators
More Women in Tops Jobs! Does it Help?

- Female CEOs/Directors have **mixed results on firm performance** (returns on asset, on equity, profits, Tobin Q, etc.) in firm-fixed effects models
  - Positive or no effect in Denmark [Smith et al. (2006), Parotta and Smith (2013)] and in Italy [Amore et al. (2013)]
  - Negative or no effect in the US [Wolfers (2006), Adams and Ferreira (2009)], in Norway [Ahern and Dittmar (2012)]
- Bertrand, Black, Jensen, and Lleras-Muney (2014) show **mixed results on relative female wages**: the Norwegian quotas increased representation of women among top 5 highest earners, but had no effect at other points in the distribution or on the gender pay gap.
Women in Senior Management and Employment Share

Sources: ILO, World Bank Indicators
Women Fail to Move from Bottom 90% to Next 9% in Early Career (age 30)

Share of Men and Women Moving from Bottom 90% to Next 9% - Recent Synthetic Cohorts

Source: Fortin, Drolet and Bonikowska (2016) Computation, LWF 1983-2010, 25-64 years old, Annual earnings from all jobs
Public Policy and Gender Pay Differentials

• Likely the better policies are those that “level the playing field”, but without lowering women’s attachment to the labour market
  o Maternity-leave benefits, parental leave provisions
  ➢ But gender neutrality is an issue! (Antecol, Bedard, and Stearns, 2016)
  o Affordable high-quality child care
• Firm practices are likely also important:
  o On-site child care and
  o Flexible hours of work
  o Paying attention to gender biases at work
Why so Few Women in Top Jobs?  
Paths for Future Research

Hypotheses from Labour/Behavioral Economics

— Women shy away from competition (Gneezy, Niederle and Rustichini, 2003; Niederle and Vesterlund, 2007)
— Women cannot say “no” to non-promotable tasks (Vesterlund, 2015)
— Negotiating divide (Babcock and Laschever, 2003, 2009)
— The importance of money vs. people (Fortin, 2008), vs. work flexibility (Blau and Kahn, 2016; Goldin, 2014)
— Differential treatment by customers (i.e. discrimination) (80 cents eBay, Kricheli-Katz and Regev, 2016)
Why so Few Women in Top Jobs?
Paths for Future Research

Hypotheses from Identity Theory/Social Psychology

— Glass cliff phenomenon (Ryan and Haslam, 2007),
— Failure of romance of leadership to take hold (Kulich, Ryan, and Haslam, 2007)
— Recognition deficit emanating from role incongruity (Eagly and Karau, 2002)
— Weak work networks within the firm or the industry (Lalanne and Seabright, 2011)
— Preferences for deontological over utilitarian judgments, weaker team spirit (Kennedy and Kray, 2013; Friesdorf, Conway, and Gawronski, 2015)
Why so Few Women in Top Jobs? Recognition Deficit

Exhibit 4

At all levels, the views on leadership ability diverge by gender.

% of respondents,\(^1\) by tenure

<table>
<thead>
<tr>
<th></th>
<th>Women can lead just as effectively as men</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C-level</td>
<td>Senior managers</td>
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<tr>
<td>Female respondents</td>
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<td><img src="#" alt="84" /> <img src="#" alt="14" /> <img src="#" alt="98" /></td>
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<tr>
<td>Male respondents</td>
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<td><img src="#" alt="43" /> <img src="#" alt="51" /> <img src="#" alt="94" /></td>
</tr>
</tbody>
</table>

\(^1\)Respondents who answered “strongly disagree,” “disagree,” or “don’t know/not applicable” are not shown.


*C-level: Chief Executive Officer, Chief Financial Officer, etc.*
Why so Few Women in Top Jobs? Preferences ....

Exhibit 6
Even successful women executives offer mixed responses.

Why do you want to join the C-suite?

- “I enjoy creating a workplace — making decisions that affect people’s lives for the better.”
- “I think I have a strategic mind and good business acumen and I understand people; I could have a big impact putting that together. It would be rewarding to have the business be successful and to create an engaging work environment for our employees.”
- “I love being on the inside circle and making decisions. I love seeing how it all goes on. It’s daunting, but I’m an information junkie. I want a seat at the table.”

Why are you not interested in the C-suite?

- “I’m happy doing what I’m doing. I have 800 employees I manage, and I love interacting with them and giving them purpose. I want to leave a legacy of a sustainable, profitable business.”
- “When you see it up close … it’s not clean at the top. Motives are not always enterprise-related. It’s more about personal agendas.”
- “My ego aspires to make it happen, but my authentic self is not sure if it is worth it. It would require me to do more and more politics, and I don’t want to. I don’t enjoy that.”

Do you aspire to be part of the C-suite?
% of successful women

- Yes
  - 41
- No
  - 59


*C-suite: Chief Executive Officer, Chief Financial Officer, etc.*
Stay Tuned!

Thank you!
References


References

References

- Dizik, Alina, “Do quotas for corporate boards help women advance?” Capital Ideas Magazine, Spring 2015,
References


References


References

References


