THE Structure of WAGES by Firm SIZE: A COMPARISON OF Canada and the United States

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Abstract

Cross-country comparisons of the skill premium between the U.S. and Canada show differences in the returns to higher education between the two countries since the 1980s. This paper analyzes whether such differences in the wage structure could be related to existing differences in the skill distribution and worker sorting across firm size between the two countries. The cross-country analysis of the size-wage structure for male non unionised workers in the private sector reveals two main results: selectivity effects on wages are present and are similar in both countries with evidence of positive selection in both small and large firms (categorized as less than and more than 500 employees respectively). At the same time, there are substantial and significant country differences in the returns to education by firm size, especially for workers below age 40: while there are no differences in the returns to education by firm size in Canada, the returns to a university degree are significantly greater in large firms in the U.S.. As a result, the university premium is about 84% higher in large American firms compared to large Canadian firms. These results bring a new perspective to the literature comparing the wage structure between the two countries in that any explanation, either market-based or institutions-based must be able to address the differential behaviour of larger firms.

Keywords: Firm Size, Wage Structure, Non Random Selection, Returns to Education, Unmeasured Ability.

JEL Classification: J24, J31, J51.

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1 Introduction

Wage inequality has grown more in the U.S. than in most other countries since the 1980s. Cross-country comparisons of the level of wage inequality between the U.S. and other industrialized countries show substantial differences in the returns to skills. At the same time, a widely known empirical fact documented in numerous countries including the U.S. and Canada, is that large firms pay more than small firms for observationally equivalent workers. Firm size wage differentials may be the result of differential pricing of skills by firm size within countries potentially leading to cross-country differences in their respective size-wage structures and in levels of wage inequality.

This paper tests for differences in the wage structure by firm size, that is differences in the skill premium by firm size both within and between Canada and the United States. The idea is to analyze whether the differences in the Canadian and American wage structures documented in the wage inequality literature can be related to differences in the skill distribution and worker sorting across firm size between the two countries.

Understanding the extent and sources of the differences in wage inequality across countries is important for several reasons. Wage inequality helps assess disparities in standards of living and poverty outcomes within and across countries (Blau and Kahn, 1996). Comparison of wage inequality across countries can also shed light on differences in individuals’ economic opportunities and incentives which in turn, have important implications for individuals’ migration decisions and countries’ immigration policies. The extent of a country’s wage inequality (or wage compression) could determine the skill composition of immigrants that it attracts as they would come from different parts of the wage and skill distribution in their home country (Borjas, 1987). More generally, studying differences in wage inequality is helpful from the broader perspective of understanding the functioning of different economies.

The empirical literature on wage inequality presents two main arguments for explaining differences in the evolution and in the level of the pricing of skills between the U.S. and other countries: competitive arguments stemming from the differential movements in supply-demand and non competitive arguments based on differences in country-specific institutional arrangements. In most studies, the analysis is done at the economy level or disaggregated only at the industry level. On the other hand, Blau and Kahn (1996) find that for male workers, measured worker characteristics explain some of the greater wage inequality in the U.S. compared to other OECD countries but they find that differences in residual wage inequality remains an important explanatory factor.

1See Blau and Kahn (1999) for the most recent reviews.
More recently, Leuven and Oosterbeek (2004) and Blau and Kahn (2005) find that individual level measures of skills such as cognitive ability or other specific human capital indices can explain some of the greater wage inequality in the U.S. but the contribution of these factors is small. In sum, the empirical literature on cross-country differences in wage inequality between the U.S. and OECD countries find that substantial cross-country differences still remain to be explained in addition to the importance of institutional factors and market forces (including considering heterogeneity in the supply of skills across countries).

Firm size may affect wage inequality between and within skill groups. Wage inequality between skill groups is likely to be greater among larger firms because workers in larger firms are on average more skilled than in smaller firms. The relatively greater demand for skills among large firms compared to small firms may come from larger firms’ greater needs to operate more complex systems. It may also be due to the fact that large firms have experienced more important skill-biased technological demand shocks than small firms.\(^2\)

Firm size can also have an impact on wage dispersion within skill groups as a result of the greater skill-biased technological changes in larger firms making skilled workers more productive in larger firms than equivalently skilled workers in smaller ones. Also, smaller firms are associated with more unstable employment conditions which may have impacted wage inequality.\(^3\) In addition, within group wage inequality may differ between large and small firms as a result of firm-size specific wage policies rewarding measured skills and unobserved ability differently. Firms of larger size incur greater monitoring costs than do small firms and may use alternative strategies to ensure worker productivity. For example, larger firms may rely more on screening at entry through the use of easily observable measures of skills (education and experience) and put less weight on on-the-job screening based on measures of ability or talent as it requires more costly monitoring than in smaller firms.\(^4\) This may generate differences in wage dispersion between large and small firms within the same group of skilled workers as workers may sort into firms on the basis of unobservable individual traits (more difficult or expensive to measure).\(^5\)

To take into account the impact of firm size on the structure of wages and skills, the paper uses a wage equation framework in which firms of different sizes have different wage policies with respect

\(^2\)Troske (1999) finds that including a measure of the capital-labor ratio K/L in the firm-size wage regression reduces the estimated size-wage premium by 27%.

\(^3\)McCall (2004) shows that downsizing and establishment size decline is a significant contributor of the level and change in wage inequality from 1970 to 2000.

\(^4\)Garen (1990) and Ferrer and Lluis (2008) find evidence of differential wage structures with respect to measured skills and unobserved ability between large and small firms.

\(^5\)For example, greater heterogeneity among skilled workers in terms of individual traits that are costly to measure may lead to greater wage dispersion in smaller firms than in larger ones.
to measured and unmeasured skills. Wage profiles by firm size are estimated and the difference in the profiles in terms of the returns to education and of the potential effect of non random sorting by unmeasured ability is tested for firms of different sizes within and between countries.

The analysis of the returns to skills by firm size has been overlooked in most studies of the relationship between size and wages which focused principally on explaining an intercept effect. Studies have looked at the effect of adding factors on reducing the firm size estimated coefficient assuming that the existence of a size wage premium is the result of an omitted variable bias. On the other hand, persistent size-wage gaps, as well as different wage profiles by firm size, can coexist with competitive labour markets if workers sort themselves into firms of different sizes based on unobserved (to the econometrician) characteristics.\textsuperscript{6}

Canada is a natural choice for a comparison of the wage structure with the U.S. as both countries share similar market characteristics such as industrial, occupational and demographic structures while at the same time displaying some differences in labour market institutions impacting wage outcomes.\textsuperscript{7} Cross-country comparisons show a larger increase in the college-high school wage ratio in the U.S. than in Canada since the 1980s implying differential wage structures between the two countries.\textsuperscript{8} Moreover, the empirical literature on wage determination has documented persistent wage differentials by firm size in both Canada and the United States.\textsuperscript{9} This raises questions about potential differences in the magnitude of the size-wage differentials between the two countries as well as differences in the contribution of the various factors explaining the size-wage gaps within countries. In particular, the presence of significant differences in the returns to skills by firm size within a country may relate to the cross-country differences in the wage structure. The effect of firm size on the pricing of skills and the resulting wage inequality within country may be stronger in the U.S. than Canada if for example there is a relatively greater demand for skilled workers among large firms in the U.S. or if large (small) American firms tend to reward skills more (less) than large (small) Canadian ones. Moreover, large and small firms may be differently affected by institutional policies that are country-specific.

There are two important institutional differences between the labor markets in Canada and the U.S which may create differences in the size-wage structure between the two countries: benefits

\textsuperscript{6}This may be due to large and small firms’ differences in monitoring technologies (Garen (1985)) or promotions (Gibbons (1997)) and/or training opportunities (Hu (2003)).
\textsuperscript{7}See Card and Freeman (1993) for an analysis of the similarities and differences in labour markets between the two countries.
\textsuperscript{9}See Oi and Idson (1999) for a review of the literature on firm size and wages in the U.S. and Morissette (1993) for a study of the Canadian case.
provision and the influence of unions. In Canada, health care is publicly provided\textsuperscript{10} while in the United States, it is provided through a mixed private/public system financed by employer contributions and payroll taxes. Since Canadian plans are financed out of general revenues, they are not perceived as an employer cost as they are in the U.S.. This difference may lead to differences in firms decisions about total compensation packages (or the proportion of cash wages over other forms of compensation) between the two countries and therefore have an impact on wages.\textsuperscript{11} Moreover, because large and small firms incur different costs associated with health insurance offering in the U.S., the compensation profiles by firm size within the United States is likely to differ while such differences should not be present in Canada. The size-wage structure may also be different across the two countries because unions exert more influence over the labour market in Canada than is the case in the United States (Freeman (1980), Dinardo and Lemieux (1997)).\textsuperscript{12} Overall, whether the resulting differences in the level of the wage structure between the two countries can be attributed to differential size-wage structures is an empirical question.

The statistical framework in this paper is based on a Roy model, in which different skills (measured and unmeasured) are not equally productive in small and large firms. Utility maximizing workers choose the size of employer for which their abilities are best suited. This results in a particular distribution of skills across firms of different size and in different wage structures by firm size. The paper uses such a model to compare and test for differences in the size-wage structure between Canada and the U.S. as well as whether or not the underlying mechanism of self-selection based on unobservables provides a good explanation of firm size differences both within and between countries. The analysis is based on cross-sectional data from very comparable dataset, the Labour Force Survey for Canada and the March Current Population Survey for the United States for the year 1998.

The methodology used in the paper applies the estimation and sampling strategy of Idson and Feaster (1990).\textsuperscript{13} In particular, the Heckman two-step methodology is used to estimate the size-wage

\textsuperscript{10}Canada has a system characterized by minimum basic coverage available to everyone independent of work. It is a system of provincial and territorial plans funded by the government out of general revenues. Additional coverage can be purchased on a tax-preferred basis, either through the employer or individually. However, this additional coverage cannot compete with the minimum benefits (Hunt-McCool, McCool and Dor (2000)).

\textsuperscript{11}Goldman, Sood and Leibowitz (2005) find that about two-third of the health insurance premium increase is financed out of cash wages and one-third is financed by a reduction in benefits in a study using panel data on one firm offering a flexible benefits plan.

\textsuperscript{12}The fact that unionized workers work predominantly in large firms (Maranto (1988), Martinello and Meng (1992), Miller and Mulvey (1996)) and tend to reduce the part of the remuneration that reward individual measured and unmeasured skills (Lemieux 1993), may reduce the returns to skills more strongly in large Canadian firms. The unionization threat argument combined with the stronger effect of unions in Canada may create differences in the way large non unionized firms reward skills in Canada than in the United States.

\textsuperscript{13}Idson and Feaster (1990) analyze the size-wage premium correcting for worker self-selection applying a similar statistical framework as the present paper to a sample of U.S firms drawn from the 1979 May CPS. Although their
structure taking into account endogeneity in the choice of firm size and the analysis is done over the sample of non unionized private sector male workers to eliminate potential differential effects of unions and female workers on wages and the choice of firm size and to make it possible to compare the results with other studies in the literature on firm size and wages.

The cross-country analysis of the size-wage structure for male non unionised workers in the private sector reveals two main results: selectivity effects on wages are present and are similar in both countries with evidence of positive selection in both small and large firms (categorized as less than and more than 500 employees respectively). At the same time, there are substantial and significant country differences in the returns to education by firm size, especially for workers below age 40. While Canada displays no differences in the returns to education by firm size, the returns to a university degree are significantly greater in large firms in the U.S.. As a result, the university premium is about 84% higher in large American firms compared to large Canadian firms while there are no significant differences in the returns to education for small firms between the two countries. Furthermore, the difference in the university premia between large American and large Canadian firms can explains most of the cross-country difference in the level of wage inequality found in the data. These results suggest that any explanation of the different evolution of the wage structure between the two countries, whether market-based or institution-based must be able to explain the differential behaviour of larger firms.

Many studies have analyzed the effect of firm size on wages for different countries (African countries, Britain, France, Germany, Italy, Russia, Switzerland) separately. To my knowledge, only the study by Gibson (2004) present an international comparison of the firm size effect on wages but statistical comparisons and tests of cross-country differences are not provided. Moreover, the object of analysis is the existence of a size-wage gap in each country while the wage structure and potential differences in the size-skill premium as well as in ability sorting effects within and across countries have been ignored.

The paper is organised as follows. Section 2 describes the data and presents an analysis of the size-wage gap in the same spirit as the existing literature. Section 3 describes the framework of analysis based on a model of non random allocation of workers into firms of different sizes and presents the estimation method. Section 4 describes the results of the cross-country analysis. Section 5 presents a discussion of the results and section 6 concludes the paper.
2 Data

This section presents the variables and sample selection procedures used for the LFS and the March CPS.\textsuperscript{14} It also compares the size-wage gaps for the two countries estimated according to the methodology used in the existing literature.

2.1 Variables and Sample Selection

Whenever possible, variables in both dataset are defined similarly. Since education is reported categorically in both surveys, the following four categories are utilised: university, post secondary, secondary and no diploma for Canada, and college, associate college, high school and less than high school for the U.S..\textsuperscript{15} Because age is reported categorically in the LFS, dummies for age, constructed in the CPS data, are used for both countries. Other variables similar in both data sets include gender, race, marital status, occupation and industry dummies.

Firm size, or the number of employees working for the worker’s employer at all locations, is reported categorically in both data sets with the following categories in the LFS: less than 20, 20-99, 100-500, more than 500. In the March CPS, the categorization is slightly different: less than 24, 25-99, 100-499, 500-999, more than 1000. Given the paper’s focus on cross-country comparison, the variable on firm size is further grouped into three mostly similar categories: less than 99, 100-500, more than 500. Wages are given on an hourly basis for all workers in the LFS. Hourly wages are computed for the U.S. based on the information on usual hours worked per week.\textsuperscript{16} Both the LFS and the CPS have information on city size given in a categorical format. In the CPS, the categories correspond to different population intervals\textsuperscript{17} while in the LFS it is given in terms of main cities (Toronto, Montreal, Vancouver or other). I define a dummy for large city as the three Canadian cities above for the Canadian case and as 500,000 individuals or more for the U.S. data.\textsuperscript{18}

The main difference between the two surveys is that the LFS provides information on establishment size in addition to firm size. Given that both variables may have a different impact on wage outcomes, the information on establishment size will be used for Canada in parallel with the

\textsuperscript{14}Descriptive statistics on the main variables used in the two data sets are presented in Appendix A Tables A1 and A2 respectively.

\textsuperscript{15}For Canada, the “no diploma” category includes individual reporting partial secondary or without diploma. In the CPS, the category “associate college” corresponds to associate degree-occupational/vocational or associate degree-academic program. Also individuals reporting some college but no degree are included in the “high school” category.

\textsuperscript{16}The CPS contains several questions related to hourly, weekly or yearly wages. I have combined the information from the three different sources to compute hourly wages. For individuals reporting only yearly wages, I divided wages by 52 weeks times the reported number of usual hours worked per week.

\textsuperscript{17}The first category starts with 100, the next one is 200-249, then 999, the last is 5 millions or more.

\textsuperscript{18}This cut-off corresponds to about the size of Vancouver (Montreal and Toronto being larger cities).
cross-country analysis. On the other hand, it will not be included when the focus of the analysis is
the cross-country comparison. For the same reason, worker’s tenure in the current job is available
in the LFS but not the March CPS so it will not be used in the analysis hereafter. Note also that
information on union status in the March CPS is available only for two rotational groups in their
last month in the sample.\footnote{They are individuals who entered the sample for the first time in December 1996 (and are now in their second
time in the sample) and in December 1997. For these two groups, union status and firm size is available in March
1998 (the last month of each group’s four-month window). For the other groups, union status would be available using
the monthly CPS in the months adjacent to March but union status changes before or after March make this
information not usable.} As a result I selected the sub-sample of workers in the March CPS with
available information on firm size and union status.

The final sample for each country consists of individuals aged between 20 and 65 working full-
time. I have excluded the self-employed as well as workers in the construction industry for which
firm size effects are not relevant. The sample size for the United States is 6807 workers. For Canada,
the sample size is 65022 observations.

Following the literature, I further select male workers non unionized in the private sector to
minimize the potential differential effects of gender and unionization on wages. This sample contains
2750 workers for the U.S. and 20556 workers for Canada.\footnote{Due to the difference in the sample size between the two countries, whenever relevant, I
compared the results with a larger sample pooling three years. This cannot be done with the LFS data as information on firm size is not available
every year.} Appendix A provides means statistics
for the full sample and sub-sample of male non unionized workers in the private sector by firm size
for both countries.

\section*{2.2 Employer-Size Wage Differentials}

Recent empirical studies on the determinants of wage and wage growth have analysed possible depart-
tures from the basic Mincer-type wage equation that includes education and a quadratic in experience.
Since the wage equation is originally derived from a model of optimal investment in human capital,
it does not offer a complete representation of the labour market as it only describes the supply side
of the market. These studies add variables that describe and capture variations in wages related
to the demand side of the labour market to the wage equation. In particular, industry, occupation,
unionization and firm size dummies are the main variables employed.

This section presents the results of a cross-sectional OLS estimation of employer-size wage differ-
entials for the two countries in the spirit of the empirical literature on firm size and wage outcomes. I
replicate the estimation of the size-wage gap using data from the LFS and CPS for 1998 by regressing
the log of wages on dummies associated with each firm size categories\textsuperscript{21} and adding control variables to see how they affect the magnitude and significance of the coefficient on firm size. Results for both countries are reported in Table 1, columns (I) to (IV). For Canada, column (V) shows the results with additional controls for establishment size. For both countries, column (VI) corresponds to the same regression as in column (IV) but for non unionized male workers in the private sector.

Overall, the results are similar to those found previously in the literature on the size wage gap. Column (I) shows the average size-wage gaps in the absence of worker and firm controls. The coefficient associated with the dummy for large firms (more than 500 employees) gives a wage differential of 0.31 for Canada and 0.14 for the U.S. In terms of percentage, the wage premium in large firms (more than 500 employees) is 36.3\% for Canada and is 15\% for the United States.\textsuperscript{22} Column (II) presents the results when education is added to the log wage equation. The size of the coefficients associated with firm size drops substantially for both countries compared to column (I) revealing that part of the size wage gap can be explained by human capital differences across workers employed in larger firms.

Introducing the effect of union membership\textsuperscript{23} in column (III), does not change the size-wage premium in the U.S. case, whereas the gap is substantially reduced in Canada. This suggests that the unionization threat or potential spill-over effects from unionization may be more substantial in Canada than in the U.S. The addition of industries and occupations (columns (IV)) reduces substantially the effects of firm size leaving an estimated wage differential of 0.14 (15\%) for Canada and 0.06 (6.3\%) for the U.S. for firms with more than 500 employees. Note that despite the slight differences in the estimated wage gaps between the two countries, the addition of worker and firm controls reduced the size wage gap (compared to column (I)) by a similar amount (about 55\%) for both countries.

Column (V) for Canada shows the effects of introducing establishment size on the size-wage gap. The coefficient associated with firm size slightly drops when establishment size is controlled for but remains significant and substantial (9.4\%). The estimated establishment size wage gap amounts to a wage differential of 13.9\%, controlling for firm size, workers’ characteristics, occupation and industry.

\textsuperscript{21}Note that the categorization for firm size in the CPS data distinguishes firms with more than 1000 employees and firms with less than 10 employees while this information is not available in the Canadian data. For comparison purpose, the category of more than 1000 employees is combined with the lower category (500 to 999 employees) to represent the category of more than 500 employees. In addition, because the lower category cutoffs, firms with less than 20 employees in Canada and less than 25 employees in the U.S., a new category defined as firms with less than 99 employees is defined which will be the omitted category in the regressions for both countries. Note also that the cutoff around 500 employees is not identical in each dataset. In the CPS, the cutoff is at 499 employees while it is at 500 in the Canadian data.

\textsuperscript{22}These percentages corresponds to the anti-log of the regression coefficient minus one.

\textsuperscript{23}The dummy for union membership also includes workers covered by collective bargaining agreements.
The significant impact of firm and establishment size is also reported in Brown and Medoff (1989) and Oi and Idson (1999) in the U.S. case.

When considering the sample of male non unionized workers in the private sector (column (VI)), the point differential in wages for working in a firm with more than 500 employees is 0.14 for Canada and 0.09 for the U.S.. Overall, the size coefficients after including controls are similar to those estimated in Morissette (1993) using the Canadian Labour Market Activity Survey (LMAS) for 1986 and in Oi and Idson (1999) for male workers who use the May 1983 CPS. This suggests that the magnitude of the gaps has not changed over time in either country. For the purpose of comparing the results in the two countries, the remainder of the analysis will focus on the last category (more than 500 employees) for characterizing large firms.\(^{24}\)

In summary, the results for both countries are consistent with those found in the firm-size literature based on other cross-sectional data sets. After controlling for worker and firm characteristics, male non unionized workers in the private sector earn about 9% more in large (more than 500 employees) U.S. firms and about 14% more in large Canadian firms. The main objectives of the paper are to consider the possibility that, in addition to paying different wages on average, small and large firms reward different worker characteristics differently, and to compare and test for differences in the size-wage structures between Canada and the U.S.. The next section presents an analytical framework based on the non random allocation of workers into large and small firms and describes the estimation method used to estimate and test for differences in the size-wage structure. The results of the within and between country analysis of the size-wage structure are presented in section 4 and discussed in section 5.

3 Statistical Framework

The main difficulty in the analysis of wage determination is that wages are determined in an equilibrium context. Any empirical analysis, therefore, has to deal with disentangling the effects of simultaneous movements in labour supply and demand on wage outcomes. However, the literature on assignment and the distribution of earnings, first studied by Roy (1951) and later developed by Sattinger (1993), provides a mechanism by which wages do not depend on workers and firms characteristics independently, but on the value that a particular skill takes on when assigned to a particular job or firm. In this framework, workers are not identically productive across firms because

\(^{24}\)I do so because the estimated coefficient for firm size between 100 and 499 employees in the U.S. (relative to firms of size less than 99) is small and often non significant, and because the coefficient associated with more than 500 employees is the highest in both countries.
production technologies are differently sensitive to workers’ skills. The model used in this paper makes the assumption that the sensitivity of the technology with respect to skills varies with the number of workers. This implies that workers are not identically productive in large and small firms.

This section describes a model of non random assignment of workers into firms of different size based on both measured and unmeasured aspects of worker skill. It then discusses the implications of the model regarding the structure of wages in firms of different sizes.

Assume there are two types of firms which differ by size. Firms are indexed by \( j = S(\text{small}), L(\text{large}) \). The only input is labour, given in efficiency units per worker. Workers, indexed by \( i = 1, \ldots, N \), are characterised by a vector of productive skills, \((SK_i, \theta_i)\), where \( SK_i \) denotes observed skills and \( \theta_i \) represents skills that are unmeasured by the econometrician (these could include innate ability, initiative, ambition, loyalty). The wage offered by large and small firms will be, in log form:

\[
\begin{align*}
\ln w^L_i &= \alpha_L \ln SK_i + \beta_L \ln \theta_i, \quad \text{for large firms} \\
\ln w^S_i &= \alpha_S \ln SK_i + \beta_S \ln \theta_i, \quad \text{for small firms}
\end{align*}
\]

On the workers’ side, it is assumed that workers’ skills \((SK_i, \theta_i)\) are exogenously given so that investment in human capital is ignored. Workers are utility maximizers and the utility associated with working in a large or small firm is assumed to depend on firm attributes that are size-specific such as the wage rate and the working environment.

Workers choose to work at a large (small) firm because they have a comparative advantage in that type of firm. Let \( V^j_i \) denote the (indirect) utility of working in a firm of size \( j \). Define \( Z_i \) as a vector of individual characteristics that affect the utility of being in a large (or small firm), the indirect utility function of worker \( i \) is given by:

\[
\begin{align*}
\ln V^j_i &= \psi_0 + \psi_1 \ln w^j_i + \psi_2 j Z_i \\
&= \psi_0 + \psi_1 \alpha_j \ln SK_i + \psi_2 j Z_i + \psi_1 \beta_j \ln \theta_i, \quad j = L, S
\end{align*}
\]

where (3) results from substituting the wage equation offered by large or small firms into equation (6).

A worker chooses to work at a large firm if his utility is maximised by such a choice, that is if \( V^L_i > V^S_i \). Utility is not directly observed but the net gains associated with the choice of, let’s say,
a large firm is represented by:

\[ \ln V_i^L > \ln V_i^S \leftrightarrow \psi_1(\alpha_L - \alpha_S)\ln SK_i + (\psi_2L - \psi_2S)Z_i + \epsilon_i > 0 \tag{4} \]

where \( \epsilon_i = \psi_1(\beta_L - \beta_S)\ln \theta_i \) is an individual specific term affecting utility. Representing the net gain from choosing a large firm by the latent variable \( U_i^* \), a worker’s assignment into a large or small firm corresponds to the following conditions:

Worker \( i \) chooses \( L \) \( \leftrightarrow \) \( U_i^* > 0 \leftrightarrow \phi_1 \ln SK_i + \phi_2 Z_i + \epsilon_i > 0 \)

Worker \( i \) chooses \( S \) \( \leftrightarrow \) \( U_i^* \leq 0 \leftrightarrow \phi_1 \ln SK_i + \phi_2 Z_i + \epsilon_i \leq 0 \) \( \tag{5} \)

where \( \phi_1 = \psi_1(\alpha_L - \alpha_S) \) and \( \phi_2 = \psi_2L - \psi_2S \). The assignment of workers into firms of different size and the wages received will therefore be given by the following allocation rule: A worker with endowment \( (SK_i, \theta_i) \) chooses a large firm if and only if:

\[ U_i^* > 0 \leftrightarrow \ln \theta_i > g(\ln SK_i, \phi_2/\phi_1 Z_i) \]

This inequality defines the conditional distribution of the worker’s innate ability, \( \theta_i \), given \( SK_i \) across firm size.

This framework emphasizes the notion that different workers have different comparative advantage in firms of different sizes. This idea is relevant when analyzing the returns to skills across firm size and the role of unmeasured aspects of skills in driving workers’ allocation into firms of different sizes. The framework corresponds to a switching regression model with endogenous switching that can be summarised by the following set of equations:\(^{25}\)

\[ \ln w_i^L = X_i \gamma_L + u_iL \tag{6} \]
\[ \ln w_i^S = X_i \gamma_S + u_iS \tag{7} \]
\[ U_i^* = W_i \delta + \epsilon_i \tag{8} \]

where \( u_iL = \beta_L \ln \theta_i \)
\( u_iS = \beta_S \ln \theta_i \)
\( \epsilon_i = \psi_1(\beta_L - \beta_S)\ln \theta_i \)

\(^{25}\)See Maddala (1977) for a review of switching regression models. Robinson (1989) also provides a detailed discussion of such models applied to workers’ choice of unionization.
The matrix $X$ stands for workers’ measured human capital such as education, and age as well as marital status and race. It also contains dummies for occupation, industry and large city to control for compensating wage differentials. $W$ contains the variables in $X$ as well as the variables in $Z$ which affect the selection process. Distributional assumption on the vector of error terms and the correlation between $u_{iL}, u_{iS}$ and $\epsilon_i$ define the selectivity term, or inverse Mills ratio, to be added to the wage equation. Assuming normality of the vector of error terms defined in (9), the mean wage of workers in large (small) firms given that they chose to work in a large (small) firm is:

$$
E[\ln w_i^L | U_i^* > 0] = X_i \gamma_L + E[u_{iL} | \epsilon_i < W_i \delta] \\
= X_i \gamma_L + \sigma_{\epsilon L} \frac{\phi(W)}{\Phi(W)} \tag{10}
$$

$$
E[\ln w_i^S | U_i^* \leq 0] = X_i \gamma_S - \sigma_{\epsilon S} \frac{\phi(W)}{1 - \Phi(W)} \tag{11}
$$

Significant estimates of $\sigma_{\epsilon L}$ and $\sigma_{\epsilon S}$, the covariance between $\epsilon$ and $u_{iL}$ and $u_{iS}$ respectively, can be interpreted as evidence of non random selection of workers into large and small firms. Although the magnitude of the covariances does not have a direct interpretation, their sign reflects the selection process. Given that the selection equation characterizes the choice of large firms, positive selection into large firms corresponds to $\sigma_{\epsilon L} > 0$ and positive selection into small firms is implied by $\sigma_{\epsilon S} < 0$. Positive selection in large firms is equivalent to saying that workers who chose to work in large firms are better than average workers in terms of unmeasured dimensions of skills. This would occur if large firms assign greater reward to unmeasured skills than small firms do.\(^{26}\)

The estimation is performed using the Heckman two-step method. The results provide information on the potentially differential effects of education on wages in small and large firms as well as on the effect of the inverse Mills ratio in each case. In this paper, the inverse Mills ratio has an interpretation that goes beyond the so-called selectivity term because given the definitions in equations (9), it provides a proxy for unmeasured individual-specific ability $\theta_i$.

Identification of the coefficient associated with the inverse Mills ratio in the wage equation is obtained through nonlinearities implied by the use of the normal distribution for the estimation. Using all the explanatory variables in the wage equation as explanatory variables in the selection equation implies non linearity which permit identification of the inverse Mills ratio in the wage equation. For that matter, the vector $Z_i$ defined earlier is composed of the set of explanatory

---

\(^{26}\)Given the structure of the error terms in (9), the covariances are defined as $\sigma_{\epsilon_j} = \beta_j \psi_1(\beta_L - \beta_S) \sigma_\theta$, $j=L,S$ and therefore, positive selection in large firms could be interpreted as $(\beta_L - \beta_S) > 0$ while positive selection in small firms could be interpreted as $(\beta_L - \beta_S) < 0$. 

variables $X_i$ usually employed in the wage equation.\footnote{The variables in the wage equation are education, age dummies, marital status, occupation, industry and city size.}

Additional variables affecting the choice of firm size can also be added to the selection equation to identify the Mills ratio beyond identification due to nonlinearities of the probit/logit specification. I use interactions between the worker’s industry and city size. Table 2 below shows that there is a correlation between firm and city size and that there is substantial variation in this correlation across different industries. This suggests that information on city size may help explain the choice of firm size beyond what is explained by industry choice or in other words, controlling for industry. Appendix B presents the logit results for estimating the selection equation and the Mills ratio.

Table 2: Correlations of Firm Size with City Size$^a$

<table>
<thead>
<tr>
<th>City Size by Industry:</th>
<th>Canada</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Firm Size</td>
<td>Firm Size</td>
</tr>
<tr>
<td>Primary</td>
<td>0.009</td>
<td>0.038</td>
</tr>
<tr>
<td>Durables</td>
<td>-0.058*</td>
<td>-0.149*</td>
</tr>
<tr>
<td>Non Durables</td>
<td>0.019</td>
<td>0.034</td>
</tr>
<tr>
<td>Transport</td>
<td>0.117*</td>
<td>0.142*</td>
</tr>
<tr>
<td>Trade Wholesale</td>
<td>-0.002</td>
<td>-0.052</td>
</tr>
<tr>
<td>Trade Retail</td>
<td>0.080*</td>
<td>0.007</td>
</tr>
<tr>
<td>Finance</td>
<td>0.075*</td>
<td>0.067*</td>
</tr>
<tr>
<td>Services</td>
<td>-0.037*</td>
<td>0.093*</td>
</tr>
</tbody>
</table>

$^a$-Firm size and city size are used with the full categories originally provided in the dataset for each country.

$b*$ = 10% level of significance.

Tests of equality of the education effects and inverse Mills ratio’s coefficients across firm size (and for a given firm size across countries) are done similarly using the residuals from unconstrained regressions by firm size and country (such that all variables are allowed to vary by size and country) and comparing them to regressions which include equality restrictions (across firm size or countries) only for the variables on education and the inverse Mills ratios (all other variables remaining unconstrained). The resulting statistic corresponds to the Wald statistics.

4 Results

This section describes the results of the comparison of the size-wage structure between Canada and the United States for non unionized private sector male workers. Table 3 presents the results of
separate regressions for large and small firms including correction for non random selection. Tests of equality of the returns to education between large and small firms are presented (a joint test as well as individual tests by education levels) in the fourth and seventh columns for Canada and the U.S. respectively. Tests of equality of the wage structure by firm size between the two countries are presented in the last two columns (for large and small firms) jointly and by education level.

The size-wage structure displays similar features in both countries in terms of the existence and direction of the selectivity effects. In both countries, there is evidence of non random selection with positive selection into small firms. Indeed, while there is no significant evidence that large firms reward unmeasured ability, the selectivity term is significant in the wage equation for small firms showing evidence that small firms do attract above average workers in terms of unmeasured ability and they receive higher wages. Examples of such unmeasured skills or ability may include a propensity to operate in a work environment that is more prone to fast changes, or dimensions of ability related to creativity and autonomy in decision making, all better suited to smaller firms' environment.\textsuperscript{28} This result is consistent with the findings in Idson and Feaster (1990) based on the March CPS data for 1979 suggesting stability over time of the sorting patterns across firm size in the U.S.. It is also consistent with the results in Ferrer and Lluis (2008) showing evidence of significantly lower returns to unmeasured ability in larger firms (categorized as more than a thousand employees) using Canadian data from the Survey of Labour and Income Dynamics. Also, as can be seen from the last two columns of the table, tests of differences in the Mills ratios between the two countries cannot reject equality implying that the sorting pattern by firm size seems to be similar in Canada and the U.S..

In terms of the returns to education, the picture is slightly different in Canada than in the U.S.. The joint test as well as individual tests of differential returns to education by firm size cannot reject the null of equality in the Canadian case with high p-values in each case. For the U.S. there is some (although weak) evidence that the returns to higher education are greater in large firms with a p-value for the joint test of 13%. The university premium in large firms is about 40% larger in the U.S. (it is only 18% larger in large Canadian firms) relative to small firms. As a result, the test of equality in the returns to education between the two countries rejects the null of equality on the joint test and

\textsuperscript{28}Note that the findings are robust to dropping the industry-city size interactions and identifying the selectivity terms through non linearities implied by the use of the normal distribution. Note also that a sensitivity analysis of the definition of large firms (using 100 or more employees as the new cut-off) leads to different results for the selectivity terms. The results are different in that the inverse Mills ratio in small firms (less than 100 employees) are not anymore significant. The results of each analysis are available upon request.
the individual test for a university diploma. In other words, while a university diploma is associated with an estimated pay differential of 34% relative to no high school diploma within a large Canadian firm, the estimated pay differential is 54% in large American firms implying a 0.20 percentage point difference in the university premium for large firms.\textsuperscript{29} This result is consistent with the analysis of Burbidge, Magee and Robb (2002) who find differences in the US and Canadian university premia for male workers using the March CPS and LFS data.\textsuperscript{30} The present result suggests that the cross-country differential in the university premium might be explained by the behaviour of large firms (more than 500 employees).

Note that this result could be driven by the difference in firm size categorization between the two datasets. While large firms in Canada are defined as more than 500 (\textit{not} including 500 employees), large firms in the U.S. are defined as more than 499 employees (including 500 employees). If there is any significant bunching at 500 (since firm size is self-reported) and if firms of employees around or close to 500 employees are the ones driving wages significantly up, the differential size-wage premium between the two countries may be due to the fact that firms of 500 employees are not included in the large size group in Canada, lowering the size-wage premium for large firms in Canada relative to the U.S.. Appendix A tables A3 and A4 show that this is unlikely to be the case. The frequency of observations by firm size categories as well as the unconditional mean and OLS estimates of the log of wages by firm size categories in the U.S. show that the main driver of the size-wage premium are firms of 1000 and more employees (not of 500 to 999 employees). In the size categorization used in the present analysis, including the cross-country comparison, firms of size 1000 or more employees are treated similarly in both countries. In fact it is the fact that these largest firms are more frequent in the U.S. than in Canada and employ a larger part of the working population that seems to be driving the results (potentially due to having greater market power).\textsuperscript{31}

Based on Card and Lemieux (2001)’s finding about differences in the returns to education between younger and older cohorts, we re-run the estimations and tests on the sample of workers below age 40 expecting to find different results for younger workers in terms of the differential educational returns

\textsuperscript{29}The significant differential returns to college education between large and small firms and across countries are similar whether one includes or not the Mills ratio (see appendix table B.2).

\textsuperscript{30}The difference is smaller as their analysis aggregates workers across all firms.

\textsuperscript{31}Using other sources of available data, firm size distribution in Canada in 1996 was: Less than 20: 93.4%, 20-499: 6.4%, 500 or more: 0.2% and firms with 500 employees or more employed 12.5% of workers in 1997 (employment dynamics, Statistics Canada) while firm size distribution in the U.S. in 1997 was: Less than 20: 89.47%, 20-499: 10.23%, 500 or more: 0.3% and firms with 500 employees and more employed more than 30% of workers, almost all of which are employed in firms of 1000 or more employees (U.S. Census Bureau).
by size within and potentially between countries.\textsuperscript{32} The results, in table 4, show even stronger size differentials in the returns to a university education in the U.S. (about 52\%) and the test statistic whose p-value is now 4.14\% leads to the rejection of the null of equality at a reasonable level. Also for this sample of younger workers, cross-country differences in the university premium in large firms are now estimated at about 84\%. One can also notice the stronger and now significant effect of the Mills ratio in large Canadian firms reflecting the significant impact of unobserved ability and reducing the impact of education in large Canadian firms. This however cannot explain the cross-country differences in the returns to education in large firms as the test of equality of the Mills ratios between the two countries cannot reject the null of equality (p-value of 0.530).\textsuperscript{33}

Overall, the results from the cross-country analysis of the size-wage structure suggest similarity in the presence of worker self-selectivity into large and small firms and its effect on wages between Canada and the U.S. while there are substantial and significant differences in the returns to education between large Canadian and American firms, especially for younger workers. Together these two results seem puzzling. Assumptions of perfectly competitive markets including perfect worker mobility, and of similar supply and demand for skills in both countries imply similar size-wage structures between the two countries assuming similar distribution of unobserved ability and worker sorting across firm size. Two questions arise from these results: 1) What factors could explain such differential pricing of higher education among large firms between the two countries? and 2) How much of the difference in the level of wage inequality between Canada and the U.S. can be explained by such difference in the returns to education among large firms between the two countries? The next section discusses the validity of possible factors explaining the greater returns to college education in large U.S. firms and provides a simple estimate of the contribution of the cross-country educational wage differential among large firms to the level of cross-country wage inequality.\textsuperscript{34}

\textsuperscript{32}The authors show that since the 1980s, educational wage differentials have risen for young workers and remained stable for older workers in the U.S. as well as Canada and the U.K.. Although the present analysis only uses one year of data, the differential evolution of the skill premium by age groups found in their analysis could potentially lead to differences in terms of the size-wage structure by age group in the present data for 1998 both within as well as between countries.

\textsuperscript{33}For Canada, there is now significant evidence of positive selection in both small and large firms. This is not impossible if the selection model is based on a multi-factor ability sorting model. The model presented in section 3 is a particular case of this more general framework in which ability is multi-dimensional.

\textsuperscript{34}The analysis shown is done over the sample of non unionised male workers in the private sector. The analysis for the sub-sample of young workers lead to similar conclusions. It is therefore not shown and available upon request.
5 Discussion

Using CPS data for the U.S. and the survey of consumer finance for Canada for several years during the 70s and 80s, Freeman and Needles (1991) find that the slower growth of the college/high school premium in Canada compared to the U.S. in the 80s can be explained by the greater growth of the college graduate proportion of the Canadian workforce compared to the American one. Are there differences in the supply of skills to large Canadian and American firms? Can the skill mix of workers in large firms be different between the two countries? Appendix table B.3 describes the industrial and occupational composition of large firms for both countries. The table shows small differences in each country’s industrial distribution. On the other hand, differences in the occupational distribution are larger. There are 7.7% more managerial occupations among large Canadian firms compared to large American firms and 8.8% more low skill occupations (handlers) in large U.S. firms relative to large Canadian firms. Overall this implies that large Canadian firms have on average a greater proportion of relatively more skilled workers than large U.S. firms. This difference in the skill mix of workers in large firms is not apparent among small firms.\(^{35}\) As a result, the greater returns to university education in large U.S. firms may be due in part to the relative scarcity of (managerial) skills in large U.S. firms found in the data.

Additional market-based explanations may come from differences in the demand for skills between large Canadian and American firms. These differences may come from large firms’ different use of capital between the two countries. Moreover, given that the capital-labour ratio explains a substantial part of the size-wage premium (Troske, 1999), it is possible that not including capital information to the wage specification creates an omitted variable bias affecting all estimates including the returns to education. To check whether the high returns to education in large American firms result from omitting capital information, I re-ran the estimations for the U.S. adding a measure of investment rates per worker (by industry).\(^{36}\) The data were obtained from the Bureau of Economic Analysis.

\(^{35}\)The table equivalent to table B.3 for small firms is available upon request.

\(^{36}\)A more precise test of the role of capital in explaining the cross-country differential returns to university education in large firms requires to perform the same analysis with the Canadian data. Unfortunately, capital data for the year 1997 by detailed industry level is not publicly available for Canada. The U.S. analysis is still informative for evaluating the importance of an omitted variable bias in the returns to education. Indeed, if the higher returns to education in large American firms capture the differential use of capital between large Canadian and American firms, then a similar omitted bias argument applies within countries between large and small firms. In other words, the returns to education in large American firms may capture the differential use of capital between small and large firms. Moreover, the capital-skill complementarity hypothesis suggests that omitting capital information would imply an upward bias in the returns to college education. Checking for the presence of a bias in the U.S. case, the country associated with the highest returns to education, may therefore be sufficient to validate (or invalidate) the cross-country differential returns to education.
on capital flow for the year 1997 providing information on the use of different types of investment goods in 1997 by industry.\textsuperscript{37} I then computed a per worker capital measure by dividing the previous variable by the number of full-time workers in the given industry. I matched the variable to the CPS dataset by industry using 2 digit NAICS codes. Adding capital information to the wage regression did not lead to substantial changes in the estimates, ruling out the possibility of an important omitted variable bias resulting from the differential use of capital between large American and Canadian firms.\textsuperscript{38}

The cross-country difference in the returns to college education in large firms may also arise from country-specific institutional arrangements which have been found to matter in understanding wage inequality trends between the two countries. In the wage inequality literature, cross-country differential trends in the skill premium have been explained by emphasizing the role of country-specific institutions in filtering the extent of the change in the skill premium, reducing flexibility in wage and/or employment settings in other countries relative to the U.S..\textsuperscript{39} Example of institution-based factors analyzed are differences in unemployment rates (Gottchalk and Joyce (1998)), employment losses (Card, Kramarz and Lemieux (1999)) or hours reductions (Johnson and Kuhn (2004)), union strength (Blau and Kahn (1994), Dinardo and Lemieux (1997)), employment and social protection measures (Brunello, Comi and Lucifora (2000)).\textsuperscript{40}

One of the main difference in labour market institutions between Canada and the U.S. is the greater presence and strength of unions in Canada. The present results may be consistent with the idea of greater union spillover effects in Canada affecting non unionized large firms’ option to differentiate workers pay based on differences in education, or reducing flexibility in pay settings of large Canadian firms (Neumark and Wachter (1995)). Note that based on the results in table 1, the interaction effects between unions and large firms (and therefore possible union spillover effects) seem to be stronger in Canada than the U.S.. Indeed, there is a stronger drop in the firm size estimated

\textsuperscript{38}Given the small effect on the estimates and so as not to increase the length of the paper excessively, we do not include the results which are available upon request.
\textsuperscript{39}Studies which focus on market-based explanations for understanding wage inequality trends do not emphasize differences in the rate of increase in wage inequality between the U.S. and other countries. These studies focus on the differential changes in the relative supply and demand of skills and the resulting changes in the skill premium which happen in each country. See Katz and Murphy (1992) for the original study of the U.S case, and Murphy, Riddell and Romer (1998) who find similar results after updating the previous study to more recent U.S data and include Canadian data. Card and Lemieux (2001) emphasize cohort effects in the relative supply of skills to explain the evolution of inequality in both U.S. and Canada.
\textsuperscript{40}An exception is Beaudry and Green (2003) who show that wage inequality differences in the U.S. and Germany can be explained by an imbalance in the accumulation of physical capital versus human capital which occurred in the U.S. but not in Germany. This may or may not be due to different institutional settings between the two countries.
coefficient on wages for Canada than the U.S. after inclusion of a union dummy. To further investigate the possibility of greater spillover effects in Canada, I ran separate regressions estimating the returns to education by groups of workers in industries facing different levels of unionization (measured as the rate of unionization in the worker’s own industry. Table 5 below presents the estimates of the returns to a university/college degree in both countries in large firms. Over the three groups identified (low, medium and high unionization rates), the estimates show consistent evidence of a decline in the university premium associated with an increase in unionisation threat in the U.S. and some evidence of it for Canada (when the unionisation threat increases from medium to high levels).

Table 5: Returns to College/University in Large Firms by Unionization Rate in Workers’ Own Industry, Canada - U.S.\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Canada</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>(U^b \leq 25%)</td>
<td>0.225***</td>
<td>0.388***</td>
</tr>
<tr>
<td>25% &lt; U \leq 55%</td>
<td>0.188**</td>
<td>0.677**</td>
</tr>
<tr>
<td>U &gt; 55%</td>
<td>0.341***</td>
<td>0.340**</td>
</tr>
<tr>
<td>(U^b \leq 1%)</td>
<td>(0.088)</td>
<td>(0.083)</td>
</tr>
<tr>
<td>1% &lt; U \leq 4%</td>
<td>(0.326)</td>
<td>(0.110)</td>
</tr>
<tr>
<td>U &gt; 4%</td>
<td>(0.151)</td>
<td></td>
</tr>
<tr>
<td>No. of Observations</td>
<td>1019</td>
<td>3060</td>
</tr>
<tr>
<td></td>
<td>805</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>483</td>
<td>636</td>
</tr>
</tbody>
</table>

\(^a\)-Estimations based on the the sample of non unionised, private sector, male workers. The main wage specification used is identical to the one that created the results in tables 3 and 4.

The results are also consistent differences in health care systems between the two countries. The wage structure in the United States is statistically different for small and large firms while such differences are not significant in Canada. Moreover, the effect of the difference in health care system is expected to be stronger for large firms than small ones. With regards to the contribution of the returns to education to cross-country differences in

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\(^{41}\)Given that the distributional values of the rate of unionization do not intersect between the two countries (the highest rate in the U.S. is lower than the lowest rate in Canada) and given small cell issues associated with finer distributional values, we define only three groups or categories of unionization rates for each country.

\(^{42}\)With a privately funded system, small firms are less likely to offer health insurance and therefore be in a similar situation as Canadian firms. In the U.S., 35% of small firms (less than 199 employees) do not offer health insurance while only 1% of large firms do not offer such benefits (Williams and Lee (2002)).

\(^{43}\)Testing whether differences in health care systems explain the greater university premia in large U.S. firms would require additional empirical analysis using information on health insurance in the U.S. or dental insurance (similarly privately funded in both countries). The idea would be to compare the university premia in large firms that offer the benefit to those that do not offer it and add correction for worker selection effects (with selection based on benefits offering in addition to firm size). If offering employer-provided benefits allows firms to attract better workers then one may expect the returns to higher education (before correction for selection) to be greater in the large firms that provide such benefits. The cross-country difference would come from differences in benefits offering among large firms between the two countries.
wage inequality, I use a re-weighting method to compute the wage inequality that would prevail in Canada if the pricing of skills was based on U.S. values (for the returns to college education in large firms). If the differential returns to college education in large firms largely contributes to the greater level of wage inequality in the U.S. compared to Canada, then accounting for this differential would closely align the predicted measure of Canadian wage inequality with the actual U.S. wage inequality measure. Table 6 below computes actual Gini coefficients for each country (first two columns) and the predicted Gini coefficients for Canada if Canadian workers in large firms received the university premium offered in U.S. large firms (last column). Consistent with the wage inequality literature, the first two columns of the table show that the level of inequality in the U.S. is greater than in Canada as the Gini coefficient for Canada is smaller (closer to the value of 0 indicating perfect equality) than the American one.\(^4\) The most interesting result concerns the effect of the re-weighting technique which leads to a predicted Gini coefficient for Canada that very closely replicates the U.S. one. This exercise suggests that the difference in the returns to higher education in large firms between the two countries largely explains the cross-country difference in the level of wage inequality found in the data for 1998.

**Table 6: Gini Coefficients, Canada-U.S.**

<table>
<thead>
<tr>
<th></th>
<th>United States</th>
<th>Canada</th>
<th>Canada Reweighted(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini Coefficient</td>
<td>0.309</td>
<td>0.279</td>
<td>0.304</td>
</tr>
</tbody>
</table>

\(^a\)Sample of non unionized, private sector, male workers.
\(^b\)Gini coefficient that would prevail if male non unionized private sector workers were receiving the returns to university of their American counterparts, everything else unchanged.

6 Conclusion

This paper compares and tests differences in the wage structure by firm size between Canada and the United States as an attempt to further our understanding of the differential pricing of skills in the two countries reported in the wage inequality literature. The results from the cross-country

\(^44\)The Canadian Gini coefficient is of similar magnitude as the one calculated in studies conducted by Statistics Canada. For the U.S. it is smaller than the value computed by the U.S. department of Labor which is closer to 0.4. This may come from difference in the composition of the sample used as our sample is a more homogenous sample, more specific to a particular population of workers. Difference arise also based on which income measure is used.
analysis of the size-wage structure show similarity in the presence of worker self-selectivity into large and small firms and similar effects of selection on wages between Canada and the U.S.. At the same time, there are statistically significant differences in the returns to education between large Canadian and American firms, and the differences are substantial for younger workers.

Different explanatory factors have been investigated. The cross-country differential in the university premia in large firms may be the result of the scarcity of greater skills in large U.S. firms compared to large Canadian firms. It may also be the result of stronger union spillover effects affecting large Canadian non unionized firms’ decisions to differentially reward based on greater skills. It may also come from the higher frequency of very large firms in the U.S. which enjoy greater market power.

Overall, the results suggest that comparison and tests of the differences in the wage structure between Canada and the U.S. must address the issue of the differential behaviour of large firms between the two countries. The cross-country differential in the university premia in large firms seems to explain most of the difference in the level of wage inequality between the two countries found in the data. It is tempting to conclude from these results that differences in the American and Canadian wage structures found in the wage inequality literature are partly driven by large American firms. A counterfactual exercise using several years of data on wages, skill measures and firm size for each country would permit a more complete estimation of the contribution of the differential pricing of skills in large U.S. firms in explaining the differential trends in the American and Canadian wage structures. Another extension to this analysis would add comparisons of the wage structure by firm size for more countries such as the U.K. which experienced similar wage inequality increases as the U.S. and Germany which had a much flatter evolution of the skill premium than the U.S.. Compared to other European countries, these two countries both have a high proportion of larger firms (Pagano and Schivardi (2003)) which may differentially reward higher education relative to small firms.
References


Table 1: Firm Size Wage Differentials\textsuperscript{a}, Canada-United States, 1998

<table>
<thead>
<tr>
<th></th>
<th>Canada\textsuperscript{b}</th>
<th>United States\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(I) (II) (III) (IV) (V) (VI)</td>
<td></td>
</tr>
<tr>
<td>100 ≤ F. Size ≤ 500</td>
<td>0.249*** 0.183*** 0.149*** 0.123*** 0.128*** 0.139***</td>
<td>0.045*** 0.013 0.008 0.004 0.031</td>
</tr>
<tr>
<td></td>
<td>(0.005) (0.005) (0.005) (0.004) (0.004) (0.008)</td>
<td>(0.018) (0.015) (0.015) (0.015) (0.023)</td>
</tr>
<tr>
<td>F. Size &gt; 500</td>
<td>0.308*** 0.220*** 0.178*** 0.141*** 0.090*** 0.138***</td>
<td>0.140*** 0.069*** 0.062*** 0.061*** 0.093***</td>
</tr>
<tr>
<td></td>
<td>(0.005) (0.005) (0.005) (0.004) (0.005) (0.008)</td>
<td>(0.014) (0.012) (0.012) (0.013) (0.019)</td>
</tr>
<tr>
<td>Nearest University</td>
<td>0.512*** 0.514*** 0.308*** 0.301*** 0.311***</td>
<td>0.623*** 0.622*** 0.443*** 0.464***</td>
</tr>
<tr>
<td></td>
<td>(0.006) (0.006) (0.007) (0.007) (0.014)</td>
<td>(0.022) (0.022) (0.025) (0.035)</td>
</tr>
<tr>
<td>Post secondary</td>
<td>0.273*** 0.273*** 0.181*** 0.177*** 0.194***</td>
<td>0.313*** 0.312*** 0.205*** 0.202***</td>
</tr>
<tr>
<td></td>
<td>(0.005) (0.005) (0.005) (0.005) (0.009)</td>
<td>(0.025) (0.025) (0.026) (0.037)</td>
</tr>
<tr>
<td>Secondary</td>
<td>0.164*** 0.169*** 0.117*** 0.114*** 0.116***</td>
<td>0.122*** 0.129*** 0.121***</td>
</tr>
<tr>
<td></td>
<td>(0.005) (0.005) (0.005) (0.005) (0.009)</td>
<td>(0.004) (0.004) (0.004)</td>
</tr>
<tr>
<td>Age 30-39</td>
<td>0.234*** 0.222*** 0.195*** 0.191*** 0.221***</td>
<td>0.622*** 0.622*** 0.443*** 0.464***</td>
</tr>
<tr>
<td></td>
<td>(0.005) (0.005) (0.005) (0.005) (0.009)</td>
<td>(0.022) (0.022) (0.025) (0.035)</td>
</tr>
<tr>
<td>Age 40-49</td>
<td>0.312*** 0.289*** 0.249*** 0.245*** 0.284***</td>
<td>0.313*** 0.312*** 0.205*** 0.202***</td>
</tr>
<tr>
<td></td>
<td>(0.005) (0.005) (0.005) (0.005) (0.010)</td>
<td>(0.025) (0.025) (0.026) (0.037)</td>
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<tr>
<td>Age 50 +</td>
<td>0.333*** 0.313*** 0.269*** 0.265*** 0.292***</td>
<td>0.191*** 0.189*** 0.135*** 0.131***</td>
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<tr>
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<td>(0.006) (0.006) (0.006) (0.006) (0.012)</td>
<td>(0.020) (0.020) (0.021) (0.027)</td>
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<td>(0.004) (0.004) (0.004)</td>
<td>(0.016) (0.016) (0.015) (0.026)</td>
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<td>Indus./occup.</td>
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<td>0.041*** 0.092*** -</td>
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<td>0.08 0.33 0.35 0.45 0.45 0.41</td>
<td>0.02 0.31 0.31 0.38 0.41</td>
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\textsuperscript{a} Observations for the full sample are 68610 observations for Canada and 7191 for the US. Observations for the sample of male non unionized and private sector are 20556 for Canada and 2750 for the US.

\textsuperscript{b} The dependent variable is log of hourly wages. Also includes dummies for gender, marital status, metropolitan city and public sector. The omitted industry is wholesale trade and omitted occupation is handlers.
<table>
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<tr>
<th>Variables$^a$</th>
<th>Canada</th>
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<th>Tests of</th>
<th>Equality</th>
<th>United States</th>
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<th>Tests of</th>
<th>Equality</th>
<th>U.S. vs Canada</th>
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<td>≤ 500</td>
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<td>Small F.</td>
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<td>&lt; 500</td>
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<td>Small F.</td>
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<td>0.246***</td>
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<td>0.307***</td>
<td>1.157</td>
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<td>(0.032)</td>
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<td>(0.085)</td>
<td>(0.200)</td>
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<tr>
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<td>0.164***</td>
<td>0.149</td>
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<td>0.174**</td>
<td>0.072</td>
<td>1.065</td>
<td></td>
<td>0.000</td>
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<td>(0.028)</td>
<td>(0.014)</td>
<td>(0.699)</td>
<td></td>
<td>(0.070)</td>
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<td>(0.015)</td>
<td>(0.500)</td>
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<td>(0.983)</td>
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<td>(0.493)</td>
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<td>(0.135)</td>
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<td>1479</td>
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</tbody>
</table>

$^a$ Dependent variable is log of hourly wages. Also includes dummies for large city, age, married, industry (base category is wholesale trade) and occupation (base category is handlers).

$^b$ Tests based on the restricted and unrestricted residuals (restrictions based on the education variables) of separate regressions for small and large firms with data pooled for each country. In parenthesis are p-values of the tests.

$^c$ The large firm category includes firms of exactly 500 employees or more for the U.S. and 501 employees or more for Canada.

$^d$ Standard errors computed using bootstrapping and 500 repetitions.
Table 4: Heckman Two-Step Estimations, Canada-U.S.
Non Unionised Firms, Private Sector, Male Young Workers (20-39 years old)
Large Firm is greater than 500 Employees

<table>
<thead>
<tr>
<th>Variables</th>
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<th>United States</th>
<th></th>
<th></th>
<th>Tests$^b$ of Equality</th>
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<th>U.S. vs Canada</th>
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<th></th>
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<tr>
<td>Large F.</td>
<td>Small F.</td>
<td>Tests of</td>
<td>Tests of</td>
<td>Large F.</td>
<td>Small F.</td>
<td>Tests of</td>
<td>Tests of</td>
<td>Large F.</td>
<td>Small F.</td>
<td>Tests of</td>
<td>Tests of</td>
<td></td>
</tr>
<tr>
<td>&gt; 500</td>
<td>&gt; 500</td>
<td>Equality Size</td>
<td>Equality Size</td>
<td>&gt; 500</td>
<td>&lt; 500</td>
<td>Equality Size</td>
<td>Equality Size</td>
<td>&gt; 500</td>
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<td>Equality Size</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>0.270***</td>
<td>0.273***</td>
<td>0.003</td>
<td>0.496***</td>
<td>0.326***</td>
<td>4.141</td>
<td>5.92</td>
<td>0.171</td>
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<tr>
<td>/ College</td>
<td>(0.042)</td>
<td>(0.034)</td>
<td>(0.956)</td>
<td>(0.079)</td>
<td>(0.080)</td>
<td>(0.041)</td>
<td>(0.015)</td>
<td>(0.678)</td>
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<tr>
<td>Post Secondary</td>
<td>0.126***</td>
<td>0.171***</td>
<td>1.804</td>
<td>0.250**</td>
<td>0.135*</td>
<td>2.831</td>
<td>2.02</td>
<td>1.547</td>
<td></td>
<td></td>
<td></td>
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<td>/ Asso. College</td>
<td>(0.034)</td>
<td>(0.016)</td>
<td>(0.179)</td>
<td>(0.078)</td>
<td>(0.070)</td>
<td>(0.092)</td>
<td>(0.154)</td>
<td>(0.213)</td>
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<tr>
<td>Secondary</td>
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<td>0.079***</td>
<td>1.37</td>
<td>0.106*</td>
<td>0.069</td>
<td>1.230</td>
<td>0.764</td>
<td>1.22</td>
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<tr>
<td>/ High School</td>
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<td>(0.019)</td>
<td>(0.241)</td>
<td>(0.058)</td>
<td>(0.044)</td>
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<td>(0.381)</td>
<td>(0.268)</td>
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<tr>
<td>Joint Test</td>
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<td>(0.158)</td>
<td>1.817</td>
<td>(0.142)</td>
<td>2.993</td>
<td>1.226</td>
<td>(0.029)</td>
<td>(0.298)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mills Ratio$^d$</td>
<td>0.358**</td>
<td>-0.235*</td>
<td>13.212</td>
<td>0.268</td>
<td>-0.483***</td>
<td>10.43</td>
<td>0.393</td>
<td>3.008</td>
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<td></td>
<td>(0.172)</td>
<td>(0.134)</td>
<td>(0.000)</td>
<td>(0.199)</td>
<td>(0.187)</td>
<td>(0.001)</td>
<td>(0.530)</td>
<td>(0.082)</td>
<td></td>
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<td>0.42</td>
<td>655</td>
<td>787</td>
<td>3501</td>
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</tr>
</tbody>
</table>

a-Dependent variable is log of hourly wages. Also includes dummies for large city, married, industry (base category is wholesale trade) and occupation (base category is handlers).
b-Tests based on the restricted and unrestricted residuals (restrictions based on the education variables) of separate regressions for small and large firms with data pooled for each country. In parenthesis are p-values of the tests.
c-The large firm category includes firms of exactly 500 employees or more for the U.S. and 501 employees or more for Canada.
d-Standard errors computed using bootstrapping and 500 repetitions.
APPENDIX A: Descriptive Statistics by Firm Size

Table A.1: Descriptive Statistics by Firm Size\textsuperscript{a}, (LFS 98)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total All Workers</th>
<th>Total Male Wkrs</th>
<th>Large Firm ( &gt; 500 )</th>
<th>Small Firm ( &lt; 500 )</th>
<th>Large Firm ( &gt; 99 )</th>
<th>Small Firm ( &lt; 99 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Size (&gt; 500)</td>
<td>34.56</td>
<td>24.54</td>
<td>1</td>
<td>0</td>
<td>32.55</td>
<td>0</td>
</tr>
<tr>
<td>Firm Size (&gt; 99)</td>
<td>82.29</td>
<td>53.25</td>
<td>1</td>
<td>38.05</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Large Establishment ( &gt; 500)</td>
<td>14.23</td>
<td>8.56</td>
<td>34.81</td>
<td>0</td>
<td>11.36</td>
<td>0</td>
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<tr>
<td>University</td>
<td>21.21</td>
<td>21.27</td>
<td>30.45</td>
<td>18.29</td>
<td>24.40</td>
<td>11.68</td>
</tr>
<tr>
<td>Post Secondary</td>
<td>34.98</td>
<td>33.17</td>
<td>31.47</td>
<td>33.73</td>
<td>33.07</td>
<td>33.48</td>
</tr>
<tr>
<td>Secondary</td>
<td>29.59</td>
<td>29.56</td>
<td>27.73</td>
<td>30.16</td>
<td>28.70</td>
<td>32.18</td>
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<tr>
<td>No Secondary</td>
<td>14.20</td>
<td>15.98</td>
<td>10.33</td>
<td>17.81</td>
<td>13.80</td>
<td>22.64</td>
</tr>
<tr>
<td>Age 20-29</td>
<td>23.33</td>
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<td>28.25</td>
<td>29.87</td>
<td>28.32</td>
<td>33.00</td>
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<td>32.36</td>
</tr>
<tr>
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<td>24.80</td>
<td>22.36</td>
<td>23.76</td>
<td>20.52</td>
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<td>Age 50 +</td>
<td>17.15</td>
<td>14.57</td>
<td>14.50</td>
<td>14.59</td>
<td>14.72</td>
<td>14.10</td>
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<td>65.25</td>
<td>67.64</td>
<td>64.48</td>
<td>66.96</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Union</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Public</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Log\textsuperscript{a}(wage)</td>
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<td>2.73</td>
<td>2.87</td>
<td>2.68</td>
<td>2.80</td>
<td>2.52</td>
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<td>15672</td>
<td>14893</td>
<td>5663</td>
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</table>

\textsuperscript{a}-hourly wages reported for Canada and computed for the U.S.

Table A.2: Descriptive Statistics by Firm Size\textsuperscript{a}, (CPS 98)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total All Workers</th>
<th>Total Male Wkrs</th>
<th>Large Firm ( &gt; 500 )</th>
<th>Small Firm ( &lt; 500 )</th>
<th>Large Firm ( &gt; 99 )</th>
<th>Small Firm ( &lt; 99 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Size (&gt; 499)</td>
<td>56.69</td>
<td>47.02</td>
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<td>0</td>
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<tr>
<td>Firm Size (&gt; 99)</td>
<td>73.53</td>
<td>34.57</td>
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<td>34.73</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Large Establishment</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
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<td>31.51</td>
<td>33.54</td>
<td>40.45</td>
<td>27.41</td>
<td>37.07</td>
<td>26.86</td>
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<td>7.28</td>
<td>8.15</td>
<td>7.31</td>
</tr>
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<td>High School</td>
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<td>52.98</td>
<td>46.75</td>
<td>53.49</td>
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<td>6.47</td>
<td>12.31</td>
<td>8.11</td>
<td>12.32</td>
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<td>Age 20-29</td>
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<td>19.08</td>
<td>17.75</td>
<td>20.27</td>
<td>18.88</td>
<td>19.47</td>
</tr>
<tr>
<td>Age 30-39</td>
<td>30.36</td>
<td>33.64</td>
<td>34.16</td>
<td>33.17</td>
<td>32.23</td>
<td>34.41</td>
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<tr>
<td>Age 40-49</td>
<td>29.96</td>
<td>27.88</td>
<td>28.69</td>
<td>27.16</td>
<td>28.17</td>
<td>27.32</td>
</tr>
<tr>
<td>Age 50 +</td>
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<td>19.38</td>
<td>19.38</td>
<td>19.70</td>
<td>18.78</td>
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<tr>
<td>Married</td>
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<td>68.49</td>
<td>71.16</td>
<td>66.12</td>
<td>69.62</td>
<td>66.36</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Log\textsuperscript{a}(wage)</td>
<td>2.73</td>
<td>2.79</td>
<td>2.89</td>
<td>2.71</td>
<td>2.85</td>
<td>2.69</td>
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<td>1479</td>
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<td>977</td>
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</table>

\textsuperscript{a}-hourly wages reported for Canada and computed for the U.S.
### Table A.3: Descriptive Statistics by Firm Size\(^a\), (LFS 98)
Male Workers, Non Unionized Private Sector

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Log Wage</th>
<th>Unconditional Mean</th>
<th>OLS Estimates(^b)</th>
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<tr>
<td>Firm Size &lt; 20</td>
<td>27.55</td>
<td>2.52</td>
<td>1.99</td>
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<tr>
<td>20 ≤ Firm Size ≤ 99</td>
<td>21.95</td>
<td>2.66</td>
<td>2.08</td>
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<tr>
<td>100 ≤ Firm Size ≤ 500</td>
<td>26.74</td>
<td>2.85</td>
<td>2.17</td>
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</tr>
<tr>
<td>Firm Size ≥ 500</td>
<td>23.76</td>
<td>2.87</td>
<td>2.17</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)-Based on all categorizations provided in each survey.

\(^b\)-Estimates based on OLS regressions of the log of wages on all the firm size dummies, workers and firm characteristics (as in the last column of table 1) and no constant term.

### Table A.4: Descriptive Statistics by Firm Size\(^a\), (CPS 98)
Male Workers, Non Unionized Private Sector

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Log Wage</th>
<th>Unconditional Mean</th>
<th>OLS Estimates(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Size &lt; 24</td>
<td>18.98</td>
<td>2.63</td>
<td>2.02</td>
<td></td>
</tr>
<tr>
<td>25 ≤ Firm Size ≤ 99</td>
<td>16.55</td>
<td>2.73</td>
<td>2.09</td>
<td></td>
</tr>
<tr>
<td>100 ≤ Firm Size ≤ 499</td>
<td>18.25</td>
<td>2.74</td>
<td>2.09</td>
<td></td>
</tr>
<tr>
<td>500 ≤ Firm Size ≥ 999</td>
<td>6.95</td>
<td>2.81</td>
<td>2.13</td>
<td></td>
</tr>
<tr>
<td>Firm Size ≥ 1000</td>
<td>39.27</td>
<td>2.89</td>
<td>2.15</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)-Based on all categorizations provided in each survey.

\(^b\)-Estimates based on OLS regressions of the log of wages on all the firm size dummies, workers and firm characteristics (as in the last column of table 1) and no constant term.
APPENDIX B: Identification of the Mills Ratio

Identification of the Mills ratio comes from estimating a logit of the likelihood of choosing a large firm and adding interactions between industry and city size. These interaction variables may potentially affect the likelihood of choosing a large firm if one thinks that there is extra information given in the size of the city where an individual lives once industry has been taken into account (or beyond the information contained in the individual’s industry type) to explain his/her choice of firm size.

Table B.1 below shows the results of the logit estimation. Most of the interaction coefficients for Canada are significant while only some are significant for the U.S. The weak significance for the U.S. seems to be a question of sample size since the results improve when pooling data for the same sample of non unionized private sector workers over the years 1997 to 1999 (last column). For both countries the joint test of significance of the interactions rejects the hypothesis that the coefficients are all equal to zero implying that overall, the interactions are jointly significant in explaining firm size choice.

Table B.1: Cross-Industry Effects of Living in a Large City\(^a\) on Choosing to Work in a Large Firm (\(>499\)) - Non Unionised, Private Sector, Male Workers\(^b\)

<table>
<thead>
<tr>
<th>Variables(^c)</th>
<th>Canada</th>
<th>USA</th>
<th>USA Pooled data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary*Large City</td>
<td>-0.649**</td>
<td>-0.632</td>
<td>-1.241***</td>
</tr>
<tr>
<td></td>
<td>(0.423)</td>
<td>(0.657)</td>
<td>(0.341)</td>
</tr>
<tr>
<td>Non Durable*Large City</td>
<td>-0.508***</td>
<td>-0.477**</td>
<td>-0.421***</td>
</tr>
<tr>
<td></td>
<td>(0.139)</td>
<td>(0.229)</td>
<td>(0.129)</td>
</tr>
<tr>
<td>Durable*Large City</td>
<td>-0.099</td>
<td>-0.076</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td>(0.113)</td>
<td>(0.180)</td>
<td>(0.100)</td>
</tr>
<tr>
<td>Transport*Large City</td>
<td>-0.015</td>
<td>0.128</td>
<td>0.400**</td>
</tr>
<tr>
<td></td>
<td>(0.115)</td>
<td>(0.280)</td>
<td>(0.158)</td>
</tr>
<tr>
<td>Trade (Wholesale)*Large City</td>
<td>-0.301***</td>
<td>-0.224</td>
<td>0.175</td>
</tr>
<tr>
<td></td>
<td>(0.105)</td>
<td>(0.321)</td>
<td>(0.174)</td>
</tr>
<tr>
<td>Trade (Retail Sale)*Large City</td>
<td>-0.012</td>
<td>0.032</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(0.094)</td>
<td>(0.203)</td>
<td>(0.107)</td>
</tr>
<tr>
<td>Finance*Large City</td>
<td>-0.262**</td>
<td>0.077</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td>(0.115)</td>
<td>(0.319)</td>
<td>(0.186)</td>
</tr>
<tr>
<td>Services*Large City</td>
<td>-0.137**</td>
<td>-0.060</td>
<td>-0.050</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
<td>(0.303)</td>
<td>(0.102)</td>
</tr>
<tr>
<td>F-Test(^c)</td>
<td>48.63</td>
<td>6.26</td>
<td>31.76</td>
</tr>
<tr>
<td>(p-value)</td>
<td>(0.000)</td>
<td>(0.610)</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

\(a\)-Large city is defined as a dummy equal to one for more than one thousand individuals in the U.S. case and for Vancouver, Toronto and Montreal for Canada.

\(b\)-Based on a sample of 20556 observations for Canada and 2750 observations for the U.S. for 1998 and 8883 for the U.S. pooled data for the years 1997-1999.

\(c\)-Dependent variable is dummy for working in a firm of more than 500 employees. Also includes education, age and marital status and occupation. The omitted industry is wholesale trade and the omitted occupation is handlers.

\(d\)-F-Test of joint equality to zero.
### Appendix Table B.2: OLS Estimations, Canada-U.S.
Non Unionised, Private Sector, Male Workers
Large Firm is greater than 500 Employees

<table>
<thead>
<tr>
<th>Variables</th>
<th>Canada</th>
<th>United States</th>
<th>Tests(^b) of Equality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 500</td>
<td>≤ 500</td>
<td>U.S. vs Canada</td>
</tr>
<tr>
<td></td>
<td>≥ 500</td>
<td>≤ 500</td>
<td></td>
</tr>
<tr>
<td>University / College</td>
<td>0.323*** (0.027)</td>
<td>0.408*** (0.061)</td>
<td>3.33 (0.00)</td>
</tr>
<tr>
<td>Post Secondary / Asso. College</td>
<td>0.202*** (0.022)</td>
<td>0.158** (0.065)</td>
<td>2.91 (0.00)</td>
</tr>
<tr>
<td>Secondary / High School</td>
<td>0.136*** (0.022)</td>
<td>0.063 (0.055)</td>
<td>18.23 (0.00)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>0.47</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>4884</td>
<td>1271</td>
<td></td>
</tr>
</tbody>
</table>

\(a\)-Dependent variable is log of hourly wages. Also includes dummies for large city, age, married, industry (base category is wholesale trade) and occupation (base category is handlers).

\(b\)-The large firm category includes firms of exactly 500 employees or more for the U.S. and 501 employees or more for Canada.

\(c\)-Standard errors computed using bootstrapping and 500 repetitions.

### Table B.3: Industry and Occupation Distribution among Large Firms by Country
Non Unionised, Private Sector, Male Workers

<table>
<thead>
<tr>
<th>Industry</th>
<th>Canada</th>
<th>USA</th>
<th>Difference CA-USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>0.046</td>
<td>0.016</td>
<td>0.030</td>
</tr>
<tr>
<td>Non Durable</td>
<td>0.111</td>
<td>0.164</td>
<td>-0.053</td>
</tr>
<tr>
<td>Durable</td>
<td>0.179</td>
<td>0.234</td>
<td>-0.054</td>
</tr>
<tr>
<td>Transport</td>
<td>0.095</td>
<td>0.105</td>
<td>-0.009</td>
</tr>
<tr>
<td>Trade (Wholesale)</td>
<td>0.105</td>
<td>0.066</td>
<td>0.039</td>
</tr>
<tr>
<td>Trade (Retail Sale)</td>
<td>0.129</td>
<td>0.139</td>
<td>-0.010</td>
</tr>
<tr>
<td>Finance</td>
<td>0.110</td>
<td>0.096</td>
<td>0.013</td>
</tr>
<tr>
<td>Services</td>
<td>0.222</td>
<td>0.177</td>
<td>0.044</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Canada</th>
<th>USA</th>
<th>Difference CA-USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>0.0208</td>
<td>0.003</td>
<td>0.017</td>
</tr>
<tr>
<td>Management</td>
<td>0.280</td>
<td>0.202</td>
<td>0.077</td>
</tr>
<tr>
<td>Sciences</td>
<td>0.138</td>
<td>0.174</td>
<td>-0.035</td>
</tr>
<tr>
<td>Teaching</td>
<td>0.017</td>
<td>0.012</td>
<td>0.004</td>
</tr>
<tr>
<td>Medical</td>
<td>0.009</td>
<td>0.021</td>
<td>-0.012</td>
</tr>
<tr>
<td>Arts</td>
<td>0.011</td>
<td>0.0155</td>
<td>-0.004</td>
</tr>
<tr>
<td>Office</td>
<td>0.070</td>
<td>0.069</td>
<td>0.001</td>
</tr>
<tr>
<td>Sales</td>
<td>0.135</td>
<td>0.127</td>
<td>0.007</td>
</tr>
<tr>
<td>Services</td>
<td>0.060</td>
<td>0.037</td>
<td>0.022</td>
</tr>
<tr>
<td>Handlers</td>
<td>0.256</td>
<td>0.336</td>
<td>-0.088</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Canada</th>
<th>USA</th>
<th>Difference CA-USA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4884</td>
<td>1271</td>
<td></td>
</tr>
</tbody>
</table>