EXAMINING THE EFFECTS OF CHANGES IN PAID MATERNITY LEAVE POLICY IN CANADA, WITH PARTICULAR ATTENTION TO QUEBEC AND ONTARIO

by

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ABSTRACT

This research project examines the effects of changes in the maternity leave legislation on the wages of women with children in Canada, specifically Quebec and Ontario, using the data from the Survey of Labour and Income Dynamics 1999 – 2003. I estimate regression equations on women's wages using OLS, Heckman two step models and difference–in–differences estimation strategy. The results from all these of three methods confirm many of the previous studies' findings, which suggest that maternity leave contributes to the existence of the wage gap associated between women with children and women without children. My analysis shows that a longer maternity leave coverage can help in narrowing this gap.

Keywords: family gap, maternity leave policy effect, Quebec Ontario policy comparison, child effect on women's wages, pay differential for women with and without children

To the memory of my mother.

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INTRODUCTION

There has been extensive research conducted for the United States and Great Britain into the so–called "family gap" in pay, that is the differential in wages between women with children and women without children (Robert Wright (1988), Christine Greenhalgh (1980), Francine Blau and Lawrence Kahn (1987, 1996, 2000), Jane Waldfogel (1995, 1998, 1999), Abraham Katharine (1987), James Smith and Michael Ward (1989), Susan Harkness (1996), Michal Mick and Gillian Paul (2004)). However, there is little Canadian analysis on family gaps for women. Since 1990, Quebec and Ontario have followed different policy paths regarding parental leave. The purpose of this paper is to exploit the variations in policy across these two provinces and over time to investigate the effect of parental leave on the family gap. I will show how these differences in policy affect the family gap in these provinces. The question I want to answer is this: does maternity leave contribute to women with children earning higher wages?

Several conditions have made maternity provision protection more important for policy makers in the recent years, notably the dramatic changes in the labour market in the past several decades, including women's increasing participation rate in the labour force and the falling fertility rates related to work–family time pressure and the growing commitment to eliminate discrimination in employment. This new importance of

maternity leave is reflected in the fact that at least some maternity leave provision exist in the legislation of most of the developed countries.

This paper is organized as follows: After the **Introduction,** a **Literature Review** containing ten different papers on the topic of reasons, size and magnitude of family gap is incorporated. In the next part I discuss the **Theoretical Framework** of the hypothesis I want to test, and then talk about the recent **Policy Changes** concerning maternity benefits, with special attention paid to the two provinces Quebec and Ontario. The next section describes the **Empirical Strategy**. The **Database Description** section is followed by the **Estimated Results** and finally the **Conclusion** is presented.

LITERATURE REVIEW

Francine D. Blau and Lawrence M. Kahn (2000) in their paper paid special attention to the issue of discrimination when talking about gender differences in occupation. They compare the maternity leave benefits of the United States to the other OECD countries and find that the maternity and family leave available for the mothers of these countries is different in the sense that the rest of the OECD countries have a much longer period of leave. The figures show that a longer maternity leave has a positive effect on women's pay after they are going back to work.

Waldfogel (1998) finds that while the gender gap narrowed during the 1980s and 1990s in the United States and Great Britain, the gap between women with children and those without children has been widening. Her tests and results tell us that the effect of maternity leave it is significant when looking at the family gap in pay. According to her findings, the US lags in the area of family policies such as maternity leave and childcare. In fact, it is the only one among those countries included[1] in her study, which does not offer any kind of paid leave. In the United Kingdom there is also little public provision for women with children.

Canada's position was already more generous in 1994 than the US and UK in the provision of benefits, according to Waldfogel (1999). She showed that mothers here were better off in terms of after–leave wages than their counterparts in the U.S. and the United

[1] Sweden, Australia, Norway, Denmark, France, New Zealand, Finland, Belgium, United States, West Germany, United Kingdom, Canada, Switzerland, Japan

Kingdom. She attributes this to the relatively more generous maternity leave laws in place in Canada. Waldfogel suggests that the gap between mothers and other women may be smaller in those countries with an extensive family policy framework. She mentions that in Scandinavian countries, like Sweden and Denmark, there is only a small negative effect of children on women's pay.

Waldfogel (1998) calls the difference between the wages of women with and without children a family penalty. She cites other researchers, like Fuchs (1988), and Korenman and Neumark (1992) who found that this family penalty is about 10–15 percent even after characteristics such as education and work experience has been controlled for. It should be mentioned that married men receive a family premium ranging from 10–15 percent according to Jacobsen and Rayack (1996) and Korenman and Neumark (1991). Waldfogel's findings, that there is a wage premium associated with job protection say that this way the negative effect on income of having children can be offset.

Waldfogel (1998) argues that maternity leave coverage raises women's pay in the way that more women might return to their former employer after childbirth and by this mothers' subsequent wages become higher. According to her research, this might be suggestive that providing better coverage could close about 40 percent of the family gap due to penalties associated with having children.

Waldfogel (1998) controls for heterogeneity bias, by employing two separate methods. The first method is a first difference specification, where the individual effect is assumed to be time invariant and is potentially correlated with one or more of the independent variables. Uses early (mean 21) and late (mean 30) wage observations. If the

unobserved characteristics vary across individuals but not over time, this method, according to Waldfogel, effectively removes it. The second method is a fixed effect specification, and as above, this specification relies on the assumption that the fixed effects are time invariant. "The fixed effect model uses three reported wages from three different years to track the effects of children on wages over time. Taken together, the first difference and fixed effects models provide no evidence of significant heterogeneity bias. Controlling for unobserved heterogeneity has had little effect on the estimated wage effects of children."

Other researchers have looked at the question of family gap in pay as well. For example, Phipps, Burton and Lethbridge (2001) examine why Canadian women with children have lower wages than those women without. They use the 1995 Statistics Canada General Social Survey (GSS) data to examine the importance of the time spent out of the labour market for mothers. In order to achieve their goal Phipps, Burton and Lethbridge control for time spent out of labour force since they are suspicious of total time out being endogenous to income: women with higher income take less time out caring for children while women with lower wages are more likely to take longer time out of the labour market. Phipps, Burton and Lethbridge take account of the direct as well as the indirect impact of total duration of time out. The direct impact is that individuals do not acquire additional experience while taking time out, and also their human capital might deteriorate during the time out, while the indirect impact is no gaining seigniority and therefore possible movement from the primary to the secondary labour market. They conclude that having ever had a child is strongly significant. This result supports the importance of job protected maternity leave.

Todd and Sullivan (2002) studied the effects of children on households' disposable income, although they did not look specifically at women's wages. They found that the fiscal effect of children is smaller in Norway, Finland, and the United States than in Australia, Canada, Germany, Sweden and the United Kingdom.

Waldfogel and Harkness (1999) extend Waldfogel's earlier analysis of the family gap to include data from five other industrialized countries in addition to the United States and the United Kingdom: Australia, Canada, Germany, Finland and Sweden. They mostly used databases from 1994 and 1995 for the seven sample countries, and looked at the population between 24 and 44 years of age. They find that when looking only at full time workers the wages of women without children exceeded the wages of women with children in each and every sample country. Moreover, they find that children reduce women's employment much more in Australia, Germany and the United Kingdom than in Canada and the United States. Because of this variation across countries Waldfogel and Harkness (1999) ask whether policy differences might cause these distinctions. Waldfogel and Harkness suggest that this topic be evaluated further with special attention paid to the role maternity leave and child care have in closing the pay gap between mothers and other women.

Finally, Anderson, Binder and Krause (2002) address the issue of how different women pay the wage penalty of motherhood in the United States. Their results reveal a difference in this family gap among non–Hispanic white women and black women. Since mothering also effects education and occupation, they also conduct different regressions for educated and non educated women. Their findings show that for white women, the least educated mothers bear no penalty at all, while college educated mothers of two or

more children have the highest wage–disadvantage. As they control for unobserved heterogeneity, they find that exiting the labour force explains a smaller percentage in the case of black women than white women (12 and 20 percent respectively). Anderson, Binder and Krause suggest that this puzzle cannot be explained by human capital variables, and therefore needs further research.

THEORETICAL FRAMEWORK

This section presents the motivation for the hypothesis I would like to test. The paper's aim is to investigate the impact of maternity benefit policies on the wages of women with children. Particularly, the goal is to determine the influence of maternity benefits on the family gap in Canada.

My hypothesis is that family gap decreases with maternity leave coverage. And this is manifested in the higher wages of mothers after taking time off for raising children. Although a woman who has child related work interruptions does not acquire experience during the time out, with maternity coverage available more women might return to their former employer after childbirth and by this their subsequent wages are higher.

Maternity leave coverage may "induce women who would otherwise have left the labour market altogether for a lengthy period of time to instead return by the end of the leave period and to maintain employment continuously with their employer". (Waldfogel, 1998) By this, maternity leave can provide a safety net for women over the period of childbirth, therefore raise their level of work experience and job tenure, thus can redeem the family gap in pay.

POLICY CHANGES

Effective November 18 1990, the Federal Government adopted the following Act concerning Unemployment Insurance dealing with special benefits: 15 weeks of maternity benefits and 10 weeks of parental benefits in the period surrounding the birth of a child.

Maternity leave is designed to give expectant mothers the possibility of withdrawing from work in the later stages of their pregnancy and to allow them some time to recuperate after childbirth. Parental leave is available for both parents while they are caring for their new born child. Benefits usually cover 55% of a claimant's weekly insurable earnings, to a maximum of $413 per week. There are nonetheless exceptions: claimants who are in a low–income family with a net annual income of less than $25,921 and who are receiving the Child Tax Benefit can receive a higher benefit rate called family supplement. (http://www.sdc.gc.ca/asp/gateway.asp?hr=en/ei/types/)

To be eligible, an employee must have worked a minimum of 600 hours in the previous 52 weeks or since the start of her last claim. Every Canadian jurisdiction requires employers to reinstate employees who have taken a maternity leave to their former position or to a comparable one with equivalent wages and benefits. This leave can usually be supplemented by adding a period of parental leave. The federal government (the Employment Insurance program) provides maternity and parental

benefits, while the provincial labour standard laws are responsible for the provision of job protection.

In Quebec, since January 1, 1991 each mother and father was entitled to a maternity leave combined with parental leave not exceeding 34 consecutive weeks. The additional leave was funded by the province and was paid at the same rate as the EI benefits.

The extension of parental leave is a very significant development in the Canadian employment standards legislation. In 2000, encouraged by the lead of Quebec, all the remaining Canadian jurisdictions increased parental benefits from 10 weeks to 35 weeks, while keeping the previously available 15 weeks of maternity benefits. This way, starting from December 31, 2000 everyone had their labour legislation in accord with the Employment Insurance parental benefits.

The only exception was Quebec, where the legislative power decided to come up with an individual program for the mothers from their province. While the federal government increased the period of paid leave from 25 weeks to 50 weeks, and Ontario responded to this by increasing its job protection from 25 to 50 weeks, Quebec left its job protection at 34 weeks.

EMPIRICAL STRATEGY/MODEL

I start with Ordinary Least–Squares regression on a broad range of data to see whether different circumstances provide different results, and gradually narrow it towards a specific interest group. This group then serves as a baseline for further investigation. Afterwards I use several techniques and methods to control for possible heterogeneity, sample selection bias and endogeneity. These methods include Quasi Cohort analysis and Heckman Two–Step Selection Correction Estimation.

The dependent variable in each model is lnW – the natural logarithm of hourly wage for all paid–worker full time jobs during the reference year.

In forming the baseline model I will use a combination of Waldfogel's (1998) and Viitanen's (2004) family gap model. These models share many features with the following equation regarding their explanatory variable selection:

$$lnW = \alpha + \beta_1 E + \beta_2 C + \beta_3 U + \beta_4 P + \beta_5 F + \beta_6 O + \beta_7 Y + \beta_8 I + \beta_9 A + \beta_{10} S + \beta_{11} N + \epsilon \quad (1)$$

E = highest level of education (grouped in 7 categories); C = Size of Area of Residence (grouped in 5 categories); U = member of a union or covered by a collective agreement; P = indicator of whether the employer is in the public or private sector; F = firm size, based on the number of employees at all locations in Canada; O = seven groups for Standard Occupation Classification code; Y = Number of years of work

experience, which includes all part–time and full–time work since first starting to work full time– a value of zero is given for people with less than a year of experience and for those who have never worked full–time; I = total other income calculated based on the sum of family income less a woman's own income; A = person's age as of December 31 of the reference year; S = age squared; N = number of children in the family.

I keep all individuals who were employed full–time at least partially during the reference year and I drop agriculture workers (approximately 1.5% of the total population) in order to avoid the seasonal variability of the collected data in their case.

Quebec and Ontario, the two most populous provinces of Canada, are good candidates for comparison. They have similar economic and geographic environments, they are influenced by the same business cycles, and there is homogenous data collection. Although there are some undeniable social and cultural differences between Quebec and Ontario, I suggest that comparing these two is still more plausible than the comparison of family gaps between two different countries like the United States and France, for example. If we assume that the relative cultural differences remain static over this period (1999-2003) than these differences in culture between Ontario and Quebec will be differenced out by the double difference estimator. As well, we assume that the distribution of children's ages in the period 1999–2003 is constant. In other words the number of newborns in each year is similar, and therefore the number of women eligible for maternity leave is similar each year as well. Together, these assumptions insure that DID estimates are consistent.

The self selection problem I am concerned with is that women with children who return to work are not randomly selected from women with children. Sample selection

problem might be greater for mothers, because of the arising child care costs. Since mothers and other women may differ in some additional characteristics as well, the model needs to include a productivity factor that can account for the self–selection problem. When a mother decides whether to go back to work after a leave of absence child–care costs can be very decisive. Low–productivity workers, who would not earn enough to cover childcare costs, might stay at home. Therefore, only the high productivity women would get a job and earn income.

Waldfogel (1997) says that one possible answer to the main question of why women with maternity leave coverage have higher wages is that they are more productive than their counterparts are. Maternity leave coverage and wages might be positively correlated in her study (on the United States) because coverage is more likely to be part of the compensation package of highly productive workers. The maternity leave I am studying is statutory, and covers all workers who meet the basic eligibility in terms of hours worked. This endogeneity issue is therefore less likely to cause any problems in my study, than in research that looks at the effect of maternity leave provisions in private contractual agreements.

In order to show the distinct policy effects in the two provinces I pool the data from year 1999 with data from 2000 and from years 2002 with 2003. This way, the model could better represent the wage effect in the respective periods given that there was a policy change at the end of year 2000. The distinct policy effects may be reflected in women's wages of 2002 – 2003.

To follow the main stream of research and to obtain results which are comparable to the existing literature I run a set of OLS regressions for each year between 1999 and

2003 on a sub–sample of the SLID database. I estimate regression equations on a sub–sample of women aged 25 – 34 year who are employed full–time for at least some period during the survey year and who have positive non-zero hourly wages.

To control for observed heterogeneity the log of composite hourly wages is regressed on a set of human capital and demographic characteristics including educational background, city size, unionization, employed at a public or private firm, firm size, occupation, work experience, other income (other family members' income less a woman's own), age, and age squared.

By Age Group

As a first step I separate the 25 – 34 year age group into 25 – 29 and 30 – 34 five year groups. By doing this, unobserved heterogeneity among women can be reduced since women within a five year age band are also more likely to have similar social characteristics and responsibilities than women in the larger age group 25 – 34. For example, women aged 25 – 29 and who have children are likely to have similar responsibilities with respect to their children's care, since women in this age group likely have children of a similar age. This may not be true for women aged 30 – 34 and who have children since women from this group may have children of greatly differing ages. Children of these mothers may require vastly different care and so the effect of children on these women may not be comparable. Therefore, it is most appropriate to only consider mothers aged 25 – 29.

Province–by–Year Effect

In the second step needed to arrive to the core dataset of this analysis is to separate the two provinces of Quebec and Ontario from the rest of the country and each other for the 25 – 29 age group mentioned above. Concentrating on these two provinces only is justified in two ways. First, 49% of the observations come from Ontario and Quebec which suggests that we cannot expect significantly different results for Quebec and Ontario than for the rest of the country. Second, as the OLS and other regression results show later, the coefficients of child effects on wages were the same for Ontario than those for the whole country when excluding Ontario and Quebec.

Quasi Cohort Analysis

The Quasi Cohort Analysis allows us to run a regression on a group of women aged 25 – 29 in the period of 1999 – 2000 and another regression on the group aged 30 – 34, in 2002 – 2003. The data for the quasi cohort is formed by pooling data from the years 1999 – 2000 and 2002 – 2003, respectively, for each province separately. The underlying assumption of this method is that the relationship for those aged 25 – 29 in 1999 – 2000 will remain constant over the time period being considered.

For each province the coefficients from each cohort are compared. The aim here is to determine whether the cross cohort difference in the family gap is different for Quebec and Ontario. Each of these estimates is consistent and therefore the differences between them are also consistent.

The way things evolved (described in the policy changes section) between Quebec and Ontario provides natural environment for a retrospective quasi–experimental

cohort analysis. In such a study, one would identify two cohorts with similar characteristics and the values of state variables of interest in steady state within those cohorts. These variables also serve as explanatory ones from which to draw conclusions. One cohort (Ontario) receives one or a sequence of policy interventions on its economic environment while the other gets no intervention. Eventually one compares the occurrence of the outcome.

Heckman Two–Step Selection Bias Control

A typical cause for concern when estimating wage equations for females is that there may be a sample selection issue to the extent that many of the women in the sample are not engaged in paid work and therefore have no wages. This question might be further complicated if we deal with women with children and without children since the decision to have children gives raise to potential endogeneity of fertility status with respect to wages. Therefore we might need to deal with three types of selection bias.

To separate these issues first we have to decide whether to keep those in the sample who have zero wages. First, if we decide to keep them in our sample then we face the problem of Sample Selection Bias. Sample Selection Bias refers to a problem when the dependent variable is available only for part of the respondents. When a substantial fraction of women are not engaged in paid work because their returns to participation would be relatively low, simply running a regression with wage as the dependent variable and the number of children as one of the explanatory variables, without further treatment of the sample, may lead to biased estimates of the effect of children on wages.

In the second version we might decide not to keep those women who do not have non–zero (positive) composite hourly wages in our sample. Then the dependent variable is available for all observations but an independent variable included in the model which is having a child is potentially a choice variable. Running a regression on wages as a dependent variable and the dummy indicating that a woman has one or more children may still lead to biased estimates of the effect of children on wages. The reason for this potential bias is the fact that women with children may differ from those women without children in many observable and unobservable characteristics. This is sometimes called heterogeneity or endogeneity bias.

Finally the third possible version of our problem is the joint selection bias meaning that the database contains both the above mentioned shortcomings. Using the SLID database to estimate the effect of children on women's wages we are confronted with both types of biases in the same model. In a model of this type, the participation in the labour force and the endogeneity of fertility are not interpreted as independent and therefore have to be estimated simultaneously.

Analysing the second type of selection bias, namely heterogeneity bias and the third, joint selection bias, is not a purpose of present project but the effect of potential SSB is of special interest. In handling this problem I use Heckman Two–Stage Selection Bias Control to account for participation in the labour force. The wage equation to be estimated is

$$\ln W_i = X_i\beta + \gamma$$

To account for labour force participation the Heckman two step model is using the probit model for individual *i*

$$P_i = Z_i\delta + \epsilon$$

With the decision to enter the workforce given by P = 1 if $P_i > 0$ and 0 otherwise, where P is a variable for propensity to participate in the labour force and Z is a vector of personal household and economic characteristics affecting the woman decision to enter the labour force and u are normal disturbances.

One important condition for the use of Heckman Two–Step model is that in order to make the probit model work the database used should contain both those observations where the independent variable is equal zero and non–zero.

A second condition is that the probit model contains at least one variable which is not related to the dependent variable in the wage equation. The most successful probit equation contained the joint use of the following variables: years of work experience, number of children, total other family income, age of youngest child, city size, and the number of adults in the family. The variable of total other family income was excluded from the wage equation model to act as an excluded instrument in the probit model.

The number of adults in the family may have a positive effect on the probability of a mother working since adults may share in performing household tasks, allowing a mother more time and energy to devote to work. It could be the case that having more adults in the family could have an effect on wage due to peace of mind and less stress but this seems like a secondary effect and would therefore not affect wages greatly.

The age of the youngest child may be relevant factor in explaining a mother's probability of working since having a young child will require more parental attention. As above this seems to have a marginal secondary effect on women's wages.

The total of other family income seems important in determining a mother's decision to work since families with higher income are more likely to afford child care, allowing the mother more freedom to pursue her career.

It will be argued that these variables are not related to a mother's wage. For example, the number of adults in a mother's family does not logically seem to be a factor in determining her wage, nor is it information that an employer can or would request.

The age of the youngest child is not something that is likely to directly affect a mother's wage, since it is not information that employers can or would request. In addition, total other family income seems to be something that is outside the factors that affect a mother's wage. For these reasons, these three variables, the number of adults in the family, the age of the youngest child and the total other family income are suitable excluded instruments in the Heckman Two–Step Selection Bias Control.

DATABASE DESCRIPTION

This analysis uses the Survey of Labour and Income Dynamics (SLID). This is a longitudinal survey, meaning that data are collected from the same person for several years, with primary focus on labour and income variables and the relationship between them and family composition. For this analysis, I have to resort to the use of the publicly available database that was published each year between 1999 and 2003 containing a sum of 363,479 observations. This is a cross sectional sub–sample of the confidential longitudinal Database public–use microdata file and includes a collection of income, labour and family variables on persons and families in Canada.

Both the confidential and the publicly available database contain very detailed classification of income sources. Wages and salaries are gross earnings from all jobs held by a person before deductions. It includes composite hourly wages available for all paid workers during the reference year. This is calculated based on the implicit hourly wages, weighted using total hours paid for each. With reference to labour data, the data set includes information about a person's work experience, jobless periods, and job characteristics for the survey year. In terms of education, SLID has data both about educational activity and educational attainment. Although, the number of children per households is not provided, it is possible to calculate it by merging the economic family, census family and personal data files using the provided key file.

I included all women who were employees but excluded those who were not participating in the labour force. Self–employed women are also not included in the model since their reported income might be different from those of employees and they are not covered under the Employment Insurance Act. Only women who are married or in a common–law relationship are included. These considerations aim to reduce unobserved heterogeneity among the survey families used.

There are some shortcomings of my data from the perspective of my identification strategy. For example, the exact ages of children is not observed. In order to avoid the problems arising from this lack of information, I narrowed down the sample to women between ages 25 to 29. This can help in assuring that their children are somewhat in the similar age group.

Table 1 presented below contains selected Summary Statistics from the Survey of Labour and Income Dynamics SLID database published each year between 1999 and 2003, used in the models of this paper. It is worth mentioning that between the two periods the relative change in the hourly wages in the provinces of Quebec and Ontario was 18.18% and 9.6% respectively.

Table 1 **Selected Summary Statistics from the Survey of Labour and Income Dynamics SLID database published each year between 1999 and 2003, used in the models of this paper.**

	Quebec		Ontario	
	1999–2000	**2002–2003**	**1999–2000**	**2002–2003**
Number of observations	828	833	1 373	1286
	Mean	Mean	Mean	Mean
Composite hourly wage	12.92	15.27	14.16	15.53
Total Other Income	21 870	24 733	23 817	24 288
Education				
0 – attended high school	14.0%	9.6%	6.8%	6.9%
Graduated from high school	9.8	5.1	11.9	11.2
Non–University (no certificate)	10.6	11.9	10.9	8.9
Some University (no certificate)	1.6	1.6	4.5	5.8
Non–University certificate	37.2	41.4	34.4	38.1
Bachelor's degree	20.9	23.9	23.3	22.1
Above BA/MA/PhD	6.5	6.6	8.2	6.5
Number of Children				
None	52.4%	55.9%	62.8%	63.4%
One	23.6	23.2	17.1	19.4
Two	17.4	14.4	14.6	13.7
Three or more	6.6	6.5	5.5	3.5
Marital Status				
Married	25.2%	18.5%	48.2%	42.4%
Common law	39.4	39.6	10.3	9.6
Separated	4.0	4.2	3.4	3.7
Divorced	0.7	1.6	1.2	0.8
Widowed	0.1	0.1	0.1	0.3
Single (never married)	30.7	35.9	36.7	43.2

Table 1 **(Continued)**

	Quebec		Ontario	
	1999–2000	**2002–2003**	**1999–2000**	**2002–2003**
Firm Size				
Less than 20	35.4%	21.3%	24.1%	21.0%
20 to 99	20.0	14.9	17.0	16.0
100 to 499	10.3	12.7	13.9	10.3
500 to 999	7.9	6.6	8.4	4.8
1000 and over	26.3	21.9	36.7	47.9
Class of worker				
Employee	91.9%	94.1%	95.5%	94.3%
Some business	8.0	5.9	4.5	5.7
Union membership				
Yes	28.7%	30.1%	24.9%	24.8%
Only collective agreement	2.7	2.8	1.5	1.1
Neither	68.5	67.1	73.6	74.1
Job type				
Full–time	80.6%	79.9%	86.3%	78.9%
Part–time	19.4	20.1	13.7	21.1
Public/private sector				
Public sector	19.2%	25.2%	22.4%	21.4%
Private sector	80.8	74.8	77.6	78.6

RESULTS

The estimated family gaps based on the OLS regressions for Ontario and Quebec for each of the years 1999 to 2003 and for full time employed women aged 25 – 34 are shown in Figure 1. The coefficients for one, two, and three or more children presented come from the basic regression model discussed earlier in the Theoretical Framework section (detailed results available upon request). The results show that the effect of children on women's wages is becoming smaller over the sample period 1999 – 2003.

Table 2 The family gap in Ontario in 1999–2000

	The family gap in Ontario in 1999 – 2000	
	OLS	**Heckman Two–Step Selection Bias Control**
One Child	–0.055 (0.036)	–0.045 (0.032)
Two Children	–0.062** (0.032)	–0.044 (0.036)
Three or More Children	–0.268*** (0.086)	–0.265*** (0.069)

The coefficients of column one, Table 2 present the magnitude of the family gap for mothers of one, two or three or more children from Ontario 1999 – 2000. In the second column one can see that the coefficients obtained after controlling for selection bias still represent a family gap of comparable magnitude.

By Age Group

The results of dividing the 25 – 34 age group into two equal five–year sub–groups for Quebec and Ontario group are presented in Figure 3 and 4. While the 25 – 29 age group's results show an unambiguous improvement for mothers' pay compared to non–mothers (Figure 3) the 30 – 34 age group, for the Quebec and Ontario group, shows some negative effect for those women with three or more children (Figure 4), but the coefficients themselves are not significant (detailed results available upon request).

Province–by–year Effect

Up to this point we can discover some similarities in changes across the Quebec/Ontario group shown in Figures 1 through 4 even through the various approaches applied. Since population in these two provinces account for more than 49% of the total population of the whole country, this number assures that focusing only on Quebec and Ontario gives a good indication of the effect of policy changes under investigation. Separating these two provinces holds the first surprise. Focusing only on the data from Quebec I find that for women aged 25 – 29 in the 1999 – 2000 pooled data there is a child premium. Focusing only on Ontario and using the 1999 – 2000 pooled data presented in column 3 of Table A1 shows a child penalty for each mother regardless of the number of children.

Quebec decided not to follow the Canada–wide year–2000 policy changes and the 2002 – 2003 pooled years' coefficients in column 2 Table A1 show that the premium for having one child from 1999 – 2000 becomes a penalty, from a positive number changed to a negative number, while there is a significant decrease in the child premium for having two children, and the penalty for three or more children becomes even greater.

Since some of the women in my 'treatment group' would actually have given birth under the old policy, at least those who have two or more children, this might explain the above results.

For Ontario, the results presented in Table A1 for the 2002 – 2003 pooled data show that the child penalties in 1999 – 2000 for one child and three or more (26.8%) become a premium and the penalty for two children (6.2%) become smaller. I also find that Canadian results excluding only Quebec were similar to those of Ontario.

Table 3 Basic OLS results: Province Difference; Time Difference; Difference–in–Difference

	Que _ Ont 99/00 _ 99/00	Que _ Ont 02/03 _ 02/03	Que _ Que 02/03 _ 99/00	Ont _ Ont 02/03 _ 99/00	Diff–in–Diff
One Child	0.110** (0.048)	–0.064 (0.057)	–0.065* (0.050)	0.109** (0.055)	0.174*** (0.074)
Two Children	0.125** (0.064)	0.031 (0.074)	–0.046 (0.075)	0.048 (0.062)	0.094 (0.089)
Three or more children	0.228** (0.122)	–0.173 (0.142)	–0.060 (0.122)	0.341*** (0.143)	0.401** (0.188)

Note: *** indicates statistically significant at $p < 0.01$
** indicates statistically significant at $p < 0.05$
* indicates statistically significant at $p < 0.10$

Column 1 of Table 3 shows the differences between the coefficients for women having one two and three or more children in Quebec in 99/00 minus those coefficients of Ontario in 99/00. These results emphasize that in the period of 99/00 Quebec had a significant family premium compared to Ontario.

Column 4 of Table 3 shows the differences between the coefficients for women having one two and three or more children in Ontario in 02/03 minus those coefficients of Ontario in 99/00. The results indicate that over time the family gap became narrower or

even disappeared after the 2000 policy change. The numbers show a 10.8% difference for women having one child and a 34% difference for mothers of three or more children.

Finally, since Quebec and Ontario are neighbouring provinces within a country we can use a difference in difference strategy to identify the effect of the 2000 policy change in Ontario. These results are displayed in column 5 of Table 3. They are the magnitude of the change for Ontario compared to those similar changes in Quebec indicating that the family gap decreased by 17.2% for mothers of one child and by 40% for those women having three or more children as a result of the policy change in Ontario.

Quasi Cohort Analysis

The quasi–cohort analysis results shown in Figure 9 for Quebec and Figure 10 for Ontario reinforce the previous findings of the OLS regression using the pooled years 1999 – 2000 and 2002 – 2003 using women with children aged 25 – 29. For Quebec, the implied effect of having children changes from a premium for the first group (25 – 29 in 1999 – 2000) to a child penalty for the second group (28 – 32 in 2002 – 2003) for women having two and three or more children and with a slight improvement for those women having one child. The corresponding numbers for Ontario show that for women with one or two children, a child penalty for the first group becomes a child premium for the second group while for women with three or more children a large child penalty for the first group becomes a smaller penalty. These results represent the same general, positive changes as those of the results using Ontario and Quebec using the pooled years 1999 – 2000 and 2002 – 2003 and the age group 25 – 29.

Table 4 **Quasi Cohort: Province Difference; Time Difference; Difference–in–Difference**

	Que _ Ont 99/00	Que _ Ont 02/03	Que _ Que 02/03	Ont _ Ont 02/03	Diff–in–Diff
	99/00	02/03	99/00	99/00	
One Child	0.110**	–0.003	–0.036	0.077	0.113
	(0.048)	(0.088)	(0.084)	(0.056)	(0.101)
Two Children	0.125**	–0.065	–0.085	0.105*	0.190**
	(0.064)	(0.091)	(0.094)	(0.059)	(0.111)
Three or more children	0.228**	0.125	0.031	0.134**	0.102
	(0.122)	(0.131)	(0.122)	(0.120)	(0.179)

Note: *** indicates statistically significant at $p < 0.01$
** indicates statistically significant at $p < 0.05$
* indicates statistically significant at $p < 0.10$

Column 1 of the Quasi Cohort analysis displayed in Table 4 is identical to that of Table 3 since by definition a quasi cohort analysis is using the same data set for the first period for both provinces.

On the other hand, column 4 shows the differences between the coefficients for women of an age group of 25 – 29 having one two and three or more children in Quebec in 99/00 minus those coefficients of Ontario in 99/00. Although these results have different magnitude than those previously presented in Table 3 for the age group of 25 – 29 (and seem to be somewhat moderate compared to them) the changes point in the same direction. The coefficient for women having two children indicates that over time their family gap became 10.5% narrower.

The difference–in–difference method used to obtain column 5 presents a similar decrease in the family gap for Ontario as the previous one in Table 3. This is not surprising though, since the coefficients obtained in the quasi cohort analysis did not alter substantially from those of the basic findings.

Heckman Two–Step Selection Bias Control

The results for the Heckman Two Step Selection Control estimation presented in Appendix Table A2 are similar to the main results from OLS in Table A1. The initial child premium in Quebec becomes a child penalty for women with one and three or more children and those with two children suffer a reduction of their child premium. At the same time we can find a similar upward trend for Ontario as with the previous results using only OLS. These results are also presented in Figure 9 and Figure 10 in the Appendix.

In order to obtain comparable results to those in Table 3 and Table 4 the Heckman selection bias control coefficients are reorganized and presented using the same difference in province, difference in time, and difference–in–difference methods. These findings are presented in Table 5:

Table 5 **Heckman Two–Step Selection Bias Control: Province Difference; Time Difference; Difference–in–Difference**

	Que _ Ont 99/00 99/00	Que _ Ont 02/03 02/03	Que _ Que 02/03 99/00	Ont _ Ont 02/03 99/00	Diff–in–Diff
One Child	0.128*** (0.050)	–0.031 (0.058)	–0.096** (0.053)	0.064 (0.055)	0.159*** (0.077)
Two Children	0.089* (0.059)	–0.005 (0.048)	–0.018 (0.066)	0.066** (0.038)	0.083* (0.076)
Three or more children	0.279*** (0.098)	–0.066 (0.081)	–0.087 (0.107)	0.258*** (0.069)	0.345*** (0.127)

Note: *** indicates statistically significant at $p < 0.01$
** indicates statistically significant at $p < 0.05$
* indicates statistically significant at $p < 0.10$

When compared to Table 3 and 4, Table 5 brings no surprising results. Column 1 contains the inter province differences and shows the same premium for mothers in

Quebec in 1999 – 2000 compared to those in Ontario. The usual upward trend is present again in column 4 – the time difference for Ontario between the first and second period. Finally, column 5 gives almost identical results using the difference–in–difference method as the basic OLS coefficients in column 5 of Table 3.

Summarizing Table 3, 4, and 5 we can conclude that the findings all point in the same general direction: Quebec's initial family bonus from the first period compared to Ontario gradually disappeared as Ontario advanced after applying the new maternity leave policy in 2000. Quebec's apparent slip behind Ontario might be reversed once again when their even–more generous legislation becomes effective in 2006. Until then, the data from the remaining three years for 2004, 2005, and 2006 might reinforce these findings and provide an interesting extension for further research.

Side Issues

Analysing the remainder of Table A1 an interesting finding is that women who work in the public sector do approximately 12% better than their counterparts who work in the private sector, after controlling for other relevant factors (12 % is the average of the 4 estimates from Table A1). Also of note is that women who work in larger firms (more than 1000 employees, 500 – 999 employees, and 100 – 499 employees), as indicated by the coefficients of the firm size dummy variables, earn significantly more than those in small firms (less than 20 employees), after controlling for other factors. Similarly, union membership has a positive effect on women's wages, with these women earning on average 9.6% more than the non–unionized workers.

CONCLUSION

The evidence of parental leave coverage available for women in Canada is investigated in this paper. Using a difference in differences estimator I compared the wages of mothers before and after the policy change in Ontario to changes in a similar group of mothers in Quebec over the same time period. Generally results show that more generous maternity leave mitigates the family gap.

Longer parental leave coverage appears to ensure higher wages for mothers. Covered maternity leave can be used to undo the negative effects of motherhood on women's wages. These results suggest that policy makers who wish to reduce the family gap could implement covered maternity leave to help mothers accommodate their adaptation to their work load and care for their children.

The issue of heterogeneity bias and joint Heckman Sample Selection Bias is not a central focus of this paper. Analysis which focuses on these issues may lead to different results. However, I do control for Sample Selection Bias which aims to correct part of the joint Heckman SSB.

The findings of this paper tell us that Quebec had a wage premium in 1999 – 2000, but after the policy changes initiated in 2000, Ontario's women with children earned more relative to women in Ontario with no children.

APPENDICES

Figure 1 Family Gap in Wages: Quebec and Ontario

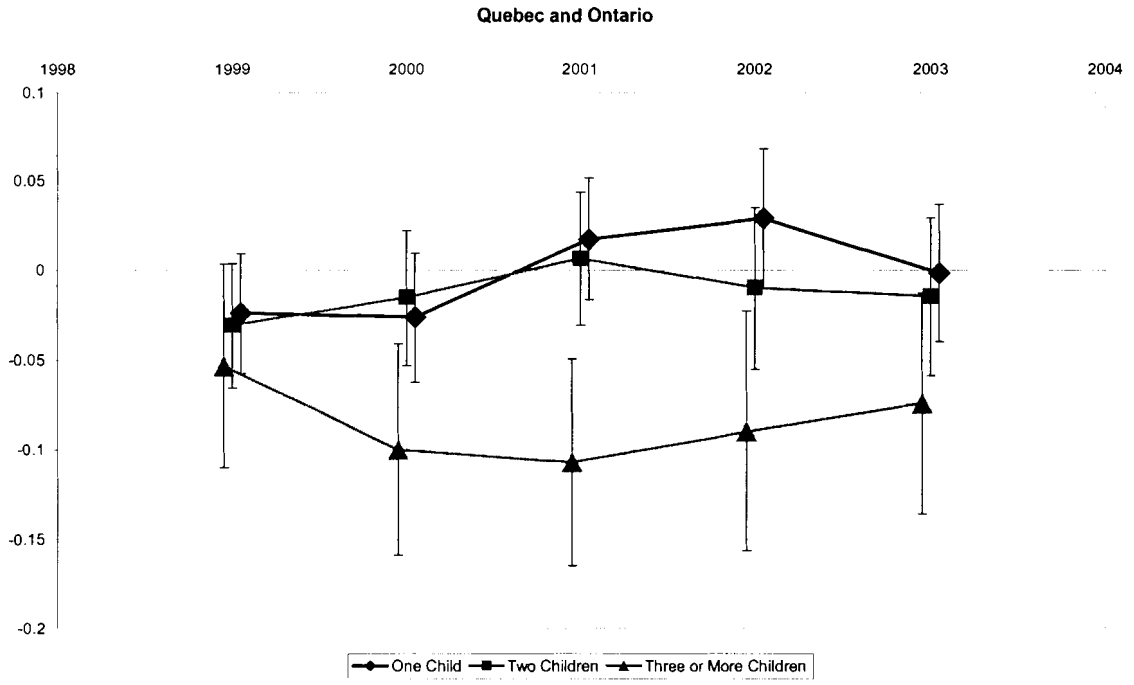

Figure 2 Age Structuring Effect: Age Groups: 25 – 29 Quebec and Ontario

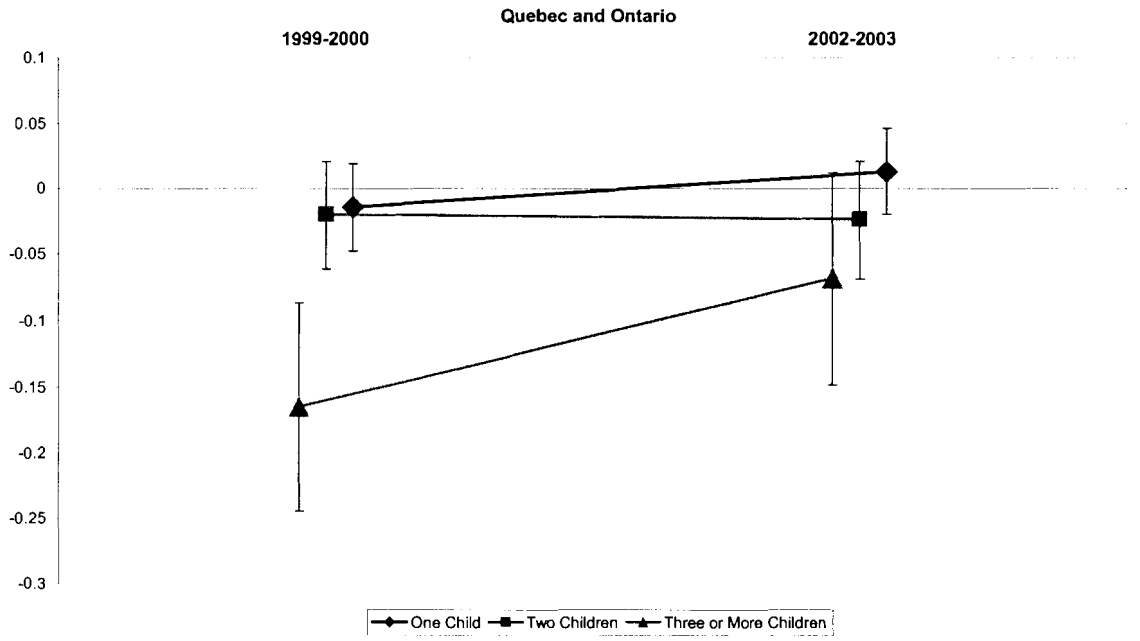

Figure 3 Age Structuring Effect: Age Groups: 30–34 Quebec and Ontario

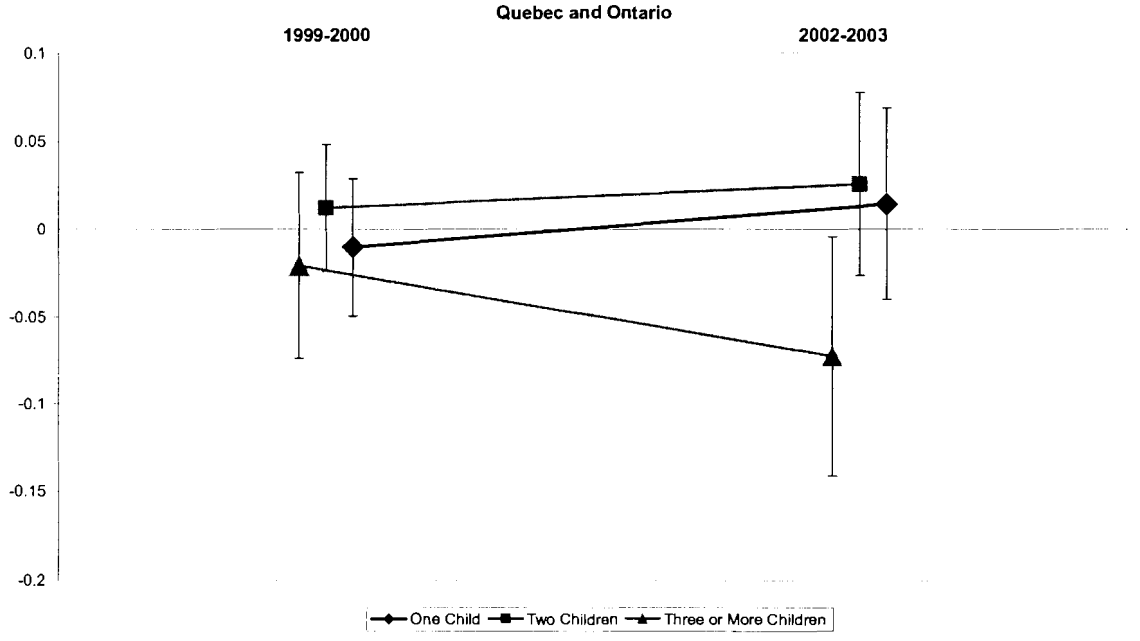

Figure 4 Province Selection Effect: Quebec

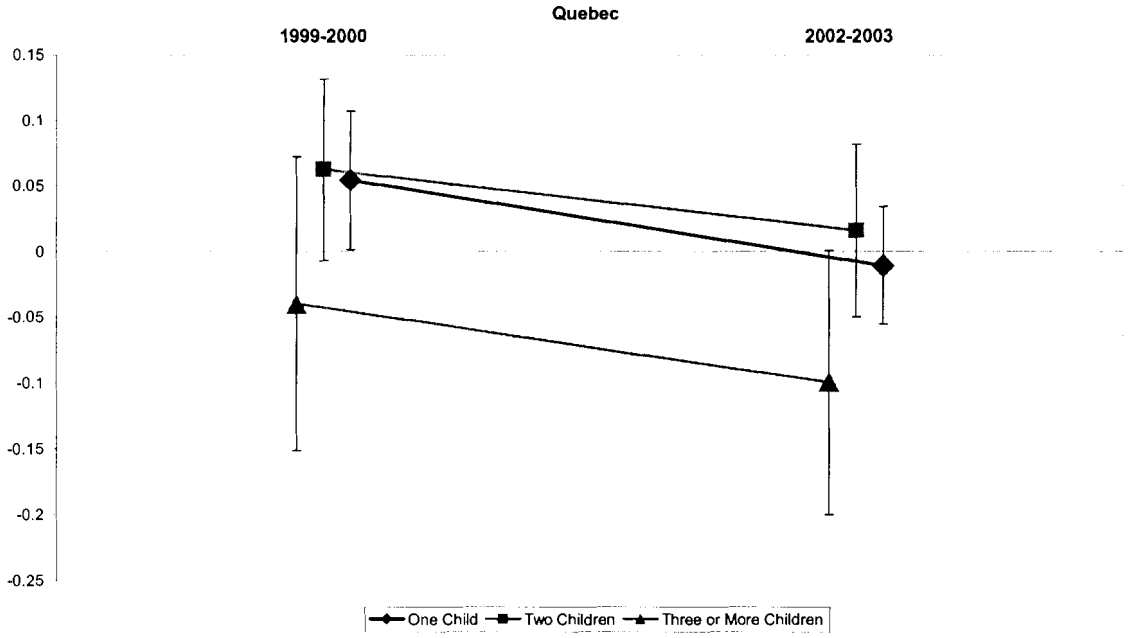

Figure 5 Province Selection Effect: Ontario

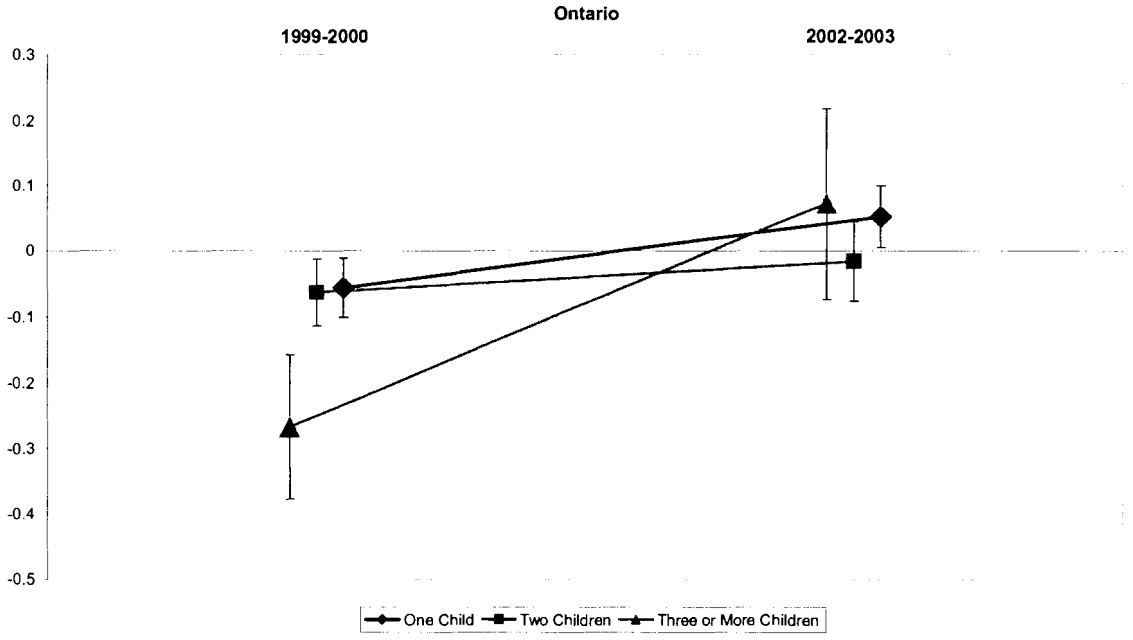

Figure 6 Quasi Cohort Analysis: Quebec

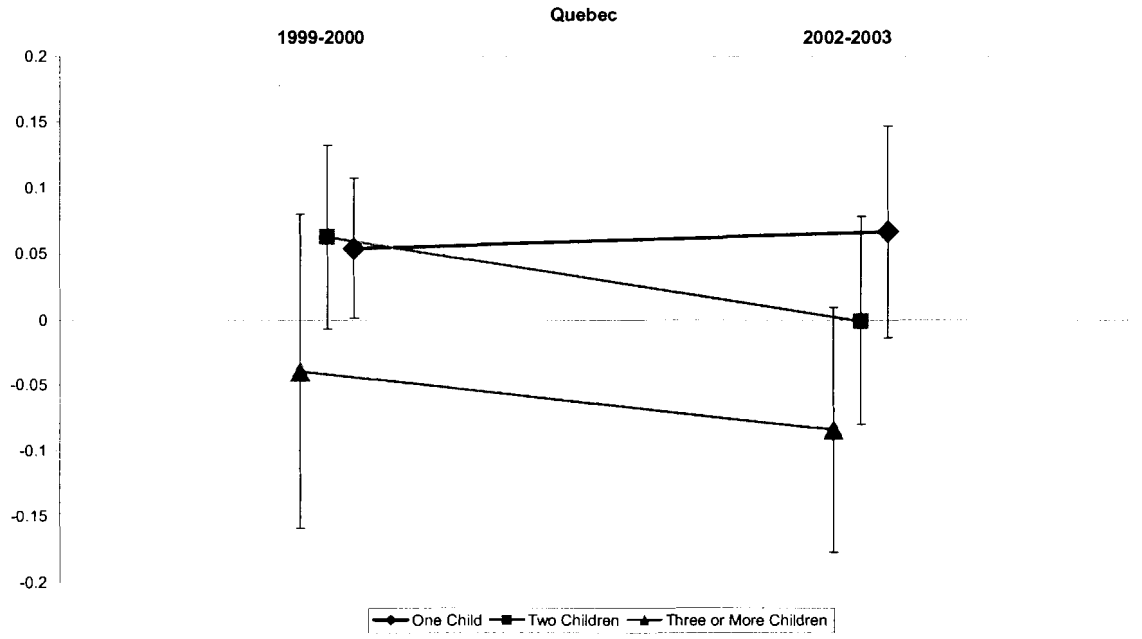

Figure 7 Quasi Cohort Analysis: Ontario

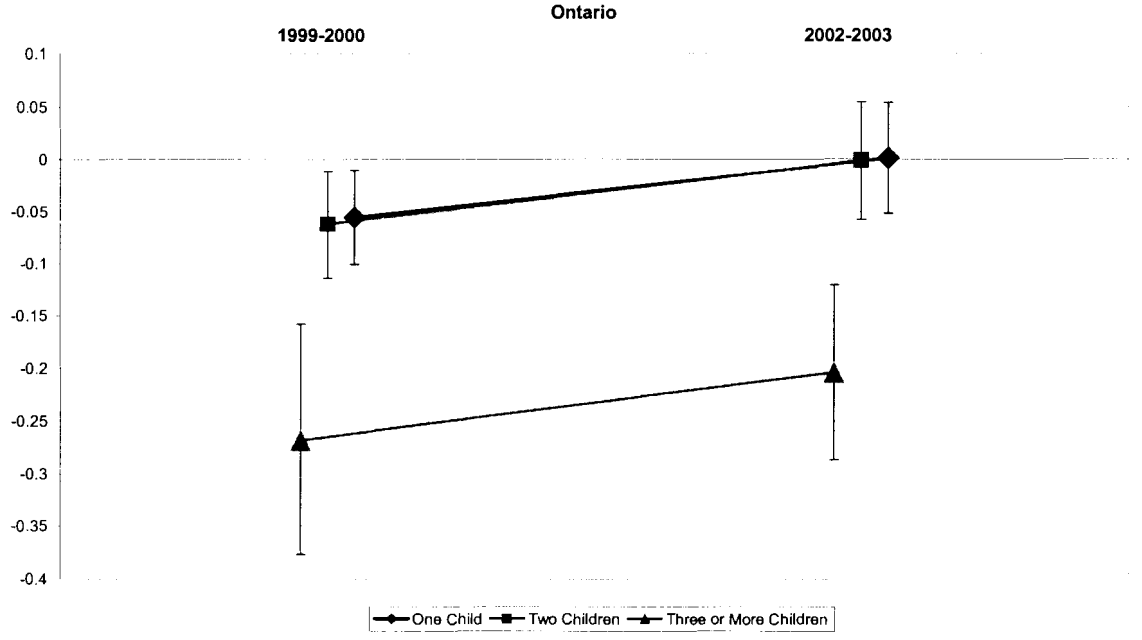

Figure 8 Heckman Two–Step Method: Sample Selection Bias Control Quebec

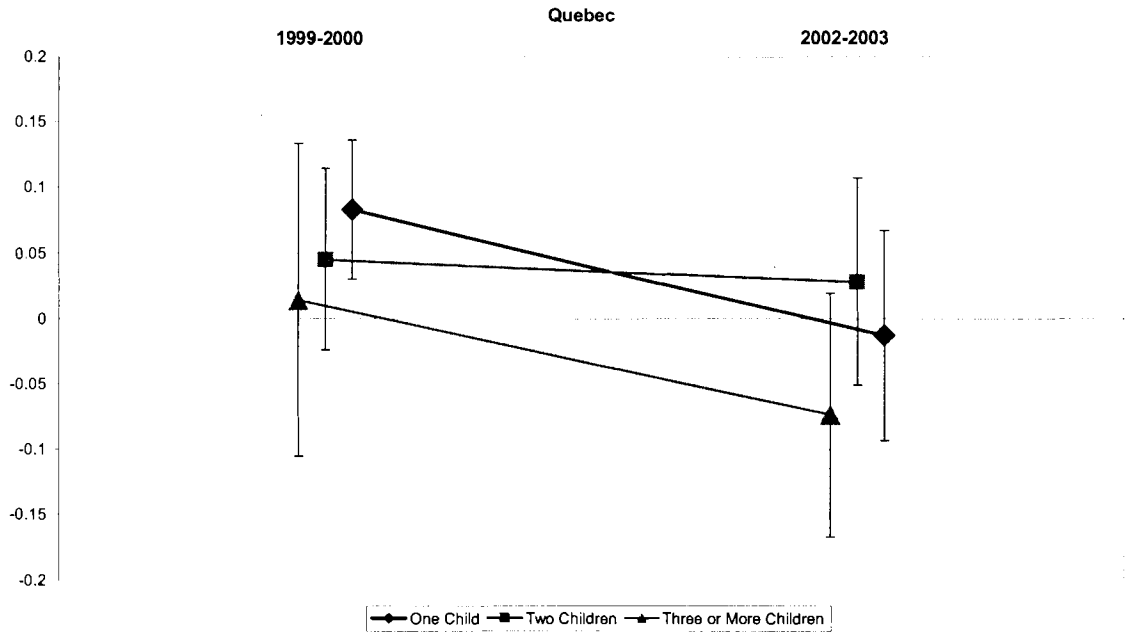

Figure 9 Heckman Two–Step Method: Sample Selection Bias Control Ontario

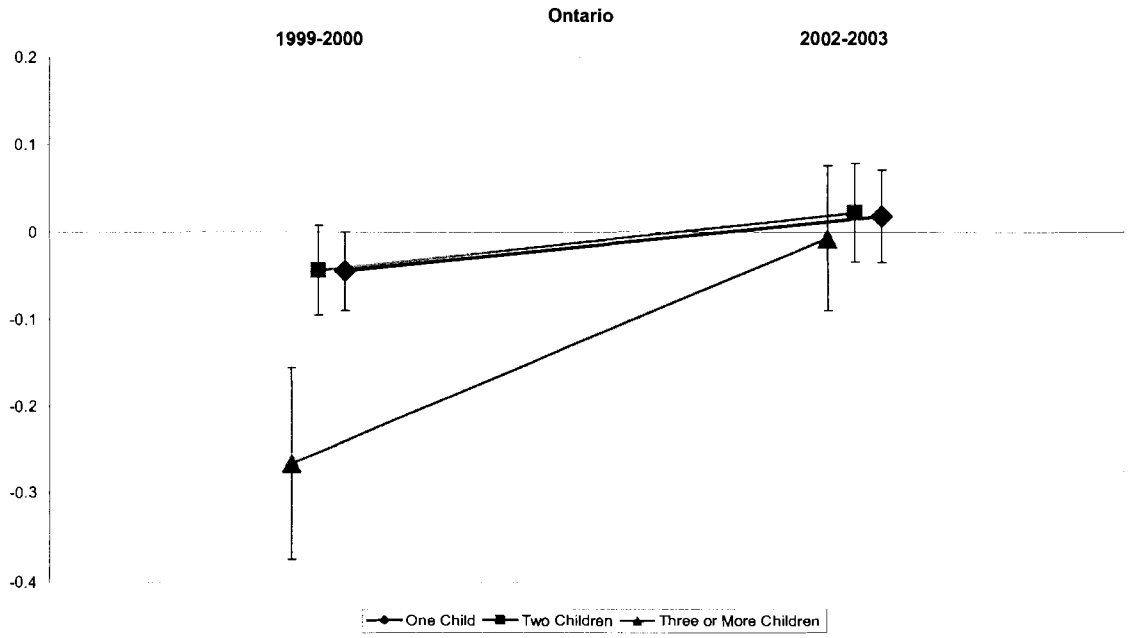

Table A1 Main results for age group 25 – 29

	Quebec		Ontario	
	1999–2000	2002–2003	1999–2000	2002–2003
One Child	0.054*	–0.011	–0.055	0.053
	(0.031)	(0.038)	(0.036)	(0.042)
Two Children	0.062	0.016	–0.062**	–0.015
	(0.055)	(0.051)	(0.032)	(0.053)
Three or More Children	–0.039	–0.099	–0.268***	0.073
	(0.086)	(0.085)	(0.086)	(0.114)
Education				
Graduated from high school	0.007	–0.003	0.072	0.072
	(0.069)	(0.083)	(0.062)	(0.065)
Non–University (no certificate)	–0.010	0.032	0.049	0.153**
	(0.070)	(0.066)	(0.058)	(0.070)
Some University(no certificate)	0.119	0.146	0.115*	0.168**
	(0.177)	(0.128)	(0.070)	(0.078)
Non University certificate	0.190***	0.070	0.146***	0.141***
	(0.057)	(0.058)	(0.053)	(0.058)
Bachelor's degree	0.295***	0.305***	0.261***	0.266***
	(0.065)	(0.062)	(0.057)	(0.061)
Above BA/MA/PhD	0.340***	0.270***	0.367***	0.256***
	(0.089)	(0.075)	(0.065)	(0.070)
City Size				
5 000 – 29 000	–0.014	0.036**	0.001	–0.019*
	(0.051)	(0.043)	(0.055)	(0.067)
30 000 – 99 000	0.032	0.006***	–0.037*	–0.042***
	(0.055)	(0.053)	(0.049)	(0.067)
100 000 – 500 000	–0.063	–0.027	–0.008	0.000***
	(0.051)	(0.046)	(0.044)	(0.056)
More than 500 000	0.093***	0.032***	0.043***	0.024***
	(0.041)	(0.036)	(0.044)	(0.058)
Union Member	0.090**	0.054*	0.130***	0.110***
	(0.044)	(0.036)	(0.030)	(0.034)
Public sector	0.082*	0.108***	0.097***	0.149***
	(0.050)	(0.038)	(0.033)	(0.035)
Years of Work Experience	0.015***	–0.000	0.007*	–0.000
	(0.005)	(0.000)	(0.004)	(0.000)
AGE	–0.119	–0.319	0.152	0.166
	(0.468)	(0.396)	(0.344)	(0.375)
AGE squared	0.002	0.006	–0.002	–0.002
	(0.008)	(0.007)	(0.006)	(0.006)

Table A1 (Continued)

	Quebec		Ontario	
	1999–2000	**2002–2003**	**1999–2000**	**2002–2003**
Firm Size				
20 to 99	0.050	0.072	0.000	0.058
	(0.040)	(0.038)	(0.033)	(0.035)
100 to 499	0.083*	0.130	0.060*	0.152
	(0.053)	(0.039)	(0.036)	(0.039)
500 to 999	0.180***	0.073	–0.016	0.267
	(0.060)	(0.051)	(0.044)	(0.052)
More than 1000	0.168***	0.201	0.067***	0.162
	(0.039)	(0.036)	(0.028)	(0.032)
Occupational Classification				
Managerial/administrative	0.204***	0.258***	0.338***	0.367***
	(0.066)	(0.056)	(0.048)	(0.057)
Teaching/ Clerical	0.125**	0.202***	0.200***	0.323***
	(0.063)	(0.053)	(0.047)	(0.056)
Sales / Services	0.246***	0.281***	0.241***	0.311***
	(0.044)	(0.043)	(0.036)	(0.043)
Mining and Quarrying	0.279***	0.314***	0.194***	0.315***
	(0.056)	(0.046)	(0.041)	(0.048)
Product fabricating/assembling	0.196***	0.224***	0.249***	0.290***
	(0.067)	(0.062)	(0.061)	(0.062)
Construction Trades	0.051	0.112***	0.027	0.151***
	(0.047)	(0.046)	(0.036)	(0.045)

Note: *** indicates statistically significant at $p < 0.01$
** indicates statistically significant at $p < 0.05$
* indicates statistically significant at $p < 0.10$

Table A2 Heckman selection model: Two–Step estimates

	Quebec		Ontario	
	1999–2000	**2002–2003**	**1999–2000**	**2002–2003**
One Child	0.083**	–0.013	–0.045	0.018
	(0.038)	(0.037)	(0.032)	(0.045)
Two Children	0.045	0.028	–0.044	0.022**
	(0.046)	(0.047)	(0.036)	(0.011)
Three or More Children	0.014	–0.074	–0.265***	–0.007**
	(0.069)	(0.081)	(0.069)	(0.003)
Number of observations	700	806	1113	1221
Censored observations	166	135	180	157

Note: *** indicates statistically significant at $p < 0.01$
** indicates statistically significant at $p < 0.05$
* indicates statistically significant at $p < 0.10$

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