When Fathers Leave, Do Mothers Stay?

Estimating the Effects of Quebec's Paternity Leave Policy on Mothers' Labour Market Outcomes

by

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Abstract

Paternity leave is increasingly being introduced as a means to promote gender equality both at home and in the workplace. In 2006, under the Quebec Parental Insurance Plan (QPIP), Quebec introduced five weeks of use-it-or-lose-it paternity leave reserved for new fathers (i.e., non-transferrable). At the time, Quebec stood as the sole Canadian province to have reserved paternity leave. With this natural experiment, we conduct difference-in-difference and triple-difference analyses to estimate whether Quebec's paternity leave policy has an effect on the labour market outcomes of new mothers in the province. We find that, in all, a father's decision to take the leave opportunity is more of an influential factor on mothers' labour market outcomes than the presence of the policy itself. Where the policy alone has a positive effect, fathers choosing to take leave furthers this positive effect.

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1 Introduction

In the evolving context of gender roles and the labour market, parental leave has been at the forefront of recent social policy agendas. As a result, there exists a sizeable amount of economic research on parental leave policies. Because such policies have traditionally been designed for women, existing research has mainly focused on mothers' use of policies such as maternity and parental leave. There is therefore a gap in the literature on how parental leave policies designed for new fathers impact own and mothers' outcomes. This research seeks to bridge that gap in the Canadian context by shifting the focus to paternity leave. Specifically, the objective of this research is to examine the impact of Quebec's reserved paternity leave on mothers' labour market outcomes.

Today, women account for nearly half of Canada's labour force, with the female labour force participation rate at more than 80 percent.[1] The implementation of maternity leave has been an important contribution that has allowed this to happen. That being said, Canada's parental leave policies have not fully eradicated gender inequalities in the workplace and the home. The child penalty is a veritable issue for Canadian mothers, who earn anywhere from 12 to 20 percent less than women without children – with no equivalent penalty apparent for fathers.[2] In an attempt to rectify this issue, the Canadian government offers gender-neutral shared parental leave that can be taken by both parents. Despite these efforts, a mere 30 percent of new fathers use their eligible parental leave, compared to nearly 90 percent of new

[1] See Statistics Canada (2018).
[2] See Zhang (2009).

mothers.[3] There is, however, one exception – the province of Quebec.

In 2006, under the Quebec Parental Insurance Plan (QPIP), Quebec introduced five weeks of use-it-or-lose-it paternity leave reserved for new fathers (i.e., non-transferrable). The goal of reserved paternity leave is to encourage fathers to be involved in caring for their newborn, while also providing an opportunity for mothers to be more involved in the labour force. With the implementation of this policy, the province saw an increase of 250 percent in eligible fathers taking leave, translating to more than 80 percent of Quebec fathers.[4] At the time, Quebec stood as the sole Canadian province to have reserved paternity leave. The implementation of a policy in one province and not in others acts as a natural experiment and is ideal for difference-in-difference (DiD) estimation. In this case, Quebec acts as the treatment group, and will be examined before and after 2006. The control group for this research consists of Ontario and British Columbia – reasoning for this selection will be explained in the sections to follow. Triple-difference analysis will also be conducted to control for any potential biases in the DiD estimations.

Statistics Canada's Employment Insurance Coverage Survey (EICS) micro-data set will be the primary source of data for the research in this paper. This survey is administered to a sub-sample of respondents in the Labour Force Survey (LFS). The purpose of the EICS is to examine the impact and performance of the Employment Insurance (EI) program in Canada. As of 2000, the questionnaire was expanded to

[3] Ibid.
[4] See Silcoff (2018).

include questions pertaining to maternity and parental benefits, asked to mothers with a child aged 0 to 12 months.

Using the EICS data, this paper attempts to answer the following research questions. What effects, if any, does paternity leave have on the duration of mothers' leave? Does paternity leave have an impact on mothers' earnings? Lastly, does paternity leave influence mothers' employment and occupation type? To address these questions, the following hypotheses are tested. Reserved paternity leave decreases the duration of mothers' parental leave (H1). With use-it-or-lose-it paternity leave, men are more likely to take parental leave, meaning women can reduce their leave and return to work sooner. Next, paternity leave has a positive impact on mothers' hourly earnings (H2). With the implementation of a program that shifts some of the child care responsibilities to new fathers, the expectation is that there might be less of an earnings penalty on mothers. An increase in hourly earnings might also be explained by the final hypothesis: paternity leave allows mothers to pursue full-time work and more demanding occupations (H3). Fathers who take on child care responsibilities through paternity leave might be more likely to take on additional duties in the home, meaning mothers can more easily work full-time positions and are less constrained to flexible-time occupations. If mothers are more likely to pursue higher-demanding positions as a result, we are more likely to observe higher hourly earnings.

The remainder of this paper is organized as follows. Section 2 describes the organization of employment insurance policy in Quebec and the remainder of Canada. Section 3 reviews existing literature, in the Canadian and international contexts, on

parental leave and labour market outcomes. Section 4 introduces the data, and Section 5 discusses methodological choices adopted for this paper. Section 6 summarizes the empirical findings, and a final section concludes.

2 Policy Context

In Canada, the right to job-protected unpaid leave as a new parent is established by provincial labour codes and consequently varies in length across provinces.[5] Federal legislation also exists to ensure the right to unpaid leave for federal employees and federally regulated industries, though it is by no means a floor for provincial legislation.[6] Although the right to leave is provided by the province, parental benefits obtained during that leave are accessed through the federal Employment Insurance Act.[7] In other words, excluding Quebec, Canadian parents can apply for parental leave benefits as a Special Benefit under Employment Insurance (EI). Before the recent expansion and during the timeframe of this research, benefits included up to 15 weeks of maternity leave, as well as up to 35 weeks of standard parental leave that could be shared between parents. The income replacement rate for parental leave under EI is at 55 percent.

For new parents in Quebec, QPIP offers a different benefit regime. Under the basic plan, parents are eligible for up to 18 weeks of maternity leave, 5 weeks of paternity leave, 32 weeks of parental leave which may be shared, or 37 weeks of

[5] See Ministry of Labour, Government of Ontario (n.d.).
[6] See Hanratty and Trzcinski (2008).
[7] See Ministry of Labour, Government of Ontario (n.d.).

adoption leave which is also shareable. Under QPIP, basic benefits provide an income replacement rate of 70 percent. Parents in Quebec are still eligible for EI benefits while using QPIP, such as regular benefits, though parental leave under EI's Special Benefits are excluded from this, meaning they cannot be combined to increase parental leave beyond benefits provided under QPIP.

3 Literature Review

With parental leave typically designed for and taken by mothers, a dominant area of focus in the literature considers the impact of mothers' leave (be it maternity or parental) on employment outcomes for women. However, as child care responsibilities more broadly have largely been associated with mothers, social policies regarding child care that are not explicitly designed for mothers can inevitably impact mothers' labour market outcomes. For this reason, it is important that studies examining both policy types are included in this literature review.

3.1 Canadian Studies

Studies surrounding parental leave in Canada offer both federal and provincial analyses due to the country's policy structure. Hanratty and Trzcinski (2008) provide an analysis of the expansion of Canada's federal parental benefits in 2000, from a combined 25 weeks to a combined total of 50 weeks, on mothers' returns to work and labour force participation. The authors note that, at the time of the federal benefit expansion, many provinces extended the amount of job-protected leave under their

labour codes as well. With data from the National Longitudinal Survey of Children and Youth from 1998-2003, their difference-in-difference analysis reveals that the benefit expansion decreased mothers' returns to work during the year after birth (presumably meaning they took the additional leave), but ultimately did not decrease labour force participation of those women in the long-term.

While Hanratty and Trzcinski (2008) focus on federal benefits, other research makes use of provincial variations in the Canadian context, as provincial legislation varies both in terms of the timing and level of benefits. For instance, ten Cate (2003) uses LFS data from 1976 to 2000 to examine whether parental leave policies raise or lower the probability of employment for women. Using variation across provinces, she conducts difference-in-difference analysis to find that there is a 3 to 4 percent increase in the probability of employment for women with young children (relative to those with older children) in the presence of a maternity/parental leave policy. Baker and Milligan (2008) similarly explore the changing length of mandated job-protected maternity leave across Canadian provinces using a difference-in-difference approach. With LFS data up to 2002, the authors find that, as a result of longer leave entitlements, job-protected leave can increase the time mothers spend at home with their infants and the likelihood that mothers return to their pre-birth employer.

Looking specifically at Quebec's variation, Ang (2015) examines two of the province's policies pertaining to fertility incentives to determine their impact on female labour supply. These policies include a cash-transfer incentive along with the implementation of QPIP. Prior to 2006, new parents in Quebec received benefits through EI in the same way new parents in the rest of Canada do. With the

introduction of QPIP, new parents in Quebec experienced an increase in their benefits (in terms of duration and replacement rate) compared to those under EI. Ang (2015) uses data from the Canadian Census and the LFS to conduct difference-in-difference analysis, and finds that the cash-transfer incentive led to decrease in female labour supply, while the increase in parental leave generosity from QPIP meant that Quebec saw an increase in the labour supply of women in their childbearing years. This study did not, however, examine fathers' use of paternity leave under QPIP.

Ang's (2015) study provides a look at mothers' outcomes related to both parental leave (QPIP) and alternative child care policies (cash-transfer incentives). QPIP, however, offers another look into a policy not explicitly designed for mothers that might impact their labour market outcomes – paternity leave. Previous literature on this topic is scarce in the Canadian context. Mayer and Le Bourdais (2018) offer what appears to be the only study on this policy in Canada. Using the 2011 rotation of the General Social Survey (GSS), part of their study evaluates the impact of QPIP's paternity leave on the duration of mothers' leave. Results from their research suggest that in the presence of the policy, new mothers take shorter parental leave. Specifically, mothers in Quebec took on average two and a half weeks less than mothers in the rest of Canada. Interestingly, mothers' shorter leave was not matched with longer leave for fathers. Mayer and Le Bourdais (2018) find that the incidence of paternity leave is negatively associated with the duration of fathers' leave, suggesting that this policy does not have a particularly positive effect on balancing parenting roles. This study does not examine additional labour market outcomes for mothers beyond leave duration and is limited to only one rotation of the GSS.

3.2 International Studies

Maternity and parental leave entitlements and use vary significantly across countries. A federal American policy that is often explored in existing literature is the Family and Medical Leave Act (FMLA) – a labour law introduced in 1993 providing individuals with job-protected unpaid leave for up to twelve weeks for reasons including parental leave.[8] Prior to this federal labour law, some American states introduced legislation to protect new mothers. For instance, in 1976, Illinois, New Jersey and New York required that employers fund maternity benefits through health insurance, thus increasing the cost of health insurance for women of childbearing years.[9] Gruber (1994) uses difference-in-difference analysis to uncover that the costs of maternity benefits were born entirely by employed women of childbearing years through a decrease in wage equivalent to the additional cost of their health care insurance.

Baum (2003) examines both state maternity leave legislation as well as the federal FMLA to determine their impact on mothers' post-birth employment retention. Using data from the National Longitudinal Survey of Youth from 1998 to 1994, this study finds that maternity leave legislation increases the probability that employed mothers who take leave return to their pre-birth employer. Berger and Waldfogel (2004) use Cox proportional hazard models to estimate the effects of maternity leave coverage (including coverage through the FMLA) on mothers' leave duration from 1988 to 1996. They find that women who are employed prior to giving

[8] See U.S. Department of Labor (n.d.).
[9] See Ehrenberg and Smith (2012).

birth and who have leave coverage return to work sooner than new mothers without coverage, suggesting that, in the presence of maternity leave, women are able to return the workforce faster. Despite the fact that the FMLA is not designed solely for maternity leave and can be used for various forms of leave, including paternity, this does not appear to be a point of focus in American research to date.

As the FMLA provides unpaid parental leave for American parents, 2004 marked a major change to parental leave legislation in the United States when California became the first state to offer paid family leave. The policy consists of six weeks of partially paid leave following the birth or adoption of a child. Rossin-Slater, Ruhm and Waldfogel (2013) use data from the Current Population Survey from 1999 to 2010 to examine how California's paid leave impacts mothers' labour market outcomes. Using difference-in-difference analysis, they find that, in the medium term (defined as one to three years after the birth), employed mothers increase their usual weekly work hours by 10 to 17 percent. The authors also suggest similar growth could be found in wage income.

While the U.S. has a more parsimonious parental leave regime, other countries, particularly in Europe, offer more generous leave entitlements. Ruhm (1998) examines paid parental leave in nine European countries from 1969 to 1993 to understand the effect it has on women's employment outcomes.[10] Through difference-in-difference analysis, he finds that paid parental leave leads to an increase in women's employment for both short and extended leave periods. However, the

[10] Countries included in Ruhm's (1998) study consist of Denmark, Finland, France, Germany, Greece, Ireland, Italy, Norway and Sweden.

effect of paid leave on hourly earnings varies based on leave length – short leave appears to have little effect while extended leave of nine months decreases women's hourly earnings. Ginja, Jans and Karimi (2018) look to the Swedish parental leave system to understand how more generous leave entitlements impact mothers' labour supply. Specifically, they look at the impact of the 'Speed Premium' regime, which provides mothers with higher leave entitlements for a subsequent child without having to return to work to re-qualify for maternity leave. Using regression discontinuity, they confirm that without the earnings qualification for an additional leave, mothers decrease their hours worked.

Today, parental leave entitlements continue to increase in generosity in some European countries. In Germany, for example, mothers are currently eligible for up to three years of partially paid leave. Schönberg and Ludsteck (2014) conduct a difference-in-difference analysis to examine the labour market effects of five expansions in German maternity leave entitlements over time, up to the current level of three years. The authors note that, with each expansion, the purpose has been to increase the time women are able to spend at home with their children post birth. Findings suggest just that – with each expansion, the short-run employment rates of new mothers are reduced. Interestingly, they find that the policy expansions have only trivial effects on long-run employment outcomes for mothers, including employment rates, employer continuity, and income. Kluve and Tamm (2013) focus specifically on the 2007 expansion of Germany's parental leave entitlements and find instead that the expansion leads to an increase in mothers' employment after benefit expiration (i.e., in the long run). This study also touches on the introduction of Germany's

paternity leave during the 2007 expansion of parental benefits, finding that new fathers appear to take the two-month leave offered to them. Kluve and Tamm (2013) do not, however, focus on mothers' outcomes as a result of paternity leave use.

In the Norwegian context, Ugreninov (2013) takes a different approach to paternity leave in an attempt to better understand mothers' sick leave. She hypothesizes that the high levels of sick leave for Norwegian mothers can be explained by the fact that most mothers bear the brunt of family responsibilities. Ugreninov (2013) uses the introduction of paternity leave to determine whether this attempt to balance family responsibilities between parents would decrease the amount of sick leave taken by Norwegian mothers. Although the results from this study are statistically insignificant, suggesting that paternity leave does not have an impact on mothers' sick leave, the results suggest that mothers who were affected by the implementation of paternity leave (i.e., those with eligible partners) took fewer days of sick leave.

Ugreninov's (2013) study emphasizes an important point – not only do women take longer periods of leave after childbirth, impacting their labour market outcomes, but when mothers assume primary responsibility of child care, they often take additional time away from work on top of parental leave to perform such duties. Duchini and Van Effenterre (2018) also explore this concept in the French context, finding that women with children are typically restricted from having traditional work schedules and require more flexibility in their jobs. This was especially the case in France prior to 2013 when children in primary school did not have classes on Wednesdays. This constraint contributed to the gender wage gap as women were

predominantly the parent staying home to take care of their children on Wednesdays. In 2013, a reform occurred in the school system that saw some classes take place on Wednesday mornings. As a result of the school week expansion, Duchini and Van Effenterre (2018) find that women are able to work longer and more regularly. They also observe an increase in the hourly wage, leading to a sizeable reduction in the gender wage gap.

4 Data and Descriptive Statistics

4.1 Data Collection

The research in the present paper will utilize data from Statistics Canada's public use version of the Employment Insurance Coverage Survey (EICS). As a sub-section of the Labour Force Survey, the EICS mainly asks respondents questions regarding their use of employment insurance and is administered annually. Questions pertaining to maternity and parental leave, which are of particular importance to the research in this paper, are asked to mothers with a child aged 0 to 12 months. For this reason, the research at hand analyzes the impact of paternity leave on mothers' labour market outcomes. The public use data does not allow for the examination of fathers' corresponding labour market outcomes.

As paternity leave was implemented in Quebec in 2006, data will consist of five rounds of the EICS from 2004-2008 so that two years before and two years after the program implementation can be observed. These five rounds of the EICS are merged into one dataset. The sample includes only mothers in a husband-wife, dual-earner

couple in Quebec, Ontario, and British Columbia.[11] With these restrictions, the age range of mothers in the sample includes those 15 to 44 years old. The size of the economic family is also naturally limited to between three people to five or more people. As a result, the final sample is made up of 1546 observations. A list of all variables used in this research with more comprehensive definitions and coding can be found in Appendix A.

4.2 Descriptive Statistics

The public use EICS allows for the examination of multiple labour market outcomes for mothers, though does not allow for the examination of fathers' similar outcomes. Dependent variables include the duration of mothers' leave (in months), mothers' usual hourly earnings, mothers' full/part-time status of their current position, and mothers' occupation/industry group. The main explanatory variables include province and year (which capture the presence of paternity leave), as well as mothers who received maternity/parental benefits and fathers who claimed/intended to claim parental benefits. All mentioned key variables are presented below in Table 1.1 and 1.2, though it should be noted that these represent descriptive statistics for the merged dataset. To find a breakdown of descriptive statistics for all variables by year and province, see Appendix A.

[11] In order for paternity leave to potentially impact the mothers' labour market outcomes that will be observed in this research (e.g., usual hourly earnings, duration of leave), it must be the mothers included in the sample have partners who are eligible for paternity leave and that both the mother and the father are employed. Based on the type of grouping for the economic family in the survey, this consists of husband-wife, dual-earner couples.

Table 1.1 Key Categorical Variables

Variable	Percent
Dependent Variables	
naics6, Mothers' industry based on NAICS 1997	100.00
Agriculture & Forestry, Fishing, Mining, Oil and Gas	1.49
Construction	0.71
Manufacturing	9.83
Retail Trade & Accommodation and Food Services	14.62
Educational Services & Health Care and Social Assistance & Public Administration	46.77
All others	26.58
noc6, Mothers' occupation based on NOC 2001	100.00
Management	5.76
Business, Finance and Administration	25.74
Health and Natural Applied Sciences	19.60
Social Science, Education, Government, Religion, Art, Culture, Recreation and Sport	24.84
Trade, Transport and Equipment Operators	5.82
Sales and Service	18.24
Explanatory Variables	
syear, Survey reference year	100.00
2004	20.05
2005	20.44
2006	19.53
2007	21.60
2008	18.37
prov, Province	100.00
Ontario	52.01
Quebec	35.96
British Columbia	12.03

Table 1.2 Key Non-Categorical Variables

Variable	Mean	Std. Dev.	Min.	Max.
Dependent Variables				
hourearn, Mothers' usual hourly earnings	20.731	9.266	3.17	80.98
alleave, Mothers' leave duration (in months)	10.972	4.701	0	68
ftpt, Mothers' full/part-time status	0.832	0.374	0	1
Explanatory Variables				
matpar, Mothers who received maternity/parental benefits	0.934	0.240	0	1
spclaim, Fathers who claimed/intend to claim parental benefits	0.266	0.442	0	1

This research also makes use of several control variables that are available from the EICS data. The first group of control variables consists of mothers' demographics, including age, education, immigrant status and student status. There is also a set of control variables with additional information on parental leave, including reasoning for why spouses did not claim parental benefits, whether the mother has worked since the birth/adoption, size of the economic family, and planned or current childcare arrangement. Control variables are also included for household finances. These contain the main source of funds used to meet household expectations, whether families received the child tax benefit or child benefit, household income in the month prior to the birth/adoption, and how mothers' income changed after the birth/adoption. All controls variables are presented in Table 2.1 and 2.2 below for the merged dataset.

Table 2.1 Categorical Control Variables

Variable	Percent
Mothers' Demographics	
educ, Highest educational attainment	100.00
Grade 8 or lower	0.32
Grade 9-11, non graduate	2.91
Grade11-13, graduate	10.22
Some post-graduate	5.69
Community college/CEGEP	44.76
University graduate (all levels)	36.09
student, Student status	100.00
Student	3.23
Non-student	96.77
Parental Leave	
reaspncl, Reason that spouse is not claiming parental benefits	100.00
Mother wants to stay home	30.79
Mother can take time off easier	11.58
More financially advantageous	13.58
Spouse not eligible for EI	10.28
Other	7.18
Valid skip	26.58
efamsz_r, Size of economic family	100.00
Three people	45.80
Four people	39.20
Five or more people	15.01
chldcare, Planned/current child care arrangement	100.00
Mother herself or shared with husband	9.90
Friend or relative will take care of child	24.00
Private babysitter	12.29
Bursary or daycare (private or public)	35.83
Other	6.08
Valid skip	2.72
Not stated	9.18
Household Finances	
mainfunds, Main source of funds to meet household needs	100.00
Wages or self-employment earnings of spouse/partner/family member	81.63
Own wages or self-employment income	6.60
EI benefits	7.83
Pensions, disability insurance, workers' compensation	0.26
Alimony, student loans, scholarships	0.13
Financial assistance from friends or relatives	0.39
Income from investments, interest, dividends, rentals or savings	1.81
Other	1.36
m_hhinc, Household income in the month before the birth/adoption	100.00
Less than $1,600 (less than $20,000 per annum)	5.63
$1,600 to less than $5,000 ($20,000-$60,000 per annum)	60.60
More than $5,000 (more than $60,000 per annum)	33.76

m_incdec, Increase/decrease in mothers' income after birth/adoption	100.00
Decrease	66.75
Increase	4.98
Stayed the same	28.27
m_chginc, Change in mothers' income (per month)	100.00
$0-$200	4.98
$201-$400	9.83
$401-$600	11.13
$601-$800	7.24
$801-$1000	12.81
$1001-$2000	17.08
$2001 and over	8.67
Stayed the same	28.27

Table 2.2 Non-Categorical Control Variables

Variable	Mean	Std. Dev.	Min.	Max.
Mothers' Demographics				
agecat, Age	0.914	0.280	0	1
immigr, Immigrant status	0.105	0.307	0	1
Parental Leave				
wrkafter, Mother has worked since birth/adoption	0.235	0.424	0	1
Household Finances				
childben, Received child tax benefit of child benefit	0.749	0.434	0	1

5 Analytical Framework

5.1 Before-and-After and Treatment-and-Control Approaches

This paper examines the implementation of paternity leave in Quebec and its impact on various labour market outcomes for mothers. When Quebec introduced QPIP in 2006, it stood as the sole Canadian province to have reserved paternity leave. The introduction of a program, or treatment, in one jurisdiction at a given time while not in others can be understood as a natural experiment. Researching this type of experiment requires the use of a treatment group and a control group, where the latter acts as the counterfactual to the treatment group, as well as data for the pre- and post-treatment periods for both groups. Consider the following model, adapted from Albouy (n.d.),

$$y_{pt} = \alpha + \lambda P + \sigma T + \delta(P * T) + \varepsilon_{pt} \quad (1)$$

where y_{pt} represents the dependent variable, P is a provincial fixed effect, T is a time fixed effect, $P * T$ is the interaction between province and time, meaning δ can be understood as the true effect of the treatment or policy, and ε_{pt} is the error term. For simplicity, assume that in this model, there are two provinces (one treatment and one control), $p = 1,2$ and two time periods, $t = 1,2$. Assuming a program is implemented in province 1 in period 2, then the following equations represent the expected average outcomes for both provinces in both time periods:

$$E[\bar{y}_{11}] = \alpha + \lambda \quad (2.1)$$

$$E[\bar{y}_{12}] = \alpha + \lambda + \sigma + \delta \quad (2.2)$$

$$E[\bar{y}_{21}] = \alpha \quad (2.3)$$

$$E[\bar{y}_{22}] = \alpha + \sigma \quad (2.4)$$

One approach that could be employed to understand the effect of this treatment is the before-and after-approach. This approach compares the outcomes in the treatment group during the post- and pre-treatment time periods, as demonstrated below:

$$E\left[\hat{\delta}\right] = E[\bar{y}_{12}] - E[\bar{y}_{11}] \tag{3.1}$$

$$E\left[\hat{\delta}\right] = (\alpha + \lambda + \sigma + \delta) - (\alpha + \lambda)$$

$$E\left[\hat{\delta}\right] = \sigma + \delta.$$

The issue with this approach, however, is that it does not account for underlying trends over time that might be explaining the difference between the pre- and post-treatment outcomes. So long as a time trend exists, i.e. $\sigma \neq 0$, this approach will produce a biased estimator, in that $E\left[\hat{\delta}\right] \neq \delta$.

Another approach is the treatment-and-control approach, also known as the yardstick or benchmark approach. This method obtains outcome estimates by using observed outcomes in a comparable group, i.e., the control group, that act as a counterfactual for the treatment group. The post-treatment outcomes in both jurisdictions are used, as demonstrated in the equation below:

$$E\left[\hat{\delta}\right] = E[\bar{y}_{12}] - E[\bar{y}_{22}] \tag{3.2}$$

$$E\left[\hat{\delta}\right] = (\alpha + \lambda + \sigma + \delta) - (\alpha + \sigma)$$

$$E\left[\hat{\delta}\right] = \lambda + \delta.$$

A setback with this approach is that it does not account for permanent differences in outcomes between the treatment and control group. If permanent differences exist, i.e., $\lambda \neq 0$, this approach will also produce a biased estimator, in that $E\left[\hat{\delta}\right] \neq \delta$.

5.2 Difference-in-Difference Approach

A third option is difference-and-difference (DiD) estimation, which combines both before-and-after comparisons and treatment-and-control comparisons to identify the effect of a policy in a given jurisdiction. Specifically, DiD is defined as "the difference in average outcome in the treatment group before and after the treatment *minus* the difference in average outcome in the control group before and after treatment."[12] With this approach, one should be able to produce an unbiased estimator, as shown below:

$$E\left[\hat{\delta}\right] = (E[\bar{y}_{12}] - E[\bar{y}_{11}]) - (E[\bar{y}_{22}] - E[\bar{y}_{21}]) \tag{4}$$

$$E\left[\hat{\delta}\right] = \big((\alpha + \lambda + \sigma + \delta) - (\alpha + \lambda)\big) - ((\alpha + \sigma) - \alpha)$$

$$E\left[\hat{\delta}\right] = (\sigma + \delta) - \sigma$$

$$E\left[\hat{\delta}\right] = \delta.$$

To ensure that a proper set of treatment and control groups are used, allowing the DiD method to produce an unbiased estimator, three assumptions must hold. While it can be challenging to verify the assumptions in the model, an attempt to do so for the research in this paper is outlined below.

No Anticipation Effect

This assumption suggests that if the policy change is anticipated, those in the treatment group might alter their behaviour in response, skewing the results and not capturing the true effects of the policy. In the case of QPIP, the policy was announced the year prior to implementation. That being said, there is little concern of an

[12] See Albouy (n.d.).

anticipation effect here as it is unlikely that five weeks of paternity leave would act as a fertility incentive, altering birth rates. It is just as unlikely that families would relocate to Quebec in order to be eligible for such leave.

Common Support

This assumption states that the sample populations in the treatment and control groups are comparable. In the context of the present paper, Quebec, Ontario and British Columbia represent the three largest provinces in Canada in terms of population size and economic complexity. During the reference period of this study, all three provinces share comparable birth rates, as shown in Table 3, which is key considering this study examines the impact of parental leave.

Table 3. Provincial Crude Birth Rates[13]

Year	Quebec	Ontario	British Columbia
2004	9.8	10.7	9.6
2005	10.0	10.6	9.6
2006	10.7	10.7	9.7
2007	11.0	10.9	10.2
2008	11.3	10.9	10.1

Statistics Canada. (2019).

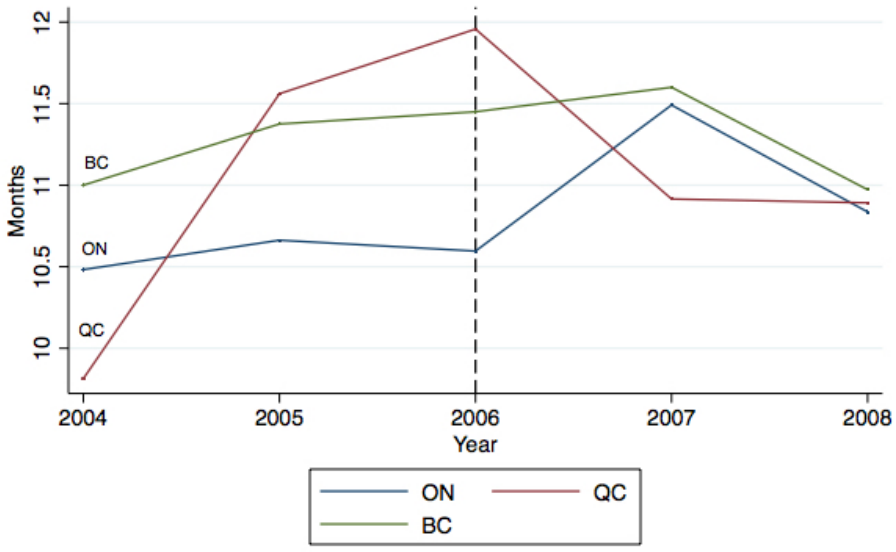
Common Trend

This assumption, also understood as parallel trend, states that, in the absence of the policy, both the treatment and control groups would follow similar trends. In

[13] Provincial crude birth rates represent the number of live births per 1,000 population.

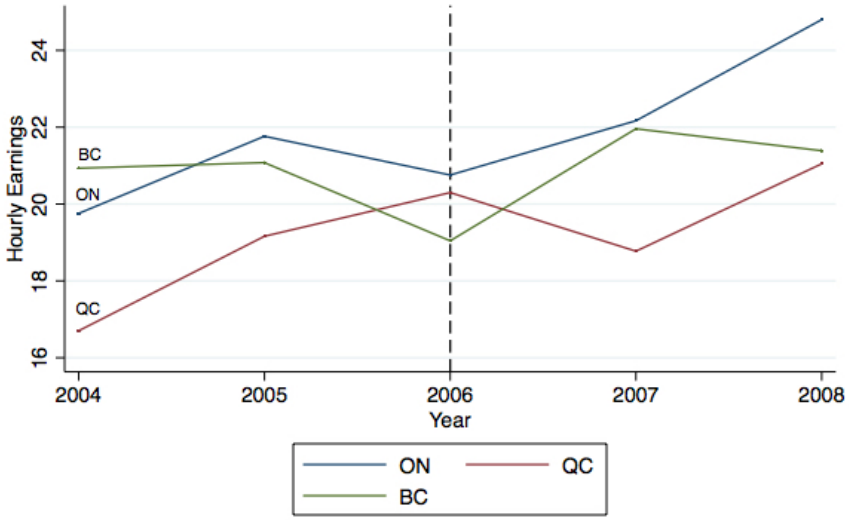
other words, the control group represents the counterfactual change in the treatment group if the treatment had not taken place, meaning the pre-treatment period for both groups should follow a parallel trend. This is considered to be the most important assumption that must hold in order to justify the use of DiD. To verify this assumption, average yearly values or proportions by province for the dependent variables that will be examined using DiD are shown graphically below. DiD analysis will be conducted for the following three outcomes: mothers' average leave duration, mothers' usual hourly earnings, and mothers' full/part-time status.

Figure 1. Mothers' Average Leave Duration



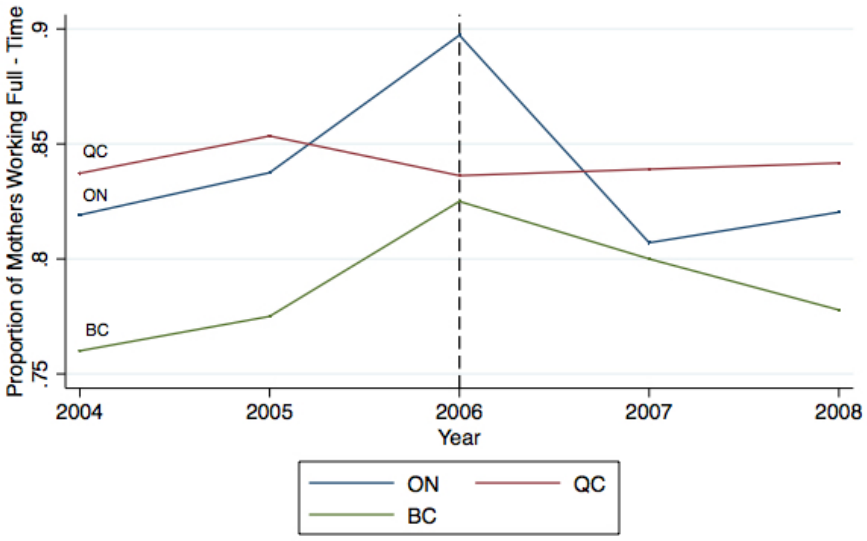
EICS, Statistics Canada

Figure 2. Mothers' Average Hourly Earnings



EICS, Statistics Canada

Figure 3. Proportion of Mothers Working Full-Time



EICS, Statistics Canada

Figure 1 illustrates how mothers' average parental leave duration varies across the reference period of this study in Quebec, Ontario and British Columbia. In the post-treatment period, the average leave duration of mothers in Quebec appears to decrease by approximately one month, from an average of 12 to 11 months. Figure 2 demonstrates the variation in mothers' average hourly earnings across the reference period for the same provinces of interest. At the beginning of the post-treatment period, the average hourly earnings of mothers in Quebec decreases, though it increases soon after. Figure 3 illustrates the proportion of mothers occupying full-time employment positions in all three provinces across time. After the introduction of QPIP in 2006, the proportion of Quebec mothers in full-time positions increases slightly but steadily. However, from 2004 to 2008, there is little to no change overall in the proportion of full-time working mothers in Quebec. When we look at the controls provinces, we see more fluctuation over time, including large drops in the proportion of full-time working mothers in the post-treatment period.

Figures 1 through 3 demonstrate lack of clear and strong parallel trends between the treatment group (Quebec) and the controls (Ontario and British Columbia) in the pre-treatment period. As such, the standard linear DiD estimators could potentially be biased. It is challenging to know the degree of any potential bias, as small deviations might only lead to a minor bias, though it is important to also consider an alternate approach to minimize biases.[14]

[14] See Albouy (n.d.).

That said, DiD analysis will be employed as a starting point. Applying DiD to the research at hand, the generalized regression model becomes:

$$y_{ipt} = \beta_0 + \beta_1 Prov_p + \beta_2 Year_t + \beta_3 Policy_{pt} + \beta_4 X_{ipt} + \varepsilon_{ipt} \quad (5)$$

where y_{ipt} is the outcome for individual *i* in province *p* at time *t*, and *Prov* and *Year* are provincial and year fixed effects. *Policy* is an interaction term that equals one for Quebec in the post-treatment period, meaning that β_3 can be taken as the true effect of the treatment. X_{ipt} is a vector of individual-specific controls, so β_4 is also a corresponding vector of coefficients, and ε_{ipt} is a random, unobserved error term.

5.3 Triple-Difference Approach

When the common trend assumption is weak and there is concern that the standard linear DiD method might produce biased estimators, one solution is to employ the difference-in-difference-in-difference approach, or triple-difference approach. This approach can be introduced if there exists an additional comparison group that is not exposed to the treatment and is present in all provinces across time. By having a third level of variation, we are able to relax the assumption of a parallel pre-treatment trend that is required in standard linear DiD method.[15] Recall that under the DiD approach in this paper, the assumption was that, in order for mothers to be exposed to the treatment (the effect of paternity leave on mothers' labour market outcomes), it must be that the mothers have a partner who is eligible for paternity leave and that both partners are employed. In that case, mothers who are the sole earner in the couple are not exposed to the treatment as the partner will not

[15] See Ding, Kottelenberg, and Lehrer (2018).

be taking parental leave if they are not employed. Hence, the type of economic family can be used as the third dimension in which the treatment varies.

Then, in addition to comparing mothers inside and outside of Quebec, before and after the policy was implemented, the triple-difference approach here also compares the outcomes of mothers in Quebec who are exposed to the treatment (dual-earner couples) versus Quebec mothers who are not exposed (single-earner couples). Applying triple-difference to the research at hand, the generalized regression model becomes:

$$y_{icpt} = \beta_0 + \beta_1 Prov_p + \beta_2 Year_t + \beta_3 Cohort_c + \beta_4 (Prov_p * Year_t)$$

$$\beta_5 (Prov_p * Cohort_c) + \beta_6 (Year_t * Cohort_c) + \beta_7 Policy_{cpt} + \beta_8 X_{icpt} + \varepsilon_{icpt} \qquad (6)$$

where y_{icpt} is the outcome for individual *i* of cohort *c* in province *p* at time *t*, and *Prov*, *Year* and *Cohort* are provincial, year, and cohort fixed effects, respectively. Here, it is necessary to include vectors of interactions for provincial and year fixed effects, provincial and cohort fixed effects, as well as year and cohort fixed effects. As such, β_4 through β_6 represent corresponding vectors. *Policy* is an interaction term that equals one for Quebec in the post-treatment period for the cohort of interest, meaning meaning β_7 can be taken as the true effect of the treatment. X_{ipt} is a vector of individual-specific controls, so β_8 is also a corresponding coefficient vector, and ε_{ipt} is a random, unobserved error term.

6 Empirical Results and Discussion

The following three hypotheses are tested. Reserved paternity leave decreases the duration of mothers' parental leave (H1) since time with the newborn can be more readily shared. Next, paternity leave has a positive impact on mothers' hourly earnings (H2) since she is expected to take less time off work. Lastly, paternity leave allows mothers to pursue full-time work and more demanding occupations/industries (H3), again because her parenting demands can be more readily shared.

6.1 Hypotheses One and Two – Difference-in-Difference Estimation

To test (H1) and (H2), DiD analysis is first conducted on mothers' usual hourly earnings (logged) and mothers' leave duration (in months). This is done by estimating equation (5) above. Table 4.1 summarizes the estimates with mothers' leave duration as the dependent variable. In Models (1) through (3), the dependent variable includes observations in which mothers took zero months of leave.[16] Model (1) has no controls, beyond province and year, Model (2) includes various controls, excluding the mother's use of leave, while Model (3) has all controls, including the mother's use of leave. Due to concerns of possible endogeneity regarding the mother's use-of-leave dummy, Models (4) and (5) include only non-zero observations for the dependent variable – in other words, all mothers take at least one month of leave. Model (4) has no controls, beyond province and year, and Model (5) includes a set of additional

[16] There are only a few observations (29) where mothers took zero months of leave where maternal leave was available. For this reason, we felt that a Tobit model was not necessary.

controls. Models (6) and (7) similarly include only non-zero observations for the dependent variable, and mirror the specifications of Models (4) and (5), though they are represented in log form to allow the coefficients to be interpreted as proportional effects.

In Table 4.1, the preferred specifications include Models (2), (5), and (7). F-tests were completed to verify that these specifications add explanatory power over Models (1), (4), and (6), respectively. Results of these tests can be found in Table B1 of Appendix B. In all cases, the coefficient of interest, *Policy*, (highlighted in heavier font), is positive in sign and statistically significant at at least the 90 percent confidence level on the basis of a two-tailed test. Looking specifically at Model (7), this suggests that, holding all else constant, mothers who are in Quebec after the implementation of paternity leave take 15.1 percent longer leave than other mothers (and is statistically significant at the 99 percent level). Interestingly though, the coefficient on *Father's Leave* is the opposite sign (and statistically different from zero at the 99 percent level in all cases). Looking again at Model (7), this suggests that, holding all else constant, mothers take 18.4 percent shorter leave when their partners also take parental leave.

Table 4.1 Difference-in-Difference Estimation of Leave Duration Effects

Variables	Dependent Variable						
	Leave Duration (months)			Non-Zero Leave Duration (months)		Logged Non-Zero Leave Duration (months)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Province							
QC	0.144	0.599	0.709*	0.212	0.649	-0.011	0.0319
	(0.408)	(0.415)	(0.405)	(0.395)	(0.402)	(0.037)	(0.038)
BC	0.428	0.366	0.482	0.428	0.375	0.0210	0.0177
	(0.384)	(0.382)	(0.372)	(0.370)	(0.368)	(0.035)	(0.034)
Year							
2005	0.711*	0.585	0.620*	0.789**	0.676*	0.059*	0.0500
	(0.378)	(0.376)	(0.367)	(0.366)	(0.365)	(0.034)	(0.034)
2006	0.805*	0.552	0.755*	0.714*	0.475	0.0441	0.0211
	(0.416)	(0.412)	(0.402)	(0.401)	(0.398)	(0.037)	(0.037)
2007	0.883**	0.782*	0.917**	0.815**	0.717*	0.0552	0.0468
	(0.404)	(0.403)	(0.393)	(0.390)	(0.389)	(0.036)	(0.036)
2008	0.441	0.359	0.401	0.352	0.295	0.0289	0.0244
	(0.425)	(0.423)	(0.412)	(0.410)	(0.408)	(0.038)	(0.038)
Policy	**0.133**	**0.892***	**0.577**	**0.120**	**0.949***	**0.0704**	**0.151*****
	(0.515)	**(0.535)**	**(0.522)**	**(0.497)**	**(0.517)**	**(0.04)**	**(0.048)**
Mother's Leave			4.462***				
			(0.486)				
Father's Leave		-1.879***	-1.832***		-1.943***		-0.184***
		(0.332)	(0.324)		(0.321)		(0.030)
Immigrant		-0.310	-0.0454		-0.172		0.001
		(0.392)	(0.383)		(0.380)		(0.036)
Age		0.406	0.279		0.402		0.043
		(0.442)	(0.431)		(0.429)		(0.040)
Highest Educational Attainment							
Grade 9-11, non-grad		0.00400	0.579		0.325		-0.0011
		(2.199)	(2.143)		(2.104)		(0.196)
Grade 11-13, grad		0.133	0.551		0.517		0.0290
		(2.121)	(2.066)		(2.028)		(0.189)
Some post-grad		-0.141	0.449		0.267		-0.0400
		(2.150)	(2.095)		(2.058)		(0.192)
Community College/CEGEP		0.0146	0.476		0.381		-0.0051
		(2.097)	(2.043)		(2.005)		(0.187)
University degree		0.430	0.900		0.730		0.0143
		(2.101)	(2.047)		(2.009)		(0.187)
Student		-0.676	-0.686		-0.700		-0.0606
		(0.670)	(0.653)		(0.647)		(0.0603)
Family Income Group							
Middle-income		0.656	0.212		0.151		0.0377
		(0.526)	(0.514)		(0.520)		(0.049)
High-income		1.483***	0.900*		0.872		0.102**
		(0.556)	(0.545)		(0.548)		(0.051)

Constant	10.26***	9.163***	4.984**	10.48***	9.536***	2.28***	2.214***
	(0.293)	(2.186)	(2.177)	(0.283)	(2.092)	(0.026)	(0.195)
Observations	1,546	1,546	1,546	1,517	1,517	1,517	1,517
R-squared	0.007	0.041	0.091	0.007	0.040	0.007	0.040
SSR	33916.548	32753.429	31040.357	30367.059	29344.889	263.909	255.129
F-statistic	1.45	3.59	8.02	1.52	3.51	1.60	3.50
Root MSE	4.696	4.6314	4.5101	4.486	4.426	0.4182	0.4126

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The hypothesis for this outcome, (H1), was that the presence of paternity leave would decrease leave duration for mothers as leave sharing would allow mothers to return to work sooner. The results of these estimations, however, show a more complex set of outcomes. Despite the fact that QPIP increased the amount of fathers taking leave in Quebec overall, these results suggest that being in the presence of QPIP alone does not decrease mothers' leave duration – in fact, it appears to increase if the father does not take parental leave. That said, when fathers do take leave, our findings suggest that it does lead to a decrease in leave duration for mothers. In the case of Model (7), the net outcome is a reduction by 3.3 percent (15.1-18.4). This has important implications – although the presence of paternity leave does not appear on its own to help mothers return to work sooner, these results confirm the importance of sharing childcare responsibilities on the labour market outcomes of mothers when fathers do take up the parental leave options. By fathers taking on some amount parental leave, mothers tend to return to the labour force somewhat sooner than those whose partners take no leave.

Looking at demographic factors, results in Table 4.1 suggest that immigrant status and age do not largely influence the leave duration of mothers in this study. The

same can be said regarding the mother's highest educational attainment – Model (5) suggests that, compared to mothers with less than a grade nine level education and holding all else constant, mothers with a university degree only take 0.7 of a month longer in leave, or 1.4 percent longer leave in Model (7), though these results are not statistically significant. One area that does seem to influence the mother's leave duration, however, is the family income level. Model (7) suggests that, compared to mothers in low-income families and holding all else constant, those in high-income families take roughly 10 percent longer leave (and is statistically significant at the 90 percent confidence level). This result is intuitive, as mothers in high-income families have the financial flexibility to extend leave.

Table 4.2 presents the results for the DiD analysis with logged hourly earnings as the dependent variable. Similar in layout to Table 4.1, the sample in Models (1) through (3) includes all mothers, regardless of whether or not they took parental leave. Model (1) has no controls, beyond province and year, Model (2) includes various controls, excluding the mother's use of leave, and Model (3) has all controls, including the mother's use of leave. In Models (4) and (5), the sample includes only observations where the mother took some amount of parental leave. Model (4) has no controls, beyond province and year, and Model (5) includes a set of controls.

Table 4.2 Difference-in-Difference Estimation of Hourly Earnings Effects

Variables	Dependent Variables				
	Logged Hourly Earnings (all mothers)			Logged Hourly Earnings (mothers who took leave)	
	(1)	(2)	(3)	(4)	(5)
Province					
QC	-0.142***	-0.071**	-0.067**	-0.142***	-0.0728**
	(0.0382)	(0.0314)	(0.0313)	(0.0384)	(0.0315)
BC	-0.0364	-0.0137	-0.0102	-0.0401	-0.0104
	(0.0360)	(0.0289)	(0.0288)	(0.0359)	(0.0288)
Year					
2005	0.123***	0.0438	0.0448	0.137***	0.0479*
	(0.0354)	(0.0285)	(0.0284)	(0.0355)	(0.0286)
2006	0.0725*	0.0290	0.0352	0.0847**	0.0370
	(0.0390)	(0.0312)	(0.0311)	(0.0389)	(0.0312)
2007	0.105***	0.0687**	0.0728**	0.110***	0.0700**
	(0.0379)	(0.0305)	(0.0304)	(0.0379)	(0.0305)
2008	0.188***	0.125***	0.127***	0.196***	0.129***
	(0.0398)	(0.0320)	(0.0319)	(0.0398)	(0.0320)
Policy	**0.0424**	**-0.0688***	**-0.0784***	**0.0417**	**-0.0629**
	(0.0482)	**(0.0405)**	**(0.0404)**	**(0.0483)**	**(0.0405)**
Mother's Leave			0.136***		
			(0.0376)		
Father's Leave		0.0524**	0.0539**		0.0499**
		(0.0251)	(0.0251)		(0.0251)
Immigrant		-0.0374	-0.0294		-0.0376
		(0.0297)	(0.0296)		(0.0298)
Age		0.282***	0.279***		0.281***
		(0.0335)	(0.0334)		(0.0336)
Highest Educational Attainment					
Grade 9-11, non grad		0.161	0.178		0.161
		(0.166)	(0.166)		(0.165)
Grade 11-13, grad		0.285*	0.298*		0.287*
		(0.161)	(0.160)		(0.159)
Some post-grad		0.369**	0.387**		0.380**
		(0.163)	(0.162)		(0.161)
Community College/CEGEP		0.492***	0.506***		0.502***
		(0.159)	(0.158)		(0.157)
University Degree		0.766***	0.781***		0.775***
		(0.159)	(0.158)		(0.157)
Student		-0.0446	-0.0449		-0.0599
		(0.0508)	(0.0506)		(0.0507)
Family Income Group					
Middle-income		0.179***	0.166***		0.155***
		(0.0398)	(0.0398)		(0.0408)
High-income		0.366***	0.348***		0.338***
		(0.0421)	(0.0422)		(0.0430)
Constant	2.885***	1.875***	1.748***	2.884***	1.893***
	(0.0275)	(0.165)	(0.169)	(0.0275)	(0.164)
Observations	1,546	1,546	1,546	1,517	1,517
R-squared	0.032	0.390	0.396	0.034	0.392
SSR	298.040	187.655	186.058	286.480	180.212

F-statistic	7.25	54.35	52.59	7.60	53.74
Root MSE	0.44021	0.35056	0.34918	0.43572	0.34685

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 4.2, the preferred specifications include Models (2) and (5) that do not include the mother's leave dummy. F-tests were again completed to verify that these specifications add explanatory power over Models (1) and (4), respectively. Results of these tests can be found in Table B2 of Appendix B. In Models (2) and (5), the coefficient of primary interest, *Policy*, is negative, though it is not statistically significant in Model (5) at conventional levels. Looking at Model (5), this negative coefficient suggests that, holding all else constant, the earnings of mothers who are in Quebec in the presence of paternity leave are 6.29 percent lower than for other mothers. In both Models (2) and (5), the coefficients on the *Father's Leave* dummy are the opposite sign of the *Policy* coefficients, suggesting that, holding all else constant, mothers whose partners actually take leave experience an earnings premium of roughly 5 percent (these results are statistically different from zero at the 95 percent confidence level). If we assume that when both parents take leave, the mother takes shorter leave, which was shown to be the case in the results of Models (5) and (7) in Table 4.1, then this Table 4.2 result could be explained by the fact that with shorter leave for mothers, there is less of an earnings loss compared to mothers who do not share leave with their partner. That said, even when fathers take up the leave, this is much shorter than the mothers' leave time, so it only partially off-sets the wage loss of time spent from the job by mothers.

The hypothesis for this outcome, (H2), predicted that paternity leave would

increase mothers' earnings. In the specifications of interest, Models (2) and (5) of Table 4.2, results suggest the opposite, though only by a small amount. That being said, the *Policy* coefficient is not always statistically significant. As this research examines the impact of a policy designed for fathers on the labour market outcomes of mothers, it is not surprising that the effect of the policy is not statistically significant in all model specifications when looking at hourly earnings. It is anticipated that if this analysis were conducted on the corresponding outcomes for fathers, more significant results might be present.

Results from Table 4.2 do, however, reveal the demographic factors at play surrounding mothers' hourly earnings. Here, age appears to be an important factor. Both Models (2) and (5) imply that, holding all else constant, mothers aged 25-44 earn approximately 28 percent more than mothers aged 15-24 (statistically different from zero at the 95 percent confidence level). This is intuitive, as younger mothers are more likely to be students and less likely to have begun their careers; but also, even if they are no longer students, they are likely to have much less job experience than their older, more established colleagues. In line with this finding, Table 4.2 estimates also suggest that education is an influential factor – Models (5) and (7) indicate that, compared to mothers with less than grade nine level education and holding all else constant, mothers with a university degree earn an additional 78 percent.

6.2 Hypotheses One and Two – Triple-Difference Estimation

To account for the possibility of biased estimators in the standard linear DiD regressions, triple-difference analysis is also conducted to test the first two

hypotheses. This is done by estimating equation (6) above, where *Cohort* consists of mothers in a dual-earner couple. By introducing the third dimension in which the treatment varies, the sample now includes single-earner mothers as well. As a result, the sample size in this case contains 1,809 observations.

Table 5.1 summarizes the triple-difference estimates with mothers' leave duration as the dependent variable. Models (1) through (7) mirror the model specifications of the DiD analysis shown in Table 4.1 (where the additional regressors represent the interactions of provincial, year, and cohort fixed effects). As such, Models (2), (5), and (7) are also the preferred specifications in Table 5.1 and the tests of their joint significance can be found in Table B3 of Appendix B. In all cases, the *Policy* coefficients are positive, though not statistically significant, and the *Father's Leave* coefficients are negative and statistically significant at the 99 percent confidence level. Looking to Model (7), we can see that, holding all else constant, being a mother of a dual-earner couple in Quebec in the presence of QPIP leads to 13.1 percent longer leave duration (though not statistically significant). However, Model (7) indicates that when the father takes leave, the mother's leave duration decreases by 16.4 percent. This leaves us with a net reduction of 3.3 percent (13.1-16.4).

Table 5.1 Triple-Difference Estimation of Leave Duration Effects

Variables	Dependent Variables						
	Leave Duration (months)			Non-Zero Leave Duration (months)		Logged Non-Zero Leave Duration (months)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Province							
QC	0.0557	0.178	0.144	-0.343	-0.205	0.0331	0.0514
	(1.150)	(1.145)	(1.137)	(1.117)	(1.114)	(0.095)	(0.095)
BC	-1.230	-1.157	-1.163	-1.375	-1.271	-0.044	-0.038
	(1.362)	(1.356)	(1.347)	(1.325)	(1.321)	(0.113)	(0.113)
Year							
2005	1.915*	1.971*	1.891*	2.101*	2.127**	0.159*	0.159*
	(1.107)	(1.101)	(1.094)	(1.082)	(1.077)	(0.092)	(0.092)
2006	1.280	1.244	1.508	1.281	1.285	0.0671	0.0663
	(1.124)	(1.114)	(1.108)	(1.098)	(1.090)	(0.094)	(0.093)
2007	2.323*	2.274*	2.483*	2.173*	2.146*	0.269**	0.263**
	(1.337)	(1.329)	(1.321)	(1.298)	(1.291)	(0.111)	(0.110)
2008	0.233	0.105	0.384	0.287	0.174	0.0585	0.0485
	(1.101)	(1.091)	(1.085)	(1.075)	(1.067)	(0.092)	(0.091)
Dual Earner Couple (Cohort)	-0.957	-1.111	-1.375	-1.085	-1.192	-0.009	-0.025
	(0.850)	(0.846)	(0.842)	(0.831)	(0.828)	(0.071)	(0.071)
Prov*Year							
QC*2005	1.011	1.133	1.285	1.011	1.099	0.0952	0.0987
	(0.870)	(0.863)	(0.858)	(0.851)	(0.845)	(0.073)	(0.072)
QC*2006	1.151	2.045	1.444	1.279	2.113	0.0223	0.0916
	(1.522)	(1.516)	(1.511)	(1.477)	(1.472)	(0.126)	(0.126)
QC*2007	-0.239	1.080	0.370	-0.128	1.122	-0.090	0.0151
	(1.555)	(1.556)	(1.553)	(1.508)	(1.510)	(0.129)	(0.129)
QC*2008	-0.149	1.260	0.689	-0.115	1.245	-0.045	0.0701
	(1.532)	(1.536)	(1.530)	(1.487)	(1.492)	(0.127)	(0.127)
BC*2005	-0.399	-0.523	-0.196	-0.936	-1.090	-0.119	-0.131
	(1.338)	(1.329)	(1.322)	(1.306)	(1.299)	(0.112)	(0.111)
BC*2006	-0.0937	-0.334	-0.375	-0.119	-0.364	-0.044	-0.065
	(1.341)	(1.330)	(1.322)	(1.312)	(1.303)	(0.112)	(0.111)
BC*2007	-0.298	-0.432	-0.255	-0.355	-0.517	-0.125	-0.131
	(1.318)	(1.310)	(1.302)	(1.290)	(1.284)	(0.110)	(0.110)
BC*2008	-0.875	-0.902	-0.714	-1.216	-1.273	-0.142	-0.142
	(1.328)	(1.322)	(1.314)	(1.295)	(1.291)	(0.111)	(0.110)
Prov*Cohort							
QC*Cohort	-0.444	-0.175	-0.159	-0.00209	0.239	-0.093	-0.074
	(1.208)	(1.199)	(1.191)	(1.174)	(1.166)	(0.100)	(0.100)
BC*Cohort	2.021*	2.028*	1.959*	2.372**	2.381**	0.159*	0.162*
	(1.127)	(1.119)	(1.112)	(1.092)	(1.086)	(0.093)	(0.093)
Cohort*Year							
Cohort*2005	-1.493	-1.698	-1.687	-1.539	-1.691	-0.120	-0.129
	(1.139)	(1.136)	(1.128)	(1.112)	(1.109)	(0.095)	(0.095)
Cohort*2006	-0.972	-1.057	-1.226	-1.095	-1.203	-0.058	-0.067
	(1.186)	(1.177)	(1.169)	(1.158)	(1.149)	(0.099)	(0.098)
Cohort*2007	-1.391	-1.485	-1.632	-1.332	-1.426	-0.197*	-0.201*
	(1.357)	(1.348)	(1.340)	(1.317)	(1.310)	(0.112)	(0.112)
Cohort*2008	0.327	0.271	-0.0518	0.230	0.181	-0.026	-0.031
	(1.161)	(1.152)	(1.146)	(1.133)	(1.125)	(0.097)	(0.096)

Policy	**0.406**	**0.0222**	**0.522**	**0.339**	**0.0428**	**0.156**	**0.131**
	(1.536)	**(1.526)**	**(1.519)**	**(1.491)**	**(1.482)**	**(0.127)**	**(0.126)**
Mother's Leave			2.329***				
			(0.467)				
Father's Leave		-1.874***	-1.795***		-1.898***		-0.164***
		(0.351)	(0.349)		(0.343)		(0.029)
Immigrant		-0.130	0.0232		-0.0715		0.004
		(0.398)	(0.397)		(0.390)		(0.033)
Age		0.0680	-0.0352		0.0329		0.0460
		(0.435)	(0.432)		(0.425)		(0.036)
Highest Educational Attainment							
Grade 9-11, non grad		-1.517	-1.380		-1.124		-0.134
		(2.105)	(2.091)		(2.038)		(0.174)
Grade 11-13, grad		-1.096	-1.109		-0.820		-0.107
		(2.036)	(2.022)		(1.969)		(0.168)
Some post-grad		-1.697	-1.593		-1.432		-0.178
		(2.062)	(2.048)		(1.995)		(0.170)
Community College/CEGEP		-1.318	-1.302		-1.040		-0.132
		(2.011)	(1.998)		(1.945)		(0.166)
University Degree		-0.966	-0.903		-0.719		-0.112
		(2.019)	(2.006)		(1.953)		(0.167)
Student		0.0241	0.106		0.205		0.0015
		(0.677)	(0.673)		(0.665)		(0.057)
Family Income Group							
Middle-income		0.956*	0.647		0.689		0.080*
		(0.495)	(0.495)		(0.490)		(0.042)
High-income		1.724***	1.350**		1.347**		0.131***
		(0.538)	(0.540)		(0.532)		(0.045)
Constant	11.34***	11.69***	10.21***	11.68***	12.04***	2.303***	2.284***
	(0.801)	(2.267)	(2.271)	(0.783)	(2.196)	(0.0669)	(0.187)
Observations	1,809	1,809	1,809	1,776	1,776	1,776	1,776
R-squared	0.021	0.047	0.060	0.024	0.047	0.018	0.044
SSR	49574.739	48298.734	47631.378	45373.398	44270.060	331.010	322.251
F-statistic	1.77	2.62	3.31	1.93	2.63	1.43	2.41
Root MSE	5.2685	5.2164	5.1817	5.0876	5.0412	0.4345	0.4301

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The triple-difference estimates in Table 5.1 seem to suggest again that the mother's immigrant status and age do not largely influence their leave duration – both in terms of magnitude and statistical significance. Coefficients representing the mother's highest education level do not follow a monotonic pattern, though they are not statistically significant either. It seems, however, that the family income level plays a role – Model (7) indicates that, compared to mothers in low-income families

and holding all else constant, mothers in high-income families take 13.1 percent longer leave (statistically significant at the 99 percent confidence level).

The results of the triple-difference analysis with leave duration as the dependent variable are quite comparable to those in the DiD analysis. However, results of the triple-difference and DiD analyses using hourly earnings as the dependent variable are less alike. Table 5.2 summarizes the triple-difference estimates with logged usual hourly earnings as the dependent variable. Models (1) through (5) mirror the model specifications of the DiD analysis shown in Table 4.2 (where, again, the additional regressors represent the interactions of provincial, year, and cohort fixed effects), meaning Models (2) and (5) are also the preferred model specifications. The tests of their joint significance can be found in Table B4 of Appendix B.

Table 5.2 Triple-Difference Estimation of Hourly Earnings Effects

Variables	Dependent Variables				
	Logged Hourly Earnings (all mothers)			Logged Hourly Earnings (mothers who took leave)	
	(1)	(2)	(3)	(4)	(5)
Province					
QC	-0.0283	0.0137	0.0120	-0.0336	0.00904
	(0.0965)	(0.0771)	(0.0769)	(0.0962)	(0.0769)
BC	0.0781	0.133	0.133	0.103	0.157*
	(0.114)	(0.0913)	(0.0910)	(0.114)	(0.0912)
Year					
2005	-0.0966	-0.00160	-0.00546	-0.0792	0.000696
	(0.0929)	(0.0742)	(0.0739)	(0.0932)	(0.0744)
2006	0.0666	0.0460	0.0586	0.0609	0.0493
	(0.0943)	(0.0750)	(0.0749)	(0.0946)	(0.0752)
2007	0.202*	0.150*	0.160*	0.192*	0.138
	(0.112)	(0.0895)	(0.0893)	(0.112)	(0.0891)
2008	0.163*	0.130*	0.143*	0.156*	0.125*
	(0.0923)	(0.0734)	(0.0733)	(0.0926)	(0.0736)
Dual Earner Couple (Cohort)	0.213***	0.136**	0.124**	0.207***	0.130**
	(0.0713)	(0.0570)	(0.0569)	(0.0715)	(0.0571)
Prov*Year					
QC*2005	-0.00939	-0.0353	-0.0280	-0.0177	-0.0410
	(0.0730)	(0.0581)	(0.0580)	(0.0732)	(0.0583)
QC*2006	-0.124	-0.105	-0.133	-0.105	-0.0986
	(0.128)	(0.102)	(0.102)	(0.127)	(0.102)
QC*2007	-0.212	-0.114	-0.148	-0.196	-0.101
	(0.130)	(0.105)	(0.105)	(0.130)	(0.104)
QC*2008	-0.200	-0.122	-0.150	-0.206	-0.130
	(0.129)	(0.103)	(0.103)	(0.128)	(0.103)
BC*2005	-0.137	-0.141	-0.126	-0.175	-0.173*
	(0.112)	(0.0895)	(0.0893)	(0.112)	(0.0897)
BC*2006	-0.0998	-0.119	-0.121	-0.133	-0.157*
	(0.112)	(0.0896)	(0.0893)	(0.113)	(0.0899)
BC*2007	-0.0424	-0.0484	-0.0399	-0.0533	-0.0625
	(0.111)	(0.0882)	(0.0879)	(0.111)	(0.0886)
BC*2008	-0.213*	-0.122	-0.113	-0.244**	-0.155*
	(0.111)	(0.0890)	(0.0888)	(0.111)	(0.0891)
Prov*Cohort					
QC*Cohort	-0.107	-0.0649	-0.0641	-0.0979	-0.0589
	(0.101)	(0.0807)	(0.0805)	(0.101)	(0.0805)
BC*Cohort	-0.0138	-0.0603	-0.0636	-0.0174	-0.0559
	(0.0945)	(0.0754)	(0.0751)	(0.0940)	(0.0749)
Cohort*Year					
Cohort*2005	0.235**	0.0688	0.0693	0.239**	0.0752
	(0.0956)	(0.0765)	(0.0762)	(0.0957)	(0.0765)
Cohort*2006	-0.00423	-0.00682	-0.0149	0.0145	0.00184
	(0.0995)	(0.0792)	(0.0790)	(0.0997)	(0.0793)
Cohort*2007	-0.0824	-0.0764	-0.0834	-0.0685	-0.0647
	(0.114)	(0.0908)	(0.0905)	(0.113)	(0.0904)
Cohort*2008	0.0594	0.0138	-0.00156	0.0858	0.0318
	(0.0974)	(0.0776)	(0.0775)	(0.0975)	(0.0776)

Policy	**0.212**	**0.0367**	**0.0606**	**0.197**	**0.0341**
	(0.129)	**(0.103)**	**(0.103)**	**(0.128)**	**(0.102)**
Mother's Leave			0.111***		
			(0.0316)		
Father's Leave		0.0308	0.0346		0.0282
		(0.0236)	(0.0236)		(0.0237)
Immigrant		-0.0695***	-0.0622**		-0.0712***
		(0.0268)	(0.0268)		(0.0269)
Age		0.267***	0.262***		0.265***
		(0.0293)	(0.0292)		(0.0294)
Highest Educational Attainment					
Grade 9-11, non grad		0.108	0.115		0.116
		(0.142)	(0.141)		(0.141)
Grade 11-13, grad		0.229*	0.228*		0.235*
		(0.137)	(0.137)		(0.136)
Some post-grad		0.285**	0.290**		0.295**
		(0.139)	(0.138)		(0.138)
Community College/CEGEP		0.412***	0.412***		0.424***
		(0.135)	(0.135)		(0.134)
University Degree		0.689***	0.692***		0.700***
		(0.136)	(0.136)		(0.135)
Student		-0.0245	-0.0206		-0.0344
		(0.0456)	(0.0455)		(0.0459)
Family Income Group					
Middle-income		0.179***	0.164***		0.162***
		(0.0333)	(0.0335)		(0.0338)
High-income		0.381***	0.363***		0.362***
		(0.0362)	(0.0365)		(0.0367)
Constant	2.662***	1.553***	1.482***	2.664***	1.565***
	(0.0672)	(0.153)	(0.153)	(0.0674)	(0.152)
Observations	1,809	1,809	1,809	1,776	1,776
R-squared	0.077	0.421	0.425	0.082	0.424
SSR	348.975	218.957	217.438	336.237	210.914
F-statistic	6.79	39.11	38.57	7.12	38.88
Root MSE	0 .44203	0 .35122	0 .3501	0 .43796	0.34796

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Across all models, the *Policy* coefficients are positive, which is in line with the second hypothesis that paternity leave would lead to an increase in mothers' earnings. That said, these results are not statistically significant. Looking to Model (5), being a mother of a dual-earner couple in Quebec in the presence of QPIP leads to a 3.4 percent earnings premium (though not statistically significant). Recall that the

preferred specifications in Table 4.2 (DiD analysis) suggests that the presence of QPIP leads to an earnings loss instead. However, similar to the DiD analysis, the triple-difference estimates in Table 5.2 also indicates that the effect of fathers taking leave is positive on the earnings of mothers, although these results are not statistically significant in the triple-difference analysis. In Model (5), mothers in the treatment group whose husbands took leave have a 6.22 percent earnings premium (3.4+2.82). What is particularly interesting in Table 5.2 is that, with the addition of controls (mostly demographic), the stated effect of paternity leave decreases in magnitude considerably – from 19.7 percent in Model (4) to 3.4 percent in Model (5), for example.

In the triple-difference analysis, not only do age and education appear to influence a mother's earnings, but the mother's immigrant status is also a factor. Model (5) in Table 5.2 indicates that, holding all else constant, mothers who are immigrants experience an earnings penalty of 7.12 percent (that is highly statistically significant).

6.3 Hypothesis Three – Difference-in-Difference Estimation

To test (H3), we break down the hypothesis into two parts. To first examine whether paternity leave has an effect on the proportion of working mothers in full-time positions, we conduct DiD and triple-difference estimates as we have done for (H1) and (H2). We recognize that, with a binary dependent variable, a probit or logit model is often preferred. However, to keep the analysis focused on the DiD and triple-difference methodologies, and since the fraction of full-time workers is not in the tails of the distribution, we opt for the simpler linear probability regression approach.

Note that, because we do not have access to longitudinal micro data for this study, we cannot observe whether individual mothers change their full/part-time employment status before and after the policy implementation. As such, DiD and triple-difference analyses are conducted to determine whether the policy has a statistically significant effect on the proportion of full-time employed mothers in the treatment group.

Table 6 presents the DiD estimates with the mother's full/part-time employment level as the dependent variable (taking a value of one for full-time work). In Models (1) through (3), the sample includes all mothers, regardless of the level of leave they took. Model (1) has no controls, beyond province and year, Model (2) includes various controls, excluding the mother's use of leave, and Model (3) has all controls, including the mother's use of leave. In Models (4) and (5), the sample includes only observations where the mother took some amount of parental leave. Model (4) has no controls, beyond province and year, and Model (5) includes a set of controls. In Table 6, the preferred specifications include Models (2) and (5). To test the joint significance of the preferred models, F-tests are conducted and can be found in Table B5 of Appendix B.

Table 6. Difference-in-Difference Estimation for Full-time Employment Effects

Variables	Dependent Variables				
	Full-time Employment (all mothers)			Full-time Employment (mothers who took leave)	
	(1)	(2)	(3)	(4)	(5)
Province					
QC	0.0192	0.0441	0.0511	0.0245	0.0480
	(0.0325)	(0.0332)	(0.0327)	(0.0325)	(0.0333)
BC	-0.0470	-0.0446	-0.0372	-0.0456	-0.0428
	(0.0306)	(0.0306)	(0.0301)	(0.0304)	(0.0305)
Year					
2005	0.0165	0.00220	0.00439	0.0187	0.00256
	(0.0301)	(0.0301)	(0.0296)	(0.0301)	(0.0302)
2006	0.0540	0.0457	0.0586*	0.0603*	0.0509
	(0.0331)	(0.0330)	(0.0325)	(0.0330)	(0.0329)
2007	0.00712	0.000418	0.00905	0.00832	0.00122
	(0.0322)	(0.0323)	(0.0318)	(0.0321)	(0.0322)
2008	0.0136	0.00122	0.00388	0.0131	-5.42e-05
	(0.0339)	(0.0339)	(0.0333)	(0.0337)	(0.0338)
Policy	**-0.0227**	**-0.0503**	**-0.0704***	**-0.0343**	**-0.0578**
	(0.0410)	**(0.0428)**	**(0.0422)**	**(0.0409)**	**(0.0429)**
Mother's Leave			0.285***		
			(0.0393)		
Father's Leave		0.0170	0.0200		0.0129
		(0.0266)	(0.0262)		(0.0265)
Immigrant		0.0611*	0.0780**		0.0496
		(0.0314)	(0.0310)		(0.0315)
Age		0.0636*	0.0555		0.0660*
		(0.0354)	(0.0348)		(0.0355)
Highest Educational Attainment					
Grade 9-11, non grad		-0.00273	0.0340		0.00852
		(0.176)	(0.173)		(0.174)
Grade 11-13, grad		-0.0210	0.00567		-0.0156
		(0.170)	(0.167)		(0.168)
Some post-grad		0.0199	0.0575		0.0159
		(0.172)	(0.169)		(0.170)
Community College/CEGEP		0.00320	0.0326		0.000195
		(0.168)	(0.165)		(0.166)
University Degree		0.0480	0.0779		0.0451
		(0.168)	(0.166)		(0.166)
Student		-0.0501	-0.0507		-0.0397
		(0.0537)	(0.0528)		(0.0536)
Family Income Group					
Middle-income		0.0682	0.0399		0.0559
		(0.0421)	(0.0416)		(0.0431)

High-income		0.130***	0.0932**		0.114**
		(0.0445)	(0.0441)		(0.0454)
Constant	0.818***	0.653***	0.386**	0.822***	0.671***
	(0.0234)	(0.175)	(0.176)	(0.0233)	(0.173)
Observations	1,546	1,546	1,546	1,517	1,517
R-squared	0.004	0.029	0.062	0.005	0.027
SSR	215.380	209.917	202.946	205.783	201.280
F-statistic	0.91	2.57	5.27	1.05	2.28
Root MSE	0.37422	0.37077	0.36468	0.36928	0.36656

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Across all models in Table 6, the coefficient of primary interest, *Policy*, is negative in sign. In the preferred models, the coefficient is also not statistically significant at conventional levels. We can see that in Model (5), holding all else constant, *Policy* has a non-significant effect of reducing the proportion of Quebec mothers of dual-earner couples who are working full-time post-treatment by 5.78 percentage points. Mothers whose husbands took up the leave opportunity, presented by the *Father's Leave* coefficient, have a non-significant effect of increasing the overall proportion of full-time working mothers, holding all else constant. In Model (5), this increase in proportion is by 1.29 percentage points. Here, the effect of fathers taking leave only partially offsets the reduction in the proportion of full-time working mothers, with a net reduction of 4.49 percentage points (-5.78+1.29) in Model (5).

Models (2) and (5) also suggest that mothers' immigrant status and age positively impact the proportion of full-time employed new mothers, at varying levels of statistical significance. On average, and holding all else constant, mothers who are immigrants increase the proportion of new working mothers with full-time positions – by 6.11 percentage points in Model (2) (which is statistically different from zero at

the 90 percent confidence level), and by 4.96 percentage points in Model (5) (though not statistically significant). Compared to mothers aged 15 to 24 and holding all else constant, mothers aged 25 to 44 increase the proportion of mothers working full-time by 6.36 percentage points in Model (2), and 6.60 percentage points in Model (5) (both statistically significant at the 90 percent confidence level).

6.4 Hypothesis Three – Triple-Difference Estimation

The first part of (H3) suggests that, in the presence of paternity leave, the proportion of mothers in full-time positions would increase as childcare responsibilities can more readily be shared between parents, allowing mothers to occupy more space in the labour market. At first glance, the DiD results suggest otherwise, though we must keep in mind the possibility of biased results in this approach. As a result, triple-difference analysis is conducted next to account for this possibility. Table 7 presents the triple-difference estimates with mothers' full/part-time employment status as the dependent variable. Models (1) through (5) mirror the model specifications of the DiD analysis shown in Table 6 (where the additional regressors represent the interactions of provincial, year, and cohort fixed effects), meaning Models (2) and (5) are also the preferred model specifications. To test the joint significance of the preferred models, F-tests are conducted and can be found in Table B6 of Appendix B.

Table 7. Triple-Difference Estimation for Full-time Employment Effects

Variables	Dependent Variables				
	Full-time Employment (all mothers)			Full-time Employment (all mothers)	
	(1)	(2)	(3)	(4)	(5)
Province					
QC	0.0663	0.0846	0.0806	0.0655	0.0838
	(0.0823)	(0.0821)	(0.0806)	(0.0819)	(0.0818)
BC	-0.114	-0.117	-0.117	-0.0918	-0.0948
	(0.0975)	(0.0972)	(0.0955)	(0.0971)	(0.0970)
Year					
2005	0.133*	0.133*	0.124	0.130	0.126
	(0.0792)	(0.0790)	(0.0776)	(0.0793)	(0.0791)
2006	0.111	0.102	0.133*	0.0952	0.0883
	(0.0804)	(0.0799)	(0.0786)	(0.0805)	(0.0801)
2007	-0.0241	-0.0349	-0.0109	-0.0289	-0.0418
	(0.0957)	(0.0953)	(0.0937)	(0.0952)	(0.0949)
2008	0.135*	0.130*	0.162**	0.124	0.120
	(0.0788)	(0.0782)	(0.0769)	(0.0788)	(0.0784)
Dual Earner Couple (Cohort)	0.0567	0.0328	0.00239	0.0449	0.0212
	(0.0609)	(0.0607)	(0.0597)	(0.0609)	(0.0608)
Prov*Year					
QC*2005	-0.0200	-0.0233	-0.00572	-0.0461	-0.0504
	(0.0623)	(0.0619)	(0.0608)	(0.0624)	(0.0621)
QC*2006	-0.179	-0.182*	-0.252**	-0.172	-0.177
	(0.109)	(0.109)	(0.107)	(0.108)	(0.108)
QC*2007	-0.0484	-0.0457	-0.128	-0.0527	-0.0487
	(0.111)	(0.112)	(0.110)	(0.111)	(0.111)
QC*2008	-0.0974	-0.1000	-0.166	-0.0972	-0.0974
	(0.110)	(0.110)	(0.109)	(0.109)	(0.110)
BC*2005	-0.0741	-0.0757	-0.0379	-0.113	-0.113
	(0.0958)	(0.0953)	(0.0937)	(0.0957)	(0.0954)
BC*2006	-0.0830	-0.0873	-0.0921	-0.0962	-0.101
	(0.0960)	(0.0954)	(0.0937)	(0.0962)	(0.0957)
BC*2007	0.0280	0.0370	0.0574	-0.0112	-0.00181
	(0.0944)	(0.0939)	(0.0923)	(0.0946)	(0.0943)
BC*2008	-0.0784	-0.0659	-0.0442	-0.107	-0.0956
	(0.0951)	(0.0948)	(0.0932)	(0.0949)	(0.0948)
Prov*Cohort					
QC*Cohort	-0.0377	-0.0314	-0.0296	-0.0178	-0.0120
	(0.0865)	(0.0860)	(0.0845)	(0.0860)	(0.0857)
BC*Cohort	0.108	0.110	0.102	0.113	0.116
	(0.0807)	(0.0803)	(0.0788)	(0.0800)	(0.0797)
Cohort*Year					
Cohort*2005	-0.103	-0.112	-0.111	-0.0851	-0.0927
	(0.0815)	(0.0814)	(0.0800)	(0.0815)	(0.0815)
Cohort*2006	-0.0173	-0.0142	-0.0337	0.00629	0.00726
	(0.0849)	(0.0844)	(0.0829)	(0.0849)	(0.0844)
Cohort*2007	0.00730	0.0114	-0.00556	0.0229	0.0286
	(0.0971)	(0.0967)	(0.0950)	(0.0965)	(0.0962)
Cohort*2008	-0.114	-0.120	-0.157*	-0.0979	-0.105
	(0.0831)	(0.0826)	(0.0813)	(0.0830)	(0.0826)

Policy	**0.0744**	**0.0471**	**0.105**	**0.0480**	**0.0232**
	(0.110)	**(0.109)**	**(0.108)**	**(0.109)**	**(0.109)**
Mother's Leave			0.269***		
			(0.0331)		
Father's Leave		0.0224	0.0315		0.0177
		(0.0252)	(0.0248)		(0.0252)
Immigrant		0.0590**	0.0766***		0.0492*
		(0.0285)	(0.0281)		(0.0286)
Age		0.0556*	0.0437		0.0591*
		(0.0312)	(0.0307)		(0.0312)
Highest Educational Attainment					
Grade 9-11, non grad		-0.0608	-0.0450		-0.0536
		(0.151)	(0.148)		(0.150)
Grade 11-13, grad		-0.0812	-0.0828		-0.0740
		(0.146)	(0.143)		(0.145)
Some post-grad		-0.0755	-0.0636		-0.0780
		(0.148)	(0.145)		(0.147)
Community College/CEGEP		-0.0859	-0.0841		-0.0867
		(0.144)	(0.142)		(0.143)
University Degree		-0.0463	-0.0392		-0.0484
		(0.145)	(0.142)		(0.143)
Student		-0.0584	-0.0489		-0.0531
		(0.0486)	(0.0477)		(0.0488)
Family Income Group					
Middle-income		0.102***	0.0669*		0.0965***
		(0.0355)	(0.0351)		(0.0360)
High-income		0.154***	0.110***		0.146***
		(0.0386)	(0.0383)		(0.0390)
Constant	0.755***	0.622***	0.451***	0.765***	0.634***
	(0.0573)	(0.163)	(0.161)	(0.0574)	(0.161)
Observations	1,809	1,809	1,809	1,776	1,776
R-squared	0.013	0.036	0.070	0.014	0.034
SSR	254.082	248.318	239.444	243.842	238.875
F-statistic	1.10	2.00	3.94	1.14	1.87
Root MSE	0.37718	0.37403	0.36739	0.37296	0.37031

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 7, the coefficients on the variable of particular interest, *Policy*, are all positive in sign and not statistically significant. Here, Model (5) suggests that, holding all else constant, *Policy* has a non-significant effect of increasing the proportion of employed Quebec mothers of dual-earner couples who are working full-time in the post-treatment period by 2.32 percentage points. Although neither analyses revealed statistically significant results, these results are opposite in sign than the DiD

estimates. The triple-difference estimates are in line with the third hypothesis, in that the policy has a positive effect on the proportion of new mothers working in full-time positions. Here, the coefficient for *Father's Leave* is still positive, with Model (5) suggesting that, holding all else constant, mothers whose husbands took leave have a non-significant effect of increasing the proportion of mothers working in full-time positions by 1.77 percentage points.

The triple-difference analysis confirms the positive effects that mothers' immigrant status and age have on the proportion of full-time working mothers. Results suggest that, on average and holding all else constant, mothers who are immigrants increase the proportion of full-time working mothers by 5.90 percentage points in Model (2), and by 4.92 percentage points in Model (5) (at varying levels of statistical significance). Compared to mothers aged 15 to 24 and holding all else constant, mothers aged 25 to 44 increase the proportion of mothers working full-time by 5.56 percentage points in Model (2), and 5.91 percentage points in Model (5) (both statistically significant at the 90 percent confidence level).

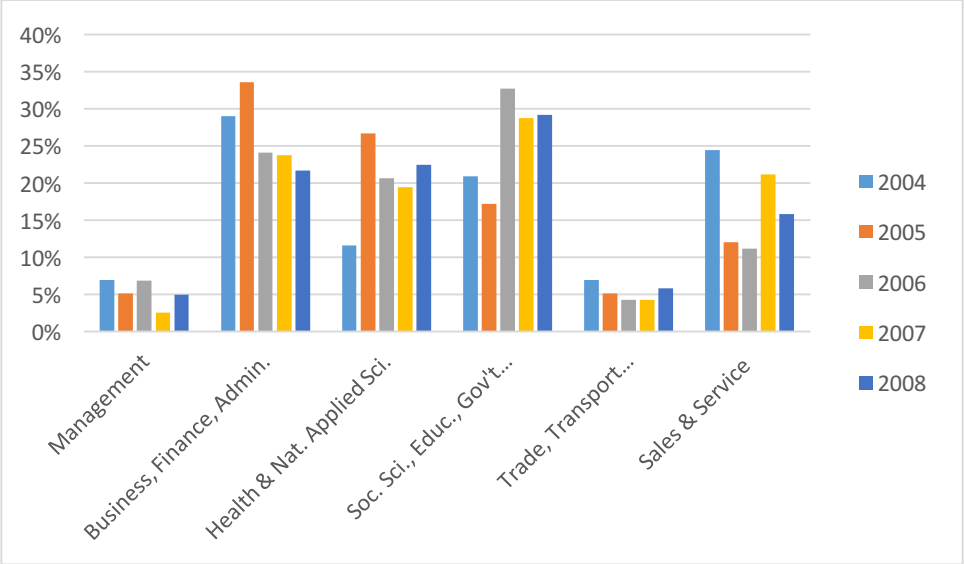
6.5 Hypothesis Three – Breakdowns Over Time

Turning to the second part of (H3), which suggests that under QPIP, mothers are more likely to work in demanding occupations and industries, we also encounter restrictions on the hypothesis testing as a result of the available data. To explain, mothers' occupation and industry type are presented as categorical variables. With a lack of longitudinal data, we are not able to transform these variable into binary variables to determine whether mothers changed their occupation or industry type in

the post-treatment period. Consequently, we can only examine these outcome variables over time. Therefore, to examine this part of the hypothesis, we compare the occupation and industry breakdowns of mothers in Quebec before and after the policy implementation, both for the full sample and for the sample of mothers whose husbands took up the leave opportunity. This in and of itself poses challenges – NAICS and NOC classifications are quite broad and it is therefore challenging to suggest that one industry or occupation category is more demanding than another without knowing specific job titles. We recognize the limitations involved here (particularly those outlined in Section 5 above), though we feel that these outcomes should be still observed to, at the least, provide a glimpse into how they move across the timeframe of this research.

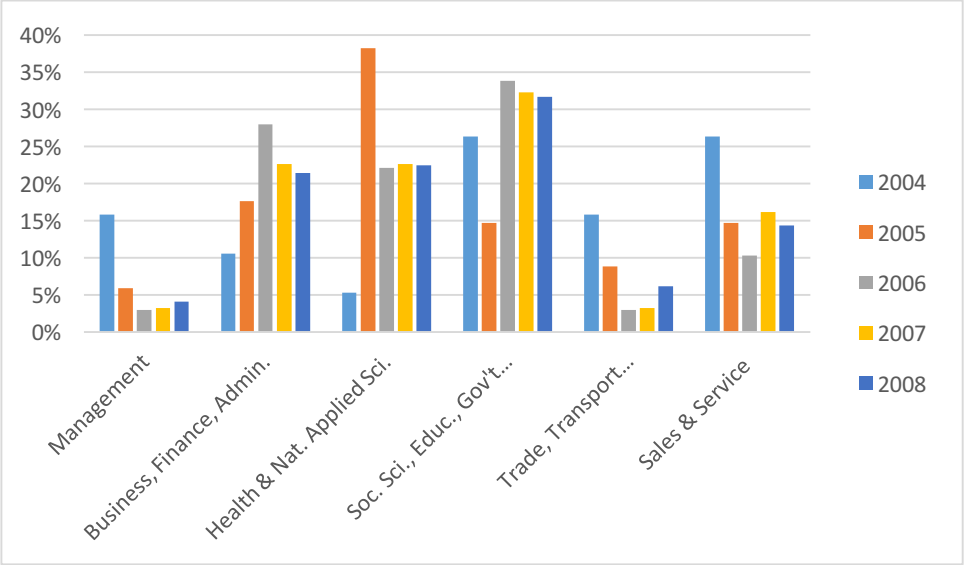
Figures 5 and 6 illustrate the occupation breakdowns (according to the National Occupation Classification, or NOC) by year for all Quebec mothers, and those whose husbands took leave, respectively. The breakdowns by categories over the years are fairly similar between the two samples. One observation worth mentioning is that although the proportion of mothers working in business, finance, and administration decreases in Figure 5 (for all Quebec mothers) in the post-treatment period, this proportion actually increases in Figure 6 (for Quebec mothers whose husbands took leave). Occupations of this type are often known to be inflexible in terms of a work-life balance and are largely male-dominated, so it is interesting to see an increase in the proportion of new mothers in these fields during the post-treatment period when their husbands take leave.

Figure 5. Occupation Breakdown – All Quebec Mothers



EICS, Statistics Canada

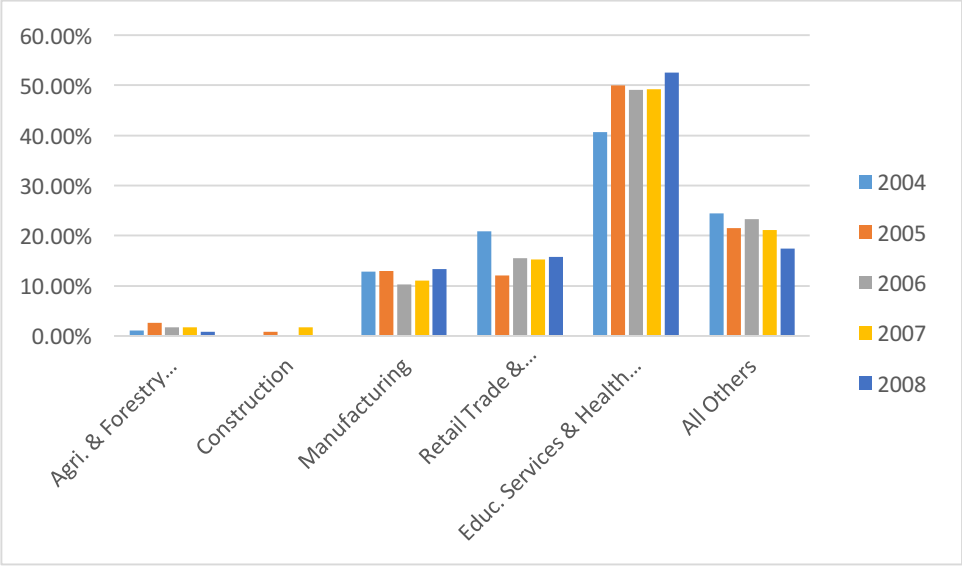
Figure 6. Occupation Breakdown – Quebec Mothers Whose Husbands Took Leave



EICS, Statistics Canada

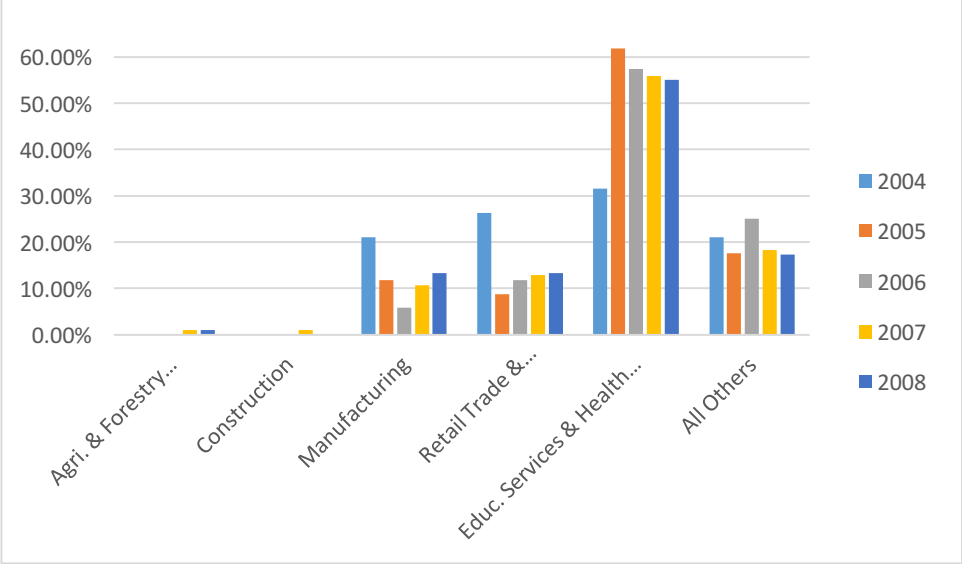
Figures 7 and 8 illustrate industry breakdowns (according to the North American Industry Classification System, or NAICS) by year for all Quebec mothers, and those whose husbands took leave, respectively. Again, the breakdowns of the two samples over time are quite comparable. An interesting observation in this case is that, while the proportion of all Quebec mothers working in educational services, healthcare, social assistance, and public administration increases in the post-treatment period (shown in Figure 7), that proportion for Quebec mothers whose husbands took leave actually decreases (as seen in Figure 8). These are industries that are traditionally largely chosen by women, so it is interesting to see a movement away from them in the post-treatment period for mothers whose husbands take leave.

Figure 7. Industry Breakdown – All Quebec Mothers



EICS, Statistics Canada

Figure 8. Industry Breakdown – Quebec Mothers Whose Husbands Took Leave



EICS, Statistics Canada

Although the data used in this study only allows for anecdotal observations regarding the influence of paternity leave on mothers' industry and occupation types, this is an area that could potentially be investigated more thoroughly in future research where the data permits.

7 Conclusion

The responsibility of caring for a newborn is often associated with mothers, through the traditional preponderance of maternity leave. However, paternity leave is gaining attention as a policy tool that can promote gender equality in the labour force and benefit both parents through shared early child care involvement. The goal

of this paper was to estimate the impact of paternity leave on the labour market outcomes of mothers, in hopes that such a policy would in fact translate to positive results for mothers. This research suggests that, in the case of Quebec's introduction of paternity leave, the presence of the policy alone does not always lead to more desirable labour market outcomes for mothers. Instead, what appears to be more important is whether fathers decide to take leave.

Using a triple-difference approach, we find three main results. First, being a mother of a dual-earner couple in Quebec in the presence of QPIP leads to 13.1 percent longer leave duration. However, when the father takes leave, the mother's leave duration decreases by 16.4 percent, leaving us with a net reduction of 3.3 percent. Second, being a mother of a dual-earner couple in Quebec in the presence of QPIP also leads to a 3.4 percent earnings premium. Again, when husbands of mothers in this treatment group take leave, the outcome is more favourable – in this case, the result is a 6.22 percent earnings premium. Lastly, the policy has a non-significant effect of increasing the proportion of Quebec mothers of dual-earner couples who are working full-time in the post-treatment period by 2.32 percentage points. When husbands of those in the treatment group take leave, the increase in proportion of full-time working mothers is 4.09 percentage points.

The estimates in this research are not always statistically significant at conventional levels. This is not particularly surprising as this research examines the impact of a policy designed for fathers, on mothers' outcomes, meaning the policy is more likely to directly impact fathers' outcomes. Although it was not possible here due to data limitations, future research should attempt to estimate the impact of

paternity leave on fathers' corresponding labour market outcomes. As this policy is, in part, designed to promote gender equality in the workplace, it is important that both fathers' and mothers' labour market outcomes are evaluated. It would also be important to see whether these positive effects on mothers come at a cost to fathers.

Although these findings reveal that, in some cases, fathers' decisions to take leave can be more meaningful in terms of positively impacting mothers labour market outcomes than the effect of simply being in the presence of paternity leave, this does not discount the importance of having a paternity leave policy in place. In fact, Quebec's paternity leave policy was instrumental in increasing the proportion of fathers taking leave in that province. As such, the findings in this research have implications when looking at paternity leave on a national scale. With the federal government's recent expansion to offer paternity benefits Canada-wide, it will be important to monitor whether the proportion of fathers taking leave increases. If indeed it does, we might observe positive labour market outcomes for Canadian mothers on a larger scale.

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9 Appendices

9.1 Appendix A – Additional Descriptive Statistics

Table A1. Variable Definitions and Coding

Variable Name	Description	Coding
hourearn	Mothers' usual hourly earnings	3.17-80.98 – Usual hourly earnings
alleave	Mothers' leave duration (in months)	0-68 – Time ended or planned (in months)
*ftpt**	Mothers' full/part-time status of current job	0 – Part-time 1 – Full-time
naics6	Mothers' industry based on NAICS 1997	1 – Agriculture & Forestry, Fishing, Mining, Oil and Gas 2 – Construction 3 – Manufacturing 4 – Retail Trade & Accommodation and Food Services 5 – Educational Services & Health Care and Social Assistance & Public Administration 6 – All others
noc6	Mothers' occupation based on NOC 2001	1 – Management 2 – Business, Finance and Administration 3 – Health and Natural Applied Sciences 4 – Social Science, Education, Government, Religion, Art, Culture, Recreation and Sport 5 – Trade, Transport and Equipment Operators 6 – Sales and Service
syear	Survey reference year	2004 2005 2006 2007 2008
*region6**	Province	0 – Ontario 1 – Quebec 2 – British Columbia
*matpar**	Mothers who received maternity/parental benefits	0 – No maternity/parental benefits 1 – Received maternity/parental benefits
*spclaim**	Fathers who claimed/intend to claim parental benefits	0 – Spouse/partner did not claim or intend to claim 1 – Spouse/partner claimed or intends to claim
*agecat**	Mothers' age (groups)	0 – 15-24 years old 1 – 25-44 years old

educ	Mothers' highest educational attainment	0 – Grade 8 or lower 1 – Grade 9-11, non graduate 2 – Grade11-13, graduate 3 – Some post-graduate 4 – Community college/CEGEP 5 – University graduate (all levels)
*immigr**	Mothers' immigrant status	0 – Canadian by birth 1 – Immigrant
*student**	Mothers' student status	0 – Non-student 1 – Student
reaspncl	Reason that spouse is not claiming parental benefits	1 – Mother wants to stay home 2 – Mother can take time off easier 3 – More financially advantageous 4 – Spouse not eligible for EI 5 – Other 6 – Valid skip
*wrkafter**	Mother has worked since birth/adoption	0 – Has not worked 1 – Has worked
efamsz_r	Size of economic family	3 – Three people 4 – Four people 5 – Five or more people
chdlcare	Planned or current child care arrangement	1 – Mother herself or shared with husband 2 – Friend or relative will take care of child 3 – Private babysitter 4 – Bursary or daycare (private or public) 5 – Other 6 – Valid skip 9 – Not stated
mainfund	Main source of funds used to meet household expenses	1 – Wages or self-employment earnings of spouse/partner/family member 2 – Own wages or self-employment income 3 – EI benefits 4 – Social assistance 5 – Pensions, disability insurance, workers' compensation 6 – Alimony, student loans, scholarships 7 – Financial assistance from friends or relatives 8 – Income from investments, interest, dividends, rentals or savings 9 – Other
*childben**	Received child tax benefit or child benefit	0 – No 1 – Yes
*m_hhinc**	Household income in the month before the birth/adoption	1 – Less than $1,600 (less than $20,000 per annum)

		2 – $1,600 to less than $5,000 ($20,000-$60,000 per annum) 3 – More than $5,000 (more than $60,000 per annum)
m_incdec	Increase/decrease in mothers' income after birth/adoption	1 – Decrease 2 – Increase 3 – Stayed the same
m_chginc	Change in mothers' income (per month)	1 – $0-$200 2 – $201-$400 3 – $401-$600 4 – $601-$800 5 – $801-$1000 6 – $1001-$2000 7 – $2001 and over 8 – Stayed the same

*Recoded from original dataset

Table A2.1 Categorical Variables by Year

Variable	2004	2005	2006	2007	2008	Total
naics6	310	316	302	334	284	1,546
Agriculture & Forestry, Fishing, Mining, Oil and Gas	4	5	4	5	5	23
Construction	1	4	2	2	2	11
Manufacturing	42	28	29	26	27	152
Retail Trade & Accommodation and Food Services	47	40	49	50	40	226
Educational Services & Health Care and Social Assistance & Public Administration	129	156	135	165	138	723
All others	87	83	83	86	72	411
noc6	310	316	302	334	284	1,546
Management	18	22	19	16	14	89
Business, Finance and Administration	82	92	76	79	69	398
Health and Natural Applied Sciences	48	71	54	66	64	303
Social Science, Education, Government, Religion, Art, Culture, Recreation and Sport	75	64	84	92	69	384
Trade, Transport and Equipment Operators	27	15	20	14	14	90
Sales and Service	60	52	49	67	54	282
prov	310	316	302	334	284	1,546
Ontario	199	160	146	171	128	804
Quebec	86	116	116	118	120	556
British Columbia	25	40	40	45	36	186
educ	310	316	302	334	284	1,546
Grade 8 or lower	0	0	0	2	3	5
Grade 9-11, non graduate	15	7	5	9	9	45
Grade11-13, graduate	36	30	38	35	19	158
Some post-graduate	27	19	17	13	12	88
Community college/CEGEP	138	150	126	151	127	692
University graduate (all levels)	94	110	116	124	114	558
reaspncl	310	316	302	334	284	1,546
Mother wants to stay home	106	92	84	103	91	476
Mother can take time off easier	17	59	43	43	17	179
More financially advantageous	81	36	32	32	29	210
Spouse not eligible for EI	46	38	33	28	14	159
Other	17	34	26	16	18	111
Valid skip	43	57	84	112	115	411

efamsz_r	310	316	302	334	284	1,546
Three people	139	141	138	171	119	708
Four people	122	125	126	112	121	606
Five or more people	49	50	38	51	44	232
chldcare	310	316	302	334	284	1,546
Mother herself or shared with husband	34	35	30	25	29	153
Friend or relative will take care of child	77	67	65	90	72	371
Private babysitter	53	51	31	33	22	190
Bursary or daycare (private or public)	84	100	127	128	115	554
Other	29	20	19	15	11	94
Valid skip	9	12	7	6	8	42
Not stated	24	31	23	37	27	142
mainfund	310	316	302	334	284	1,546
Wages or self-employment earnings of spouse/partner/family member	260	264	230	277	231	1,262
Own wages or self-employment income	22	16	22	23	19	102
EI benefits	17	27	33	23	21	121
Pensions, disability insurance, workers' compensation	1	0	0	1	2	4
Alimony, student loans, scholarships	1	1	0	0	0	2
Financial assistance from friends or relatives	0	0	4	1	1	6
Income from investments, interest, dividends, rentals or savings	4	5	9	7	3	28
Other	5	3	4	2	7	21
m_hhinc	310	316	302	334	284	1,546
Less than $1,600 (less than $20,000 per annum)	17	17	11	26	16	87
$1,600 to less than $5,000 ($20,000-$60,000 per annum)	228	182	187	180	160	937
More than $5,000 (more than $60,000 per annum)	65	117	104	128	108	522
m_incdec	310	316	302	334	284	1,546
Decrease	215	213	216	218	170	1,032
Increase	19	12	12	17	17	77
Stayed the same	76	91	74	99	97	437
m_chginc	310	316	302	334	284	1,546
$0-$200	11	11	18	19	18	77
$201-$400	37	22	32	33	28	152
$401-$600	45	38	26	37	26	172
$601-$800	27	22	17	23	23	112
$801-$1000	34	43	48	44	29	198
$1001-$2000	52	55	65	55	37	264

$2001 and over	28	34	22	24	26	134
Stayed the same	76	91	74	99	97	437

Table A2.2 Non-Categorical Variables by Year

Variable	2004		2005		2006		2007		2008	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
hourearn	19.003	9.011	20.722	8.257	20.353	9.315	20.941	8.834	22.782	10.603
alleave	10.339	4.042	11.082	5.955	11.232	4.295	11.302	4.823	10.877	3.959
ftpt	0.819	0.385	0.835	0.371	0.864	0.343	0.817	0.387	0.824	0.382
matpar	0.939	0.240	0.937	0.244	0.924	0.266	0.934	0.248	0.961	0.193
spclaim	0.139	0.346	0.180	0.385	0.278	0.449	0.335	0.473	0.405	0.492
agecat	1.897	0.305	1.934	0.249	1.921	0.271	1.892	0.311	1.930	0.256
immigr	0.123	0.328	0.085	0.280	0.113	0.317	0.108	0.311	0.099	0.299
student	0.029	0.168	0.051	0.220	0.026	0.161	0.021	0.143	0.035	0.185
wrkafter	0.274	0.447	0.218	0.414	0.225	0.418	0.2305	0.422	0.2289	0.421
childben	0.571	0.496	0.587	0.493	0.732	0.444	0.931	0.254	0.926	0.262

Table A3.1 Categorical Variables by Province

Variable	Ontario	Quebec	British Columbia	Total
naics6	804	556	186	1,546
Agriculture & Forestry, Fishing, Mining, Oil and Gas	11	9	3	23
Construction	7	3	1	11
Manufacturing	77	67	8	152
Retail Trade & Accommodation and Food Services	102	87	37	226
Educational Services & Health Care and Social Assistance & Public Administration	368	271	84	723
All others	239	119	53	411
noc6	804	556	186	1,546
Management	46	29	14	89
Business, Finance and Administration	204	146	48	398
Health and Natural Applied Sciences	155	115	33	303
Social Science, Education, Government, Religion, Art, Culture, Recreation and Sport	205	145	34	384
Trade, Transport and Equipment Operators	52	29	9	90
Sales and Service	142	92	48	282
syear	804	556	186	1,546
2004	199	86	25	310
2005	160	116	40	316
2006	146	116	40	302
2007	171	118	45	334
2008	128	120	36	284
educ	804	556	186	1,546
Grade 8 or lower	3	2	0	5
Grade 9-11, non graduate	21	17	7	45
Grade11-13, graduate	101	29	28	158
Some post-graduate	43	23	22	88
Community college/CEGEP	330	298	64	692
University graduate (all levels)	306	187	65	558

reaspncl	804	556	186	1,546
Mother wants to stay home	312	92	72	476
Mother can take time off easier	109	45	25	179
More financially advantageous	145	36	29	210
Spouse not eligible for EI	95	40	24	159
Other	59	31	21	111
Valid skip	84	312	15	411
efamsz_r	804	556	186	1,546
Three people	364	247	97	708
Four people	319	223	64	606
Five or more people	121	86	25	232
chldcare	804	556	186	1,546
Mother herself or shared with husband	97	24	32	153
Friend or relative will take care of child	214	87	70	371
Private babysitter	113	66	11	190
Bursary or daycare (private or public)	232	277	45	554
Other	44	45	5	94
Valid skip	21	16	5	42
Not stated	83	41	18	142
mainfund	804	556	186	1,546
Wages or self-employment earnings of spouse/partner/family member	668	431	163	1,262
Own wages or self-employment income	58	43	1	102
EI benefits	43	63	15	121
Pensions, disability insurance, workers' compensation	1	3	0	4
Alimony, student loans, scholarships	1	0	1	2
Financial assistance from friends or relatives	2	4	0	6
Income from investments, interest, dividends, rentals or savings	16	7	5	28
Other	15	5	1	21
m_hhinc	804	556	186	1,546
Less than $1,600 (less than $20,000 per annum)	40	36	11	87
$1,600 to less than $5,000 ($20,000-$60,000 per annum)	484	355	98	937
More than $5,000 (more than $60,000 per annum)	280	165	77	522
m_incdec	804	556	186	1,546
Decrease	597	300	135	1,032
Increase	39	31	7	77
Stayed the same	168	225	44	437

m_chginc	804	556	186	1,546
$0-$200	29	44	4	77
$201-$400	66	78	8	152
$401-$600	85	62	25	172
$601-$800	66	27	19	112
$801-$1000	124	51	23	198
$1001-$2000	169	47	48	264
$2001 and over	97	22	15	134
Stayed the same	168	225	44	437

Table A3.2 Non-Categorical Variables by Province

Variable	Ontario		Quebec		British Columbia	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
hourearn	21.653	9.824	19.343	8.424	20.894	8.704
alleave	10.810	4.514	11.092	4.873	11.317	4.957
ftpt	0.835	0.372	0.842	0.365	0.790	0.408
matpar	0.937	0.244	0.951	0.215	0.909	0.289
spclaim	0.104	0.306	0.561	0.497	0.081	0.273
agecat	1.933	0.250	1.88	0.319	1.919	0.273
immigr	0.147	0.354	0.045	0.207	0.108	0.311
student	0.031	0.174	0.034	0.182	0.032	0.177
wrkafter	0.255	0.436	0.214	0.411	0.215	0.412
childben	0.663	0.473	0.871	0.336	0.758	0.429

9.2 Appendix B – F-tests

F-tests are calculated using the sum of squared residuals (SSR) from the corresponding regressions using the following equation:

$$F_{stat} = \frac{(SSR_{restricted} - SSR_{unrestricted})/q}{SSR_{unrestricted}/(n-k-1)} \quad (7)$$

where q is the number of parameters that are restricted, n is the total number of observations in the sample, and k is the number of regressors in the unrestricted model. In each case, the null hypothesis states that the model with added regressors adds no explanatory power. In other words, the effects of all the additional controls are equal to zero.

Table B1. Difference-in-Difference Leave Duration F-tests

Models	F_{stat}	F_{crit}
Model (2) vs (1)	4.93	2.40
Model (3) vs (1)	11.78	2.30
Model (5) vs (4)	4.35	2.40
Model (7) vs (6)	4.69	2.40

The models that are tested in Table B1 correspond to Models (1) through (7) in Table 4.1 in the body of the text – the DiD estimation using leave duration as the dependent variable. As the F_{stat} values are larger than their corresponding .05 critical values, we are able to strongly reject the null hypothesis in all cases.

Table B2. Difference-in-Difference Hourly Earnings F-tests

Models	F_{stat}	F_{crit}
Model (2) vs (1)	81.66	2.40
Model (3) vs (1)	76.54	2.30
Model (5) vs (4)	80.30	2.40

The models that are tested in Table B2 correspond to Models (1) through (5) in Table 4.2 in the body of the text – the DiD estimation using hourly earnings as the dependent variable. As the F_{stat} values are larger than their corresponding .05 critical values, we are again able to strongly reject the null hypothesis in all cases.

Table B3. Triple-Difference Leave Duration F-tests

Models	F_{stat}	F_{crit}
Model (2) vs (1)	4.27	2.40
Model (3) vs (1)	6.04	2.30
Model (5) vs (4)	3.95	2.40
Model (7) vs (6)	4.30	2.40

The models that are tested in Table B3 correspond to Models (1) through (7) in Table 5.1 in the body of the text – the triple-difference estimation using leave duration as the dependent variable. As the F_{stat} values are larger than their corresponding .05 critical values, we are able to strongly reject the null hypothesis in all cases.

Table B4. Triple Difference Hourly Earnings F-tests

Models	F_{stat}	F_{crit}
Model (2) vs (1)	95.82	2.40
Model (3) vs (1)	89.43	2.30
Model (5) vs (4)	94.10	2.40

The models that are tested in Table B4 correspond to Models (1) through (5) in Table 5.2 in the body of the text – the triple-difference estimation using hourly earnings as the dependent variable. As the F_{stat} values are larger than their corresponding .05 critical values, we are again able to strongly reject the null hypothesis in all cases.

Table B5. Difference-in-Difference Full-time Employment F-tests

Models	F_{stat}	F_{crit}
Model (2) vs (1)	3.63	2.40
Model (3) vs (1)	7.79	2.30
Model (5) vs (4)	3.04	2.40

The models that are tested in Table B5 correspond to Models (1) through (5) in Table 6 in the body of the text – the DiD estimation using full-time employment as the dependent variable. As the F_{stat} values are larger than their corresponding .05 critical values, we are able to strongly reject the null hypothesis in all cases.

Table B6. Triple-Difference Full-time Employment F-tests

Models	F_{stat}	F_{crit}
Model (2) vs (1)	3.75	2.40
Model (3) vs (1)	9.08	2.30
Model (5) vs (4)	3.29	2.40

The models that are tested in Table B6 correspond to Models (1) through (5) in Table 7 in the body of the text – the triple-difference estimation using full-time employment as the dependent variable. As the F_{stat} values are larger than their corresponding .05 critical values, we are again able to strongly reject the null hypothesis in all cases.