

# The Effects of Paternity Leave: Evidence from the Introduction of a “Father’s Quota” in Quebec

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## **Abstract**

This paper uses a major reform of the parental leave system in Quebec in 2006 to analyze how households make decisions related to parental leave. It shows that the introduction of a father’s quota - a policy designed to incentive fathers to take parental leave - was successful in more than doubling the proportion of fathers taking some parental leave. This paper also provides strong evidence that households prefer to specialize: close to 80% of households split paid parental leave between parents with the mother taking as many weeks as possible and the father as little as possible. Finally, an administrative dataset allows a detailed analysis of the relationship between parental leave decisions and income. In general, households with higher labor income take more parental leave overall (summing the mother’s and the father’s weeks). However, fathers with higher labor income take less parental leave, indicating a higher degree of specialization.

In this paper, I will analyze early-life childcare decisions within the household. Understanding how households make these decisions is an important consideration when analyzing labor market outcomes of parents. There is considerable evidence that temporary reductions in labor supply, in the form of parental leave for instance, have a major impact on earnings and careers. Indeed, studies argue that mothers, that take most parental leave, pay large child earnings penalties that persist over the long-term (see for example Kleven et al. (2015)). In this context, the main question this paper tries to answer is how households make decisions related to parental leave. More precisely, this paper will study the effect of incentivizing fathers to take more parental leave. It will also analyze how parental leave decisions are related to the labor market income of each parent and if there is evidence of specialization within households.

To answer these questions, I will use a major change in parental leave policy in Quebec. In January 2006, Quebec’s provincial government created the “Régime québécois d’assurance parentale” or Quebec Parental Insurance Plan (QPIP). One of the main components of the reform was the introduction of a “father’s quota”: 5 weeks of non-transferable paid parental leave weeks reserved for fathers. Prior to the reform, parental leave time could be split between the parents without any restrictions. However, in practice, in the large majority of households, only mothers took paid parental leave. The father’s quota incentivizes fathers to take time off from work at the birth of a child. Since the weeks are not transferable to mothers, not taking them would result in the household foregoing some of the available paid parental leave time. Indeed, the policy had a significant impact on the household’s decisions, as the fraction of fathers taking some parental leave time more than doubled following the reform. The 2006 reform provides the ideal setting to analyze household parental leave decisions. First of all, analyzing the response of fathers to the new incentives introduced by the father’s quota provides insight into how households make decisions related to splitting parental leave time. Second, this paper, with the help of detailed administrative data on QPIP recipients, is able to provide evidence on how parental leave decisions are related to parents’ income.

This paper makes the following main contributions. First, it provides evidence that while the reform changed many aspects of the parental leave system the most important aspect is the introduction of the father's quota. It shows that while the reform had an impact on both fathers and mothers, the magnitude of the impact was much larger for fathers than for mothers. Using a difference-in-difference estimator, the reform is estimated to induce an extra 50% of all new fathers to take parental leave. After 2006 in Quebec, more than 80% of all new fathers take some parental leave compared to 30% beforehand. Meanwhile, the fraction of mothers taking some parental leave goes from around 85% to around 95%. This paper then examines parental leave behavior under QPIP using an administrative dataset. It finds that the majority of households split the weeks of parental leave in a very specific way: the mother takes the maximum amount available to her and then the father takes the weeks that remain. This behavior seems to imply that the constraint introduced by the father's quota binds and that most households would prefer to specialize even further. The paper then analyzes the relationship between income and parental leave behavior. While taking parental leave is more costly for higher income households (in terms of foregone income), these households still take more parental leave. While richer households take more parental leave overall (summing mother and father time-off), when focusing on fathers this pattern does not hold. In fact, fathers that have higher income take less time off. This suggests a higher degree of specialization in households with high income fathers.

The rest of the paper is organized as follows. Section 1 reviews the related literature and highlights the main contributions of this paper. Section 2 describes in detail parental leave systems in Quebec before and after the introduction of QPIP. Section 3 discusses the data that is used in this paper. Section 4 looks at the effect of the reform on parental leave take-up of fathers and mothers. Section 5 describes in detail the behavior of households under QPIP.

# 1 Literature Review

Understanding parental leave decisions is crucial to analyze labor market outcomes of parents. A major question is whether a policy such as a father's quota can reduce the wage-gap between men and women. There exists a large literature that tries to determine the causes of the wage-gap. Blau and Kahn (2016) provide an overview of the literature that analyzes its determinants. One explanation that is particularly compelling is provided in Goldin (2014). The author of that paper argues that the main explanation for the remaining gender wage-gap is the remuneration structure of the labor market. Firms disproportionately reward workers that work long and unusual hours. As a result, the penalty of having a flexible job, in terms of foregone wages, is large. For a variety of reasons, women might have a preference, relative to men, for flexible schedules. Therefore, Goldin argues that women are hit disproportionately by these penalties for flexible schedules or time off.

Goldin's paper provides a framework to think about the gender wage-gap. However, it does not address the question of why women value flexibility more than men. One possible explanation is that women have to take time off to have children and that early-life childcare responsibilities fall mainly on mothers. Therefore, women have a harder time than men conciliating family and professional life and end up paying penalties in terms of lower wages. Bronson (2015), provides evidence that this is an important consideration for many women, as it appears to be a major mechanism in explaining differences in college major choices between men and women. In fact, Bronson's paper argues that women select disproportionately into degrees that are lower paying but allow a high degree of work-family flexibility. In addition to affecting education decisions, many studies find evidence of a "child earnings penalty", a decrease in earnings growth following the birth of the first child. For example, Waldfogel (1997) finds that even after controlling for actual labor market experience, such a penalty can still be observed. More recently Kleven et al. (2015) estimate that in Denmark the "child penalty" is about 20% of earnings and accounts for about 80% of total earning inequalities. Finally, Gruber (1994) shows that the cost of mandated benefits related to childbirth where

largely passed on to mothers in the form of lower wages. Therefore, it is a legitimate question to wonder if the same phenomenon takes place with the father's quota.

Given these observations policies surrounding pregnancy and childcare, such as the father's quota, could have a major impact on the wage-gap. Previous papers have studied the father's quota in other countries. In addition to Quebec, it has been instituted in places such as Sweden, Norway and Iceland. Ekberg et al. (2013) find that in Sweden, the policy had strong effects in the short-term in terms of the splitting of parental leave time. However, they find little evidence of long term effects in terms of division of household work or labor market outcomes. Similarly, looking at Norway, Cools et al. (2011) find little evidence of a change in the division of household work and surprisingly find a negative impact on mothers' labor market outcomes. One possible explanation though is that the reform Cools et al. look at also increased mothers' parental leave time making the effect they identify unclear. Dahl et al. also look at the reform in Norway. They show the presence of important peer effects in the take-up of parental leave for fathers: fathers that know other fathers that took paternity leave are more likely to take some themselves. Finally, Patnaik (2016) looked at the daddy quota policy in Quebec. Her paper shows a strong effect in terms of participation in the program and also a long-term effect in terms of splitting household work.

This paper expands on Patnaik in terms of looking more closely at participation in the program. Patnaik's small dataset (about 200 observations per year) does not allow her to study the determinants of participation in the program. By using an administrative dataset that tracks all program participants I am able to look more closely at how participants self-select by choosing the number of weeks of parental leave they take. One potential caveat is that, given results in previous studies, it is possible that the effects on labor market outcomes are small or insignificant. However, it is still worth looking into.

Finally, a recent report by Clavet, Corneau-Tremblay, and Lacroix (2016) uses the same administrative dataset used here. They conduct a comprehensive review of the effects of the 2006 parental leave reform. One new result presented in this paper is that, conditional

on household income, fathers with higher income take less weeks of parental leave on average.

## 2 Description of Parental Leave in Quebec

As explained previously, in January 2006, Quebec’s provincial government introduced a major reform of the parental leave system. Up until 2006, Quebec’s parental leave policy, like that of other Canadian provinces, was under the federal government’s Employment Insurance (EI) system. In 2006, Quebec’s provincial government created a new system called QPIP. In addition to introducing a father’s quota, the new system also changed parental leave policy along many dimensions. These changes are summarized in Table 1. It is also useful to note that to this day, other Canadian provinces are still under the EI system. This provides a useful comparison group to think about the effects of the reform.

**Table 1: Description of Policy Changes**

<b>Policy feature</b>	<b>EI system (pre-2006)</b>	<b>QPIP regime basic (post-2006)</b>	<b>QPIP regime special (post-2006)</b>
Total number of weeks	50 weeks	55 weeks	43 weeks
Income replacement rate	55%	70% for 30 weeks then 55% for 25 weeks	75%
Insurable income max (2006)	39,000 C\$	57,000 C\$	57,000 C\$
Father’s quota	None	5 weeks	3 weeks

The first thing to notice is that under the new QPIP system, households have the choice between two regimes: a basic regime and a special regime. The trade-off between the two regimes is that the basic regime has more paid parental leave weeks but the income replacement rate is higher in the special regime. Most households choose the basic regime (74%). Households can only choose one regime for both parents and cannot switch in the middle of the parental leave period. Table 1 also shows that parental leave policy became more gen-

erous following the reform. The maximum number of weeks of paid parental leave increased post 2006 (55 weeks in the basic regime). In addition, total transfers also increased with both the income replacement rate and the insurable income maximum higher under QPIP. The insurable income maximum refers to the maximum income that can be replaced at the specified income replacement rates. Income above this limit is not replaced when parents take parental leave (the replacement rate falls to 0%). The insurable income maximum has increased steadily in both systems since 2006, with QPIP staying more generous. In 2016 they were 51,300 C\$ and 71,500 C\$ for EI and QPIP respectively. Finally, the weeks reserved for fathers are 5 weeks and 3 weeks under the basic and the special regime respectively.

The fact that parental leave system changed in many ways presents challenges in terms of identifying the effect of the father's quota, since under the more generous plan both mothers and fathers are expected to take more parental leave. In addition, it becomes unclear if fathers take more parental leave because of the father's quota or because of the more generous conditions. However, as shown in Figures 1 and 2, the policy had a much bigger impact on fathers than mothers.<sup>1</sup> Therefore, while it is important to think about this carefully in the analysis, the main effect of this policy is an increase in paternity leave relative to maternity leave. In any case, the next sections will provide a more detailed description of household decision-making under QPIP.

### 3 Data

This paper uses two main data sources to study parental leave in Quebec. The first source is an administrative dataset that contains the universe of QPIP recipients and detailed information on number of weeks and transfer amounts for program participants. As far as I know, this paper is the first to use this data. The second source is survey data from Statistics Canada.

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<sup>1</sup>Note that in Figures 1 and 2, the year refers to the year in which the parents took the parental leave. However, the new parental leave system only applied to children born after January 1st. As a result, the data for 2006 includes both pre and post reform families, which explains why the fraction of parents that take the parental leave is somewhat in between pre and post reform fractions.

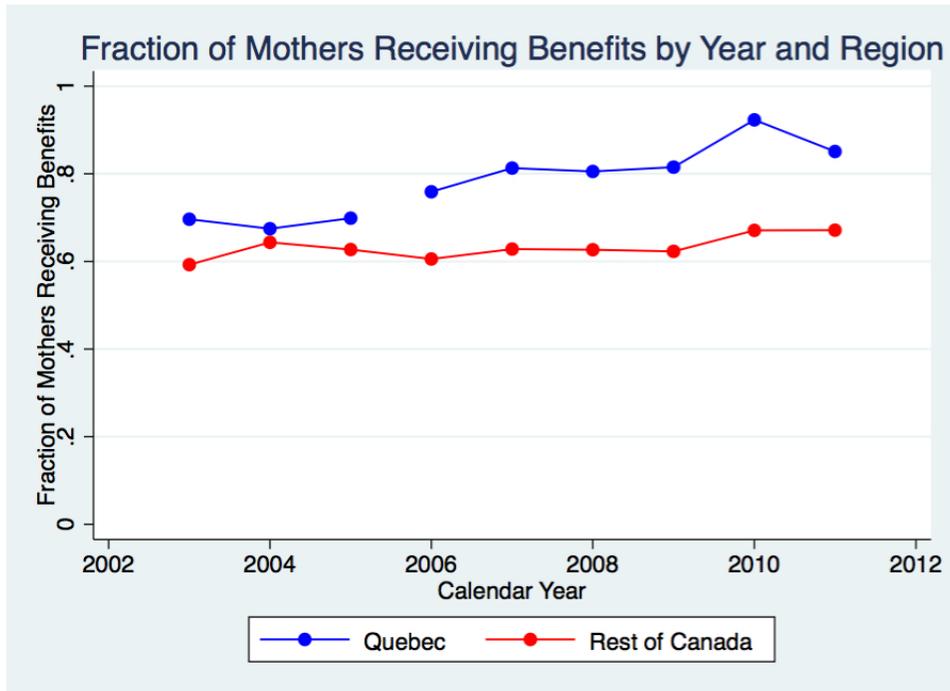


Figure 1: Data from Employment Insurance Coverage Survey (EICS)

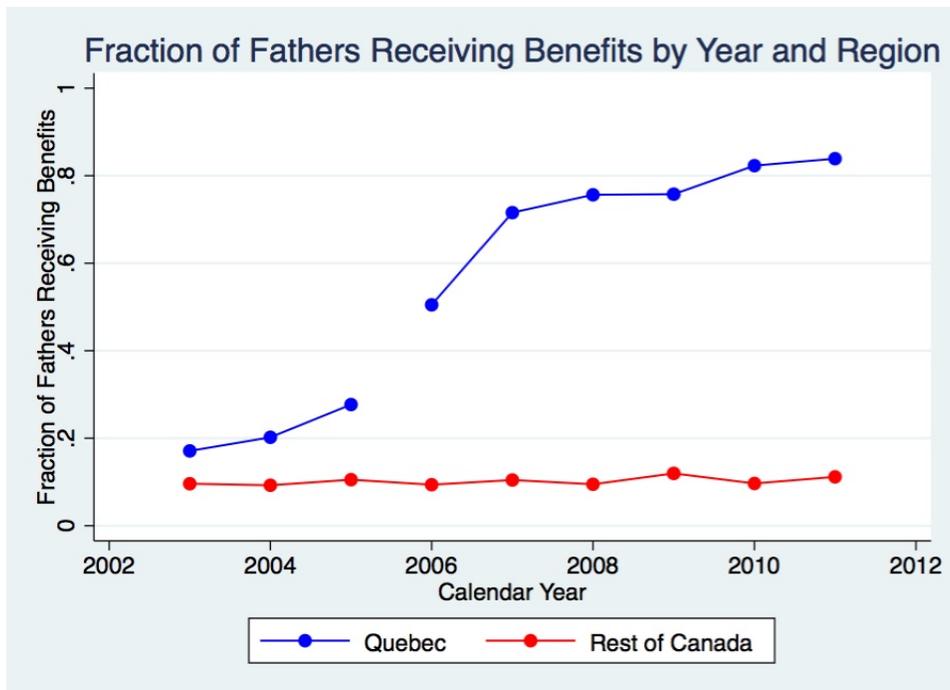


Figure 2: Data from Employment Insurance Coverage Survey (EICS)

The survey is the Employment Insurance Coverage Survey (EICS). EICS is a supplement to the Labor Force Survey (the main labor force survey in Canada) that is designed to study participants in cash transfer programs such as parental leave programs.

I will now describe in greater detail each of the two main datasets:

- The administrative data comes from the "Conseil de gestion de l'assurance parentale" (CGAP) that manages QPIP. This dataset allows me to look in detail at early childcare decisions within the household, after the reform. It contains all beneficiaries from QPIP between the introduction of the new system in 2006 and 2015, with information about the number of weeks of parental leave (with the income replacement rate of each week taken), the amount of benefits received and insurable income. It also contains the age of the parent and whether the parent is salaried or self-employed. This dataset allows me to study how households split parental leave under the program and how a household's income might affect decisions.

However, the data does have some limitations that need to be addressed. The first drawback is that parents that do not take parental leave are not observed in the sample. This means that many observations contain only one parent. Out of 740,000 total births, for 75,000 observations (10.1%) we only observe the father and for 175,000(23.6%) observations we only observe the mother. In the cases where only the father is observed it is probably fair to assume that most cases correspond to households where the mother is ineligible for parental leave because she is either unemployed or not in the labor force. This is supported by the fact that survey data indicates that the participation rate of eligible mothers in the program is higher than 95%. The cases where only mothers are observed is trickier as survey data indicates that around 5% are single mothers and 8% correspond to cases where fathers are not eligible. However, even after the reform, the participation rate of eligible fathers is still only around 85% meaning that there is a significant amount of fathers that make the decision not to participate in the program. Using a back of the envelope calculation ( $85\%$  of the  $100\% - 8\% - 5\% = 87\%$  of eligible

fathers) indicates that probably about 13% of the sample are made up of fathers that decide not to participate in the program. The uncertainty around the reason why the father is not observed is a drawback. In particular, it is reasonable to think that all three groups are very different. For example, single mother households probably do not behave in the same way as households where the father decides not to take parental leave. However, even limiting our analysis to the cases where the father is observed provides interesting insights.

A second limitation is that actual earnings are not observed. Rather only insurable income is. In most cases, this is a good measure of labor market income. However, this is only true up to the maximum insurable income. For people earning more, the maximum insurable income value is reported. Over the course of the period considered, this concerns about 9.6% of observed mothers and 20.4% of observed fathers. The percentages are stable from year to year. This is a problem when considering the effects of income on parental leave decision. However, the very large dataset makes it possible to consider subsamples of the population that are not affected by this censoring problem.

- The Employment Insurance Coverage Survey (EICS) has been active since 1997 and is linked to the broader Labor Force Survey. It gives detailed information on a sample of mothers receiving parental leave benefits, including number of weeks they received benefits, amount of benefits, and pre-leave wage. It also says whether the spouse is eligible for parental leave, and if he is, whether he took some leave. In addition, it contains demographic information about the household including province of residence. The survey covers all Canadian provinces before and after 2006, allowing cross-province comparisons that are a good starting point to look at the effect of the reform (as seen in figures 1 and 2 for example). The data does have some limitations: since it is not designed to look specifically at the program in Quebec, the sample of new parents in Quebec is only about 250 per year, which might be small if we worry that there might be a lot of heterogeneity in parental leave decisions. Also, as stated previously, 2006 is problematic as the survey year refers to the year in which benefits were received and not

year of birth. As a result 2006 contains some households that are under the EI system and some that are under the QPIP system. The way I will deal with this is by dropping 2006 in certain cases. Finally, the information on spouse behavior is rather limited as we only know whether or not the spouse took parental leave and do not for how long or the amount of program transfers. This limits the amount of analysis that can be done in terms of understanding the full extent of household decision-making. Nevertheless, it is a start and provides some evidence that complements other data sources.

## 4 Effect of the Reform on Parental Leave Take-up

As stated previously the introduction of the reform in Quebec but not in other Canadian provinces suggests thinking of the reform as a treatment with Quebec being the treated group and other Canadian provinces as the control group. Therefore, in general, the empirical strategy will rely on comparing the change in parental leave behavior of parents that had children after January 1st 2006 in Quebec to the change in parental leave behavior in other Canadian provinces.

For such a quasi-experimental setting to identify the average treatment effect requires identifying assumptions. Crucially, it relies on the fact that households cannot influence which group they fall in. Since date of birth is hard to control this is a reasonable assumption. Migration is another phenomenon that might confound the estimated effect. However, migration between Quebec and other Canadian provinces is not very large, with the total number of interprovincial migrants (both in and out of Quebec) less than 0.5% of the population. In addition, the new parental leave system is not so much more generous that we would expect parents to delay having children or migrate in response to it. Finally, looking at the summary statistics there is also almost no change in the population in terms of wages, age, education or size of family in the year before and the year after the reform. Taken together these elements suggest that the quasi-experimental setting identifies the average treatment effect.

Figures 1 and 2 suggest that there was a major impact of the reform in terms of take-up of parental leave, particularly for fathers. The fraction of fathers taking some parental leave in Quebec increases from less than 30% before 2006 to close to 80% from 2007 onwards. There is also an effect on mothers, as the fraction taking some parental leave in Quebec increases from 70% to more than 80%. In contrast, in other Canadian provinces, the fraction of parents taking parental leave is very stable over the whole period. Figures 3 and 4 present similar graphics for the subpopulation of parents that are eligible for parental leave. The main reason a new parents would not be eligible for parental leave is if they earned less than 2000 C\$ in wages in the 52 weeks preceding the start of the leave period. Therefore, this concerns mostly parents that are not in the labor force or are long-term unemployed. The evidence in figures 3 and 4 is similar to that in figures 1 and 2: there is an impact on take-up for parents with a much bigger impact for fathers. The fraction of eligible fathers that take some parental leave increases from close to 30% to more than 80% (and more than 90% by 2011). For mothers, the fraction increases from 90% to almost 100%.

A more formal approach would be to use a difference-in-difference method to estimate the impact of the reform. A difference-in-difference estimate can be obtained by estimating the following equation using the EICS data separately for fathers and mothers:

$$p_i = \delta(Q_i \times \text{Post-treatment}_i) + \lambda Q_i + \sum_T \gamma_T Y_i + X_i' \beta + \epsilon_i \quad (1)$$

$p_i$  is the dependent variable in the specification. In two specifications it will be an indicator variable equal to 1 if parent  $i$  (either the mother or the father) takes some parental leave. In the third specification  $p_i$  refers to the number of months of parental leave that mother  $i$  takes.  $Q_i$  is an indicator variable equal to 1 if parent  $i$  lives in Quebec.  $\text{Post-Treatment}_i$  is an indicator variable equal to 1 if parent  $i$  was eligible for parental leave in 2007 or later (after the introduction of QPIP). Therefore, the interaction of  $Q_i$  and  $\text{Post-Treatment}_i$  will be equal to 1 only for our treated group (Quebec residents after the introduction of QPIP).

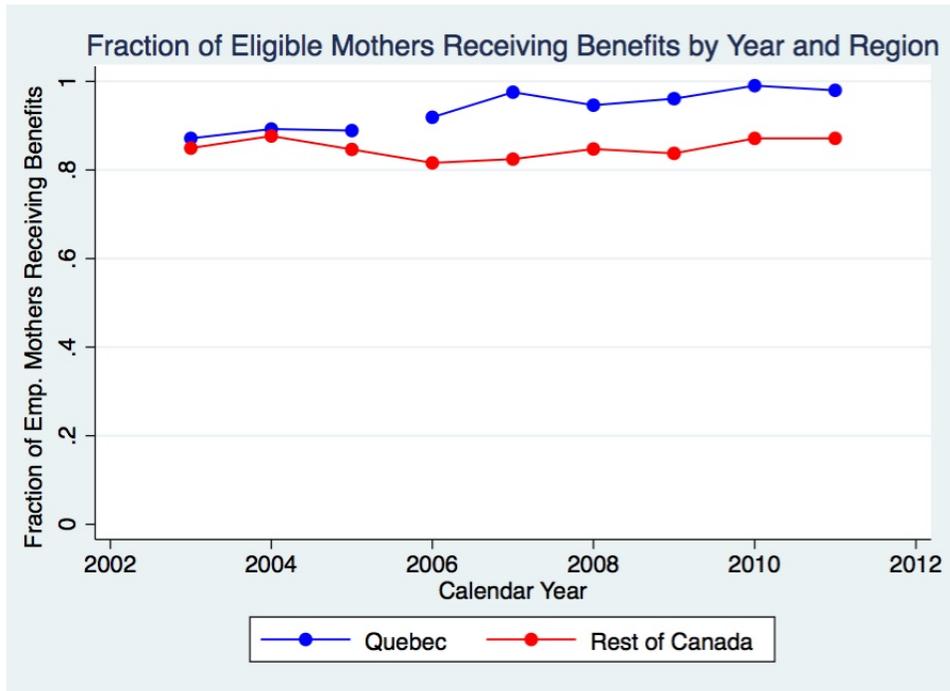


Figure 3: Data from Employment Insurance Coverage Survey (EICS)

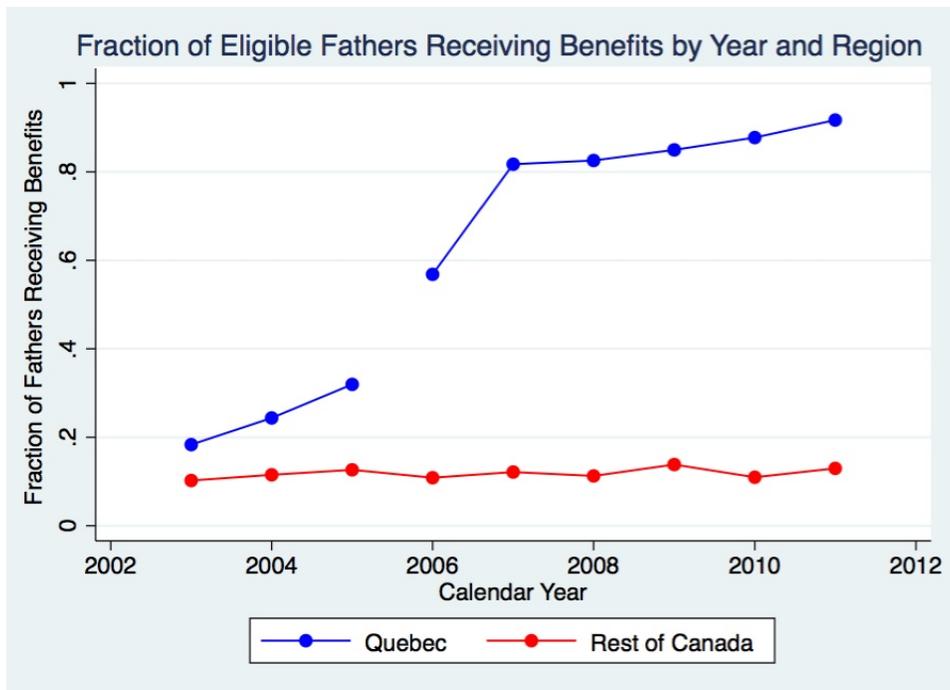


Figure 4: Data from Employment Insurance Coverage Survey (EICS)

$Y_i$  are year-specific indicator variables.  $X_i$  is a vector of demographic controls that include (in some specifications) hourly wage, education controls and household total income<sup>2</sup>. This estimation excludes data from 2006 as the survey does not distinguish parents under QPIP and under EI. The estimated difference-in-difference effect of the reform is then the estimate for  $\delta$ . The results from the estimation are presented in table 2.

**Table 2: Effect of the reform on parental leave participation and mothers' number of months of parental leave**

	Father	Mother	Mother months	Father	Mother	Mother months
QC x Post-2006	0.554*** (0.0226)	0.0941*** (0.0179)	0.126 (0.267)	0.568*** (0.0247)	0.101*** (0.0182)	-0.0981 (0.265)
Quebec	0.119*** (0.0181)	0.0272 (0.0160)	0.327 (0.226)	0.124*** (0.0202)	0.0221 (0.0162)	0.231 (0.229)
Hourly Earning				0.000867 (0.000495)	0.00234*** (0.000552)	-0.00170 (0.00672)
# family mem.				-0.00880 (0.00523)	-0.0258*** (0.00556)	-0.274*** (0.0721)
Income group				0.00626 (0.00460)	0.0453*** (0.00485)	0.274*** (0.0625)
Constant	0.0876*** (0.0100)	0.848*** (0.0125)	9.834*** (0.173)	0.0812** (0.0304)	0.651*** (0.0332)	10.36*** (0.423)
Observations	8284	7292	6551	6761	6747	5698
$R^2$	0.321	0.017	0.005	0.354	0.069	0.012

Heteroskedasticity robust standard errors in parentheses, also includes year fixed effects and education controls

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

As seen in table 2, the estimates do not depend on the specification. The estimated increase in the probability that fathers take some parental leave is close to 0.55. The same number for mothers is close to 0.10. For mothers, richer households take more time off, although the effect is economically small (a 40 C\$ increase in hourly wage - 4 times the standard deviation - is only associated with approximately a 3 day increase in parental leave). Finally, this specification does not provide any evidence that the reform changed the amount of months of

<sup>2</sup>Total household income is grouped in 20,000/year increments. This is the most precise measurement of household income that is available in this data

parental leave that mothers took. This could be because parental leave time is not measured very precisely (at the month level). However, it is also consistent with the fact that QPIP gave a maximum of 50 weeks to the mother (under the basic regime, which most households choose) which is the same as the total number of weeks under EI.

One potential issue with the method described above can be seen in figures 2 and 4. The identifying assumption of the difference-in-difference estimator is that without the reform, the treatment and control group would have evolved following parallel trends. Looking at those figures, it seems like Quebec had been experiencing an increase in the fraction of fathers taking parental leave relative to the rest of Canada even before 2006. However, I perform a variety of tests on whether the pre-treatment trend is significant or not and I find that they all fail to reject the null hypothesis of no difference in trends. The first test I perform is simply comparing the proportion of fathers in Quebec that take parental leave in 2004 and 2005, with the null hypothesis that the proportions are equal. I find p-values of 0.087 and 0.129 for the total population of fathers and the subpopulation of eligible fathers respectively. The difference between the two proportions is therefore not significant at the 5% level. Next, I estimate the linear trend for the pre-2006 data on father's leave. I use data going back to 2000 to estimate the trend more precisely.<sup>3</sup> I allow the trend to be different for Quebec and for other Canadian provinces and then test whether the trends are statistically different or not. I find p-values of 0.059 and 0.094 for the total population of fathers and the subpopulation of eligible fathers respectively. Again, the null hypothesis that the two pre-treatment trends are the same cannot be rejected.

The tests suggest that the difference-in-difference approach is adequate. However, the fact that the p-values are so close to the thresholds might still be worrying. One robustness check that I perform is attempting to construct a synthetic control (Abadie et al. 2010) based on a weighted average of other provinces. However, in this particular case, this method does not work because no other province experienced a growth similar to Quebec's in terms of

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<sup>3</sup>I also perform the same tests with data only between 2003 and 2005 and find almost identical results - all fail to reject the null of no difference in the trends at the 5% level, although barely

increased paternity leave. In this respect Quebec is an outlier. Therefore, there is no way to reweigh the provinces to get an adequate synthetic control. Given this issue, the most that can be said is that there is no statistical evidence that the pre-treatment trends are different in Quebec and in other Canadian provinces.

## 5 Parental Leave Behavior under QPIP

The administrative dataset from CGAP allows us to study in more detail the way in which different households take parental leave. In particular, it allows us to break down the way in which weeks are shared between parents and the relationship between earnings and parental leave decisions.

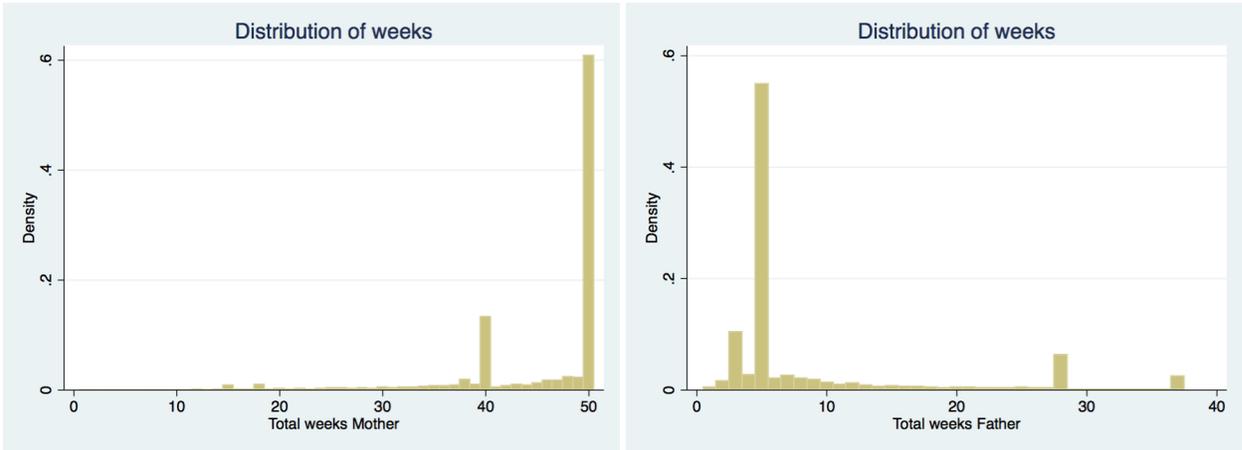
### 5.1 Sharing of Parental Leave within the Household

Figure 5 presents a histogram of the distribution of weeks for fathers and mothers. A lot of information can be gathered from this simple graph. First, 60.8% of mothers take 50 weeks of parental leave - the maximal amount under the basic regime. Another 13.2% take 40 weeks, the maximal amount of weeks under the special regime. 13.3% take lower than 40 weeks with no particular value standing out. Similarly 12.7% take an amount between 40 and 50 weeks with most of the mass concentrated closer to 50 weeks.<sup>4</sup> Fathers also have a few values that stand out: 55% of fathers take 5 weeks and 10.4% take 3 weeks. These are the maximal number of weeks that fathers can take if the mother is taking her maximum in the basic and special regimes respectively. However, two other values stand out for fathers: 28 weeks (6.3%) and 37 weeks (2.5%). These are the maximum amount of weeks that fathers can take under the special and basic regimes respectively.<sup>5</sup> Interestingly, for 79.5% of the households where

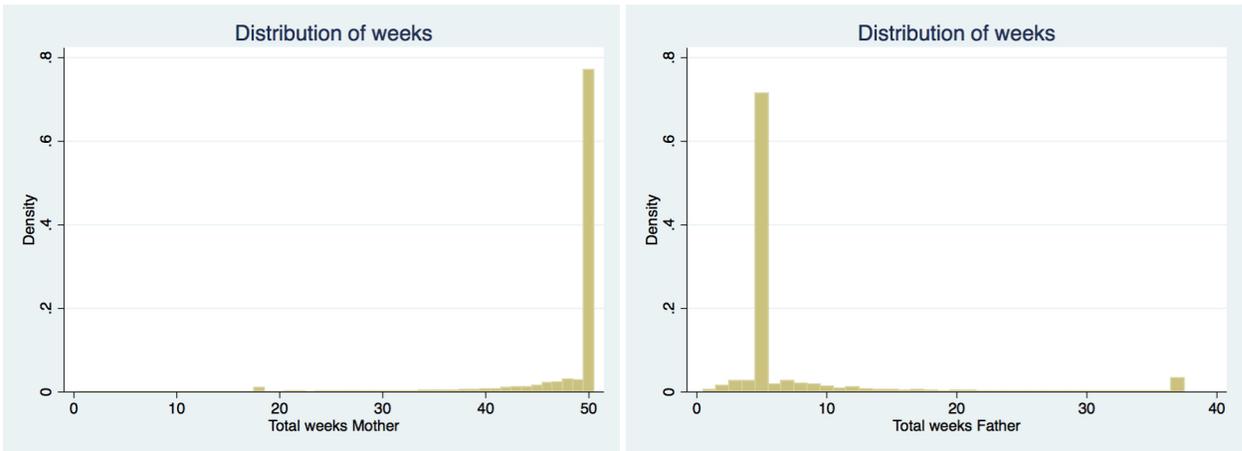
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<sup>4</sup>This is consistent with maximizing behavior since by taking 41 weeks the household has to choose the basic regime which has a lower income replacement rate over all weeks. Therefore, the marginal cost of this extra week is very high.

<sup>5</sup>15 and 18 weeks are reserved for mothers as pregnancy leave under the special and basic regimes respectively



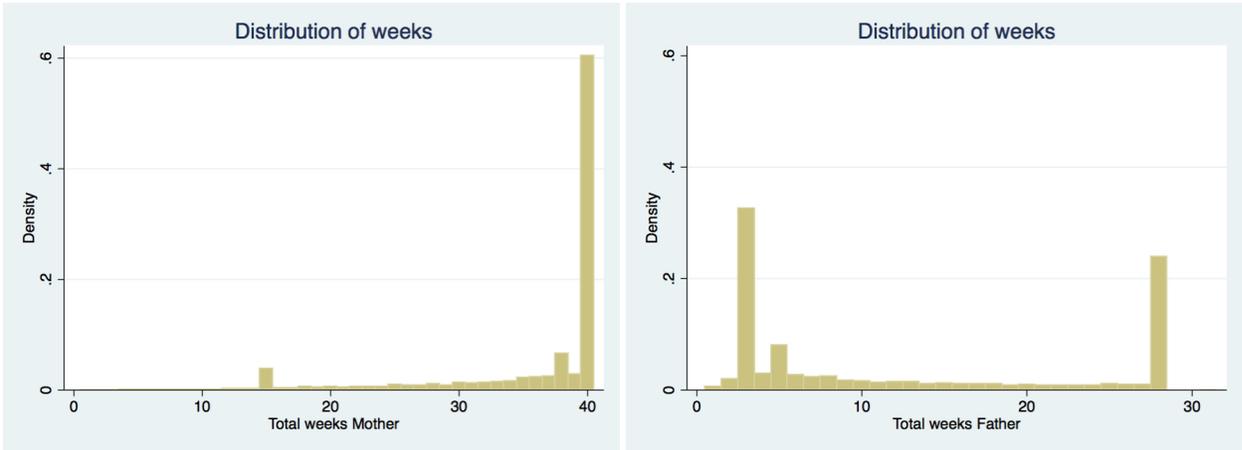
**Figure 5:** Overall distributions of the number of weeks of parental leave



**Figure 6:** Overall distributions of the number of weeks of parental leave under basic regime

fathers take either 28 or 37 weeks the mother is not observed. Given the participation rate of eligible mothers close to 100% it is safe to assume that in most of these cases the mother is not eligible. Finally, most of the remaining mass of the distribution is concentrated between 3 and 15 weeks. Figures 6 and 7 present histograms broken down by type of regime and tell a similar story.

Given all these observations, a lot can be said about the way most households make decisions. Although most households choose the basic regime, a substantial portion choose the special regime. A large fraction of households take the maximal amount of leave (or very close to the maximal amount at least). The way most households split the weeks is by



**Figure 7:** Overall distributions of the number of weeks of parental leave under special regime

allocating all the parental leave that can be freely shared to mothers and then fathers taking the maximum amount of weeks that cannot be shared. This suggests that the constraint imposed by the father’s quota is binding and that households would rather specialize fully when it comes to parental leave. This is also suggestive evidence that some of the political motivations for this policy might not be working out. For example, one could think that such a policy would remove a fixed cost of taking any parental leave for fathers (in the form of stigma from employers for instance) and allow households to better optimize the sharing of parental leave. However, the fact that a large proportion of fathers are taking some leave but few are taking more than the amount reserved for them does not support that idea.

## 5.2 Parental Leave and Insurable Income

Another interesting dimension of household decision-making is: how does length of parental leave vary with insurable income? In particular, it is interesting to see if there are observable patterns in terms of how benefit take up is related to earnings. One important related question is the distributive effect of the policy. Dahl et al. (2013) argue that in Norway paid maternity leave is regressive with transfers benefiting mostly higher income households. QPIP is funded by a payroll tax that is proportional to insurable income. Since transfers are also proportional

	Basic	Special
Weekly Insurable Income Father	926.05	846.95
Weekly Insurable Income Mother	730.49	614.26
Observations	545982	195828

**Figure 8:** Mean insurable income by type of regime

to insurable income, the question of the distributive effect comes down in large part to the number of weeks taken by the household as a function of incomes.

As most households take the maximum amount of parental leave - or close to that amount - one way in which households vary the amount of weeks they take is by choosing either the basic regime or the special regime. Figure 8 shows that average insurable income is higher for households that choose the basic regime. However, one thing to keep in mind is that in many ways the two groups might not be comparable. In particular, many households that choose the special program are probably single income households (single mothers or mothers not in the labor force). This can be seen by the fact that for 42% of households that choose the special regime only one parent is observed, In comparison, only 18.5% of households that choose the basic regime have only one observable parent. Some of those cases might be fathers that decide not to take any parental leave. However, the high participation rate observed in the survey data implies that it is not the majority. Therefore, this provides evidence that the special regime is used by single income families to take leave without foregoing too much income. Another way in which this can be seen is that 74.5% of fathers choose the special regime when the mother is not observed (as argued previously, these are mostly cases where the mother is not in the labor force).

Another way to approach this question is to look more directly at the relationship between number of weeks of parental leave and insurable income. One issue is that households with different structures - such as single mothers - or with different labor force status are not

eligible for the same number of weeks. To get around this, table 3 presents the regression of total number of weeks on insurable incomes and restricts the analysis to the subset of the population that choose the basic regime and where both parents are observed. This population is relatively comparable and also has the advantage that both parents' incomes are observed. Interestingly, higher weekly insurable income for mothers is related to more total parental leave, while higher insurable income for fathers is associated with less parental leave. Quantitatively the effect for mother is much more important. Taken together, these results suggest that overall richer households take more parental leave time. This is true even though higher earning households pay a higher cost for parental leave in terms of non-replaced income. The results also imply that for a given total household income, the father earning more implies a decrease in total weeks. This could be explained by a higher degree of specialization in households where fathers earn more. Therefore father in those households might not take all the weeks of parental leave that are reserved for them.

The next step would be to look at how earnings are related to number of weeks of each parent. A first approach would be to use a naive specification estimated for mothers and fathers separately ( $j = m$  for mothers and  $j = f$  for fathers):

$$p_{ji} = \delta_j w_{ji} + \beta_j X_{ji} + \epsilon_{ji}$$

In the above equation,  $p_{ji}$  is the amount of parental leave individual  $i$  takes,  $w_{ji}$  is that individual's pre-child wage, and  $X_{ji}$  is a set of controls. The issue with this naive approach is that households make parental leave decisions together. In particular, an increase in the amount of weeks one parent takes decreases the available weeks for the other parent. Therefore, the number of weeks one parent takes is a function of the number of weeks the other parent takes. Intuitively they should be substitutes. The true model should take this form (assuming a linear form for simplicity):

$$p_{mi} = \delta_m w_{mi} + \beta_m X_{mi} + \gamma_m p_{fi} + \epsilon_{mi}$$

**Table 3:** The effect of income on total parental leave weeks (basic regime and both parents observed)

	Total weeks
Weekly Insurable Income Father	-0.0000442* (0.0000184)
Weekly Insurable Income Mother	0.000453*** (0.0000176)
Self-employed Father	0.198*** (0.0312)
Self-employed Mother	-1.360*** (0.0364)
Age Father	0.00624*** (0.00118)
Age Mother	0.0137*** (0.00141)
Constant	53.11*** (0.0369)
Observations	400349
$R^2$	0.009

Robust standard errors in parentheses, also contains year fixed effects

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

$$p_{fi} = \delta_f w_{fi} + \beta_f X_{fi} + \gamma_f p_{mi} + \epsilon_{fi}$$

It is well known that such a simultaneous model is not identifiable as such. Without an instrument it is not possible to proceed further in the general case. However, focusing on fathers (which we are particularly interested in) there are two special cases where we can safely ignore substitution patterns. One case is when the mother is not in the labor force and therefore not eligible for parental leave benefits. In those cases, the father can freely choose the amount of weeks without worrying about restricting the mother's decision. The second case is when the mother takes the maximal amount of weeks available to her. In those cases, the choice of the father is reduced to choosing how much of the father's quota he will take.

Table 4 presents the results in those two special cases. I will focus first on the case where the mother takes the maximum available to her. In that case, higher income for the father will decrease the number of weeks he takes. However, the magnitude of the effect is very small with a 100 C\$ per week increase in income only decreasing by 0.035 the expected number of days of parental leave. This small effect might be explained by the fact that there is not much variation in the data with most fathers choosing 5 weeks of parental leave. The fact that the effect is negative indicates that for fathers the higher cost of parental leave in terms of foregone income outweighs the desire to consume more parental leave at higher income levels. This income effect can be observed for the first subgroup as the coefficient on the insurable income of mothers. An increase in that variable increases the total household income but keeps the cost of parental leave for the father constant. The effect when the mother is not in the labor force is much more substantial. A 100 C\$ per week increase in income will decrease the expected number of days of parental leave by about 3.5 days. Here as well, the increased cost outweighs the income effect for the father's decision.

**Table 4:** The effect of income on father's number of weeks

	Mother takes max	Mother not in LF
Weekly Insurable Income Father	-0.0000683*** (0.00000414)	-0.00685*** (0.000125)
Weekly Insurable Income Mother	0.0000271*** (0.00000396)	
Self-employed Father	0.00935 (0.00671)	-1.017*** (0.231)
Age Father	-0.00267*** (0.000214)	0.0917*** (0.00598)
Constant	4.891*** (0.00778)	23.88*** (0.236)
Observations	296527	74528
$R^2$	0.004	0.040

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

## Conclusion

This paper shows that the introduction in 2006 of QPIP had a major impact on household parental leave behavior. While the reform impacted both fathers and mothers, the magnitude of the impact was much larger for fathers than for mothers. This paper also shows that the majority of households split the weeks of parental leave in a very specific way. This observed behavior suggests that the constraint introduced by the father's quota binds and that most households would prefer to specialize even further. Furthermore, richer households take more parental leave even though they face a higher cost (in terms of foregone income). However, when focusing only on fathers the opposite holds, as higher income fathers take less parental leave time.

In many ways this paper is still very preliminary. As discussed in the introduction much of the interest for this policy concerns the labor market outcomes. Therefore, using tax agency administrative data to look at the labor market effects is a crucial next step. Although I

have not been able to access the tax data yet, what I know about its structure suggests a specific empirical strategy. The dataset only contains households that are residents of Quebec. However, it does contain new parents before and after the reform. As a result, to estimate the effect of the reform, the control group would be parents that had children just before the cutoff date. The large sample size and the arbitrary cutoff date lends itself to using a regression discontinuity design. Once again, the goal would be to see the effect in terms of labor market outcomes.

Another area for further work on this subject is building a model of parental leave decision-making. The goal of such a model would be to formalize some of the intuition discussed in this paper, especially in terms of the relation between income and parental leave weeks. A model would also make it possible to discuss the relative merits of counterfactual policies. The variation in prices introduced by the discontinuities in the replacement rate seem to be promising sources of variation to estimate preferences of households over parental leave.

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