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PATERNITY LEAVE AND LABOR MARKET
OUTCOMES

by
JANA RIAD KONTAR

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by
JANA RIAD KONTAR

Approved by:

Dr. Serena Canaan, Assistant Professor
Economics



Advisor

Dr. Nisreen Salti, Associate Professor
Economics

Member of Committee



Dr. Pierre Mouganie, Assistant Professor
Economics

Member of Committee

Date of thesis defense: April 24, 2019

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An Abstract of the Thesis of

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This paper studies the impact of a paternity leave provision on the labor market outcomes of parents. We exploit the 2002 French reform which entitled fathers to eleven consecutive days of leave. Prior to that, fathers were only entitled to three days as agreed upon by the Code of Work. Using a regression discontinuity design, we find a negative impact on fathers' earnings. The effect is highly significant and robust. On average, employed fathers experience a 3.3 percent decrease in their earnings as a result of the paternity leave. The effect is heterogeneous; our findings suggest that more educated fathers experience a larger decrease in their earnings relative to less educated fathers. Moreover, there is some evidence of an increase in the employment (versus unemployment) of fathers and this increase is mainly captured for the sample of less educated fathers.

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Chapter 1

Introduction

The issue of reconciling family and work-life has been a topic of great interest over the past few years. Discussions in this area stem from concerns over mothers' labor market outcomes and inequality in the workplace in an era of increased women's engagement in the labor force. Despite the observed convergence in the labor market outcomes of men and women, women still incur substantial motherhood penalties (Kleven et al., 2018). Women with children under the age of 6 are 11% less likely to participate in the labor force than women with older children. In the US, the pay gap was estimated in 2015 at 15% for mothers with one child and 20% for mothers with 3 and more children (Jee et al., 2018). The situation is not very different in European countries with a pay gap of 16.7% despite significant progress in introducing family-friendly policies. One potential explanation for this earnings gap, documented in several studies, is the lion's share of women in parental leave programs.¹ Research also shows that men tend to increase their hours of work after the birth of their child.

To help parents better reconcile their family and work-life, many countries

¹Prolonged leave uptake by mothers have been found to negatively affect mother's career progression and wages (Ruhm, 1998; Lequien, 2012; Thevenon & Solaz, 2013).

have been recently introducing major adjustments to their parental leave schemes. Such adjustments are being made along two dimensions. The first is a willingness to go beyond job-protected and fully paid leave entitlements to achieve more flexible leave schemes that can be adaptive to individual circumstances. Extensions in the time-frame during which the leave can be taken, securing the right to paid leave regardless of pre-birth employment length and the introduction of optional paid leaves for families with at least 3 children are all attempts at more flexible schemes. Second, there have been efforts at increasing father's involvement in child care through the introduction of leaves that are exclusively reserved for fathers. This can take two forms: either a paternity leave scheme or a parental scheme that restricts part of the leave to the father and which is often referred to as the "daddy quota".

Seventeen out of twenty-eight European countries now offer a minimum of two weeks of paternity leave (Janta and Stewart, 2018).² The introduction of paternity leaves was initially stirred by low take-up rates of shared parental leaves and the envisioned economical, social and demographic outcomes associated with father's leave taking. A paternity leave supports the mother's early return to her job, equalizes the conditions in which men and women join the labor market and promotes a more gender equal division of child care and household work (Van Belle, 2016). This translates into a better work-life balance for both parents. Socially, a paternity leave strengthens the father-child relationship given that it occurs at early stages of the physical and emotional development of the child. Added to all of that is its incentivizing impact on parental leave taking by fathers.

²The remaining EU countries either offer a small paternity leave that does not meet the minimum proposed by the European Commission in their work-life balance directive proposal or have no leave at all (Janta and Stewart, 2018).

In this paper, we focus on the French paternity leave reform to examine the impact on parent's labor market outcomes. While women's employment rates have come to closely resemble those of men in the past years, the gender balance in household responsibilities remains uneven and less responsive to change. This can affect women's long run career advancement. On top of the widespread gender inequality in care giving observed in France, the country has one of the largest fertility rates across the European Union. The high fertility rates explain at least in part the support for employed parents and the increased attention to gender equality in the household. Established in 2002 by the law n 2001-1246, 21 Dec 2001, the French paternity reform entitled fathers to eleven consecutive days of leave added to the three days previously legalized by the Code of Work. The paternity leave which supports a habitat of involved fatherhood comes as an extension to the French parental leave scheme that gives fathers the possibility to share part of the leave. However, the parental leave take-up rate by fathers never exceeded 3% (Milner and Gregory, 2015).

For identification, we use a regression discontinuity design where we compare the outcomes of parents whose first child is born around January 1, 2002—the date of implementation of the policy. Data used is from the French Labor Force Survey (LFS) from 2003 to 2017. Results show a negative impact on father's earnings. The observed effect is highly significant and robust. On average, fathers experience a 3.3% decrease in their earnings as a result of the paternity leave. We show that this effect is heterogeneous and more prevalent for more educated fathers. The negative effect is in accordance with the hypothesis of increased father's involvement with the child. However, there are several other channels through which this decrease could have happened, prominent among them are the loss of human capital and employer's perceptions of lack of job

commitment. We also find evidence of an increase in the father's probability of being employed. In terms of mother's labor market outcomes, we find some evidence of a decrease in earnings, although the decrease is relatively less significant and robust.

While there is a large literature examining the effects of maternal and parental leaves ³, the literature on paternity leaves is still in its infancy. Previous studies focusing on the labor market outcomes of a paternity leave have investigated the Norwegian, Swedish and Spanish leaves. Our paper adds to a growing body of literature by examining the French paternity leave reform introduced in 2002. Unlike the Swedish and Norwegian reforms that reserve part of the available parental leave to fathers, the French reform introduces two weeks of leave to be taken at the onset of parental leave. As for the Spanish leave, it looked very similar (at the time of investigation) to the French leave in terms of duration and compensation, however, the parental leave schemes in both countries are very different. The Spanish parental leave scheme is relatively less generous with only a proportion being paid and at a relatively lower rate. A crucial aspect of the paternity leave is its incentivizing impact on the participation of fathers in parental leave. However, parental leave-taking of fathers is hard to achieve when only a small portion of the leave is being paid. Furthermore, a study on the French society, characterized by relatively higher fertility and female employment rates, could have important policy implications.

³A review on maternal and parental leaves is available in Rossin-Slater (2017). In general, maternity leave entitlements less than one year in length have been shown to positively impact mothers' employment rates and job continuity. Prolonged maternal leaves, however, can have severe adverse effects on the job market conditions of women. Several studies have documented the negative impact on wages and career progression. A study by Stearns (2016) found that although a job protection maternity leave increases the odds of returning to work, however, it makes women less likely to be promoted to managerial positions. Longer periods of leave have been found to unfavorably affect women's wages up to eight years after their return to work in Germany (Schonberg and Ludsteck, 2014) and up to ten years in France (Lequien, 2012).

Our findings add to the strand of literature documenting a negative impact of a paternity leave on fathers' earnings (Johansson, 2010; Cools et al., 2010; Rege and Solli, 2013). Previous studies, however, are constrained by the limitations of the identification strategies used which are based on assumptions of a common trend in earnings over time (Rege and Solli, 2013) or time-constant heterogeneity (Johansson, 2010). With a more sound identification strategy, Cools et al. (2010) find a negative effect on fathers' earnings that is relatively less robust than results documented in this paper. The effect appears mainly with a bandwidth of a few weeks prior and after the introduction of the leave. The sample of fathers responding promptly to the reform might well be a very selected sample of fathers representing those already highly involved at home.

The paper is organized as follows. Chapter 2 presents an overview of other paternity leave studies. In chapter 3, we discuss in detail the 2002 paternity policy along with the French parental leave scheme. Chapters 4 and 5 describe our data and identification strategy respectively. In chapter 6, we present the empirical results with a discussion of underlying mechanisms. We conclude in chapter 7.

Chapter 2

Literature Review

With the introduction of paternity leave policies in the past two decades, a new literature has emerged examining how parents respond to a leave exclusively reserved for fathers. As Olivetti and Petrongolo (2017) document, this literature is still in its infancy due to several reasons including the low-take up rates by fathers and inadequacy of data available. So far only 3 out of 17 available EU paternity leave schemes have been investigated. Results show mixed evidence of the impact of a paternity leave on father's long-term involvement, parent's labor market behavior and family outcomes. In general, studies have shown that a paternity leave is indeed effective in increasing fathers' use of parental leave. Following the introduction of the Norwegian leave, the share of fathers taking leave increased from 3% to around 30% (Rege and Solli, 2013; Cools et al., 2015; Abrahamsen, 2018). Similarly, in Sweden, Ekberg et al. (2013) find a 50% increase in the amount of parental leave taken by fathers as a result of the daddy-month quota. As one would expect, studies also document a heterogeneous take-up response among fathers. The leave is more widely used by fathers with higher

socio-economic status (Huerta et al., 2013) and fathers of first-borns (Bartel et al., 2018).

Whether a paternity leave alters the division of household work and child care and induces a shift from market to home production remains unclear. Ekberg et al. (2013) and Abrahamsen (2018) find no evidence of a change in the behavior of fathers as measured by their share of care for sick children. Although not necessarily manifesting a causal relation, the findings of Rege and Solli (2013), on the other hand, document a significant increase in the time spent with children after the introduction of the paternity quota. Studying the same Norwegian reform, Kotsadam and Finseraas (2011) find that a paternity leave results in a more equal division of household chores among partners. The Quebec paternity leave has been found to equalize the contributions of mothers and fathers in both home and market production (Patnaik, 2018).

The effects on labor market outcomes are less precise and often go in contrast with what advocates of a father-quota would expect. So far only two studies have documented a positive impact of paternity leave on mothers' labor market outcomes. A recent investigation by Farre and Gonzalez (2017) finds that the Spanish leave increases the short-term re-employment probability of mothers. Using a difference-in-differences identification with a very restrictive assumption of the absence of time-varying trends across control and treatment groups, Johansson (2010) finds that spousal parental leave taking is beneficial to mothers, in that it can increase mothers' earnings by more than the increase that results from a reduction in maternity leave taking. Own parental leave, however, decreases each parent's long-run earnings (Johansson, 2010). Using the Norwegian paternity reform, Cools et al. (2010) and Rege and Solli (2010) find a negative impact

on fathers' earnings and mothers' earnings. Abranchesen (2018) who studies the extension of the Norwegian paternity leave finds no effects on the intensive or extensive margins of labor supply.

A paternity leave has been observed to affect family and children outcomes as well. In Spain, the two-weeks paternity leave increased child spacing and decreased subsequent fertility among older women. In Norway, there is also evidence of child spacing and an increase in the probability of divorce after the introduction of the leave. In terms of children outcomes, Cools et al. (2010) find no effects on children's cognitive skills in contrast to Huerta et al. (2013) who find positive effects on cognitive scores of children with highly involved fathers.

Chapter 3

Background

3.1 The 2002 Paternity Policy

As a response to low parental leave taking by fathers and in an attempt to strengthen the father's involvement in childcare, a paternity leave that is exclusively reserved for fathers was introduced in 2002. The entitlement allowed fathers to take 11 consecutive days anytime within a period of 4 months from the date of birth. In the case of multiple births, the father is entitled to 18 days. All fathers living in France can benefit from the leave regardless of their employment contract (temporary, permanent...), their marital status (married, divorced...) and the place of birth of their child (France or abroad). Fathers must inform their employers at least one month prior to the date of birth. Eligibility for paternity leave is determined based on registration with Social Security and a minimum number of hours worked. Specifically, fathers must have registered with Social Security at least 10 months prior to the leave and must have worked at least 150 hours in the 3 months before the beginning of leave. The leave is fully job-

protected and is compensated at a rate of 100% of earnings. Payments are in terms of social security daily allowances and are determined based on the average income over the past 3 pre-leave months. However, full compensation is guaranteed only if the leave is taken within 4 months from the childbirth date and when the father ends all other salaried activities.

The leave had no retroactive effect and only fathers whose children were born after January 2002 were eligible for the 11 consecutive days of leave. The reform was successful in increasing the number of fathers taking leave. In the first year, around 59% of eligible employees benefited from the leave and the take-up rate remained high since then (Milner and Gregory, 2015). This is in contrast to a take-up rate of only 3% prior to the reform.

A two-weeks paternity leave is important in encouraging parental leave-taking by fathers (Farre and Gonzalez, 2017; Ekberg et al., 2013). However, even when a paternity leave is in place, many other barriers keep fathers from taking the parental leave. Prominent among them is the level of compensation and flexibility. Below is an overview of the parental leave scheme available to parents in France.

3.2 The French Parental Leave Scheme

Parental leave has been one of the major issues in the French policy agenda and it had historically seen considerable adjustments. Compared to other European countries, France has a relatively generous family benefit system offering parents a wide range of paid benefits. In 2009, the country has spent around 3.8% of GDP on family provisions relative to an average of 2.9% in OECD countries.

The maternity leave available to mothers in France was first introduced in 1946. At that time, it consisted of 14 weeks with a compensation rate of 50% of earnings. The 1970s and the 1980s have been characterized by policies that are more supportive of working mothers. In 1971, maternity leave compensation has increased to 90% of earnings. Extensions in the maternity leave period to 16 weeks for all mothers and to 26 weeks for mothers expecting a third child followed in 1978 and 1985 respectively. The leave is flexible in the sense that the mother can freely spread the leave between the pre-birth period and post-birth period for her own convenience. In order to receive the benefit, mothers are obliged to take at least eight weeks, six of which are to be taken after birth.⁴ Under the current system, mothers receive a benefit of 100% of earnings equivalent to 540 euro per week (a gross monthly salary of 2885 euro).⁵

The parental leave which started as an unpaid leave in 1977 was then adjusted in 1985 by introducing a flat-rate payment known as the Child Rearing Benefit or the “Allocation Parentale d’Education”. The benefit however was made available to parents with 3 or more children. Later on, policies extended the parental leave to 3 years (1986) and made parental leave benefits accessible to parents from a second child (1994). To be eligible for full compensation, the parents must have worked at least 2 out of the 5 years preceding birth and they can not work part-time while taking the leave or otherwise they are faced with a reduced benefit. The leave can be taken simultaneously by both parents, but benefits are per family.

In 2004, the parental leave payment system was changed to Complément

⁴The same rules of social security registration and number of hours worked apply to mothers under a maternity leave.

⁵Benefits are also calculated based on the average daily wage of the 3 months preceding birth. The monthly benefit cannot exceed the social security ceiling of 3377 euros.

de libre choix d'activité (CLCA) which enabled parents to enjoy a paid leave of absence for the first child. The payment, however, is conditional on a threshold income and offered for the first 6 months only. Parents can take the parental leave in terms of full-time absence or a reduction in usual working hours. Benefits are up to 576 euros per month in the former case and are pro-rated when working part-time. 2006 saw the introduction of an optional 1-year of leave, Complément Optionnel de Libre Choix (COLCA), accessible for parents expecting a 3rd child. It offers a higher rate than CLCA but cannot be taken besides CLCA. More recently, in January 2015, there have been attempts at ensuring a better division of parental leave among parents with the “shared mission for childcare”. For the first child, each parent now is eligible for six months of leave, however, this is reduced to half in case the leave is taken by one parent only. For parents with two and more children, the new legislation declares a period of up to 2 years to be enjoyed by each parent (thus, the parental leave of 3 years can no longer be taken exclusively by one parent).

Chapter 4

Data

4.1 Labor Force Survey

The Labor Force Survey (LFS) provides individual data on a wide range of labor market outcomes defined in consistency with the International Labor Organization (ILO). Outcomes include the activity of individuals, status of employment, hours of work, type of profession, monthly income as well as the conditions of employment and the reasons behind unemployment. Importantly, the survey provides information on the characteristics of individuals and the date of birth of children in a given household. As further illustrated in chapter 5, the birth date of the child will be exploited as for a quasi-natural experiment that resembles random assignment of parents to the treatment (where fathers are eligible for the paternity leave) and control (where fathers are not eligible for the paternity leave) groups.

Starting 2003, the French LFS became a quarterly survey where every household is interrogated for six consecutive quarters. The survey covers 54000

dwellings per quarter, equivalent to around 70000 respondents. Given this major change in the pace of the survey, we limit our data to years as of early 2003 to avoid inconsistencies, though our policy was enacted in 2002.

4.2 Data Sample and Summary Statistics

Our sample comprises families with the first child born before and after January 1, 2002- the date of implementation of the paternity policy. Our main analysis compares families with the first child born in a span of 32 months around the cutoff date (16 months at each side of the cutoff).⁶ In total, the sample consists of 44,087 observations where each family is observed on average for 6 quarters.⁷ We limit our analysis to families where both mothers and fathers are observed in the household and when the father is French.

The main results are quantified using data up to 12 years following the birth of the child. However, we also examine effects over the short-run and long-run separately. For the short-run analysis, we define a time-frame of at most 4 years after the birth of the child. Longer-term effects are measured for years beyond the fourth year. The distinction between the two time-frames is critical in order to understand the overall effects and the mode of impact of the leave.

In table A.1, we present summary statistics on both labor market outcomes and parent's characteristics. Statistics show a disparity in the labor force participation of men and women with a convergence in the corresponding employment rates. When women are willing to enter the labor force, they are likely to be employed on equal terms as men. However, there is still a gap in women's readiness

⁶In our robustness checks, we also consider other bandwidths.

⁷The number of observations will differ when considering other bandwidths.

to enter the labor force. As table A.2 shows, this hesitation can be attributed to motherhood commitments where there is a clear gap between mothers with 1 child and those with more children. Labor force participation stands at 75% for mothers with 1 child, 78% for mothers with 2 children and 66% for mothers with 3 children. Conversely, men increase their labor force participation with more children. Women are also less likely to work full-time versus part-time and to occupy high-skilled professions. The wage gap is also prevalent where the average wage (in logarithm) of women is 7.18 much less than the average wage of 7.49 for men with a standard deviation of 0.55 for women relative to 0.45 for men.

Chapter 5

Identification Strategy

5.1 Regression Discontinuity Design

The fact that only fathers whose children were born after January 2002 were eligible for the paternity leave, together with the lack of announcement, render the French reform an ideal setting to study the effect of paternity leave on parents' subsequent labor market conditions. We exploit these two circumstances for a regression discontinuity (Imbens and Lemieux, 2008) with the cutoff date being January 2002. The main idea behind an RDD is that upon limiting the data to births closely surrounding January 2002, the paternity reform provides an almost exogenous variation in the eligibility to the paternity leave. Thus, parents whose children were born right before January 2002 (the control group) and parents whose children were born right after January 2002 (the treatment group) should be similar except for the fact that some are eligible for the paternity leave and others are not. On that premise, if a discontinuity is observed at the cutoff date in any of our outcome variables, it can be securely attributed to the

French paternity leave program itself. Section 5.2 further investigates the main assumption that parents at both sides of the cutoff are comparable.

Our identification is based on the following reduced-form model:

$$Y_i = \alpha + \beta D_i + \delta f(R_i) + \tau f(R_i) * D_i + \gamma X_i + \epsilon_i$$

where Y represents any of the outcomes we seek to estimate in this paper. The treatment variable D is a dummy variable that takes a value of 1 if the first child was born after January 2002. R is the running variable that denotes the date of birth of the first child (month and year) and is defined in months relative to the cutoff date (0 if the child was born in January 2002, 1 if the child was born in February 2002 and so on). $f(\cdot)$ is a polynomial function of the running variable of degrees 1 or 2. The interaction term $f(R_i) * D_i$ allows for differential slopes at both sides of the cutoff. X_i is a set of controls that include the parents' age at the birth of the first child, a dummy variable showing whether parents were born in France, a dummy variable denoting the level of education in addition to a set of month-of-birth and year-of-survey fixed effects. The intent-to-treat effect will be captured by β which specifically measures the causal effect of being eligible for the paternity leave (i.e in the case where the childbirth occurred after January 2002) on outcome Y . As outcome variables, we focus on the extensive and intensive margins of labor supply with an analysis of possible mechanisms.

We check for the robustness of our results by showing that they are not driven by the choices being made. Specifically, that the results are not sensitive to the choice of the bandwidth and the specification used. As a baseline bandwidth, we use a window of 16 months at each side of the cutoff. However, we consider

other bandwidths of 14, 18 and 20 months to increase the credibility of our results. We also estimate models with and without the set of controls mentioned above and consider different functional forms of the running variable. These checks are shown instantaneously in all regressions.

In order to further correct for misspecification of the functional form (the order of the polynomial of R) that is often likely with a discrete running variable (only month and year of birth are recorded), we employ cluster-consistent standard errors introduced by Lee and Card (2008). We thus cluster the standard errors on the different values of the running variable R and we do this for all regressions.

5.2 Validity Checks

Casual inference in a regression discontinuity design is contingent upon two conditions which ensure that the assignment to treatment is “as good as random”. The first is the absence of manipulations around the cutoff securing that parents were not able to time their child’s birth in order to benefit from the leave. The second is the continuity of individual’s pre-determined attributes at the treatment cutoff ensuring that people around the cutoff are comparable. In this section, we present formal evidence supporting the two conditions. In Figure A.1, we graph the frequency of births around the cutoff and find no evidence of strategic sorting in an attempt to take advantage of the 11 days of paternity leave. In Figure A.2, we graph the covariate variables as a function of the running variable (month-year of birth) for the sample of all fathers. Each circle represents the average of the variable of interest over a one month range. Results do not point to any serious

discontinuities at the cutoff suggesting that parents at both sides of the cutoff are equivalent in terms of their observable characteristics such as age, place of birth, education level and father's socio-professional category. Only the graphical representation of the father's age at birth seems to have a slight discontinuity at the cutoff, however, this discontinuity is imprecise and not significant at any reasonable significance level as shown in Table A.3. The insignificance of other estimates goes in line with our findings in Figure A.2.

Chapter 6

Results

6.1 Labor Market Outcomes

We start by investigating each parent's labor market outcomes using the whole sample of French fathers. The effects on labor force participation, employment vs unemployment and earnings are shown in Figure A.3. Results for fathers in Panel A suggest that the policy had no effect on labor force participation, a positive effect on employment and a negative effect on earnings. The paternity leave, however, had no effect on mother's likelihood of being in the labor force, being employed versus unemployed or mother's earnings. Panel B of Figure A.3 shows no discontinuities at the cutoff.

The corresponding regression discontinuity estimates for fathers and mothers are reported in Tables A.4 and A.5 respectively. The results further validate the observed discontinuities at the cutoff. Estimates on the employment and earnings of fathers are significant and robust to the inclusion of control variables and the different bandwidths used. In the specification that includes controls,

fathers are 1.7 percentage points more likely to be employed as a result of the paternity leave. However, employed fathers experience a 3.6 percent decrease in their earnings. Estimates of mother's likelihood of being in the labor force or being employed are not significant. Although estimates of mother's earnings are not significant, however, our analysis does not suggest that the paternity leave has no effect on mother's earnings. There is a large variation in the outcome variable such that any precise estimation and conclusions about the impact on mother's earnings are beyond the bounds of possibility. This result is also shown through the scatter plot in Figure A.3 (c) of Panel B.

6.2 Heterogeneity Analysis

Since the response of fathers to a paternity leave is heterogeneous, effects may well differ across different subsamples of families. In this section, we present our heterogeneity analysis where we separate families by the level of education of the father. We consider two mutually exclusive categories of education: lower secondary education that includes any level of education less than a general baccalaureate and upper secondary education including any level of education equal or beyond a general baccalaureate. Analyzing the results of these two subsamples will help us better interpret effects observed on the whole sample.

Sample of fathers with a lower secondary education

The graphs of this analysis are shown in Figure A.4 and the corresponding discontinuity estimates in Tables A.6 and A.7. The graphs show evidence of an increase in the employment of less educated fathers. The increase is by 2.5 percentage points and is significant across the different bandwidths. Employed

fathers, however, experience a decrease in their earnings by around 2.8 percent. The effect is highly significant and robust. No significant effect is observed on the labor force participation of less educated fathers. The results for mothers in this sample are inconclusive as shown by the scatter plots and the relatively less robust estimates. Although there seems to be an increase in the mother's probability of being employed as shown in Panel B of Table A.7, however, this effect varies considerably- both in significance and sign- with the inclusion of controls. In any case, the effect is not apparent in the graphical representation of earnings and should be cautiously interpreted.

Sample of fathers with an upper secondary education

Highly educated workers are faced with higher opportunity costs when taking time off from work. This is also the case when the leave of absence is fully paid. These costs exist because high educated workers are more likely to be in high-skilled professions with higher income and higher prospects for promotions. Declining from the job market will thus have a negative impact on career progression.

Indeed, this hypothesis is corroborated by results obtained on the sample of more educated fathers where the negative effect on earnings is of greater magnitude. The results of this analysis are reported in Figure A.5 and Tables A.8 and A.9. Fathers with upper secondary education experience a decrease in wages by 3.8 percent, much more than the effect observed on less educated fathers. The decrease is equivalent to 70 euros per month. The effect on father's employment is no longer significant shown both in Figure A.5 (b) of Panel A and Table A.8. Estimates are small in magnitude and are not significant at any reasonable significance level.

Results for mothers in this sample are equally inconclusive. The graphs in Panel B of Figure A.5 show a large variation in the outcome variables such that any conclusions about the impact on mother’s labor market outcomes are extremely doubtful. Most estimates shown in Table A.9 vary considerably between the different bandwidths, either in magnitude or sign. Having said this, we are not able to rule out the possibility of a serious decrease in the labor force participation and earnings of mothers in this sample. Estimates on mother’s labor force participation and earnings can take a value of a 6 percent decrease and confidence intervals are often irregularly negative. This decrease, shown in the sample of more educated fathers, is not consistent with what one would expect and could be explained by a possible complementarity of father’s and mother’s time at home. Given that mothers often have an inherent specialization in household work and childcare, it could be the case that when the father wishes to spend some time with the child, the mother is obliged to stay home as well.

6.3 Robustness Checks

In addition to the robustness checks of varying the length of the bandwidth and the inclusion of controls, we also check for discontinuities in the outcome variables using a fake cutoff that mirrors the original cutoff. For this purpose, we run regressions using January 1 in years other than 2002. If the effects we saw previously were really due to the paternity leave policy introduced in 2002, we should not observe any effects at the fake cutoff. In Figure A.6, we present our robustness checks for year 2000. Panel A shows the robustness checks for the sample of all fathers. Previously significant estimates are no longer significant at any reasonable confidence level when we model the outcome variable as a function

of the running variable using 2000 as a cutoff. This shows that the observed impact on employment and earnings is a precise response to the 2002 paternity leave. The only effect we see using the fake cutoff and that is in accord with our previous findings, is the effect on the employment of less educated fathers. Although highly significant, this effect might well occur by chance. Nevertheless, the effect should be cautiously interpreted.

6.4 Discussion

In this section, we expand on the effects documented in the previous section. We seek to answer three questions: What are the possible mechanisms through which the decrease in fathers' earnings has materialized? What explains the larger wage penalty that more educated fathers are faced with as a result of the paternity leave? And why is it that the positive effect on employment is captured only for the less educated fathers?

In order to investigate the first question, we split the analysis done on the whole sample into the short-run versus the long-run. Results, presented in Figure A.7, show that the effect on earnings is seen both in the short-run and over the long-run. Although less significant, the effect is of greater magnitude in the short-run, i.e in the 4 years following the birth of the child. Given that wages are less likely to respond in the short-run, this effect might be occurring through a decrease in the number of hours worked. This is also likely given that in the first 3 years after birth, parents are eligible for the parental leave. We then look at the intensive labor supply of fathers in the short-run. Figure A.8 shows the effects on the number of days worked per week, hours of work per

week, probability of working 35-39 hours relative to 30-34 hours (conditional on full-time work) and probability of having an unworked week. While the graphs do not show any clear discontinuities at the cutoff, they do point out to a slight decrease in the intensive supply of fathers in the 4 years following birth. Table A.10 reports the regression discontinuity estimates for the intensive labor supply of fathers. Panel A shows a slight decrease in the average number of days worked after the introduction of the paternity leave. The effect is small in magnitude but statistically significant across the different bandwidths. There is also some evidence of a decrease in the number of hours worked. Estimates in Panel B are consistently negative, though only statistically significant using bandwidths 14 and 16. Panel D displays the probability of having an unworked week. Although the estimates are mostly not statistically significant, they are consistently positive and often large in magnitude (11% using the first bandwidth). On the whole, the results are in accordance with the hypothesis that the father is devoting less time to work and more quality time to his child.

Apart from hours of work, a paternity leave can decrease earnings through at least three different channels. First, being on paternity leave could lead to loss of human capital (Mincer, 1974; Mincer and Ofek, 1982). Second, a leave of absence is a form of career interruption that signals to the employer lack of commitment to the job (Albrecht et al. 1999). As a result, fathers on paternity leave might face lower prospects for promotions and pay raises. Lastly, a paternity leave, especially if it occurs following the birth of the first child, could lead to a shift from market to home production. If the father on paternity leave acquires the skills needed for household responsibilities and child care, it is likely that the father will engage in such activities with more children (Becker, 1985).

This discussion leads us to the second question: What explains the larger wage penalty that more educated fathers are faced with as a result of the paternity leave? More educated fathers are faced with a higher opportunity cost from leaving their jobs. This opportunity cost arises not only in terms of forgone experience and skill depreciation, but also because of the signaling and commitment effects that could be of greater prevalence in high-skilled professions. In these types of professions, career interruptions are more costly for employers. This might help explain why employers' attitudes are less responsive to a paternity leave policy change. This latter interpretation is also supported by the employment effect we see only on less educated fathers. In the sample of more educated fathers, the paternity leave does not seem to affect the likelihood of being employed rather than unemployed.

Chapter 7

Conclusion

The past years have witnessed the introduction of parental leaves exclusively reserved for fathers. Advocates of the father quota have good reasons to believe that a paternity leave can protect mothers and children and promote gender equality in the workplace. The discussion is based on the grounds that a paternity leave can reduce the time of disconnection from the labor market and equalize the conditions in which mothers and fathers enter the labor market, translating into a better work-life balance for both parents. A paternity leave can also increase fathers' involvement at home which carries beneficial outcomes for children. Nevertheless, evidence regarding paternity leave policies has been scant.

This paper studies the effects of a paternity leave policy introduced in 2002 in France. Using a regression discontinuity design, we find that a paternity leave reduces the earnings of fathers. The decrease is more prevalent for more educated fathers. The results are consistent with Becker's hypothesis of a possible shift from market to home production which could have eventually resulted in a reduc-

tion of father's earnings, however, our data does not allow for such investigation. We also find some evidence of an increase in the father's probability of being employed, an effect mainly captured for less educated fathers. On potential effects of the policy on mothers' labor market outcomes, our paper is silent. Further research is needed to investigate the response of mothers to a paternity leave and uncover the mechanisms by which the leave affects the earnings of fathers.

Appendix A

Appendix

A.1 Figures

Figure A.1: Frequency of births

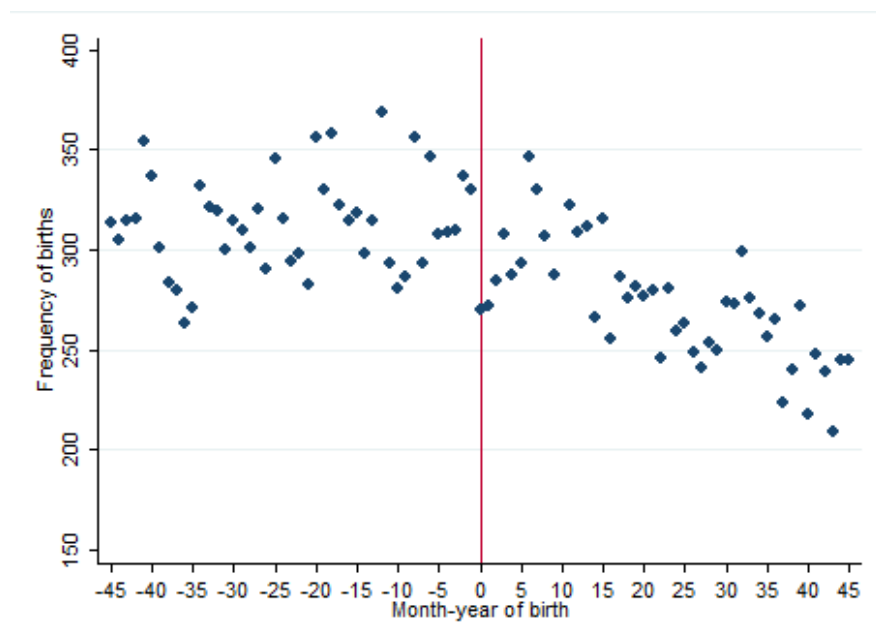
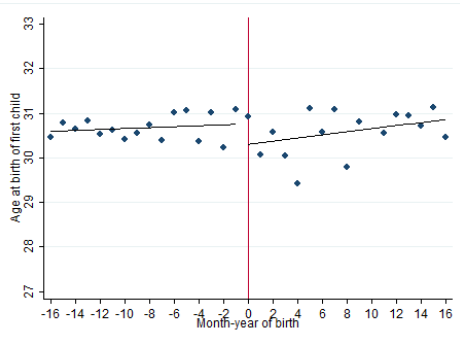
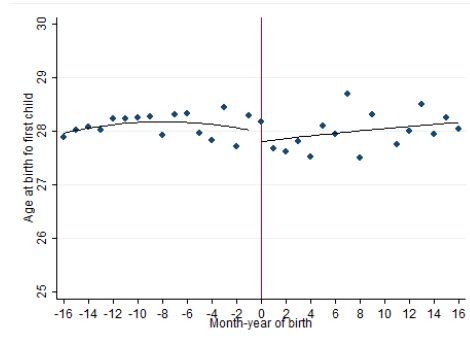


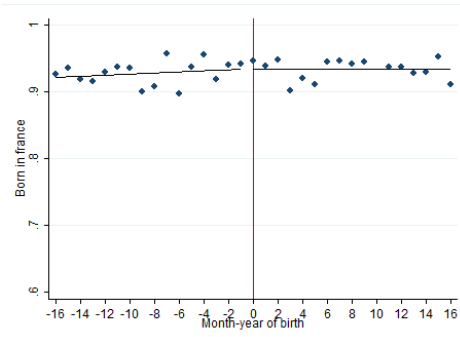
Figure A.2: Balance in covariates



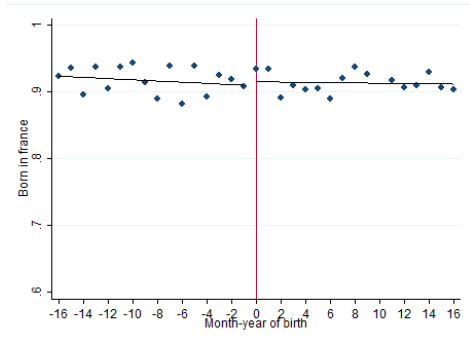
(a) Father's age at birth



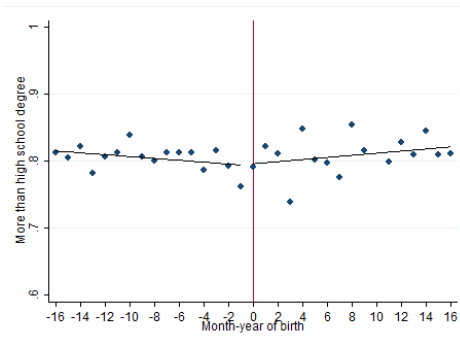
(b) Mother's age at birth



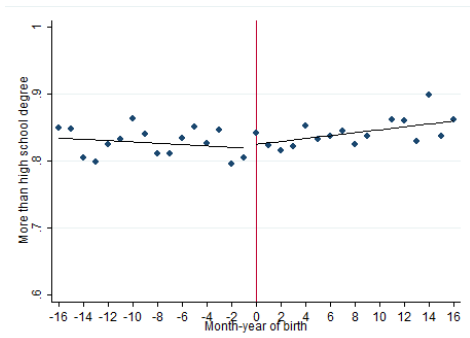
(c) Father born in France



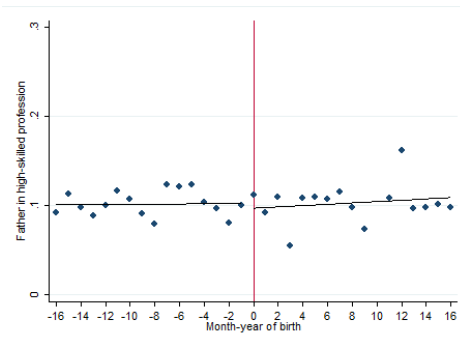
(d) Mother born in France



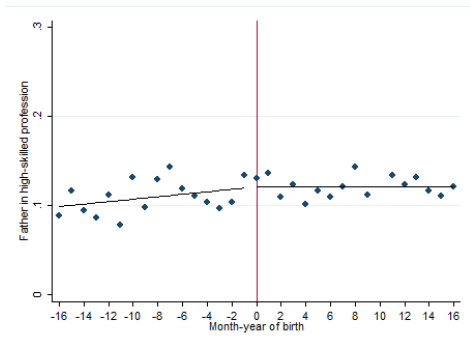
(e) Father \geq high school degree



(f) Mother \geq high school degree



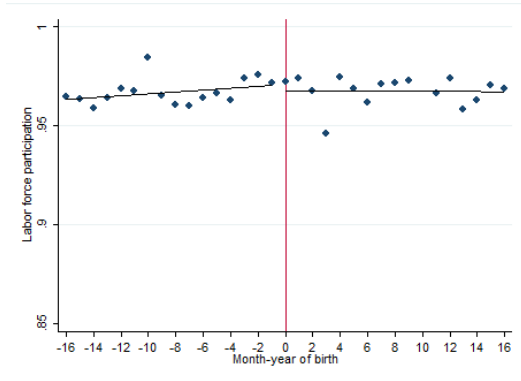
(g) Father of father in cadre profession



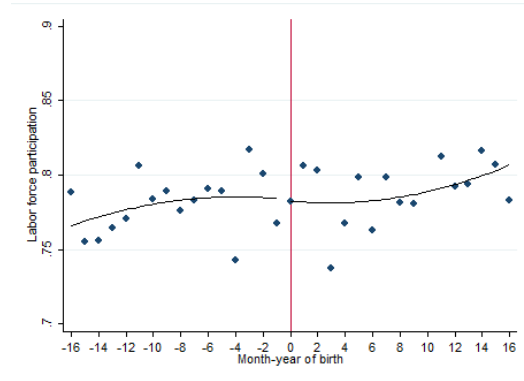
(h) Father of mother in cadre profession

Figure A.3: Labor market outcomes in the sample of all fathers

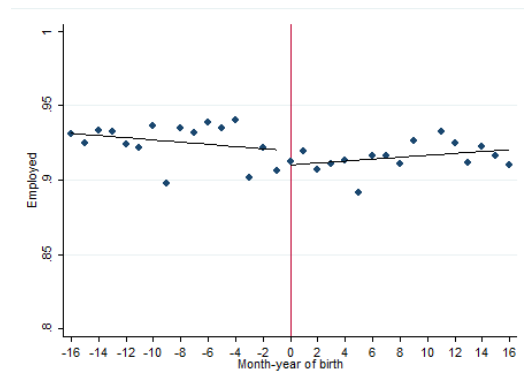
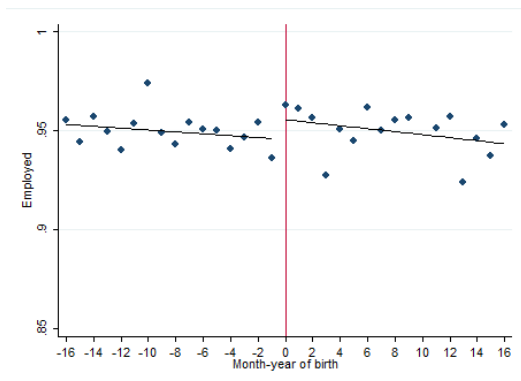
Panel A: Fathers



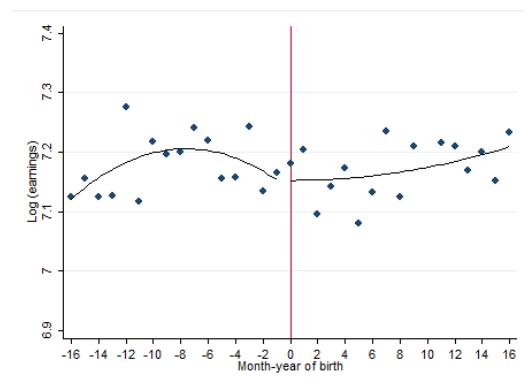
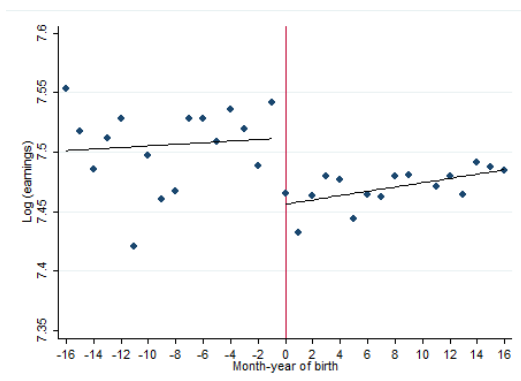
Panel B: Mothers



(a) Probability of being in the labor force



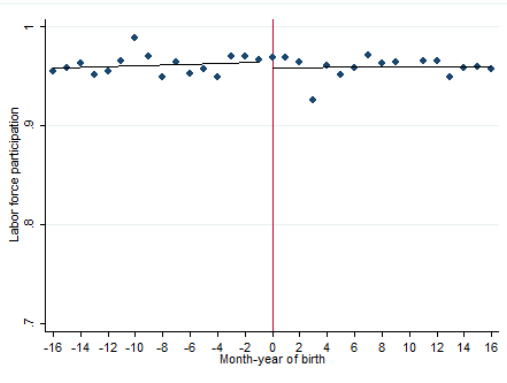
(b) Probability of being employed (versus unemployed)



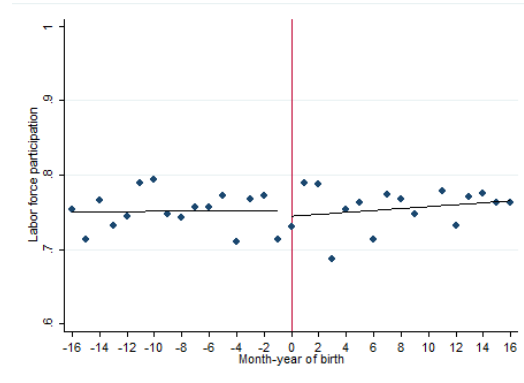
(c) Log (earnings)

Figure A.4: Labor market outcomes in the sample of less educated fathers

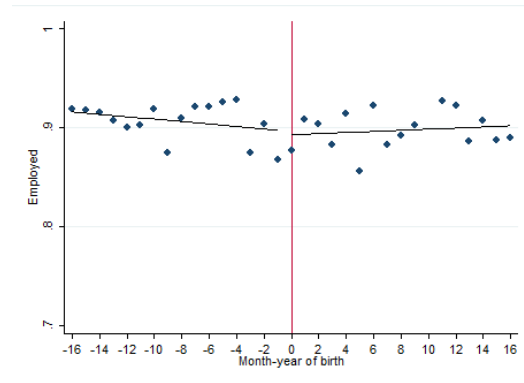
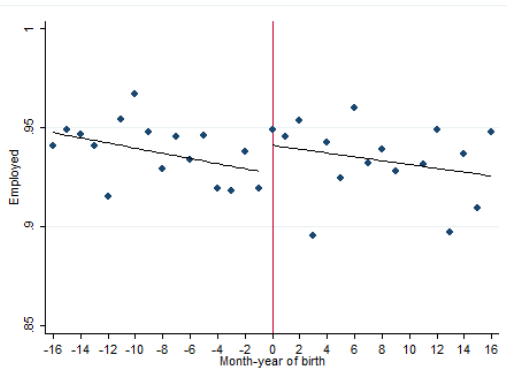
Panel A: Fathers



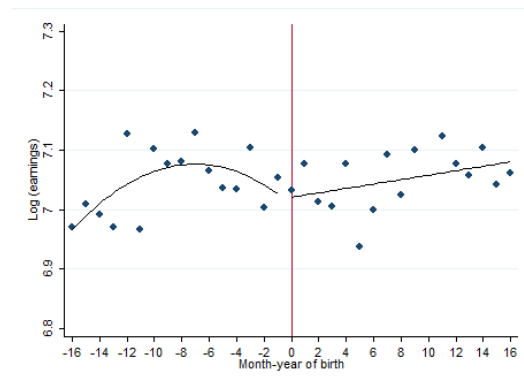
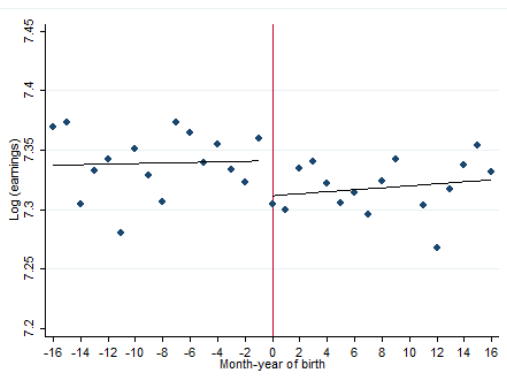
Panel B: Mothers



(a) Probability of being in the labor force



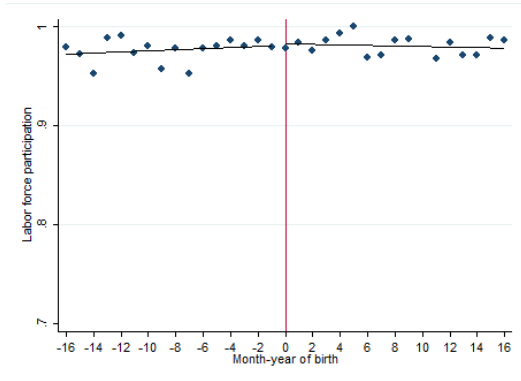
(b) Probability of being employed (versus unemployed)



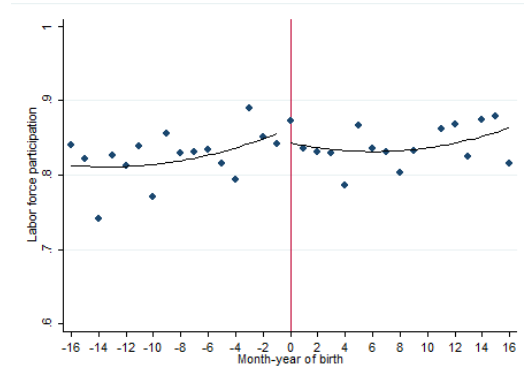
(c) Log (earnings)

Figure A.5: Labor market outcomes in the sample of more educated fathers

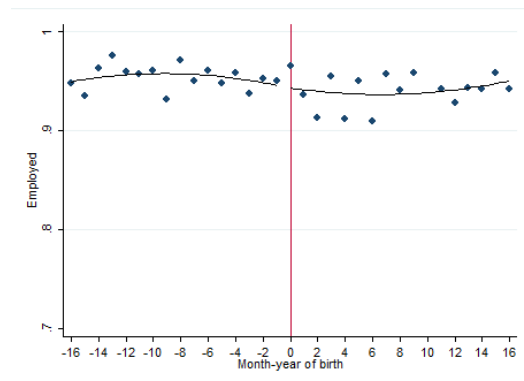
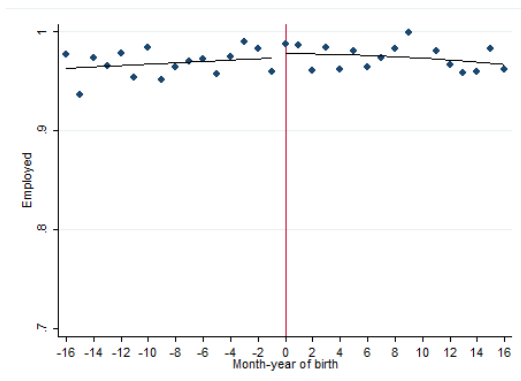
Panel A: Fathers



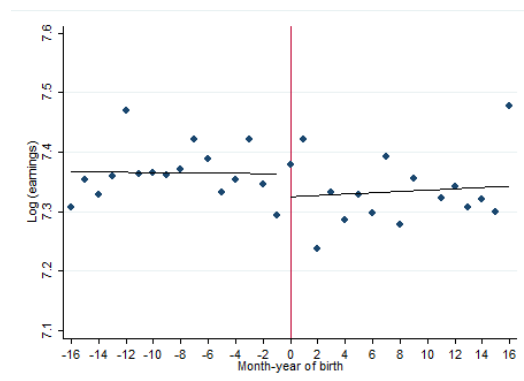
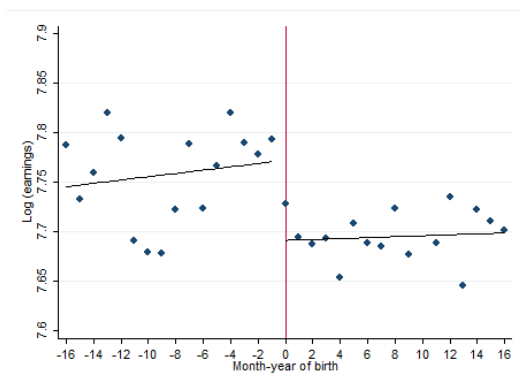
Panel B: Mothers



(a) Probability of being in the labor force



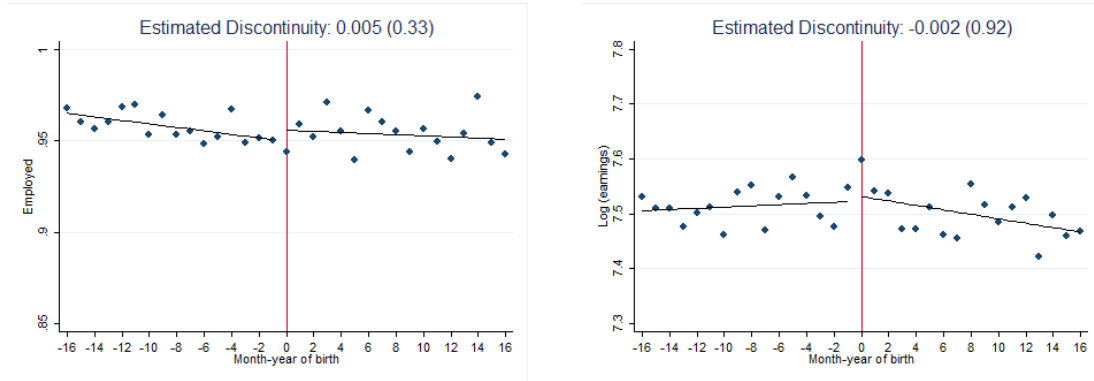
(b) Probability of being employed (versus unemployed)



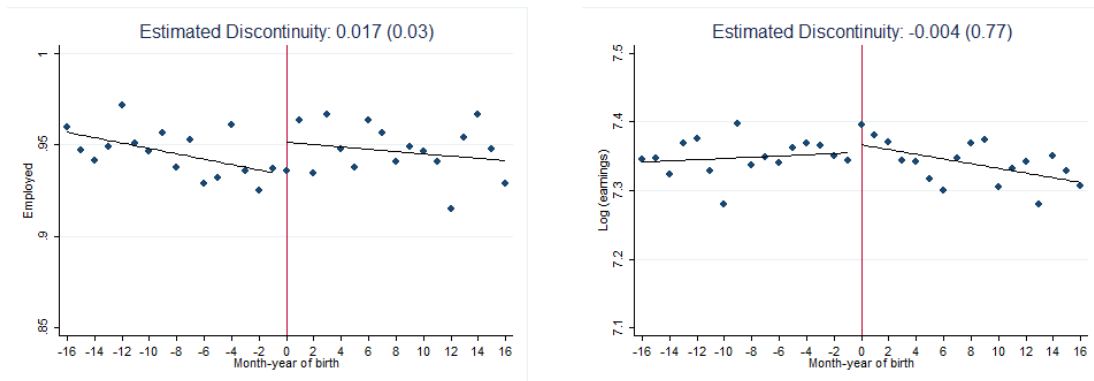
(c) Log (earnings)

Figure A.6: Robustness checks using year 2000 as a fake cutoff

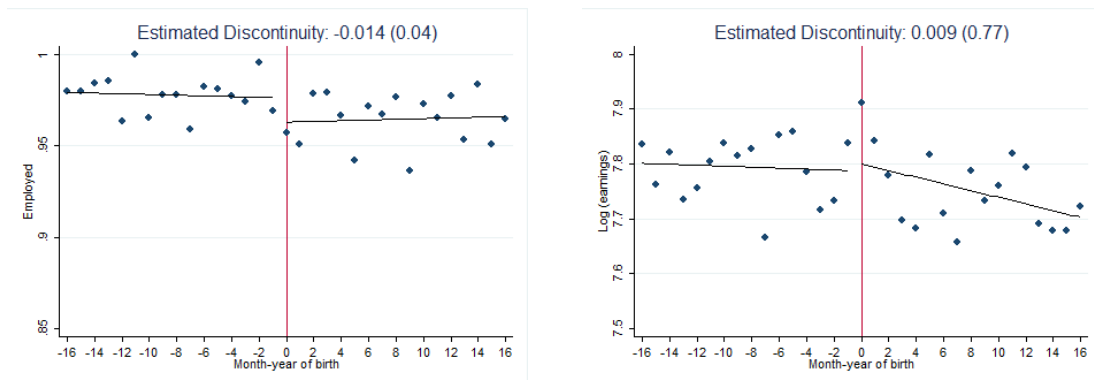
Panel A: Whole Sample



Panel B: Sample of less educated fathers



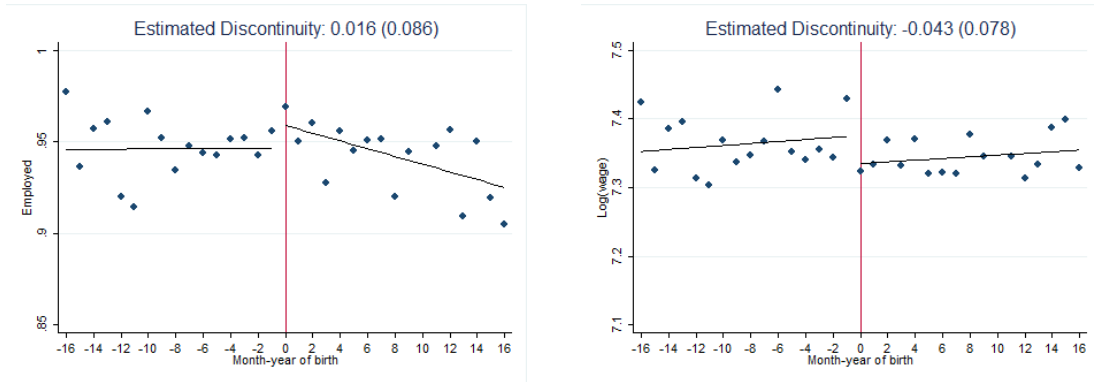
Panel C: Sample of more educated fathers



Note: Similar results are obtained regardless of the bandwidth used and the inclusion of control variables. p-value is displayed in parenthesis.

Figure A.7: Short-run versus long-run analysis for the sample of all fathers

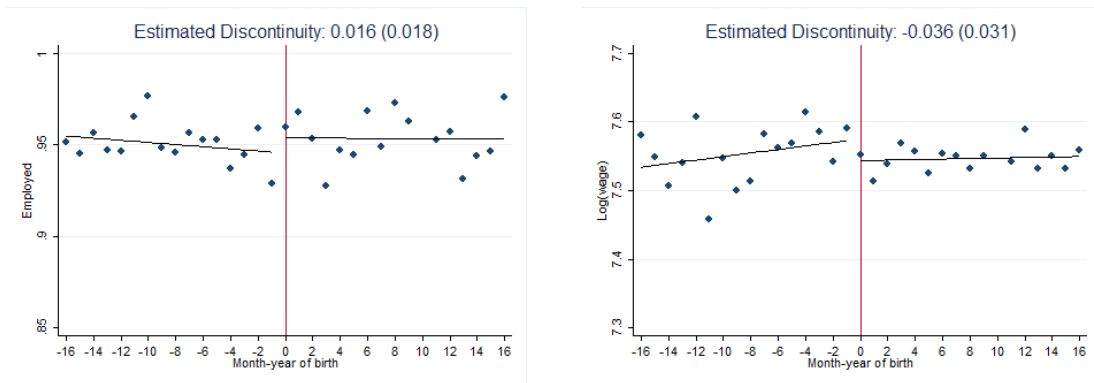
Panel A: Short-run



(a) Father's probability of being employed

(b) Father's earnings

Panel B: Long-run

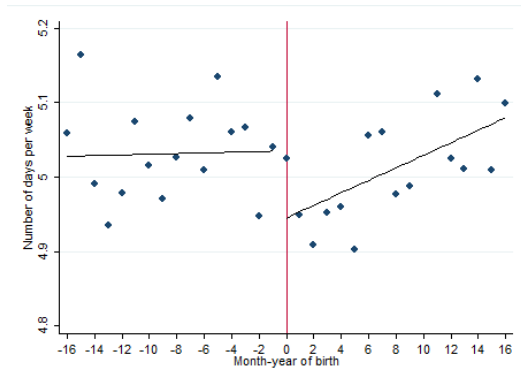


(c) Father's probability of being employed

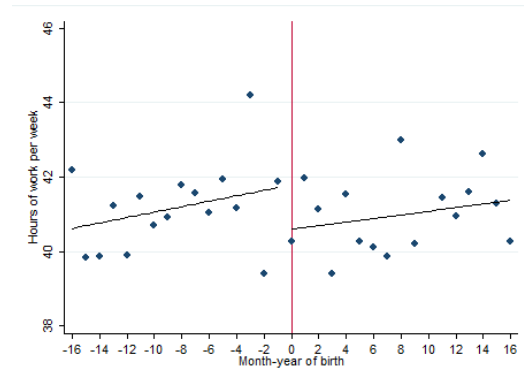
(d) Father's earnings

Note: Estimates on earnings are highly robust to the inclusion of controls and across the different bandwidths. Estimates on employment are less robust. All estimates are calculated using the baseline bandwidth of 16 months. p-value is displayed in parenthesis.

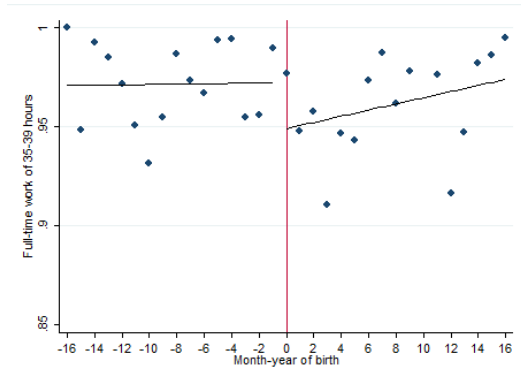
Figure A.8: Intensive labor supply of fathers in the short-run



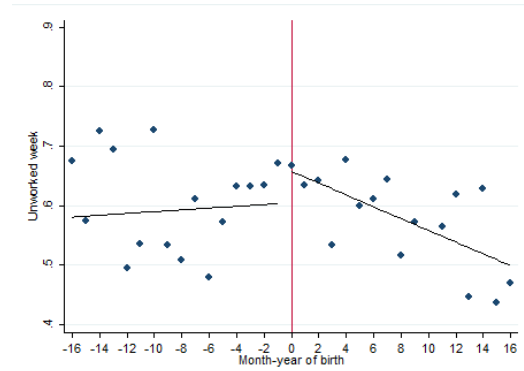
(a) Number of days worked per week



(b) Number of hours worked per week



(c) Probability of working 35-39 hours versus 30-34 (conditional on full-time work)



(d) Probability of having an unworked week

A.2 Tables

Table A.1: Summary statistics

<i>Panel A: Labor Market Outcomes</i>		
	Fathers	Mothers
Labor Force Participation	0.96 (0.17) [44087]	0.78 (0.41) [44087]
Employed	0.95 (0.22) [42629]	0.92 (0.27) [34564]
Full-time work	0.967 (0.17) [40268]	0.65 (0.47) [31556]
Log(wage)	7.49 (0.45) [11735]	7.18 (0.55) [9800]
Intermediate Professions	0.5 (0.5) [30125]	0.9 (0.3) [27891]
High-Skilled Professions	0.37 (0.48) [23890]	0.17 (0.37) [30253]
<i>Panel B: Parent's Characteristics</i>		
Age at birth	30.6 (6) [44087]	28 (5.25) [44087]
Born in France	0.93 (0.25) [44087]	0.91 (0.28) [44087]
More than high school degree	0.8 (0.39) [44072]	0.83 (0.37) [44057]

Notes: The table reports the mean, the standard deviation (in parenthesis) and the number of observations (in brackets). All statistics are calculated for the sample of all French fathers who have a child born within 32 months around the cutoff (a bandwidth of 16 months).

Table A.2: Summary statistics of labor market outcomes by number of children

	1 Child	2 Children	3 Children
<i>Mothers</i>			
Out of labor force	0.25	0.22	0.34
Unemployed	0.07	0.06	0.09
Part-time	0.28	0.37	0.45
<i>Fathers</i>			
Out of labor force	0.16	0.09	0.1
Unemployed	0.05	0.04	0.05
Part-time	0.04	0.03	0.03

Table A.3: Balance in covariates

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Father's age at birth	-0.54 (.37)	-0.54 (.34)	-0.54 (.32)	-0.5 (.3)
<i>Panel B:</i>				
Mother's age at birth	-0.31 (.4)	-0.29 (.4)	-0.37 (.36)	-0.32 (.32)
<i>Panel C:</i>				
Father born in France	-0.004 (.01)	-0.002 (.01)	0.0003 (.01)	0.002 (.01)
<i>Panel D:</i>				
Mother born in France	0.0006 (.013)	0.002 (.012)	0.003 (.01)	-0.001 (.01)
<i>Panel E:</i>				
Father \geq high school degree	0.017 (.017)	0.012 (.017)	0.012 (.016)	0.004 (.016)
<i>Panel F:</i>				
Mother \geq high school degree	0.003 (.015)	0.007 (.013)	0.004 (.012)	-0.002 (.01)
<i>Panel G:</i>				
Father of father in high-skilled profession	-0.009 (.013)	-0.006 (.012)	-0.004 (.01)	-0.004 (.01)
<i>Panel H:</i>				
Father of mother in high-skilled profession	-0.003 (.01)	-0.0002 (.01)	0.005 (.01)	0.01 (.01)
Polynomial(Panel B)	Two	Two	Two	Two
Polynomial (Others)	One	One	One	One
Observations	8364	9579	10802	12046

Notes: The estimates shown here correspond to the baseline bandwidth of 16 months at each side of the cutoff using the sample of all fathers. Estimates can be directly linked to the graphs shown in Figure A.2.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.4: Regression discontinuity estimates for fathers' labor market outcomes in the sample of all fathers

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Labor Force Participation	-0.003 (0.005)	-0.003 (0.005)	-0.001 (0.005)	-0.002 (0.005)
With Controls	-0.003 (0.005)	-0.003 (0.003)	-0.003 (0.004)	-0.003 (0.004)
<i>Panel B:</i>				
Employed	0.012 (0.007)	0.011* (0.006)	0.011* (0.006)	0.006 (0.006)
With Controls	0.017** (0.007)	0.017*** (0.005)	0.013** (0.005)	0.01* (0.005)
<i>Panel C:</i>				
Log (earnings)	-0.067*** (0.015)	-0.056*** (0.015)	-0.068*** (0.014)	-0.064*** (0.013)
With Controls	-0.026* (0.014)	-0.036*** (0.013)	-0.047*** (0.013)	-0.042*** (0.012)
Polynomial	One	One	One	One
Obs. (Panel A)	37499	42934	48408	54035
Obs. (Panel B)	36276	41526	46820	52236
Obs. (Panel C)	9953	11415	12856	14354

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Regression discontinuity estimates for mothers' labor market outcomes in the sample of all fathers

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Labor Force Participation	0.011 (0.02)	0.003 (0.02)	-0.01 (0.02)	-0.013 (0.02)
With Controls	0.012 (0.014)	-0.01 (0.02)	-0.02 (0.017)	-0.03* (0.016)
<i>Panel B:</i>				
Employed	-0.01 (0.008)	-0.01 (0.008)	-0.01 (0.007)	-0.01 (0.007)
With Controls	-0.006 (0.006)	-0.007 (0.006)	-0.009 (0.006)	-0.008 (0.006)
<i>Panel C:</i>				
Log(wage)	0.032 (0.04)	0.013 (0.04)	-0.003 (0.04)	-0.012 (0.04)
With Controls	0.072 (0.06)	0.013 (0.05)	-0.03 (0.04)	-0.05 (0.03)
Polynomial(Panel A & C)	Two	Two	Two	Two
Polynomial (Panel B)	One	One	One	One
Obs. (Panel A)	37480	42919	48397	54027
Obs. (Panel B)	29374	33673	38022	42462
Obs. (Panel C)	8287	9540	10787	12068

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: Regression discontinuity estimates for fathers' labor market outcomes in the sample of less educated fathers

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Labor Force Participation	-0.006 (0.008)	-0.006 (0.008)	-0.002 (0.008)	-0.005 (0.008)
With Controls	-0.008 (0.008)	-0.005 (0.006)	-0.004 (0.006)	-0.005 (0.005)
<i>Panel B:</i>				
Employed	0.017 (0.012)	0.017 (0.01)	0.016 (0.01)	0.01 (0.01)
With Controls	0.019* (0.01)	0.025*** (0.008)	0.02** (0.01)	0.015* (0.008)
<i>Panel C:</i>				
Log(wage)	-0.03** (0.01)	-0.028** (0.013)	-0.037*** (0.013)	-0.037*** (0.012)
With Controls	-0.02 (0.014)	-0.03** (0.013)	-0.03** (0.01)	-0.032** (0.01)
Polynomial	One	One	One	One
Obs. (Panel A)	22786	26069	29431	32877
Obs. (Panel B)	21888	25035	28259	31555
Obs. (Panel C)	5960	6831	7707	8619

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: Regression discontinuity estimates for mothers' labor market outcomes in the sample of less educated fathers

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Labor Force Participation	0.002 (0.02)	-0.007 (0.02)	-0.005 (0.02)	-0.003 (0.02)
With Controls	-0.008 (0.008)	-0.005 (0.005)	-0.004 (0.006)	-0.005 (0.005)
<i>Panel B:</i>				
Employed	-0.008 (0.01)	-0.005 (0.014)	-0.004 (0.013)	-0.001 (0.01)
With Controls	0.019* (0.01)	0.025*** (0.008)	0.018* (0.01)	0.015* (0.008)
<i>Panel C:</i>				
Log(wage)	0.037 (0.04)	0.015 (0.04)	-0.02 (0.04)	-0.028 (0.04)
With Controls	0.047 (0.04)	0.02 (0.04)	-0.019 (0.04)	-0.03 (0.04)
Polynomial(Panels A&B)	One	One	One	One
Polynomial(Panel C)	Two	Two	Two	Two
Obs. (Panel A)	22780	26067	29433	32883
Obs. (Panel B)	17168	19632	22233	24833
Obs. (Panel C)	4793	5496	6231	6968

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: Regression discontinuity estimates for fathers' labor market outcomes in the sample of more educated fathers

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Labor Force Participation	0.002 (0.006)	0.002 (0.005)	0.001 (0.005)	0.002 (0.005)
With Controls	0.004 (0.008)	0.0005 (0.006)	-0.00006 (0.006)	0.0002 (0.006)
<i>Panel B:</i>				
Employed	0.007 (0.009)	0.004 (0.009)	0.006 (0.007)	0.001 (0.007)
With Controls	0.015** (0.006)	0.003 (0.008)	0.005 (0.008)	0.0004 (0.007)
<i>Panel C:</i>				
Log(wage)	-0.081*** (0.02)	-0.08*** (0.02)	-0.096*** (0.02)	-0.089*** (0.02)
With Controls	0.001 (0.016)	-0.038*** (0.015)	-0.058*** (0.015)	-0.055*** (0.015)
Polynomial	One	One	One	One
Obs. (Panel A)	14713	16865	18977	21258
Obs. (Panel B)	14388	16491	18561	20681
Obs. (Panel C)	3993	4584	5149	5735

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Regression discontinuity estimates for mothers' labor market outcomes in the sample of more educated fathers

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Labor Force Participation	0.006 (0.02)	-0.01 (0.02)	-0.028 (0.02)	-0.028 (0.02)
With Controls	0.036 (0.02)	-0.03 (0.04)	-0.057 (0.035)	-0.06 (0.03)
<i>Panel B:</i>				
Employed	-0.006 (0.01)	0.002 (0.01)	-0.001 (0.01)	0.0008 (0.01)
With Controls	0.017 (0.015)	0.019 (0.015)	0.003 (0.014)	-0.0005 (0.01)
<i>Panel C:</i>				
Log(wage)	-0.01 (0.04)	-0.02 (0.04)	-0.06 (0.04)	-0.06* (0.03)
With Controls	-0.01 (0.03)	-0.03 (0.03)	-0.068** (0.03)	-0.065** (0.02)
Polynomial	One	One	One	One
Obs. (Panel A)	14700	16852	18964	21144
Obs. (Panel B)	12206	14041	15789	17629
Obs. (Panel C)	3494	4044	4556	5100

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: Intensive labor supply of fathers in the short-run

Bandwidth	14 months	16 months	18 months	20 months
<i>Panel A:</i>				
Number of days per week	-0.1** (0.04)	-0.09** (0.04)	-0.07* (0.04)	-0.07* (0.04)
With Controls	-0.13*** (0.04)	-0.1** (0.04)	-0.088** (0.04)	-0.08** (0.04)
<i>Panel B:</i>				
Hours of work per week	-1.3 (0.99)	-1.3 (0.93)	-0.77 (0.88)	-0.92 (0.8)
With Controls	-2** (0.8)	-1.7** (0.7)	-0.9 (0.75)	-1.1 (0.7)
<i>Panel C:</i>				
Full-time 30-34 (versus 35-39)	-0.017 (0.015)	-0.02 (0.014)	-0.02* (0.01)	-0.02 (0.01)
With Controls	0.015 (0.01)	-0.013 (0.013)	-0.026* (0.013)	-0.02* (0.01)
<i>Panel D:</i>				
Unworked week	0.037 (0.04)	0.048 (0.04)	0.05 (0.04)	0.04 (0.04)
With Controls	0.11** (0.03)	0.08** (0.04)	0.059 (0.04)	0.042 (0.04)
Polynomial	One	One	One	One
Obs. (Panel A)	10442	11651	12861	14048
Obs. (Panel B)	10442	11651	12861	14048
Obs. (Panel C)	5525	6126	6727	7327
Obs. (Panel D)	2318	2584	2899	3163

Notes: The bandwidths represent the number of months used at each side of the cutoff. Control variables include the age of parents at the birth of their first child, a dummy variable that is equal to 1 if parents were born in France and a dummy variable denoting the level of education (equals to 1 if the parent has at least a high school degree) in addition to month-of-birth and year-of-survey fixed effects. Standard errors are clustered at the month-year of birth level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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