

How Do Employment Protection and Parental Leave Benefits Affect Mothers' Post-Birth Careers?

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Abstract Parental leave policies encourage mothers of newborn children to stay home and take care of their children. Two key instruments of parental leave policies are duration of job protection and benefits payments. This paper studies the causal effects of these two policy instruments on mother's return to work decisions and their subsequent impact on mother's labor market performance in the medium-run. To examine these issues, we exploit three different policy reforms in Austria that altered various components of the parental leave system. The policy changes were abrupt and unpredicted providing us the unique opportunity to apply a regression discontinuity research design. We find that duration of parental leave benefits is central for mothers time spent at home after child's birth. Duration of the job-protected period while on leave also influences mother's decisions to return to work, but to a lower extent. Yet, prolonged work interruptions due to parental leave have surprisingly little effects on mothers' earnings and employment 5 years after birth. On the other hand, there seems to be a detrimental effect on earnings and employment for women of high earnings capacity when their work interruptions exceed the period of job-protected leave.

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1 Introduction

Parental leave regulations are central to most OECD countries family policies. Leave mandates can support new parents in two complementary ways: by guaranteeing job-protected leave and by offering financial support during that leave. This paper provides evidence on the role of these two parental leave policy instruments in shaping the length of mothers' work interruptions after childbirth. Benefits and job protection have different aims. Benefits aim to subsidize child care provided by the mother. In contrast, job protection aims to ensure continuity of women's careers in the labor market. Women's response to changes in benefit duration and job protection duration provides insightful information regarding how mothers of newborn children value these two policy dimensions.

Despite the widespread prevalence of parental leave policies, their impact on women's labor market performance is still unclear. In particular, there is very limited evidence on how these policies affect women's careers in the medium and in the long-run. Job protected leave mandates are expected to increase women's employment and earnings by encouraging job continuity after birth. Yet, prolonged periods of absence from the workplace might lead to loss of specific and general human capital and weaker labor market prospects after returning to work. Hence previous employers, while obliged to re-employ mothers when they return to work after the baby break, may either remunerate them relatively worse than their colleagues or may dismiss or layoff re-entered women with a higher probability as soon as the job protection period upon re-entry has run out. Moreover, the losses in general human capital may also lead to lower pay and less stable employment when women re-enter the labor market at new employers. Financial support during childbearing is expected to decrease incentives to return to work and might therefore have detrimental effects on women's labor market performance. On the other hand, a longer period shared between the mother and child during the first months after birth might benefit both mother's and child's health, and might also allow mothers to spend more time searching for a better job match after birth. All of these factors could eventually improve mothers' labor market performance upon re-entry.

In this paper, we explore to what extent duration of parental leave benefits and job protection affect women's decisions to return to work and their medium-run performance in the labor market. We generate causal estimates exploiting variation in parental leave (PL) regulations generated by three policy changes that took place in Austria during the 1990s. The first policy change was implemented on July 1, 1990 and extended the maximum duration of PL benefits and job protection from the child's *first* to the child's *second* birthday. This large PL extension created strong incentives for mothers of newborn children to stay home with their babies for a longer period of time. The second policy change was implemented on July 1, 1996 and effectively reduced the duration of parental leave benefits from the child's *second* birthday to the date when the child turns 18 months old while keeping the period of short protection unchanged. This policy change allows isolating the impacts of duration PL benefits while holding job protection constant. The third policy change took place in July 2000 and increased the duration of benefit payments from 18 months to 30 months while job protection was still granted to a maximum of two years. This last reform provided an extension of 6 months of job-protected benefits and additional 6

months of benefits payments without guaranteeing job protection.

To assess how changes in duration of PL benefits and job protection affected time away from work after childbirth, we first outline a simple theoretical framework to explain return-to-work decisions. Mothers differ with respect to value of time with the child and pre-birth wage. Without parental leave and conditional on earnings capacity, mother's time to return to work reflects the distribution of the underlying preferences for being at home with the child. Introducing job protection and parental leave benefits tends to delay return to work. Moreover, the exhaustion of job protection and benefits generates a sharp spike in the distribution of return-to-work times. Letting benefits end before job protection creates two spikes in the distribution of return-to-work times – one when PL payments end, the second one when job protection ends. The second spike informs about the value of job protection without benefits. Prolonging the benefit duration beyond the end of job protection provides information on how mothers of newborn children value job protection while receiving benefits and how they value benefits without job protection. Contrasting women's return to work responses under the different PL regimes provides information on the interactions between job protection and benefits.

The three policy changes were adopted for mothers giving birth on or after July 1 of the years 1990, 1996, and 2000. This allows us applying a simple but powerful empirical research design. In our analyses, we compare between mothers who gave birth in *July* or *August* and mothers who gave birth in *May* or *June*. Such a comparison creates an attractive research design that allows us to estimate the causal effect of duration of PL on mothers' return to work decisions, subsequent employment, and earnings rather precisely.

This approach has several attractive features. *First*, the assignment of a particular individual to one of the two groups can be seen as almost as good as randomly assigned. Endogenous selection does not play a role in this context as parents could not anticipate the PL reform when they made their fertility choices. For instance, the 1990 reform act was passed by the Austrian parliament not until April 1990 and in January 1990 it was still unclear whether the reform would be implemented at all, and, if so, when the new rules would be enacted. Hence the babies born between May and August 1990 were already conceived when the new PL rules became known to the public implying that selectivity into treatment and comparison groups is unlikely to exist. Furthermore, selectivity by manipulating the date of birth cannot be a major problem either. The 1990 reform created an incentive to postpone the birth date which is nearly impossible on biological grounds. While the 1996 reform created an incentive to speed up the birth event, it is unlikely that manipulation of birth dates have contaminated the comparability of treatment and comparison groups to a significant extent. The 2000 reform was enacted retrospectively in August 2001 making impossible for the mothers to time births.

A *second* attractive feature, which is related to the first point, is that observed pre-birth characteristics are almost exactly identical between treated and comparison groups. This further suggests that the two groups are very well comparable and provides further support for the plausibility of our identifying assumption of quasi-random selection into treatment and comparison groups.

A *third* attractive feature of our empirical strategy concerns the environmental conditions of treated and comparison groups. Starting from the date of birth, we follow the earnings and employment histories

of mothers over a period of five years (the most we can do for the 2000 reform) after the birth event. During this extended time interval, the labor market conditions for these two groups are (almost) identical. For instance, during the 5-year period over which we follow mothers' labor market histories, the treated and comparison groups overlap at least during 4 years and 9 months (May-August comparison). In fact, treated and comparison mothers face an *identical* economic environment during at least 69 out of the 72 months we examine and interact in the same labor markets as they live in the exact same areas. Hence, any differences between treated and comparison mothers cannot be attributed to differences in environmental conditions between the two groups. We are therefore able to overcome a typical problem that contaminates pre-post comparisons or comparisons across groups residing in different geographical areas.

Fourth, the policy change was abrupt. Women who gave birth to a child on June 30 faced substantially different PL rules than women who gave birth to a child on July 1 of the reform year (1990, 1996, or 2000). In particular, there were no transition rules that would have mitigated "unfair" differences in PL rules between mothers with a birth immediately before and immediately after the policy change. This allows us to adopt a sharp regression discontinuity approach (Hahn, Todd, and Van der Klaauw, 2001).

A *fifth* attractive feature of our empirical analysis is a very large and informative data set, the Austrian Social Security Database (ASSD). This database registers not only dates of birth but also take-up of PL benefits and other government transfers and work and earnings histories of individuals. This is particularly favorable in the present context, as our goal is to study return-to-work decisions and subsequent employment and earnings careers of mothers. Furthermore, the ASSD covers the universe of all Austrian employees which allows us to draw very specific but still rather large samples. In sum, the ASSD provides more detailed information on the effects of PL policies than most data sets used in previous studies.

Our main findings can be summarized as follows. We find that a longer duration of parental leave induces a significant delay in return to work. Extending parental leave benefits and job protection by one year (the 1990 reform) increases the time between birth and the first post birth job (return-to-work) by about 8 months. Reducing the duration of benefit payments by 6 months while keeping job protection at 12 months (the 1996 reform) speeds up return-to-work by 3 months. The effect is less than half of the delay induced by the 1990 reform, suggesting that job protected leave, even if unpaid, is also important for women's return to work decisions. Lastly, extending payment duration by 12 months while guaranteeing job protection for only half of that period (the 2000 reform) delays return to work by 4 months. Interestingly, we also find that extension of benefits delays back to work even beyond the period where benefits are exhausted.

A comparison between women's responses to the exhaustion of job protection or benefits reveals that more women return to work when benefits are removed than when job protection is removed suggesting that benefits are more important than job protection in shaping women's return to work decisions. Removing job protection for women who are receiving benefits does not affect return-to-work decisions differently than removing job protection for women who do not receive benefits. Return-to-previous job is more strongly affected by both end of benefits and end of job protection than return-to-a new employer.

Finally, we find that even though the 1990 and 1996 reforms have a substantial effect on the time until mothers return to work, there are surprisingly little medium-run effects on labor market outcomes. Both medium-run earnings and employment are not affected by the salient 1990 extension and the 1996 reduction of parental leave. The unique richness of our data allows us to explore the reasons for this striking absence of medium run effects and to offer the following explanations. First, the effects of extended parental leave on accumulated work experience are much smaller than the effects on duration until return to work. This is because mothers who returned to work earlier induced by a less generous PL regime, have more unstable employment upon re-entry. We also find that mothers in the less generous PL regimes often compensate this with higher participation rates in other social insurance programs. Second, job protection seems to insure women against wage loss. Third, a more generous PL regime that guarantees job protection seems to increase the probability that mothers work for their pre-birth employer 5 years after giving birth. The implication of this last finding is that the loss in labor market experience is not necessarily translated to a loss in tenure as mothers in the more generous PL regime are more likely to continue working at their pre-birth employer for a longer period.

Consistent with this, we find that the 2000 reform which extended parental leave benefits beyond the period of guaranteed job protection generated losses in labor market experience and tenure, and a reduction in medium run earnings. These adverse labor market outcomes are concentrated among women with high pre-birth wages suggesting that job protection and the returns to specific human capital or job match play a more significant role for women with high earnings potential.

The paper is organized as follows. In the next section, we briefly discuss related previous literature. Section 3 describes institutional features of the Austrian labor market, explains in detail the three policy changes, and outlines a simple theoretical model that generates some general predictions for mothers return to work responses to PL benefits and job protection. Section 4 presents and discusses our empirical strategy. Sections 5 and 6 present the empirical results. Section 7 concludes.

2 Previous literature

Most of the literature has found that more generous parental leave mandates tends to delay women's return to work. However, evidence of the relationship between duration of leave and women's labor market outcomes is mixed. A key empirical challenge has been finding exogenous variation in leave-taking by mothers. Many studies use variation in leave availability across employers or leave-taking by employees. However, most of these studies suffer from several sorts of biases due to unobserved differences between mothers who had access to maternity leave and mothers who do not and between mothers taking longer and shorter leaves. The use of more plausibly exogenous variation in the length of parental leave has been limited.

Studies that focus on the U.S. have examined the impact of the 1993 U.S. Family and Medical Leave Act (FMLA), which guarantees a job-protected unpaid maternity leave of 12 weeks to women working for companies with 50 or more employees. These studies find only modest or no effects of mandated protected leave on the length of parental leave and subsequent employment, although they do find some

positive impacts on job continuity (see, e.g., Klerman and Leibowitz, 1997; Klerman and Leibowitz, 1999; Baum 2003; and Waldfogel 1999). In addition, most of these studies found no significant effects on wages (see, Waldfogel, 1999; Hashimoto et al., 2004; and Baum, 2003). Nevertheless, these results are difficult to generalize to other contexts given the relatively short length of job-protected leave guaranteed by FMLA and the fact that, in most cases, this policy does not have a significant impact on duration of maternity leave taken by mothers. Moreover, it is important to note that the population affected by FMLA accounts for less than 50 percent of the private sector workers in the US (see Waldfogel, 1999).

PL rules in Canada and Europe are more generous and hence more likely to have an impact on women’s labor supply and career prospects. Baker and Milligan (2005) exploit the substantial variation in PL provisions over time and across Canadian provinces and find that both short and long mandates increase job continuity. However, only long leaves were found to increase the amount of time that mothers spend away from work. Ruhm (1998) compares employment rates and wages of men and women using panel data of European countries, and finds that longer leave mandates are associated with higher female employment but lower relative wages. Ejrnaes and Kunze (2006) investigate the role of PL on the family wage gap using administrative data for Germany and exploiting exogenous variation in the length of PL generated by policy changes in the German system. The authors find that longer PL duration leads to detrimental effects on employment and wages. In contrast, Schonberg and Ludsteck (2008) study the same reforms and find only minor effects on employment rates and mixed effects on wages.

Lalive and Zweimüller (LZ) (2009) study the effects of the 1990 and 1996 Austrian reforms on fertility and labor market outcomes. This paper complements their work in the following dimensions. First, we disentangle the role of job protection and benefits both in shaping women’s decisions to return to work and explore the subsequent effects of these two policy instruments on women’s labor market outcomes. Second, we also explore the channels through which PL duration affect women’s employment and wages by looking separately at its impacts on duration until return to work, accumulation of labor market experience, tenure, and preservation of pre-birth jobs. By examining these separate channels we are able to distinguish between the roles of job experience and job tenure or job specific match in shaping women’s wages.

We extend the existing literature in a number of ways. First, our research provides convincing evidence on the causal effects of PL duration by using exogenous variation in the length of PL. Second, we examine the impacts of PL on a wide range of labor market outcomes such as employment, wages, tenure, labor market experience, and labor market attachment. This comprehensive examination allows us to obtain a rich picture of women’s labor market performance after childbearing and analyze the channels through which PL affects earnings. Finally, while previous studies have mostly focused on only one aspect of PL policies (either job protection or monetary benefits) we are able to analyze the separate effects and interaction of these two policy instruments. Lastly, the large sample sizes and richness of the data allow us to explore the heterogeneous impacts of PL policies on different types of women.

3 The institutional environment

3.1 The Austrian PL system

Austria was among the first countries to adopt a PL legislation. The system was introduced in 1957 when mothers were protected from dismissal of the previous job for a period of 6 months. Two major reforms took place in 1961 when the maximum duration of PL was extended up until the child's first birthday and a means-tested transfer payment proportional to the unemployment benefit was introduced; and in 1974 when the transfer became flat rate and independent of household income.

The rules that were in place during the 1990s required a minimum employment experience to be eligible for PL entitlements. Women taking up PL for the first time, had to have worked (and paid social security contributions) for at least 52 weeks during the two years prior to birth. For mothers with at least one previous take-up of PL the employment requirement was reduced to 20 weeks of employment during the last year prior to the subsequent birth. PL entitlements included two main components: monetary benefits and protection of pre-birth jobs. Mothers who earn less than 200 Euros per month were eligible to a flat rate transfer of about 340 Euros per month (in 1990) or about 31 % of gross median earnings of female workers. Benefits are not taxed implying a median *net income* replacement ratio of more than 40 %. Women without a partner or with a low-income partner were eligible to higher benefit levels (*Sonderunterstützung*). In practice, the earnings ceiling for entitlement to monetary benefits was so low that it implied a banning from work. The job protection component protects mothers from dismissal of pre-birth jobs during the first 4 weeks after returning to work.¹ Women have to announce the duration and start of parental leave no later than 8 weeks after giving birth. The duration can be changed subject to a three months advance notice period.

Prior to *July 1, 1990*, the maximum duration of PL benefits and job protection ended with the child's first birthday. After *July 1, 1990*, the maximum duration of PL benefits and job protection was extended until the child's second birthday.² A further policy change took place affecting births on or *after July 1, 1996*. At that date, the maximum duration of job protection still lasted until the child's second birthday. However, parental leave benefit rules required that at least 6 months of the leave had to be taken by the father. As fathers' take-up of PL is negligible, the 1996-reform effectively implied a reduction in the duration of parental leave benefits from the child's second birthday to the date when the child became 18 months old. The 1996 reform brought also a slight increase in previous employment requirements for second and subsequent birth. Instead of originally 20 weeks within the last year, women had to spend 26

¹The effective duration of job protection is much longer than these four weeks. In Austria, layoffs are subject to advance notice regulations implying that a mother's job is protected for several months after returning from parental leave.

²The 1990 policy reform came with several additional changes. The system was changed from a "maternity" to a "parental" leave system. Not only the child's mother but also the father could go on parental leave. However, this is of no practical consequence. In 1990 less than 1 % of fathers took advantage of that possibility. A second change was that women in farm households and family businesses as well as women who did not meet the employment requirements became eligible to a transfer equal to 50 % of regular parental leave benefits up until the child's second birthday. This is of no importance in the present analysis because we confine ourselves to study behavior of female dependent employees. Furthermore, the reform made it possible to take part-time parental leave, either between child's first and second birthday (by both parents at the same time) or between child's first and third birthday (only one parent or both parents alternating).

weeks within the last year in employment.

A further major reform in PL policies took place in 2002. The reform included three major changes. First, transfer payments (*Kinderbetreuungsgeld*) were increased to 410 EUR per month and granted for a maximum of 30 months (or 36 months if both parents were engaged in caring for the child). Furthermore, transfer payments become independent of previous work requirements (so also other previously non-covered group became eligible). Third, the earnings ceiling for losing transfer payments was raised considerable. Mothers could go on leave for 30 months and, during the leave period, earn labor income up to 14,600 EUR per year (during the period when benefits are drawn). This policy change was made public on August 7, 2001, and became effective for children born on or after January 1st 2002. In order to ensure equal treatment, parliament also allowed parents who were on parental leave on August 7, 2001, and gave birth after July 1st 2000 to i) extend a job protected leave until the child turned two years old (they had this option before but may not have used it because benefits dropped after 18 months), and ii) extend parental leave payments to 30 months (36 months if shared) provided that their annual income was below 14,600 EUR. If annual income exceeds this threshold, the benefit payment is completely withdrawn (i.e., payments are not phased out). While the increase in the earnings threshold for benefits eligibility allowed some post-July mothers to work while receiving benefits after month 18, we believe this is probably of second order in analyzing medium-run labor market outcomes. Indeed, when we study return-to-work decisions, we find that only 7.8 percent of the sample of post-July mothers make use of the possibility to return to work while still receiving benefits after 18 months of giving birth and that overall durations of time away from work increased as a result of the reform. The income threshold element of the reform, is therefore unlikely to be driving results on labor market outcomes in the medium-run. In practice, we see the 2002 policy change as effectively extending benefit payments of 2000 post-July mothers by 12 months with only 6 guaranteed by job protection.

3.2 Other fertility related family policies

Besides PL benefits, fertility-related family policies in Austria consist of a broad set of measures that we only briefly discuss here. Like in many other countries, there are special rules that protect mother and child around the period of confinement (which were initially adopted as protection from health-damaging work environments). This period of *maternity protection* lasts for 16 weeks (usually 8 weeks before and 8 weeks after the actual birth). During this period women are insured against the risk of dismissal and an associated transfer equal to the average wage rate over the last quarter prior to the birth. Formally, the PL period starts when the maternity protection period ends.

A further transfer to which parents are eligible are *child benefits* (*Familienbeihilfe*). There is universal eligibility to these benefits (meaning that all parents with sufficiently long residence in Austria are eligible). These benefits amounted to about 95 Euros per month for each child below age 10, and to 110 Euros per month for each child between ages 10 and 19). The tax system has *tax deductions for children* (*Kinderabsetzbeträge*), that increase with the number of children. Furthermore there is a *birth benefit* (*Geburtenbeihilfe*) of Euro 1090 that is paid out to mother in several steps upon medical inspections between the child's birth and its fourth birthday. The supply of *child care facilities* for small children is

rather limited. According to OECD (Employment Outlook 2001) the proportion of children under age 3 enrolled in child-care arrangements was only about 4 % in 1998 which is very low relative to international standards.³

While the most significant changes in fertility-related family policies during the 1990s concerned changes in PL legislation, several other minor changes were made with respect to other family policies. In 1997 the birth benefit was abolished. In 1998 there was a major effort by the central government to improve the supply of childcare facilities in public kindergartens (Kindergartenmilliarde). However, this increase in government spending was targeted towards the age group 4-6 rather than the very small children.

3.3 Behavioral predictions

We use a simple dynamic framework to examine how duration of PL benefits and job protection affects mothers' return-to-work decisions. We assume that women are heterogeneous with respect to the utility v of staying at home with the newborn child. In addition, they get a benefit payment of b for τ_b periods. Jobs last forever and differ only with respect to the wage rate. Under these assumptions, we can write the value of employment as follows

$$V_E(w) = w + \beta V_E(w)$$

Women have the option to return to their old employer within τ_o periods. Each period, women also get a new job offer with rate λ . This means that a woman who has earned w_o at her previous employer will have expected value from returning to work V_R after t periods on parental leave of

$$V_R(t|w_o) = \begin{cases} \max \{V_E(w_o), \lambda E_w[V_E(w)]\} & t \leq \tau_o \\ \lambda E_w[V_E(w)] & t > \tau_o \end{cases}$$

which is at least the value of employment offered by her previous job and the unconditional expected value of employment at a randomly selected job. Clearly, the expected value of returning to employment decreases discontinuously at the job protection threshold. This is for two reasons. First, the option of returning to the previous employer allows women to discard all new job offers that pay below the previous wage w_o . Second, new job offers are not deterministic. This means that the expected value from returning to employment is strictly higher at τ_o than one period later.

The value of being on parental leave t months after giving birth to a child is

$$V_P(t) = \nu + b(t) + \beta \max \{V_P(t+1), EV_R(t+1|w_o)\} \quad (1)$$

where $b(t) = b > 0$ if $t < \tau_b$ and $b(t) = 0$ otherwise. The value of being on parental leave at t is the flow value of being on parental leave plus the maximum remaining on parental leave or returning to work. Two

³For instance, the comparable number for the U.S. is 54 %, for Denmark, Norway and Sweden 64 %, 40 %, and 48 %, respectively. Germany, and southern European countries have similarly low levels of child care facilities for kids under age 3. These rates include both public and private child care provision such as group care in child-care centres, residential care, childminders based in their own home, care provided by person who are not a family-member (see OECD Employment Outlook 2001).

characteristics of the value of being on parental leave are crucial. First, the value of being on parental leave decreases over time as women approach the end of benefits and end of job protection because losing these benefits makes parental leave less valuable. Second, the value of being on parental leave drops discontinuously when benefits are exhausted and / or when job protection ends. Since the benefit $b(t)$ is discontinuous, it follows that the value of being on parental leave is discontinuous. Consider the case of losing job protection. Again, since the expected value of returning to employment is discontinuous, the value of being on parental leave also is. This means that both, exhausting the benefit and exhausting job protection create discontinuous changes in the value of being in parental leave.

What does this imply for the decision to return to work? Consider first the decision of leaving parental leave to a new employer. This transition rate depends on the job offer arrival rate as well as the probability of accepting the job offer. This can be written as

$$\theta_N(t|\nu) = \lambda \text{Prob}(V_E(w) \geq V_p(t))$$

so the hazard of leaving for a new employer informs about the value of being on parental leave relative to leaving for a new job. The decision to leave for a new employer is guided by a reservation wage rule. The reservation wage decreases monotonically as women approach exhaustion of either of the two measures and it will shift every time the value of being on parental leave shifts (van den Berg 1990). The return to new employer hazard can also exhibit spikes if women can negotiate delayed starting times (Boone and van Ours 2009). Spikes in going to a new employer can happen when benefits run out but not when employment protection ends.

What about the transition rate from parental leave to the previous employer? The subgroup at risk of returning to the old employer are those who were better off on parental leave in the previous period but no longer are in the current period. Among these, some women have received a job offer and left for a new job. The remaining women will return to the previous employer. The transition rate in the job protected period ($t < \tau_o$) is

$$\theta_o(t|\nu) = (1 - \lambda + \lambda \text{Prob}(V_E(w) < V_p(t|\nu))) \text{Prob}(V_p(t-1) \geq V_E(w_o) \geq V_p(t))$$

and it reflects the proportion that enjoyed being on parental leave more than working on the pre-birth job yesterday but no longer do so today. This exit rate measures how the value of parental leave changes through time. Moreover, the exit rate to the previous employer should be characterized by strong spikes whenever the value of remaining in parental leave changes discontinuously. The size of the spike is a measure of how strongly the value of remaining in parental leave changes. The transition rate to the pre-birth employer is low after τ_o . The return-to-old employer hazard will exhibit spikes both, when the benefit runs out and when employment protection ends.

Are there differences in terms of return-to-work behavior by pre-birth wage w_o ? Women earning a pre-birth wage close to the top of the wage distribution will face a stronger incentive to return to work early than women earning low pre-birth wages since the value of their pre-birth job is high. Moreover, losing employment protection will be more important to high wage women than low wage women. Conversely, losing the benefit will be more important to low wage women than to high wage women.

The upshot of this discussion is that the distribution of return-to-work times will be characterized by spikes that reflect the discontinuous changes in the value of remaining on parental leave associated with either benefits or job protection or both running out. Moreover, both extending benefit duration as well as extending job protection will shift the distribution of return to work times. Indeed, we expect that making parental leave more generous will lead to a monotone positive shift in the return to work time. We test these central insights using the series of Austrian parental leave reforms.

4 Data and Identification

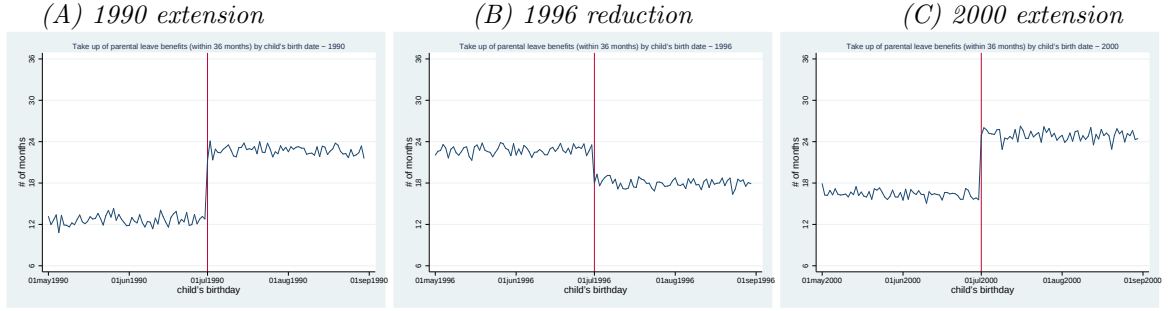
4.1 Data

We use data from the Austrian social security register (ASSD). The ASSD consists of administrative individual register data collecting information relevant for old-age social security benefits. As these benefits depend on individuals' earnings and employment histories, the data set reports individuals complete employment histories since 1972 for the universe of Austrian private sector workers. Furthermore, not only employment histories, but also time on childbearing and rearing (*Kinderersatzzeiten*) are relevant for old-age social security benefits. This is why the ASSD also reports high-quality information on the number of births by female employees with previous social security contributions.

The ASSD has several advantages which will be of particular importance for the empirical strategy developed below. First, the data set covers the *universe* of the private sector employees in Austria implying we can rely on large samples, even when very specific groups are considered. Second, the data reports, on a daily basis, the occurrence of a birth and take-up (and durations) of maternity and PL benefits since the year 1972. This allows us to determine precisely both the PL eligibility status as well as the maximum duration of PL. Third, as all employment and earnings over an individual's life cycle are reported in the data, we can look in a very detailed way at the effects of parental leave on the labor supply behavior of mothers over extended time periods. We have data on two years of labor market history prior to giving birth, as well as up to 15 years after birth. The data provide precise information on employment (at a daily basis) and earnings (subject to a top contribution ceiling). However, there is no information on hours worked, education or marital status.

We extract from the dataset all women that are potentially eligible for PL entitlements using the same criteria for all years. Since we are mostly interested in post-birth labor market outcomes of women interrupting their careers to go on PL, we applied a stricter criteria than the PL eligibility required by law, and restrict the sample to women employed in the year prior to giving birth. We further stratify the sample by parity and perform a separate analysis for women giving birth for the first time and for women giving birth at higher parities. 2005 is the last year available to us with earning records. We therefore limit the analysis on labor market performance to the fifth year after the child's birth to provide a common time period to analyze and compare the effects of the three reforms.

Figure 1: Months receiving parental leave benefits



Notes: This figure reports months receiving parental leave benefits within 36 months after giving birth to a child.

4.2 Econometric method

We use a *regression discontinuity design* to assess the effects of duration of PL benefits and job protection on mothers' return to work decisions and subsequent labor market performance. Let T denote the date of birth of a child, Y the labor market outcome of interest (e.g., time to return to work, employment status, earnings, etc.) and D a treatment indicator. Where $D = 1$ for mothers giving birth under the more generous policy regime (post-July 1st in 1990 and 2000 and pre-July 1st in 1996) and $D = 0$ otherwise.

Assignment to treatment is a discontinuous function of the date of birth T . That is, $D = I(T \geq t_0)$ for the 1990 and 2000 sample and $D = I(T < t_0)$ for the 1996 sample. Where t_0 is the day of policy change (July 1st of the relevant year). We draw two samples from our raw data. The comparison sample consists of women who gave birth under the least generous PL regime (i.e. between May 1 and June 30 in 1990 and 2000, and between July 1 and August 30 in 1996); the treated sample consists of women who gave birth under the more generous PL regime (i.e. between July 1 and August 30 in 1990 and 2000 and between May 1 and June 30 of 1996). Because the ASSD covers the universe of all individuals who, at some previous date, paid social security contributions, and because the ASSD also reports all births by these individuals, we end up with a sufficiently large data set.

While our data set does not report the PL eligibility status directly, we observe actual PL take-up. Thus, we can investigate how strongly the duration of PL changes as a function of date of birth. Figure 1 reports average durations of benefit receipt within the first three years after child's birth for mothers giving birth between May 1 and August 30 for each of the reform years. The data show very clearly that, benefits take-up are highly responsive to changes in PL regulations. For example, mothers who gave birth before July 1990 received PL benefits for roughly 13 months. In contrast, the corresponding number for mothers who gave birth after June 1990 is almost twice as high, on average about 23 months. Importantly for our empirical strategy, there is no trend in average PL durations within the period before the PL change and within the period after the PL change for none of the three years of policy changes.⁴ This evidence shows that assignment to treatment changed discontinuously between June 30 and July 1.

Thus $E(D|T = t_0 + \epsilon) = 1$ and $E(D|T = t_0 - \epsilon) = 0$, i.e. assignment to treatment is "sharp" in

⁴Note that take-up of parental leave is itself an endogenous variable. However, as most mothers use up the eligibility period, this indicator is informative on the treatment intensity.

the terminology of Hahn et al. (2001).⁵ An intuitively appealing contrast that infers the causal effect of extended PL benefits is the following

$$E(Y|T = t_0 + \epsilon) - E(Y|T = t_0 - \epsilon)$$

It can be shown that for $\epsilon > 0$ sufficiently small, this contrast identifies the average effect of offering extended PL benefits on the outcome of interest (Hahn et al. 2001).⁶ In the empirical analysis we report results based on $\epsilon = 61$ calendar days. More precisely, we compare mothers who gave birth in July/August to mothers who gave birth in May/June.

There are several reasons why a comparison between mothers giving birth in May/June and mothers giving birth in July/August is informative on the *causal* effect of duration of PL benefits. First, observed characteristics of the two groups are very similar. This is what we would expect if assignment to treatment is almost as good as randomly assigned. Table 1 shows that the two groups are quite comparable in terms of their pre-birth background characteristics and pre-birth labor market outcomes for the three policy years with the exception of a few characteristics such as age in 1990, for instance. Differences get smaller, however, once we condition on age. Importantly, pre-birth job characteristics, like average earnings per day⁷ and white collar employment are almost identical between the two groups. While the two groups are very similar, they are not completely identical. Our analysis below will therefore use regression analysis to control for these individual pre-birth characteristics.

A *second reason* that justifies the validity of our identification strategy refers to the way the treatment status is assigned to individuals. As we focus on births that took place during a relatively short period (from May until August), this comes close to a process of random assignment of treatment status to individuals unless women could plan births during this period. To assess the plausibility of this, we performed a content analysis of the major Austrian newspapers which showed that the public discussion of the 1990 reform started in November 11, 1989 – seven and a half months prior to the final implementation of the change. At that time it was neither clear whether, when, and how extended PL would actually be introduced. While, on November 15, 1989, there was the proposal that extended PL should be introduced on July 1, 1990, on November 16, 1989, 21 pro-business members of the parliament announced that they would block a law extending PL. On January 5, 1990, the headline of an article of the "Neue AZ" regarding family policy announced that the policy of "Extension of PL Has Failed". It took until April 5, 1990, that the press finally declared that the ruling coalition (social-democrats and conservatives) had

⁵Note that in the analysis, we treat time as discrete with the smallest time unit equal to 1 day. This guarantees, that the density of births at t_0 is non-zero.

⁶When assignment to treatment is sharp, $E(Y|t_0 = t_0 + \epsilon) - E(Y|T = t_0 - \epsilon) = E(Y_1 - Y_0|T = t_0 + \epsilon) + E(Y_0|T = t_0 + \epsilon) - E(Y_0|T = t_0 - \epsilon)$ with Y_0 denoting the non-treatment outcome $D = 0$ and Y_1 denoting the treatment outcome $D = 1$. For $\epsilon > 0$ sufficiently small, this contrast identifies the average effect of treatment at calendar time $t_0 - E(Y_1 - Y_0|T = t_0)$ – provided that $E(Y_0|T)$ is continuous in t_0 .

There are some differences in pre-birth labor market outcomes in 1990. However, these differences are small relative to the outcome means and are of inconsistent signs across outcomes. For example, post-July mothers in 1990 seem to have pre-birth daily earnings that are about 1% higher relative to pre-July mothers. On the other hand, they are less likely to work in white collar occupations. In 1996 and 2000, we see no differences in pre-wage earnings.

Table 1: Descriptive Statistics of Pre-Birth Characteristics and Labor Market Performance: Treated and Comparison Groups

	1990				1996				2000			
	pre (1)	post (2)	raw (3)	ctr (4)	pre (5)	post (6)	raw (7)	ctr (8)	pre (9)	post (10)	raw (11)	ctr (12)
age	25.12	25.34	0.221 *** (0.082)		26.91	26.90	-0.012 (0.088)		27.66	27.53	-0.127 (0.102)	
A. Labor market history												
Tenure (years)	3.51	3.59	0.077 (0.064)	0.006 (0.057)	3.54	3.55	0.006 (0.067)	0.010 (0.062)	3.86	3.69	-0.171 ** (0.074)	-0.126 * (0.069)
Experience (years)	6.17	6.29	0.121 (0.073)	0.004 (0.053)	6.86	6.76	-0.103 (0.082)	-0.095 (0.067)	7.42	7.26	-0.161 * (0.093)	-0.071 (0.073)
Unemployment (years)	0.223	0.242	0.019 ** (0.009)	0.018 ** (0.009)	0.372	0.383	0.011 (0.013)	0.011 (0.013)	0.473	0.464	-0.009 (0.016)	-0.010 (0.016)
Avg. daily Earnings	33.36	35.19	1.833 *** (0.532)	1.514 *** (0.505)	39.80	39.91	0.108 (0.564)	0.139 (0.548)	47.26	44.62	-2.638 (2.905)	-2.274 (2.855)
B. One year before birth												
White collar	0.597	0.579	-0.018 * (0.009)	-0.021 ** (0.009)	0.657	0.633	-0.024 ** (0.009)	-0.024 ** (0.009)	0.689	0.683	-0.006 (0.010)	-0.002 (0.010)
Daily earnings	41.78	42.58	0.795 *** (0.313)	0.512 * (0.267)	49.83	49.88	0.046 (0.384)	0.094 (0.341)	54.16	54.30	0.142 (0.469)	0.595 (0.405)
Observations	5'143	5'672			5'104	5'410			4'477	4'626		

Notes: Column (3) report raw differences between groups. Columns (4) report differences after controlling for age.

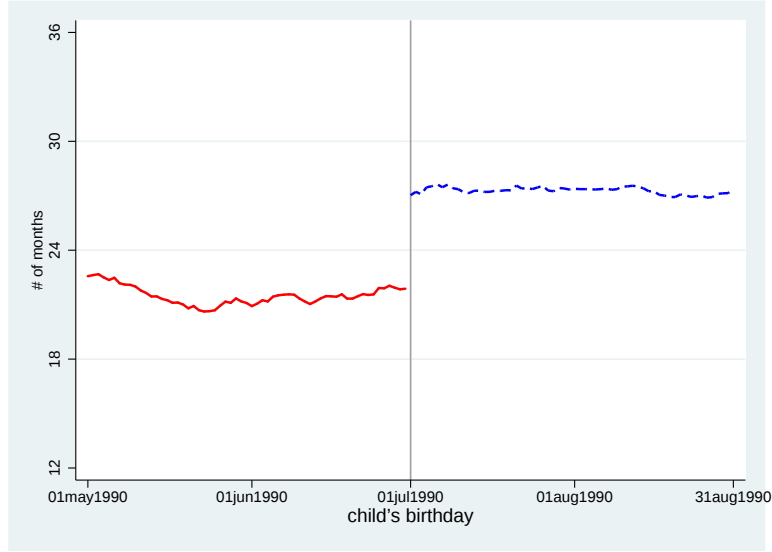
found a political compromise. In sum, the chronology of the public PL reform debate suggests that it was unclear until 3 months prior to the policy change whether and under which conditions the PL would be extended. Hence it is impossible that the fertility decisions that lead to birth of child between May and August 1990 were influenced by parents' anticipation of the July 1990 policy change. The 1996 reform followed a similar political history with high uncertainty regarding its details and likelihood of implementation near the last months before it took effect. The 2000 reform was enacted retrospectively in August 2001 making impossible for the mothers to time births.

Even if the 1990 and 1996 reforms were not anticipated by the time of conception, some parents could still self-select into the more generous PL regimes by rescheduling planned cesarean sections or induced labor. We assess the possibility of such manipulation in two ways. First, we analyzed the frequency of births by date during the months of May-August for the years of the policy changes and did not find any evidence of a spike in births on the days surrounding July 1st. Moreover, we find that the distribution of births by date of birth in years of policy changes highly resembles the distribution observed in years where there was no policy change. Second, because manipulation of birth dates is more likely to exist around the reform date, we checked for the sensitivity of our results by excluding mothers who gave birth one week before and one week after July 1st. The results were virtually identical to those obtained using the full sample and reported below.

5 Return-to-work decisions

In what follows we first analyze the effects of extending both benefit and job protection duration on return to work decisions (1990 reform). We then discuss the separate role of benefits and job protection analyzing the 1996 and 2000 reforms. We report here results based on mothers of first born children. Results for mothers at higher parities are qualitative similar.

Figure 2: Does Parental Leave Affect Return to Work?



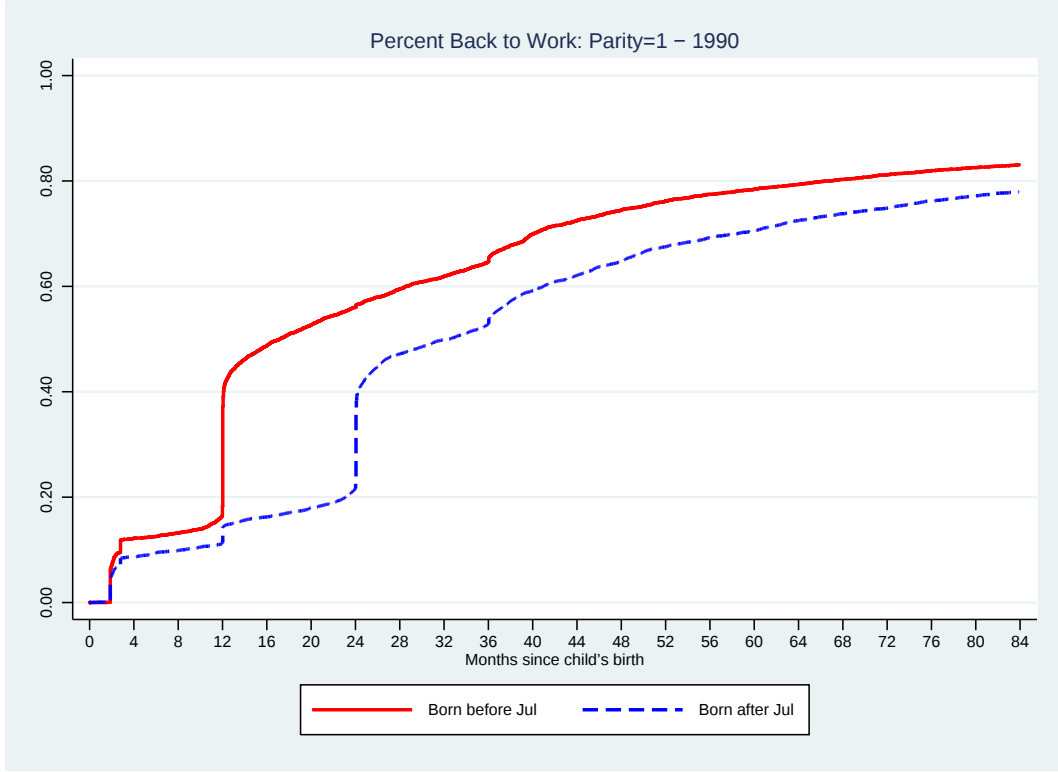
Notes: This figure reports return to work for mothers giving birth in May/June 1990 (eligible for 12 months of benefits and job protection) and mothers giving birth in July/August 1990 (eligible for 24 months of benefits and job protection). Employment refers to the number of months employed and working within 36 months after giving birth to the child.

5.1 Extending benefits and job protection duration

Figure 2 shows the average duration (in months) of time on leave by day of birth. We censor the time to return to work at 36 months for women who return after 36 months to focus on the direct effects generated by the reform. Mothers who gave birth before July 1st 1990 take, on average, 21 months until return to work. Time spent at home after child's birth is clearly longer than the 12 months provided by the PL mandate, suggesting that a large proportion of mothers fully exhaust the leave period and do not return to work even after PL benefits and job protection end. The 1990 reform delays return to work substantially. Mothers who are eligible for 24 months of benefits and job protection (children born after July 1st) return to work after 27 months – about 6 months later than the group eligible for 12 months of parental leave. The average time until return to work is again higher than the duration of PL mandates suggesting that there is still a fraction of mothers returning to work after benefits and job protection end even under this more generous regime.

Figure 3 shows the proportion returning to work at or before month t after birth. Roughly 10 percent of the pre-reform women return to work 3-4 months after birth. Thereafter, the proportion returning to work increases gradually reaching a level of 18 percent before the child's first birthday. This means that more than 80 % of mothers of newborn children fully exhaust parental leave. On the child's first birthday, the proportion back at work increases sharply to a bit more than 40 percent. Thereafter the proportion back at work increases steadily reaching a level of almost 80 percent after 5 years. The graph clearly confirms the key prediction of the theoretical framework. Time-delimited parental leave benefits and job protection introduce a sharp change in return to work behavior around the time when benefits

Figure 3: Return-to-work with extended benefits



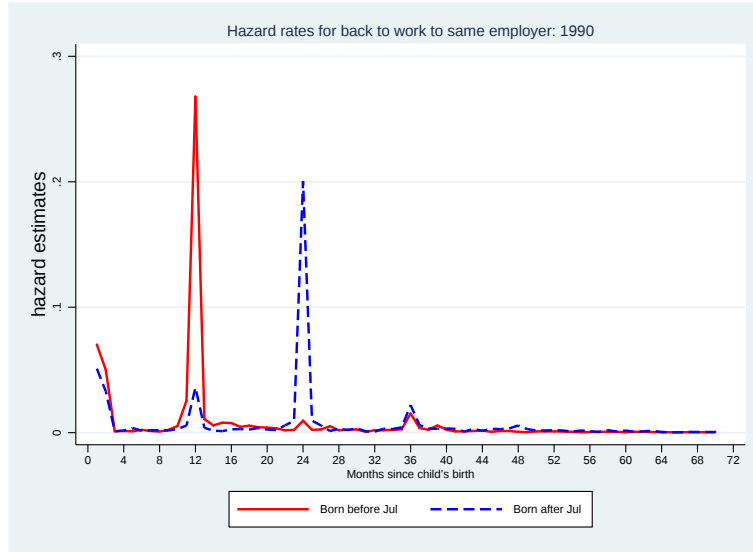
Notes: This figure shows the proportion who have returned to work on or before t months after child's birth. Women giving birth to the child before July 1990 are eligible for 12 months of job protected and paid leave. Women giving birth to the child after July 1990 are eligible for 24 months of job protected leave.

run out.

How does extending parental leave duration affect return to work? Mother's return to work behavior before the child's first birthday follows a similar pattern in the group of mothers giving birth before and after the policy change. A sizable gap between the behavior of pre- and post-July mothers appears after the first 12 months when the two groups of women face a different policy environment. While at the term of 12 months a significant share of pre-reform mothers return to work, a sizeable share of the post-reform women delay return-to-work and exhaust the two years of extended leave benefits. After the second birthday of the child, there is a steady flow of post-reform women returning to work. Interestingly, the extension of PL regulations by 12 months shifts the return to work profile of mothers by about 12 months while preserving its original shape almost completely. This is even the case, for the share that returns to work after benefits have been exhausted. Another interesting finding is that the share of women who returned to work within 72 months is still lower (by about 6 percentage points) for the post-reform group than for the pre-reform group. We will discuss in section 6 that this does not translate into a medium-run reduction in earnings capacity.

How do parental leave provisions affect return-to-work decisions to pre-birth employers? Figure 4 shows the probability of returning to work to the same employer for those who have not returned up

Figure 4: Returning to Same Employer with Extended Benefits



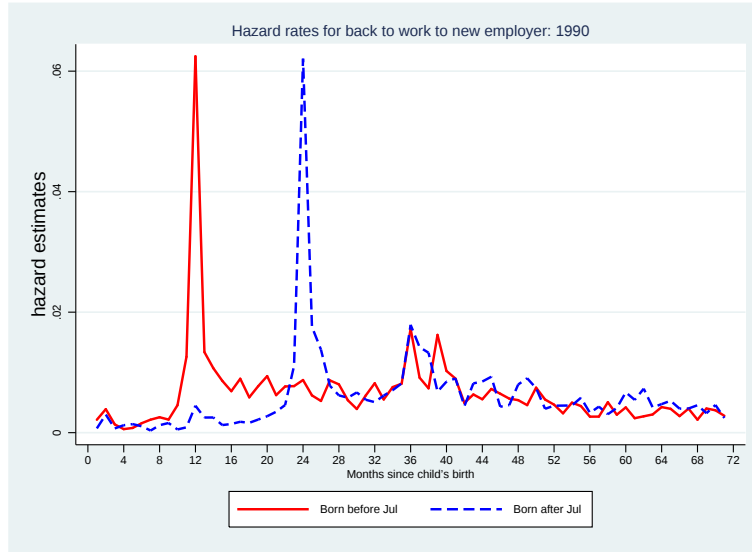
Notes: This figure shows the probability of returning to the same employer conditional on not having returned to work until t month after child's birth. Women giving birth to the child before July 1990 are eligible for 12 months of job protected and paid leave. Women giving birth to the child after July 1990 are eligible for 24 months of job protected leave.

to month t . Initially, about 8 percent of the women return to the same employer within the first 4 months. This can be explained by maternity leave protection ending typically about 2 months after birth for normal births but up to 4 months after birth for births involving low birth weight, twins, etc. The probability of returning to the pre-birth employer is then very low until 10 months after birth. There is a dramatic increase in the hazard of returning to the same employer in months 11 to 13 after giving birth peaking at 27 percent in month 12 – exactly when parental leave benefits and job protection end. Thereafter, the probability of returning to the same employer decreases but remains higher than the pre-exhaustion level. There are further small spikes at 24 and 36 months which refer to women taking part-time parental leave. The probability of returning to the same employer is basically zero after 40 months.

Extending parental leave duration from 12 to 24 months changes the timing of return to the same employer dramatically. The spike at 12 months decreases strongly from about 27 percent to less than 5 percent. In contrast, about 20 percent of the women who have not returned before their child's second birthday decide to do so on their child's second birthday – exactly when parental leave is exhausted. This shows that losing benefits and job protection is important in shaping women's decision to return their pre-birth employer.

How do parental leave rules affect decisions to change jobs after giving birth? Figure 5 shows how the probability of taking a job with a new employer for those women who have not returned to work yet. With 12 months of parental leave, the transition rate is initially close to zero percent but it increases dramatically 12 months after birth to a level of 6 percent. Thereafter, the probability of switching to a

Figure 5: Changing Employers with Extended Benefits



Notes: This figure shows the probability of returning to work at a new employer conditional on not having returned to work until t month after child's birth. Women giving birth to the child before July 1990 are eligible for 12 months of job protected and paid leave. Women giving birth to the child after July 1990 are eligible for 24 months of job protected leave.

new job after birth remains at a level of about 1 percent per month. Extending parental leave benefits introduces a shift in the transition rates to a new employer. The transition rate to a new employer decreases until 20 months after birth. Again, when benefits run out there is a strong spike of about 6 percent in returning to a new employer. Thereafter the transition rate decreases to about the same level as with 12 months of parental leave.

Does job extended job protection change the proportion returning to the same employer? Figure 6 shows the probability of returning to the same job by time of labor market re-entry. Job protection is important in return-to-work decisions. Mothers who return before job protection ends are more likely to return to the same employer than mothers who re-enter after job protection ends. Mothers returning-to-work within the protected period have a 80 % chance of going back to their pre-birth employer. In contrast, after job protection has ended, the chances of going back to the previous employer decrease. Interestingly, extending the job protection period sustains the probability of going back to the same previous employer. However, we show in section 6 that it does affect the chances of preserving the first post-birth job for a longer time.

5.2 Benefits vs. Job Protection

What is the relative importance of parental leave benefits in comparison with job protection? The 1996 reform allows discussing the value of paid job protected leave as compared to unpaid job protected leave. The 2000 reform extends benefit duration by 12 months thus adding 6 months of paid protected leave and 6 months of paid but unprotected leave. This is in contrast to the 1990 reform which added 12 months of

Figure 6: Job protection

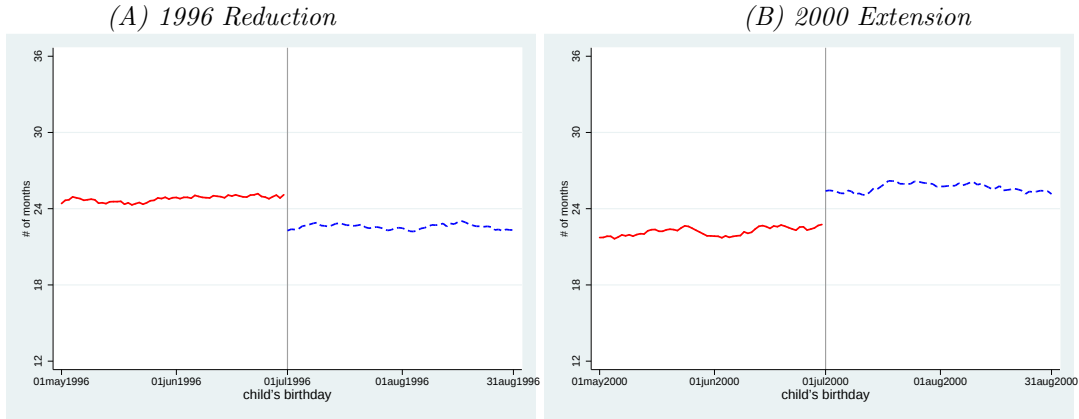


Notes: This figure shows the proportion who have returned to the same previous employer out of all who have returned on or before month t . Women giving birth to the child before July 1990 are eligible for 12 months of job protected and paid leave. Women giving birth to the child after July 1990 are eligible for 24 months of job protected leave.

paid protected leave. The comparison of the impacts of these reforms, therefore, allows disentangling the role of job protection and PL benefits. Figure 8 shows the effects of the 1996 and 2000 reforms on months until return to work (censored at 36 months). Clearly, reducing the benefit duration speeds up return to work. Women with 24 months of benefit duration (children born before July 1st 1996) spend about 25 months at home before returning to work. In contrast, women with 18 months of benefit duration (children born on or after July 1st 1996) spend on average 23 months at home before return to work. The reduction of 6 months of benefits reduced time until back to work by 2 months. The effect of 6 month reduction of benefits is less than half of the effect we observe when benefits and job protection were extended by 12 months. This result suggests that job protection (even if unpaid) is important for women's return to work decisions. The 2000 extension of benefit duration delays return to work. Women who give birth to their child before July 1 return to work after 22 months. In contrast, women who give birth to their child after July 1 return to work after 25 months.

How do these changes in benefit duration affect return-to-work decisions? Figure 8 shows the effect of shortening the benefit duration from 24 months to 18 months while keeping job protection at 24 months. The proportion of pre-reform mothers returning to work is basically zero in the first two months, increases somewhat to about 12-20 % for the first 24 months after the date of birth of the first child. At 24 months (where both benefits and job protection end), the share returning-to-work jumps to a bit more than 50 %. How does shortening benefit duration affect this? The share of post-reform mothers returning to work follows a very similar pattern in the first 18 months (a bit lower in the first 16 months). There is a significant jump at 18 months (when benefits end), and a further jump at 24 months (when job

Figure 7: Benefits vs Job Protection in Return to Work



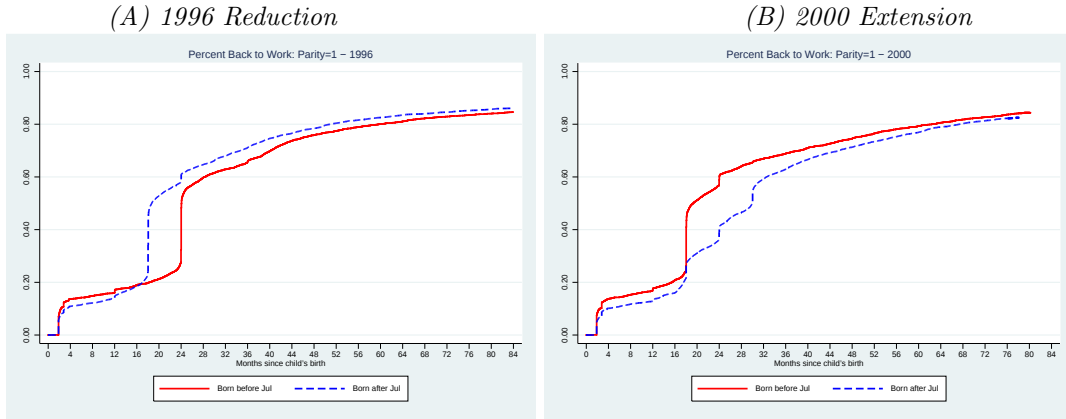
Notes: Figure A reports return to work for mothers giving birth in May/June 1996 (eligible for 24 months of benefits and job protection) and mothers giving birth in July/August 1996 (eligible for 12 months of benefits and job protection). Figure B reports employment for mothers giving birth in May/June 2000 (eligible for 18 months of benefits and job protection) and mothers giving birth in July/August 2000 (eligible for 30 months of benefits and job protection). Employment refers to the number of months employed and working within 36 months after giving birth to the child.

protection ends). About 26% of the mothers return to work at the exact exhaustion of benefits and 4% of the mothers are clearly responding to the end of the job protection period. This finding suggest that while benefits and job protection have both independent effects in delaying women's return to work, the duration of benefits appear to be more significant. After 84 months, the share returning to work is almost the same in the pre and post reform group although we still observe an advantage of a one percentage point in favor of the group who faced the less generous regime.

How does reducing duration of parental leave payments affect return to work decisions? Figure 8 provides information on the proportion back to work by time since birth. This figure shows the effect of extending benefits from 18 to 30 months while keeping job protection at 24 months. Clearly, the pre-reform cohort (with children born before July 1st 2000) displays a return-to-work pattern that is consistent with the structure of their parental leave system. About 15 % returning after 2 months, with a strong increase to almost 50 % after 18 months, and a further increase after 24 months. Interestingly, the post-reform cohort has slightly lower return to work rates in the first 18 months. There is a sizeable increase in the share returning to work of about 8 % at 18 months. This reflects the impact of lifting the earnings constraint. The share returning at 24 months when job protection ends is similar to the corresponding share in the pre-reform group. There is a further sizeable group returning at 30 months when benefits end suggesting that duration of benefits payment even when not coupled with job protection, induced some women to delay their return to work. The share having returned to work after 30 months is *lower* in the group with more generous parental leave.

How does changing the benefit duration affect decisions to return to the same employer? Figure 9

Figure 8: Benefits vs job protection: 1996 and 2000

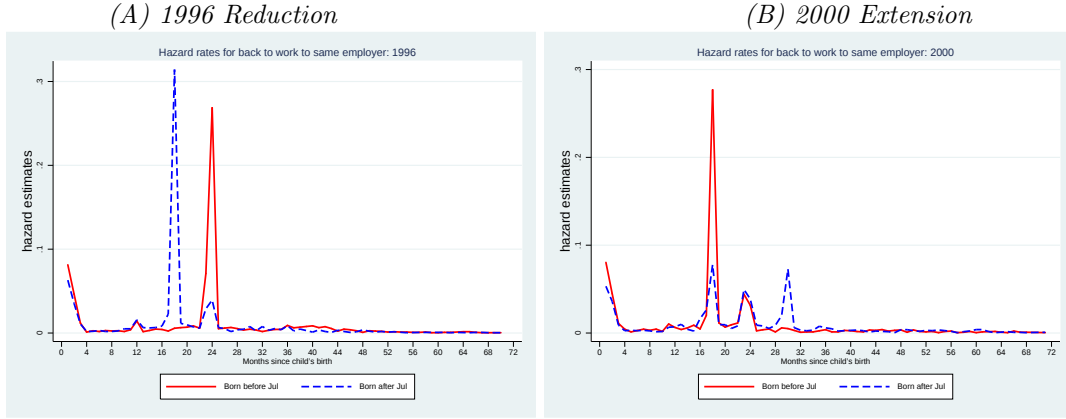


Notes: This figure shows the proportion who have returned to work on or before t months after child's birth. Women giving birth to the child before July 1996 are eligible for 24 months of job protected and paid leave. Women giving birth to the child after July 1996 are eligible for 18 months of paid job protected leave, and 6 months of unpaid job protected leave. Women giving birth to the child before July 2000 are eligible for 18 months of paid job protected leave, and 6 months of unpaid job protected leave. Women giving birth to the child after July 2000 are eligible for 24 months of paid job protected leave, and 6 months of paid leave without job protection.

shows the probability of returning to the pre-birth job as a function of time since birth. Prior to the 1996 reform, the probability of returning to the same employer is close to zero before parental leave benefit exhaustion, it jumps to 27 percent at benefit exhaustion and returns to a level close to zero percent thereafter. The 1996 reform shifts the date of benefit exhaustion forward to 18 months. This reform introduces a spike in return to the same employer of 32 percent 18 months after giving birth to the child – exactly when the benefits run out. Moreover, there is a second smaller spike in returning to the pre-birth employer at 24 months – when job protection runs out. This indicates that both benefits and job protection are important. Yet, as the size of the spike indicates, losing benefits while being job protected is more important in return to work decisions than losing job protection without benefits. How does the 2000 reform modify decisions of returning to the pre-birth employer? Adding an extra 12 months of benefits reduces the spike in return to work at 18 months from 27 percent to about 7 percent. Interestingly, the spike at the end of job protection (24 months after birthdate) remains unaffected by the 2000 reform. This suggests that losing job protection with benefits is as important than losing job protection without benefits. In contrast, benefit exhaustion at 30 months after birth introduce a new spike – of about 7 percent – in the transition rate of leaving parental leave for the same pre-birth employer. This is surprising since some employers appear to be willing to keep positions even beyond the period covered by job protection.

How do parental leave benefits affect transitions to new jobs? The 1996 reform shifts the spike in returning to new jobs from 24 to 18 months. Interestingly, the proportion leaving parental leave for a

Figure 9: Returning to the Same Employer and Parental Leave Benefits

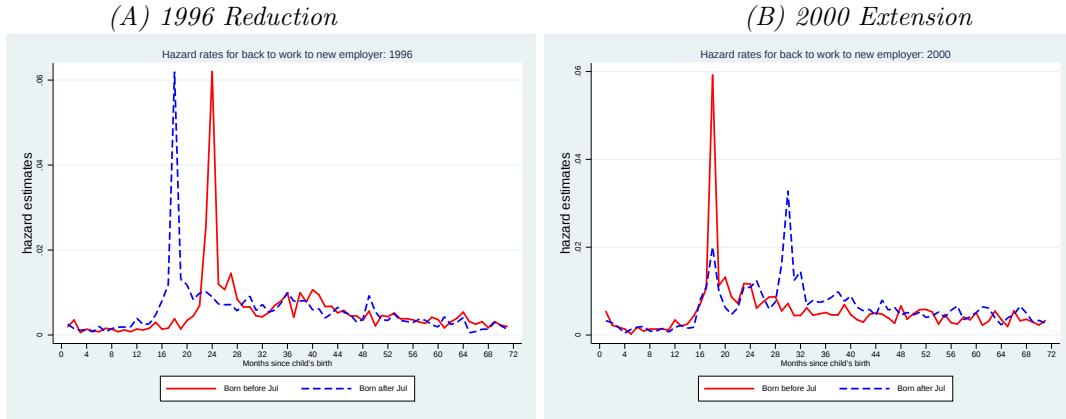


Notes: This figure shows the proportion who have returned to the same employer on or before t months after child's birth. Women giving birth to the child before July 1996 are eligible for 24 months of job protected and paid leave. Women giving birth to the child after July 1996 are eligible for 18 months of paid job protected leave, and 6 months of unpaid job protected leave. Women giving birth to the child before July 2000 are eligible for 18 months of paid job protected leave, and 6 months of unpaid job protected leave. Women giving birth to the child after July 2000 are eligible for 24 months of paid job protected leave, and 6 months of paid leave without job protection.

new job stands at 6 percent both when benefits and job protection end (before July 1996) and when only benefits end (after July 1996). This suggests that, as expected, job protection in itself does not affect return to work decisions to new jobs. Consistent with this, there is no spike in return to work probability when job protection ends (at 24 months) for the group giving birth in July-August 1996. What are the effects of the 12 extra months of benefits added by the 2000 reform? The first effect is that the spike at 18 months is reduced from 6 percent to 2 percent (referring to women who take up work along with parental leave). Moreover, the 2000 reform introduces a new spike in returning to a new employer at 30 months, when benefits end. Again, decisions to change employers are not affected by the end of job protection. Note, however, that the transition rate to new jobs is larger after job protection runs out with extended benefits. This last finding suggests that the extended period of benefits introduced by the 2000 reform induced some women to stay on leave beyond the period of job protection increasing the probability that they switch to new employers when returning to work. The loss of the guarantee to return to their pre-birth job is likely harm these women; on the other hand, a longer period on leave and with benefits might provide them more time to search for a better job. We investigate these issues in the next section.

How do changes in the duration of allowance payments affect the proportion of mothers returning to their pre-birth employer? The 6 month reduction in duration of benefits payments of 1996 shifts the profile of return to pre-birth employers by about 6 months. The pre- and post-reform profiles almost converge once the period of benefits and job protection end for both regimes. This means that mothers

Figure 10: Changing Employers and Parental Leave Benefits



Notes: This figure shows the proportion who return to work to a new employer on or before t months after child's birth. Women giving birth to the child before July 1996 are eligible for 24 months of job protected and paid leave. Women giving birth to the child after July 1996 are eligible for 18 months of paid job protected leave, and 6 months of unpaid job protected leave. Women giving birth to the child before July 2000 are eligible for 18 months of paid job protected leave, and 6 months of unpaid job protected leave. Women giving birth to the child after July 2000 are eligible for 24 months of paid job protected leave, and 6 months of paid leave without job protection.

facing a regime with reduced duration of benefits but equal duration of job protection return to work earlier but are equally likely to return to their pre-birth employers. We will turn back to this point in the next section where we examine the share working for their pre-birth employer 5 years after giving birth.

In contrast to the pattern observed for the 1996 reform, the 2000 reform did affect the likelihood of returning to pre-birth employer. In this case, there is a clear divergence in the proportion who return to the pre-birth employer that begins after the end of the job protection period and becomes more evident after 30 months where a significant proportion of post-reform mothers return to work due to the exhaustion of the benefit payments. This is consistent with the evidence presented in Figure 10 which shows higher transition rates to new employers in the post July 2000 cohort compared to the pre July cohort.

Our descriptive analysis of the return-to-work process shows that women are highly responsive to changes in duration of parental leave benefits and job protection. Both policy instruments play an independent role in shaping women's return to work decisions. Both, end of job protection and end of benefits produce sharp spikes in the return-to-work distributions. These are consistent with sharp changes in the value of remaining on parental leave. The following section discusses the role of parental leave related work interruptions for post-birth labor market success.

Figure 11: Proportion returning to pre-birth employer



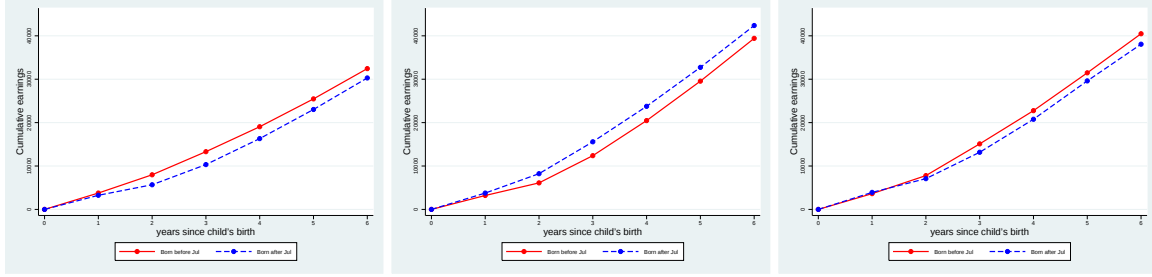
6 Medium-run impacts on labor market outcomes

The purpose of this section is to discuss the medium run effects of parental leave on mothers labor market performance after childbirth. We focus on women giving birth to their first child at the time of the policy change and defer the analysis for women giving birth at higher parities to the last part of the paper.

Table 2 reports controlled contrasts on (A) cumulative outcomes from birth, and (B) outcomes observed 5 years after birth. In all cases, estimates contrast the cohort with the more generous leave (post-July in 1990 and 2000 and pre-July in 1996) to the cohort with the more restricted leave (pre-July in 1990 and 2000 and post-july in 1996). The first row in Table 2 measures take up of parental leave benefits. Clearly, changes to the duration of parental leave benefits translate almost one for one into changes in parental leave benefit receipt. In 1990, benefit receipt increase by 10.9 months with the introduction of the more generous reform, the difference for 1996 is 4.8 months, and in 2000, the difference in the duration of benefits receipt between the more and less generous regime is 9.1 months. The second row reports effects on cumulative earnings from child's birth until the end of year 5. Women with access to extended parental leave experienced earnings losses over the first five years after the child's birth. Losses lie between 2000-3300 EUR for the three reforms. Interestingly, the reduction in cumulative earnings per additional month of benefit receipt is 254 EUR for the 1990 reform, 687 EUR for 1996, and 224 EUR for 2000 while the additional income received due to PL benefits payments is 338, 404, and 407 EUR respectively. Clearly, the 1990 and 2000 reforms are financially attractive for mothers whereas the 1996 leads to some losses in cumulative income. Why does staying on parental leave pay?

To shed light on this important issue, Figure 12 reports cumulative earnings by year since birth for the pre- and post-July groups of mothers. These figures indicate that pre- and post-July mothers have similar earnings for the first year after the child's birth. During this year, most mothers are on leave and those who work, have a similar labor market performance. Cumulative earnings of pre- and post-July groups diverge starting from the child's first birthday. This is the period where both groups of mothers face different parental leave regimes. For the 1990 and 1996 reforms, there is a disadvantage in earnings accumulated between year 1 and 2 for the group with a parental leave duration of 24 months. Clearly, the disadvantage in cumulative earnings is due to forgone income while mothers are on leave. Interestingly,

Figure 12: Cumulative Earnings Since Birth



Notes: This figure reports average cumulative earnings (coding earnings as zero if a women does not work) by time since birth.

after year 2, pre- and post- July mothers follow the same trajectory of income accumulation. This finding suggests that while the extended leave regime generates a one-time income loss due to delayed re-entry to work, it does not have medium-term consequences on women's earnings capacity.

The evolution of earnings in 2000 follows a similar pattern with the exception that a loss in cumulative earnings for the group in the extended leave regime (post-July) is also evident between years 2 and 3 of child's birthday. This is in line with the leave reform which extended benefits until month 30 therefore delaying return to work of post-July mothers.

How does extended parental leave affect return to work (right censored 72 months from birth)? Table 2 row three indicates that the 1990 extension by 12 months increases return-to-work by 8.9 months whereas both the 1996 and 2000 reform extend return-to-work by 3.3 or 4.3 months respectively. Turning to work experience (row four), we see that the 1990 reform reduces work experience by 3.1 months, the 1996 reform by 2.2 months, and the 2000 reform, reduces experience by 1.8 months.⁸ Interestingly, while extension of leave regulations significantly prolonged the time until return to work, the loss in work experience was much smaller. Why doesn't extended parental leave crowd out work experience one-for-one? It seems that mothers under the less generous regimes of PL return to work earlier but have less stable employment immediately after birth. Moreover, mothers under the less generous regimes compensate it with higher participation rates in other social insurance programs, such as unemployment insurance, which also provide income replacement while not employed. Indeed, mothers who face the less generous PL regimes claim 3 additional months of unemployment benefits in 1990 and almost one additional month in 1996 and 2000 relative to their counterparts in the more generous regime.⁹

Another interesting finding is that despite the negative impacts of the extended leave regimes on work experience, tenure with the current employer is not significantly affected by neither the 1990 nor the 1996 reforms. In contrast, tenure is reduced significantly after the 2000 reform. This striking results can be explained by the impacts of each reform on the likelihood of working with the pre-birth employer in year 5 after birth reported in row 6 of the table. About 40 percent of the women who are working in year 5, do so with their previous employer. Women in the more generous PL regimes of 1990 and 1996 appear to

⁸Further estimates indicate that experience losses are concentrated in the first three years.

⁹Unemployment insurance is conditional on work experience prior to claiming benefits and treats receipt of parental leave as work experience. Most of the mothers in our sample are eligible for unemployment benefit receipt.

be more likely to work for their pre-birth employer, by 4.2 percentage points in 1990 and 2.9 percentage points in 1996. Note that despite the fact that the longer leave regimes of 1990 and 1996 did not affect the likelihood of returning to the same pre-birth employer, they ensured a longer duration of post-birth jobs, which in turn, increased the likelihood of keeping initial first post-birth jobs 5 years after birth. A further exploration of this issue reveals that mothers giving birth in the less generous regimes of 1990 and 1996 had less stable work histories within the first 36 months after giving birth. In contrast, to the results for 1990 and 1996, we do not observe that women in the more generous regime of 2000 are more likely to work for their pre-birth employer in year 5. If anything, it seems that the probability is lower, though not statistically significant.

Panel B in Table 2 reports medium-term effects on employment and earnings capacity. Interestingly, despite delaying return to work, the more generous leave regimes of post-July 1990 and pre-July 1996 do not appear to have negative effects on employment rates in year 5 after birth. This is even more striking given that return to work profiles plotted in Figures 3 and 8 show that a slightly larger proportion of women in the more generous regimes were still less likely to have returned to work even after 84 months of giving birth. A further examination of this issue reveals that some of the mothers who gave birth in the less generous regimes returned to work immediately after exhaustion of benefits but only for a short period of time. Consistent with this, we also find no differences in daily earnings at year 5 for mothers affected by the 1990 and 1996 reforms.

In contrast, the 2000 reform appears to have a negative effect on earnings in year 5 after birth. Women who took longer leaves in 2000, earn about 1.3 EUR less per day relative to their counterparts with shorter leaves. This is an earnings reduction of 6% relative the outcome mean of the comparison group (21.7 EUR). There seems to be also a small reduction in employment rates of about 1.7 percentage points relative to an outcome mean of 49%, although the effect is only marginally significant ($t=-1.61$).

We now turn to discuss the effects on daily wages in year 5 and wage growth between one year prior to giving birth to year 5 after birth. The key potential challenge in examining wage effects, is selection into employment. Yet, as Figure 13 documents, there is no differential selection into employment between pre- and post-July mothers once both groups have exhausted their respective parental leave provisions. This implies that the comparison of daily wages of these groups is informative in the sense that this contrast is not reflecting underlying differences in pre-birth characteristics across groups. Interestingly, there is a positive effect on the daily wage 5 years after giving birth for the 1990 reform. Women giving birth under the more generous PL regime earn 93 Euro cents more than women subjected to the short leave regime. The picture is similar for the 1996 reform, albeit not statistically significant. The 2000 reform seems, however, to have a negative effect of daily wages of 74 Euro cents but not statistically significantly different from zero.

We also investigate the effects of longer leaves on wage growth from one year prior to birth to year 5 after birth. Women who give birth to their first child experience sizeable reductions in daily wages, between 9.8 percent in 1990 up to 29.2 percent in 2000. Recall, however, that daily wages refer to earnings per day. Wage growth therefore reflects both, change in the wage level and change in hours (with the latter probably being more important than the former). Results indicate that the 1990 reform has a

Table 2: Effects on Post-Birth Labor Market Outcomes

	1990 reform	1996 reform	2000 reform
A. Cumulative outcomes			
months receiving PL benefits	10.830 *** (0.230) [19.9]	4.796 *** (0.186) [22.9]	9.361 *** (0.163) [17.1]
Cumulative income since child's birth	-2'572 *** (618) [32445]	-3'180 *** (729) [42375]	-2'654 *** (787) [40480]
Months until return to work (censored at t=72)	8.818 *** (0.447) [30.1]	3.311 *** (0.412) [29.8]	4.263 *** (0.461) [30.8]
Experience since child's birth	-3.058 *** (0.371) [22.6]	-2.223 *** (0.376) [26.7]	-1.941 *** (0.405) [25.2]
Total tenure	1.236 (1.263) [52.7]	0.361 (1.153) [53.4]	-3.090 ** (1.299) [55.2]
working for pre-birth firm	0.042 *** (0.014) [0.374]	0.029 ** (0.012) [0.388]	-0.010 (0.014) [0.400]
B. Outcomes in year 5			
employed	0.003 (0.009) [0.404]	-0.005 (0.010) [0.513]	-0.017 (0.010) [0.486]
earnings	0.629 (0.452) [16.7]	0.255 (0.500) [22.4]	-1.332 ** (0.535) [21.7]
daily wage (Euros)	0.932 * (0.529) [41.3]	0.820 (0.500) [43.6]	-0.738 (0.590) [45.0]
growth in daily wage $\ln(\text{wage}(t=5)) - \ln(\text{wage}(t=-1))$	0.033 ** (0.015) [-0.098]	0.012 (0.013) [-0.203]	-0.016 (0.014) [-0.292]
Observations	10815	10514	9103

Notes: This table presents the results of controlled contrasts of the cohort with access to more generous parental leave rules for the 1990, 1996, and 2000 reform. Robust standard errors in parentheses, control group mean in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

positive effect on wage growth of 3.3 percent. That is, while daily wage levels are lower after birth, the reduction is smaller for mothers who gave birth in the more generous leave regime. The effects for 1996 and 2000 are positive and negatively respectively, but they are not significant. Overall, wage growth results are consistent with the findings for wage levels.

Overall, we have seen that despite some loss in labor market experience, mothers who gave birth under the more generous leave regimes of 1990 and 1996 do not have lower employment rates or face any wage losses 5 years after giving birth. In contrast, we do see some negative impacts on earnings for mothers who gave birth under the more generous PL regime of 2000. What is different in the more generous regime of 2000 that could explain this contrasting results? One key difference between the more generous leave regimes of 1990 and 1996 versus the extended leave of 2000 is that the latest reform, provided 12 months of additional benefits payment, but only 6 of them were job protected. As seen in Figures 8 and 9, this new regime induced some women to delay the return to work beyond 24 months and lose the job protection entitlement. This is also reflected by a lower rate of women returning to their pre-birth employer. Job continuity seems to play a key role in securing women against wage losses after child's birth.

As seen above, extensions of duration of job protection and benefit payments increase women's time away from work affecting labor market experience and job continuity after birth. A loss in general and specific or job match human capital might have different impacts on women according to their job characteristics. We therefore explore the presence of heterogeneous effects of each of the reforms stratifying the samples by women's pre-birth wages. Table 3 reports controlled contrasts between pre- and post-July mothers stratified by pre-birth wage levels. We perform a median split using mothers' wage recorded one year prior to birth. There are some differences in the effects of extensions of PL benefits on duration parental leave take up. Low wage women tend to take up benefits for about 0.2 to 0.5 months longer. Consistent with this, a more generous leave delays return to work of low wage women to a higher extent in 1990 and 1996. In contrast, the extension of benefits in 2000 delayed return to work more strongly for high wage women (4.5 months) compared to low wage women (4.1 months). The losses in cumulative earnings are typically higher for high wage women than for low wage women in absolute terms for all years and also in relative terms for 1996 and 2000. The first order reason for this is that high wage women tend to have higher wage rates also after giving birth. Therefore, a delayed return to work implied higher forgone earnings for high wage women.

Table 3 also reports effects on months until return to work (row three), work experience (row four), tenure with current employer (row five), and the likelihood of working for pre-birth firm (row six). Both high and low wage women have significantly higher durations of time until return-to-work in the regimes of extended PL. We also observe that the extra months away until return to work taken by mothers in the more generous leave regimes are not one-to-one translated into losses in work experience accumulated until year 5 for neither low nor high wage women. Earlier returns to work in the less generous regimes are partly offset by more months of unemployment upon return to work. Both high and low wage women in the less generous PL regimes end up with longer unemployment spells upon return relative to mothers in the more generous regimes. The effects are larger for low wage women..

Tenure with current employer high and low wage women is not affected by changes to parental leave in 1990, 1996. In contrast, the extended leave induced by the 2000 reform, generated losses in tenure, especially for high wage women. Effects on tenure are explained by the tendency to work for the pre-birth employer. Consider first the probability of working at pre-birth employer 5 years after birth. Interestingly, only one in 4 low wage women works for her pre-birth employer in year 5. In contrast, almost one in 2 high wage women still works for her pre-birth employer 5 years after birth. Longer leave mandates in the 1990 reform increase stability of employment with the pre-birth employer for both high (+4.6 percentage points) and low (+4.2 percentage points) wage women. In 1996, longer leaves regulations also have positive effects on the likelihood of working for pre-birth employer for both groups of women though the effects are larger and significant only for low wage women. In contrast, the 2000 reform, does have a negative effect (-3.2 percentage points) on the likelihood of working for pre-birth employer among high wage women although the estimate is only marginally significant ($t=-1.59$). Overall, we find again, that parental leave does translate into reduced accumulation of work experience without necessarily reducing tenure.

Are there any differences in outcomes after 5 years (Panel B in Table 3)? In terms of employment, there are no striking differences for the 1990 and 1996 reform. In contrast, the 2000 reform reduces the chances of working among high wage women by 4.5 percentage points. Moreover, earnings are also reduced by the 2000 reform. High wage women with access to extended benefits earn 3.1 Euros less (a reduction of 11% in daily earnings) whereas there is no effect for low wage women. Earning reductions of high wage women in 2000 appear to be a result of reduced employment and daily wages. Whereas the 1990 and 1996 reforms do not affect daily wages, the 2000 reform decreases daily wages for high wage women by 1.6 Euros (a reduction of 3%). Turning to wage growth, first note that wage growth is very different between low wage and high wage women. Pre-to-post birth wage growth is relatively small for low wage women (6.1 percent in 1990, -4.1 percent in 1996, -12.8 percent in 2000) but strongly negative for women with high pre-birth wages (-24 percent in 1990 up to -42 percent in 2000). This clearly illustrates that women with high pre-birth wages face higher adjustments to their employment situation than women with low pre-birth wages. Moreover, we find that extending parental leave provisions tends to affect predominantly high wage women. Whereas the 1990 reform increases wage growth by 3.7 percent, the 2000 reform reduces wage growth by 3.6 percent.

The results presented are based on women giving birth to their first child. Clearly, labor supply may interact in important ways with fertility decisions. An extended leave might also have differential impacts according to women's subsequent attachment to the labor force which is likely to be influenced by whether they have completed the process of family formation or are still having additional babies. Table 4 reports controlled contrasts for women who give birth at parities higher than one when the reforms are implemented. One important key piece of evidence showing the differences in post birth labor market performance between women giving birth at parity one and women giving birth at higher parities, is the pre to post birth wage growth. While women at parity 1 experience negative wage growth that ranges between -9.8 percent and up to -29.2 percent, the pre to post change in log wages for women at higher parities ranges between 0 percent to 3.2 percent. There are still remarkable differences in wage growth

Table 3: Heterogeneous Effects

	1990		1996		2000	
	Lo Wg	Hi Wg	Lo Wg	Hi Wg	Lo Wg	Hi Wg
A. Cumulative outcomes						
months receiving PL benefits	11.143 ***	10.470 ***	4.960 ***	4.609 ***	9.476 ***	9.286 ***
	(0.318)	(0.333)	(0.254)	(0.271)	(0.209)	(0.250)
	[19.9]	[19.8]	[22.7]	[23.2]	[17.2]	[17.0]
Cumulative earnings	-2'065 ***	-2'986 ***	-1'930 ***	-4'622 ***	-1'470	-3'753 ***
since child's birth	(644)	(1045)	(751)	(1296)	(901)	(1288)
	[23159]	[42178]	[30825]	[54001]	[28184]	[52870]
Months until return to work	9.470 ***	8.183 ***	3.800 ***	2.851 ***	4.073 ***	4.524 ***
(censored at t=72)	(0.636)	(0.623)	(0.584)	(0.578)	(0.665)	(0.635)
	34.33	25.68	33.08	26.47	35.22	26.28
Experience	-3.282 ***	-2.784 ***	-1.880 ***	-2.618 ***	-1.159 **	-2.837 ***
since child's birth	(0.501)	(0.546)	(0.516)	(0.544)	(0.553)	(0.592)
	[20.2]	[25.0]	[24.6]	[28.8]	[21.4]	[29.1]
Total tenure	0.813	1.724	0.162	0.250	-2.126	-3.850 *
	(1.485)	(1.933)	(1.360)	(1.776)	(1.542)	(1.985)
	[37.8]	[65.4]	[38.9]	[65.8]	[39.6]	[67.1]
working for pre-birth	0.042 **	0.046 **	0.039 **	0.013	0.016	-0.032
firm	(0.019)	(0.019)	(0.017)	(0.018)	(0.020)	(0.020)
	[0.255]	[0.477]	[0.262]	[0.500]	[0.282]	[0.491]
B. Outcomes in year 5						
employed	0.000	0.006	-0.004	-0.007	0.009	-0.045 ***
	(0.013)	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)
	[0.366]	[0.444]	[0.483]	[0.544]	[0.421]	[0.552]
earnings	0.172	1.097	0.359	0.117	0.339	-3.051 ***
	(0.497)	(0.754)	(0.559)	(0.827)	(0.582)	(0.896)
	[12.2]	[21.4]	[16.8]	[28.0]	[14.4]	[29.1]
daily wage	0.475	1.084	0.960	0.781	0.132	-1.569 *
(Euros)	(0.654)	(0.793)	(0.586)	(0.778)	(0.693)	(0.900)
	[33.3]	[48.2]	[34.8]	[51.5]	[34.5]	[53.0]
growth in daily wage	0.019	0.037 *	0.018	0.011	0.007	-0.036 *
$\ln(\text{wage}(t=5)) - \ln(\text{wage}(t=-1))$	(0.021)	(0.019)	(0.018)	(0.017)	(0.020)	(0.018)
	[0.061]	[-0.237]	[-0.041]	[-0.347]	[-0.128]	[-0.417]
Observations	5406	5409	5257	5257	4550	4553

Notes: This table presents the results of controlled contrasts of the cohort with access to more generous parental leave rules for the 1990, 1996, and 2000 reform. Lo Wg refers to women earning less than the median wage one year before giving birth to the child, Hi Wg refers to women earning more than the median wage one year before birth. Robust standard errors in parentheses, control group mean in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

between high and low wage women. While low wage women experience a positive growth in wages in the range of 13 to 22 percent. High wage women experience a wage loss of about 10 percent.¹⁰

The effects on cumulative outcomes are generally in line with the results for parity 1 both in qualitative and quantitative terms. With tenure being an exception. Whereas tenure was reduced only with the 2000 reform for women at parity 1, women at parity 2 or more suffer a significant reduction in tenure of about 3 months as a result of the 1990 reform. There is also a reduction in tenure in 2000 but the effect is smaller (-1.7 months) and not precise enough to be statistically significant ($t=-1.01$). The results on tenure can be explained via the effects on the likelihood of working for pre-birth employer. Extended leaves in 1990 and 1996 increase the likelihood that parity 1 women work for their pre-birth employers in year 5, yet not in the 2000 reform. In contrast, there is hardly any effect on returning to the pre-birth employer for women at parities greater than one (the only exception being a positive effect of 5 percentage points among high wage women in 1990). The differential effects on tenure and likelihood of working for pre-birth employer by women giving birth at different parities deserve further attention.

Finally, the effects on earnings and employment in year 5 for women at parities greater than 1, are highly in line with the results obtained for women at parity 1. The extended PL regimes of 1990 and 1996 did not have any effect on employment probabilities, earnings, or wages. In contrast, the extended leave mandate of 2000, had a negative impact on employment (-3.7 percentage points), daily earnings (-2.7 EUR), and daily wages (-1.26 EUR) in year 5 after birth. Again, the negative impacts of this reform are concentrated among high wage women.

7 Conclusions

In this paper, we exploit a series of major changes in Austrian family policies to analyze the causal effects parental leave provisions on mothers' subsequent labor market success. Austrian parental leave regulations include two key instruments to support work life balance. Parental leave payments, and job protection. In 1990 both job protection and allowance duration were increased from 12 months to 24 months. In 1996 the allowance duration was reduced by 6 months, and in 2000 the allowance duration was increased, again, by 12 months while keeping the duration of the job protection period unchanged. We study the effects of these reforms by comparing return to work behavior and medium-term labor market outcomes of two groups that have similar characteristics and face the same labor market environment: mothers who gave birth to a child two months before and two months after the policy changes. Such a comparison is powerful as, arguably, assignment to treatment can be seen as random in this samples.

We find that a longer duration of parental leave benefits induces a significant delay in return to work for the average mother in our samples. Each additional month of benefit receipt appears to delay return to work by about 0.5 months. A majority of mothers exhausted the full PL duration of benefit payments and job protection period suggesting that these policy instruments are a binding constraint for many mothers. We find that changes in maximum PL duration shifts the return-to-work profile (re-

¹⁰Alternatively, we can also directly measure subsequent fertility. We find that about 50 % of the women giving birth to a first child have a second child within 6 years. In contrast, the corresponding subsequent fertility is below 20 % for women at parity 2 or higher.

Table 4: Sensitivity Analysis: Women at Parity 2 or Higher

	(A) 1990 Reform			(B) 1996 Reform			(C) 2000 Reform		
	All	Lo Wg	Hi Wg	All	Lo Wg	Hi Wg	All	Lo Wg	Hi Wg
A. Cumulative outcomes									
months receiving PL benefits	10.676 *** (0.269) [12.9]	11.364 *** (0.380) [13.4]	10.104 *** (0.385) [12.3]	5.597 *** (0.224) [16.9]	5.703 *** (0.285) [17.2]	5.531 *** (0.347) [16.7]	10.410 *** (0.201) [16.1]	10.636 *** (0.245) [16.4]	10.180 *** (0.321) [15.8]
Cumulative earnings since child's birth	-3'287 *** (1056) [41264]	-2'972 *** (1081) [26716]	-3'305 * (1804) [55532]	-3'601 *** (1249) [50946]	-3'522 *** (1286) [33405]	-3'884 * (2158) [67894]	-6'513 *** (1182) [52205]	-2'625 ** (1262) [33414]	-9'886 *** (1994) [71534]
Months until return to work (censored at t=72)	6.334 *** (0.694) [30.5]	5.747 *** (1.003) [35.3]	6.510 *** (0.978) [25.8]	3.458 *** (0.658) [28.5]	3.742 *** (0.994) [33.7]	2.910 *** (0.883) [23.6]	4.734 *** (0.605) [27.4]	4.542 *** (0.900) [33.1]	4.967 *** (0.808) [21.5]
Experience since child's birth	-2.756 *** (0.642) [28.8]	-2.769 *** (0.899) [25.5]	-2.347 ** (0.930) [32.1]	-3.511 *** (0.643) [33.3]	-3.539 *** (0.930) [29.1]	-3.320 *** (0.904) [37.5]	-4.096 *** (0.600) [33.7]	-3.370 *** (0.844) [29.2]	-4.762 *** (0.861) [38.4]
Total tenure working for pre-birth firm	-3.367 * (1.840) [72.4]	-3.230 (2.315) [58.7]	-2.824 (2.822) [84.2]	-0.651 (1.834) [70.1]	1.243 (2.404) [56.1]	-3.264 (2.763) [81.4]	-1.724 (1.702) [63.8]	-1.247 (2.232) [53.5]	-2.295 (2.561) [73.1]
	0.008 (0.019) [0.519]	-0.016 (0.028) [0.449]	0.050 ** (0.025) [0.577]	0.000 (0.019) [0.519]	0.001 (0.029) [0.431]	-0.009 (0.025) [0.589]	0.010 (0.018) [0.465]	0.021 (0.027) [0.405]	0.003 (0.025) [0.517]
B. Outcomes in year 5									
employed	0.006 (0.014) [0.548]	0.014 (0.021) [0.501]	0.007 (0.020) [0.595]	-0.012 (0.015) [0.660]	-0.013 (0.023) [0.596]	-0.008 (0.020) [0.722]	-0.037 *** (0.014) [0.667]	-0.026 (0.021) [0.609]	-0.047 ** (0.020) [0.726]
earnings	-0.005 (0.690) [22.9]	0.793 (0.743) [15.0]	-0.418 (1.170) [30.7]	-0.516 (0.785) [29.1]	-0.706 (0.879) [19.5]	-0.450 (1.319) [38.3]	-2.701 *** (0.732) [29.4]	-1.194 (0.764) [18.7]	-3.963 *** (1.262) [40.3]
daily wage (Euros)	-0.008 (0.641) [41.8]	0.632 (0.801) [30.0]	-0.672 (0.995) [51.6]	-0.292 (0.678) [44.0]	-0.643 (0.858) [32.7]	-0.406 (1.043) [53.0]	-1.260 ** (0.620) [44.3]	-0.876 (0.731) [31.1]	-1.537 (0.962) [55.7]
growth in daily wage $\ln(\text{wage}(t=5)) - \ln(\text{wage}(t=-1))$	0.015 (0.018) [0.022]	0.030 (0.026) [0.179]	-0.004 (0.023) [-0.108]	-0.002 (0.017) [0.032]	-0.011 (0.026) [0.221]	-0.001 (0.022) [-0.118]	-0.033 ** (0.015) [-0.003]	-0.020 (0.021) [0.127]	-0.036 * (0.020) [-0.114]
Observations	4449	2224	2225	3856	1928	1928	4351	2174	2177

Notes: Sample restricted to women who worked one year prior to giving birth to their second or higher order child. Standard errors in parentheses and control group mean in brackets. Robust standard errors in parentheses, control group mean in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

employment probabilities since date of birth) for mothers who fully exhaust their maximum PL duration. This is so for women who return immediately after PL is exhausted but also hold for women with a spell of non-employment after PL exhaustion.

Our results suggest that losing benefits is more important than losing job protection in shaping return to work decisions. In addition, removing job protection while receiving benefits is about as important as removing job protection while no longer receiving benefits. There is no interaction between these two policy instruments in shaping women's return to work decisions.

Finally, we do not find important effects on earnings and employment five years after the child was born for the 1990 and 1996 reforms. Exploring possible explanations, we find that while extending parental leave benefit and / or job protection duration have a significant and large effect on duration of time until return to work, experience is reduced by a much smaller extent. Moreover, while both the 1990 and the 1996 reforms reduce work experience to some extent, they have no negative effect on the accumulation of firm specific human capital as measured by tenure with the current employer, and they even increase the proportion of women who work for the pre-birth employer 5 years after birth.

In contrast, we find that the 2000 reform has a negative effect on earnings and wage growth for women with high pre-birth wages. This is because the 2000 fails to increase the likelihood of return to the same employer, having therefore a negative effect on tenure. This negative effects on tenure seem to harm women with high pre-birth wages more strongly than women with low pre-birth wages.

We conclude that long parental leaves do have strong effects on return to work decisions. However, delayed return to work has no effects on mother's labor market success 5 years after giving birth as long as employment with pre-birth employer is guaranteed. This suggests that subsidizing child care provided by the mother while guaranteeing job continuity upon re-entry into the labor market does not have long-run negative consequences on mothers performance in the labor market .

While our empirical strategy offers a clean research design to examine the causal effects of extensions of PL policies, we should take into account that both mothers and employers were surprised by the policy changes analyzed in our study. We suspect that these policies might generate some general equilibrium effects in the longer-run. For example, prolonged job protected parental leave mandates might induce employers to offer lower starting salaries, or limited employment or training opportunities to women who are at the age of childbearing. On the other hand, more generous leave mandates and job protection might induce women to increase labor supply and investments in human capital before childbirth. These are important issues we plan to investigate in future work.

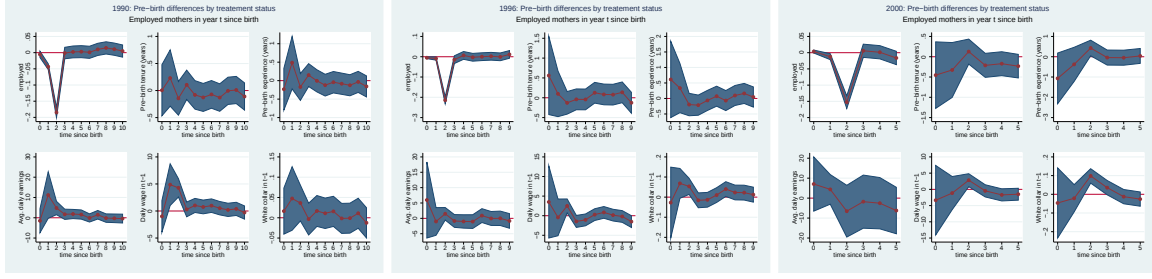
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Appendix

Figure 13: Discussing Selection Into Employment



Notes: This figure contrasts newborn mother's pre-birth characteristics who are employed in year t after birth. Pre-birth differences in mean characteristics are subtracted. Results indicate that from year $t = 5$ onwards, the pre-birth characteristics of women are balanced, i.e. there is no differential selection into employment.