

How Do Employment Protection and Parental Leave Benefits Affect Mother's 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 usually support new parents in two complementary ways: by guaranteeing job-protected leave and by offering financial support during that leave. Despite the widespread prevalence of parental leave policies, their impact on women's labor market performance is still unclear. In particular, there is limited evidence on how these policies affect women's decisions to return to work and the subsequent effects on 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 improving mother's labor market performance upon re-entry. In addition, a longer duration of benefits payments might allow mothers to search for a better job match after birth, increasing the likelihood of job stability and career development.

In this paper, we explore the impacts of duration of parental leave benefits and job protection on women's decisions to return to work and their labor market performance in the medium and in the long-run. We generate causal estimates exploiting variation in parental leave (PL) regulations from 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 at 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, which provided an extension of 6 months of job-protected benefits and additional 6 months of benefits payments without guaranteeing job protection, allows us to assess the impact of unprotected leave benefits.

The examination of women's response to changes in duration of benefits and job protection provides insightful information regarding on how women value these two policy instruments. To assess this,

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.

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 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.

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.

Austria provides an attractive experimental environment to study the effects of parental leave policies. This is because parental leave eligibility is almost universal among working women, so we do not have to deal to differences in access to parental leave benefits. Moreover, not only eligibility is almost universal, but take up rates are extremely high. The high eligibility rates combined with the high take up rates allow us to generate estimates on the effects of parental leave that approach treatment effects for the whole Austrian population. In addition, given the high eligibility and take-up rates, we expect any changes in parental leave rules to affect a large variety of women and to a large extent. This allows us to study the effects of parental leave among different groups of women. The Austrian environment is also very appealing to study the effects of parental leave as parental leave durations are relatively long (12 months in the less generous regime) and changes in PL policies were substantial. Therefore, impacts of PL durations are more likely to be detected in this context.

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 9 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 3.6 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 4.3 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. Still, we find important heterogeneous responses to both policy instruments with more women of high earnings potential responding to end of job protection relative to low wage women.

Finally, we find that even though the 1990 and 1996 reforms induced substantial delays in mother's return to work, there are surprisingly little medium-run or long-run effects on their labor market outcomes. Both earnings and employment observed 5 or 10 years after birth 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 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 less generous PL regimes, have more unstable employment upon re-entry. We also find that mothers in 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. Therefore, longer absences from work appear to have minor effects on labor market performance as long as women are able to return to work within the job protected period. Third, a more generous PL regime that guarantees job protection 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 explains 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, Schönberg 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 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 to analyze the channels through which PL affects earnings. Third, while previous studies have mostly focused on only one aspect of PL policies (either job protection or monetary benefits) we are able to examine the relative role that each policy instrument plays on mother's return to work decisions, and their subsequent impact on mother's labor market performance. Finally, while most studies focus on immediate effects of PL policies on mother's labor market outcomes upon re-entry, we not only analyze immediate outcomes but are able to observe and analyze the evolution of these outcomes in the medium and in the long run.

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. Time on parental leave counts towards seniority with the firm.

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.

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 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

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 parental leave until the child turned one securing the right to part time employment, either between child's first and second birthday (if both parents work part-time) or between child's first and third birthday (if only the mother works part time). Alternatively, mothers could choose not to take parental leave at all and have the right to part-time employment until the child turns four. In practice, very few mothers took shorter parental leaves to take advantage of the right to work part-time.

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.

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).

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 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 entitlements 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

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

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.

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. We test these main predictions by examining women's responses to three 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 dataset reports individuals complete employment histories since 1972 for the universe of Austrian private sector workers. Since time on child-bearing and rearing (*Kinderersatzzeiten*) are also relevant for old-age social security benefits, the ASSD also reports high-quality information on the number of births by female employees with previous social security contributions as well as information on maternity and parental leave take-up.

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 duration of time on leave. 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 10 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.

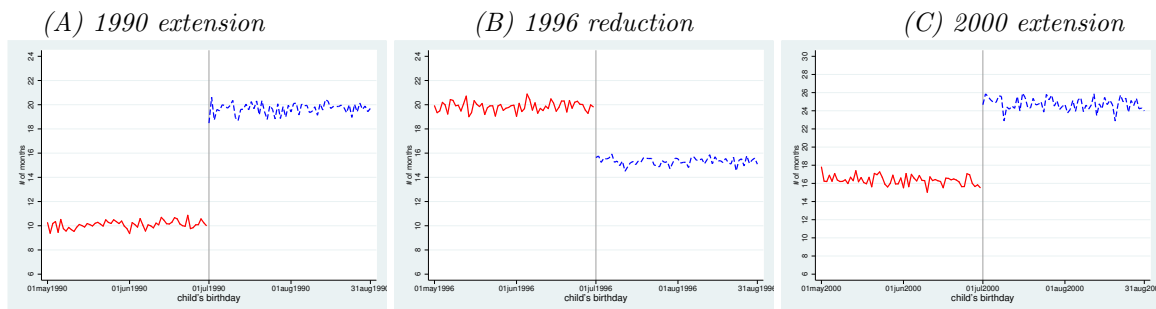
4.2 Econometric method

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 two years after child’s birth for mothers giving birth between May 1 and August 30 in 1990 and in 1996 and for the first 30 months after child’s birth for mothers giving birth between May 1 and August 30 in 2000. 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 an average of 10 months. In contrast, the corresponding number for mothers who gave birth after June 1990 is, on average, about 20 months. Importantly for our empirical

Figure 1: Months receiving parental leave benefits



Notes: This figure reports average number of months receiving parental leave benefits within 24 months (1990 and 1996 reform) and within 30 months (2000 reform) by child's date of birth.

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 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

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.

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 .

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 feature* that justifies our approach is that not only treated and comparison mothers are similar in terms of pre-birth characteristics, but they also face virtually identical macroeconomic and labor market conditions before and after giving birth. On average, July to August mothers gave birth to the child that defines their treatment status only two months after May to June mothers.

A *third 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 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 anticipations of the reforms by the time of conception is very unlikely, 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 analyze 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 check for the sensitivity of our results by excluding mothers who gave birth

⁷There 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	post	raw	ctr	pre	post	raw	ctr	pre	post	raw	ctr			
age	25.12 (1)	25.34 (2)	0.221 *** (0.082)	(3)	(4)	26.91 (5)	26.90 (6)	-0.012 (0.088)	(7)	(8)	27.66 (9)	27.53 (10)	-0.127 (0.102)	(11)	(12)
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: Columns (1), (2), (5), (6), (9), and (10), report means of pre-birth characteristics and labor market outcomes of pre- and post-July mothers for the three reforms. Columns (3), (6), and (11), report raw differences between groups. Columns (4), (8), and (12), report differences after controlling for age.

one week before and one week after July 1st. The results are virtually identical to those obtained using the full sample and reported below.

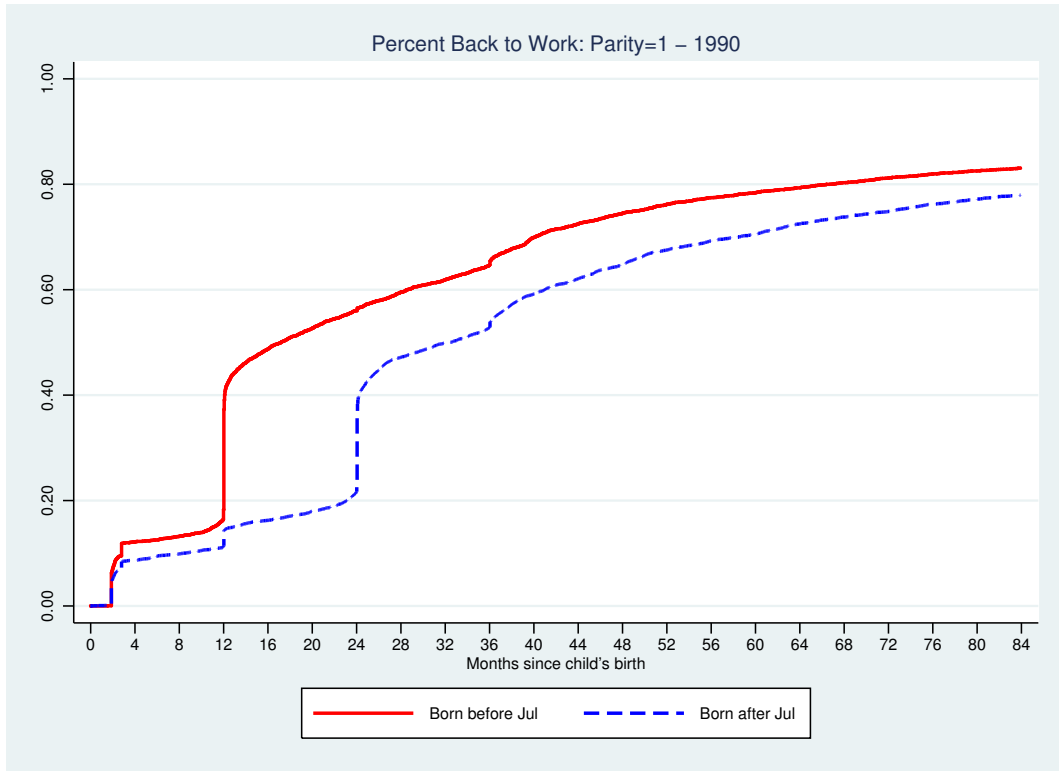
5 Return-to-work decisions

In this section we analyze the effects of changes in duration of the benefit and job protection periods on return to work decisions. We begin by reporting results based on mothers of first born children. The advantage of focusing on women at parity one is that eligibility of parental leave entitlements is almost universal among these women as most of them worked prior to giving birth. On the other hand, it is important to note that since about half of these women give birth to at least one more child during the period of interest, our results are also influenced by fertility interactions. To assess the relative role of fertility interactions, we also examine the impacts of the PL reforms among women who give birth at higher parities. Results for mothers at higher parities are qualitative similar to those reported here and are discussed later.

Figure 2 plots Kaplan-Meier failure functions for time until return to work for mothers giving birth before and after July 1990. The solid line denotes return to work profiles of the pre-July group who were offered 12 months of benefits and job protection. Roughly 10 percent of the pre-reform mothers return to work within 3 months after birth. Thereafter, the proportion returning to work increases gradually reaching a level of 18 percent before the child's first birthday. This implies that more than 80 percent of mothers of newborn children fully exhaust their parental leave entitlements. At the child's first birthday, the proportion of mothers back at work increases sharply to 44 percent. Thereafter the proportion back at work increases steadily reaching a level of almost 80 percent after 5 years. The figure clearly confirms the key prediction of the theoretical framework. Time-delimited parental leave entitlements introduce a sharp jump in return to work behavior around the time when these entitlements run out. Still, a significant proportion of mothers (56 percent) are at home and out of work when benefits and job protection are exhausted. The 1990 reform, which guaranteed job protection for 24 months, had the potential of increasing the fraction of mothers returning to work within the job protected period. On the other hand, since benefits payment were also extended by the same amount of time, return to work times are likely to be delayed.

The dotted line in Figure 2 shows return to work profiles of post-reform mothers. As expected, return to work behavior of mothers who stay on leave for less than 12 months is almost unchanged by the PL reform. These mothers are strongly attached to the labor market and their return to work is not bounded by the PL policies. A sizable gap in the behavior of pre- and post-July mothers appears at month 12 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. At the child's second birthday, when benefits and job protection end, a large fraction of post-reform mothers return to work. Interestingly, the 12-month extension of job protection and benefits leaves the proportion of mothers who return to work

Figure 2: Return-to-work with extended benefits



Notes: This figure shows the proportion who have returned to work at 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.

within the job protected period almost unaffected. Overall, the extension of PL entitlements shifts the return to work profile by about 12 months while preserving its original shape.

Interestingly, the return to work profile is also shifted for mothers who return to work after PL benefits and job protection are exhausted. This shift could be a result of an income effect or a shift in the focal point regarding the expected return to work time. The shift in return to work profiles beyond the exhaustion of PL mandates implies that the share of women who return to work is still lower (by about 6 percentage points) for the post-reform group than for the pre-reform group even 72 months after birth. Nevertheless, as we will discuss in section 6, this delay in return to work does not translate into a reduction in earnings capacity in the medium or in the long-run.

We have seen in Figure 2 that mothers delay their return to work considerably as a response to an extension of parental leave benefits and the job protected period. A natural question is whether delays in return to work were induced by the extension of the job protected period, by the extension of benefits or both. The 1996 and 2000 reforms allow us to shed light on this question as we have in both cases changes in the duration of benefits payments that are independent of the duration of job protection. Figure 3 (panels a and b) plots Kaplan-Meier failure functions for return to work profiles of mothers giving birth before and after the 1996 and 2000 reforms. Recall that the 1996 reform reduced the duration of benefits

payment to 18 months while leaving the job-protection period unchanged at 24 months. This reform allows discussing the role of paid job-protected leave as opposed to unpaid job protected leave. The 2000 reform extended benefits by 12 months thus adding 6 months of paid protected leave and 6 months of paid unprotected leave.

As seen in panel a of Figure 2, the shortening of the benefits period induced a large fraction of mothers to return earlier to work. The return to work profile is shifted backwards but, to a lower extent, relative to the expansion of the 1990 reform. This seems reasonable as the 1996 reform shortened the duration of benefits payments but left the duration of the job-protected period unchanged. About 26 percent of the post-reform mothers return to work exactly at month 18 when benefits are exhausted. Still, there is a sizable group of mothers (12 percent) who stay at home beyond the exhaustion of benefits but return within the period of unpaid job-protected leave. About 4 percent of the mothers return to work exactly at the end of the job protected period. Return to work responses to the 1996 reform suggest that while benefits and job protection have independent effects in delaying women's return to work, the impact of benefits duration appears to be more significant. This conjecture is further supported by changes in return to work profiles induced by the 2000 reform.

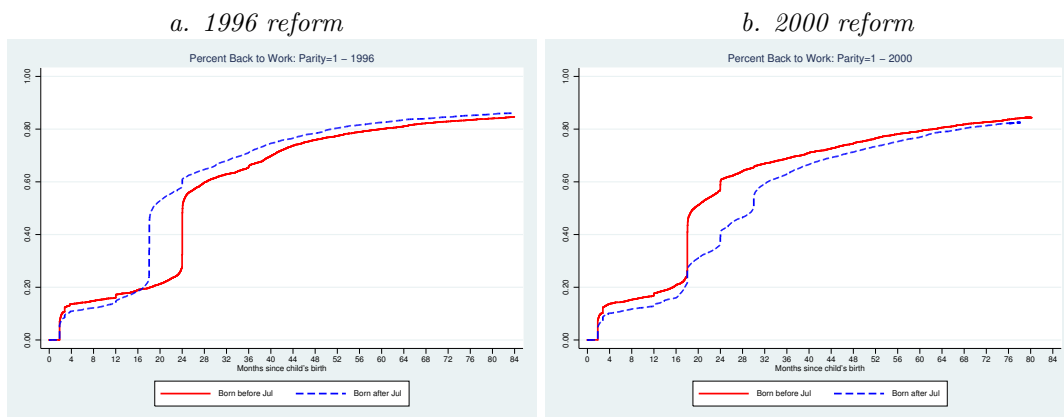
Panel B of Figure 3 shows return to work profiles for pre- and post- reform mothers in 2000. Post-July mothers received 12 extra months of benefits payment but only 6 of them were job protected. Starting from month 18, these mothers could also combine work and benefits provided that they did not pass the income ceiling. Clearly, the post-reform cohort displays a return to work profile that is consistent with the changes imposed by the PL reform. In this case, the return to work profile is shifted forward responding to the extension of the benefits period. Again, we see in this case that mothers respond to both duration of benefits and job protection. We also observe a relatively small proportion of post-July mothers (about 8 percent) who return to work exactly at month 18, the first month when the income ceiling to withdraw benefits was raised enabling mothers to work without losing the right to withdraw benefits. The share returning to work at month 24, when job protection ends, is similar to the corresponding share in the pre-reform group. There is a further sizable group returning exactly when benefits are exhausted at month 30 suggesting that duration of benefits payment even when not coupled with job protection induced some mothers to delay their return to work.

The previous set of figures clearly show that mothers are highly responsive to both benefits and job protection, with benefits appearing to play a more important role. We see that a larger proportion of mothers return to work when benefits end before the job protection period than when the job protection period ends before the period of benefits payments.

5.1 Heterogeneous responses to benefits versus job protection

As outlined in our theoretical framework, we expect the duration of benefits and job protection to affect women to a different extent according to the relative importance they attribute to benefits payments, forgone earnings, and the preservation of good job matches or firm-specific human capital. To shed some

Figure 3: Return-to-work profiles 1996 and 2000



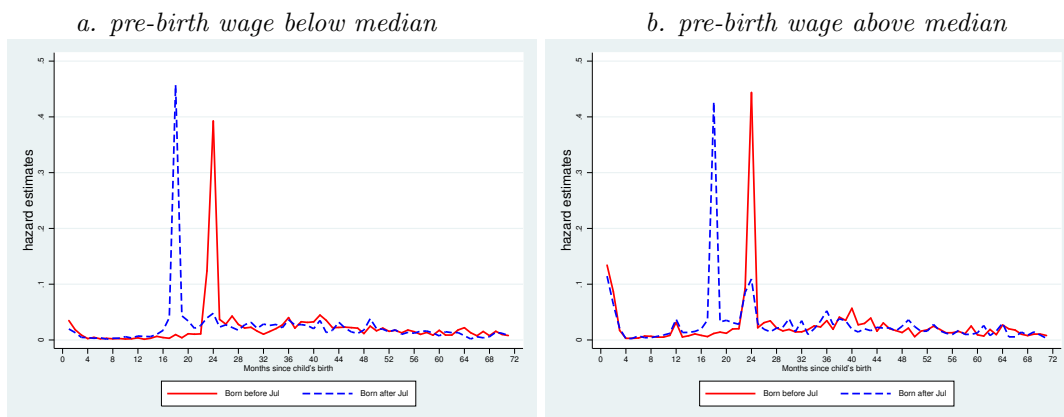
Notes: This figure shows the proportion who have returned to work at or before t months after child's birth. Women giving birth to the child before July 1996 are eligible for 24 months of job protected and paid leave. Women giving birth to the child after July 1996 and before July 2000 are eligible for 24 months of job protected leave but only 18 months of paid leave. Women giving birth to the child after July 2000 are eligible for 24 months of job protected leave and 30 months of paid leave.

light on these issues we explore the heterogeneous responses to duration of benefits and job protection stratifying the sample of women by their pre-birth wages (below and above the median). We focus on the 1996 and 2000 reforms since they allow us to disentangle the role of benefits and job protection.

Panels a and b of Figure 4 plot hazard rates for return to work of women giving birth in 1996 with pre-birth wages below or above the median respectively. Each panel plots hazard rates for pre- and post-reform mothers. As seen in panel a, low wage mothers appear to be highly responsive to the exhaustion of benefits but almost non-responsive to the end of the job protected period. In contrast, hazard rates plotted in Panel b show that high wage mothers respond differently to these two policy instruments. First, we see that about 10 percent of high wage mothers return to work within the first two months after birth responding to the end of the maternity leave period. This group of mothers is highly attached to the labor market and virtually unaffected by the PL reforms. We also observe a large proportion of post-reform mothers returning to work by the end of the benefits period and a sizable, but smaller, group returning to work just at the end of the job protection period. This suggests that job protection even when it is not coupled with benefits is still an important factor for shaping return to work decisions of women with high earnings potential.

Hazard rates for return to work in 2000 for low and high pre-birth wage women are plotted in panels a and b of Figure 5. Consistent to the 1996 figure, low wage women appear to be highly responsive to the duration of benefits payments. Adding 12 months of benefits reduced the spike in return to work at 18 months from 27 percent to about 7 percent. The post-reform women who return to work at month 18 appear to respond to the lift in income ceiling that permits them to work while still receiving benefits payments. Again in this case, we see that a very small proportion of low wage women responds to the

Figure 4: Response to benefits vs. job protection - 1996



Notes: This figure shows the proportion who returned to work in month t after child birth conditional on not returning to work before t (return-to-work hazard). Panel a plots return-to-work hazards for mothers with pre-birth wages below the median. Panel b plots return-to-work hazards for mothers with pre-birth wages above the median. 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 24 months of job protected leave but only 18 months of paid leave.

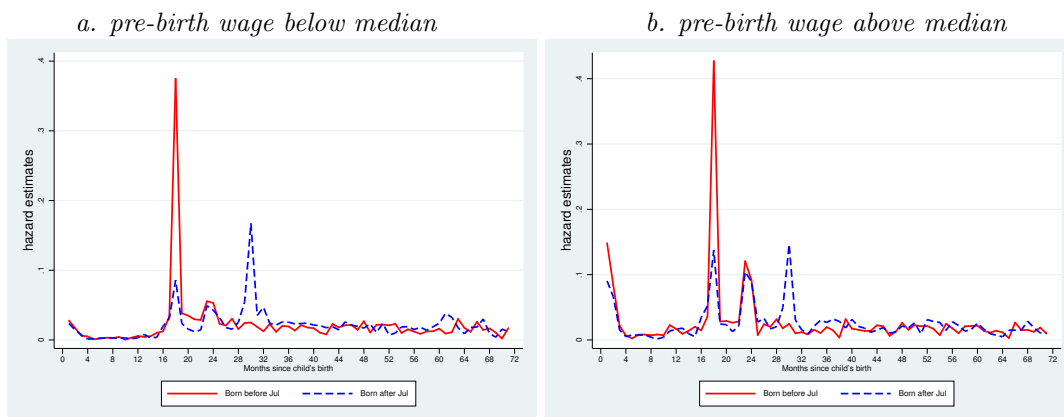
end of the job protected period among both the pre- and the post-reform cohorts. On the other hand, a sizable group of women return to work at month 30, exactly at the exhaustion of the benefits period. This spike suggest that low wage women are willing to delay their return to work as a result of the extension of the benefits payment period even if this implies losing the right to return to their previous job.

Hazard rates for high wage women plotted in panel b reveal the following patterns: first, a larger proportion of mothers (about 13 percent) takes advantage of the raise in the income ceiling to combine work and benefits. Second, a large group (about 11 percent) is responsive to the end of job protection. Interestingly, the size of the spike at the end of the job protection is almost the same for pre- and for post-reform mothers. Note that at month 24, pre-reform mothers are losing job protection but have already run out of benefits while post-reform mothers are losing job protection but can still enjoy of six extra months of benefits. This evidence suggests that high wage mothers who respond to the job protection entitlement are mostly indifferent to the duration of the benefits payments. Finally, we also observe a sizable group of high wage women who delay their return to work beyond the job protected period induced by the extension of the period of benefits payment. This last group appear to be willing to forego the right to return to their pre-birth employer in exchange of 6 extra months of benefits payments.

5.2 Effects on job continuity after birth

Panels a,b, and c of Figure 6 show probabilities of return to pre-birth employer conditional on returning to work at or before time t for pre- and post-July mothers in the three years of policy change. It is

Figure 5: Response to benefits vs. job protection - 2000

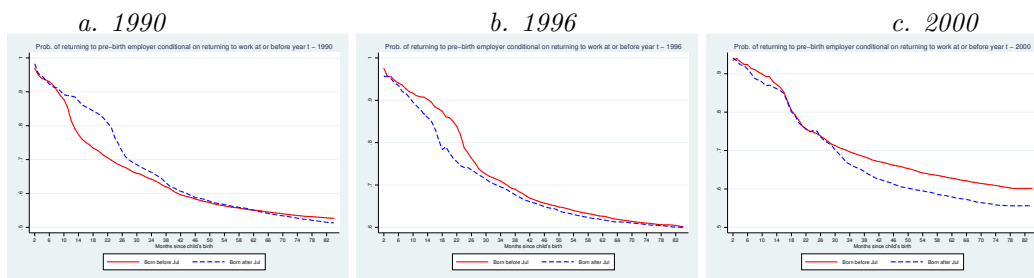


Notes: This figure shows the proportion who returned to work in month t after child birth conditional on not returning to work before t (return-to-work hazard). Panel a plots return-to-work hazards for mothers with pre-birth wages below the median. Panel b plots return-to-work hazards for mothers with pre-birth wages above the median. Women giving birth to the child before July 2000 are eligible for 24 months of job protected leave but only 18 months of paid leave. Women giving birth to the child after July 2000 are eligible for 24 months of job protected leave and 30 months of paid leave.

clear from the figure that the probability to return to the pre-birth employer declines as time to return to work increases. This pattern could be explained by three different arguments. First, there could be heterogeneity in mothers' characteristics with those who return to work later being less interested in returning to their pre-birth employer. In fact, a longer time until return to work might result from a prolonged period of job search. Alternatively, the reduction in the probability of returning to pre-birth employer, might be a direct consequence of the job protection regulation as employers are not obliged to re-employ mothers who return to work after the exhaustion of the job protected period. Finally, there could also be a mechanical aging effect that results from a decline in the number of pre-birth firms that survive over time. The sharp drop in the probability of return to pre-birth employer at the end of the job protected period suggests that the first two alternatives are more likely to explain the pattern of decreasing probabilities. As can be seen in the three panels of Figure 6, the likelihood of returning to the pre-birth employer is above 75 percent for mothers returning to work within the protected period. In contrast, less than 15 percent of the mothers who go back to work after the job protected period return to the pre-birth firm.

Return to pre-birth employer profiles in 1990 and 1996 plotted in panels a and b of Figure 6 reveal that pre- and post- reform profiles virtually converge once both PL regimes end and most women are back to work. Note that in the pre- and post- policy regimes of 1990 and 1996 the duration of benefits payment did not exceed the duration of the job protected period, even in the more generous regime. We conclude, based on the 1990 and 1996 figures, that longer leaves do not affect the probability of job continuity upon labor market re-entry as long as they are guaranteed by job protection. We will turn

Figure 6: Effects on job continuity after birth



Notes: This figure shows the proportion of mothers who have returned to the same employer on or before t months after child's birth for the three reforms. Women who give birth to a child before July 1990 are eligible for 12 months of job protected paid leave. Women who give birth to a child between July 1990 and June 1996 are eligible for 24 months of job protected paid leave. Women who give birth to a child between July 1996 and June 2000 are eligible for 24 months of job protected leave of which only 18 months are paid. Women who give birth to a child after July 2000 are eligible for 24 months of job protected paid leave and 30 months of benefits payments.

back to this point in section 6, where we show that longer leaves do affect chances of preserving the first post-birth job for a longer time.

In contrast to the pattern observed for 1990 and 1996, return to pre-birth employer profiles of 2000, plotted in panel c, reveal that the 2000 reform did affect the likelihood of returning to pre-birth employer. In this case, there is a clear divergence in the proportion of pre- and post- reform mothers who return to the pre-birth employer. The profiles begin to diverge at the end of the job protection period and this divergence becomes even more evident after 30 months where a significant proportion of post-reform mothers return to work due to the exhaustion of the benefit payments. In this case, we observe that a longer period of benefits payment that goes beyond job protected period not only delays return to work but also reduces the chances that mothers return to their pre-birth employer.

Our descriptive analysis of return to work behavior shows that women are highly responsive to changes in duration of parental leave benefits and job protection. 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 effects work interruptions induced by the PL reforms on post-birth labor market performance.

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 first focus on women giving birth to their first child at the time of the policy change. Results for women giving birth at higher parities are discussed later. A key potential challenge in examining the effects on post-birth labor market performance, is differential selection into

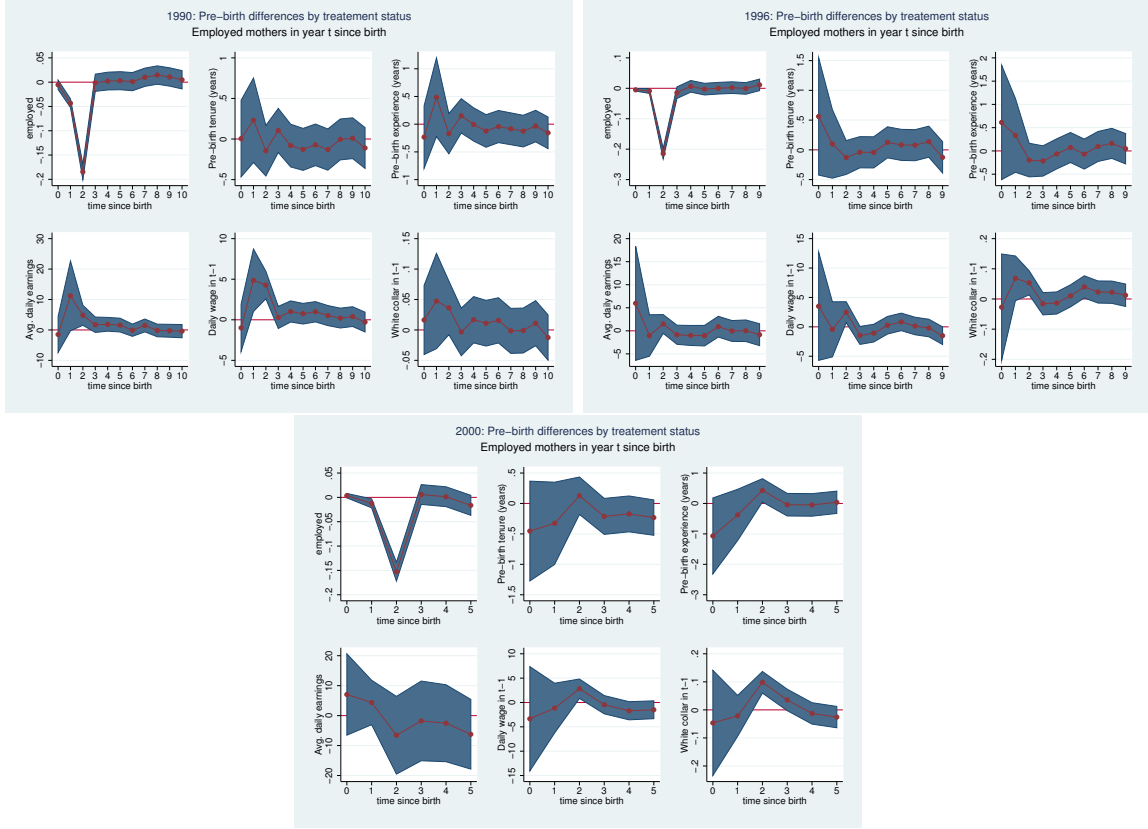
employment among pre- and post-July mothers. We examine this issue in Figure 7, panels a, b, and c for the three policy reforms. The first quadrant in each of the three panels shows differences in employment rates (along with confidence intervals) between mothers giving birth in the more and the less generous regimes for the three policy changes. As expected, in the second year after childbirth, employment rates of mothers in the less generous regimes are higher compared to those of mothers in the more generous regimes. Nevertheless, there are no differences in employment rates between pre- and post-July mothers starting from year 3 after child's birth when both groups have exhausted their respective parental leave provisions. Interestingly, despite the fact that mothers giving birth in the more generous regimes were less likely to have ever returned to work (as seen in Section 5), employment rates of mothers in the more and less generous regimes are virtually identical starting from year 3 after birth. The contrasting result in these two outcomes is explained by the fact that a larger share of mothers in the less generous regimes returned to work but only for a short period of time.

The following set of figures in panels a,b, and c of Figure 7, check for differential selection into employment in each of the years following childbirth by comparing pre-birth labor market outcomes of pre- and post-July mothers by employment status. In year 2 after birth we observe that employed mothers who gave birth in the more generous leave regimes are positively selected (i.e., they have better pre-birth labor market outcomes relative to mothers employed in the less generous regimes). Starting from year 3, once employment rates of pre- and post-July mothers equalize, we see no further evidence of differential selection into employment. We therefore conclude that not only employment rates of pre- and post- July mothers are similar once both groups have exhausted their PL provisions, but we can also assure that pre- and post- employed mothers come from the same part of the earnings potential distribution. These two findings are important as they imply that a comparison of labor market outcomes between pre- and post-July mothers in the medium and in the long run is unlikely to be confounded by differences in observed or unobserved characteristics across the two groups.

Table 2 reports controlled contrasts between pre- and post-July mothers for labor market outcomes observed 5 years after birth. Each column reports estimates for a specific policy reform (i.e., 1990, 1996, and 2000). Outcome means for the cohort with the less generous leave are reported in brackets. 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) while controlling for mother's age at birth and the following indicators of mothers' labor market performance measured 12 months before child's birth: tenure, experience, months of unemployment, cumulative income, and daily wages, and indicators for industry, region, and white collar for employment in the last year prior to giving birth. We also adjust for changes in macro economic conditions at time of re-entry by controlling for the local unemployment rate in the region of pre-birth employment. However, since time of re-entry is a choice variable, we focus on differences in conditions at time of re-entry that are driven by exogenous factors. Namely, we control for the unemployment rate at end of benefits and/or job protection period.⁸ Doing so ensures that effects on labor market outcomes are not driven by changes

⁸For May to June 1990 mothers, we control for the unemployment rate in pre-birth region of employment 12 months after

Figure 7: Discussing Selection Into Employment



Notes: This figure show differences in labor market outcomes, along with confidence intervals, between pre- and post-July mothers in the three reforms by year since child’s birth. In all cases, the outcomes of women in the more generous regime are subtracted from the outcomes of women in the less generous regime. The first quadrant in each panel shows differences in employment rates by year since child’s birth. The following quadrants check for differential selection into employment between pre- and post-July mothers by comparing pre-birth characteristics of employed mothers of the two groups relative to unemployed mothers.

in the business cycle at time of re-entry. We also estimated alternative models where we allow for a two-sided linear trend in time to policy change. Estimates are highly similar to those reported here although they are less precise. In addition, we also re-estimated all models while excluding mothers who gave birth during one or two weeks around the cutoff date. Estimates are virtually identical to those obtained when using the full sample.

The first row in Table 2 reports estimates for length of parental leave benefits take up. Clearly, changes to the duration of parental leave benefits translate almost one for one into changes in parental leave benefit receipt. In 1990, duration of benefit receipt increase by 10.9 months after a 12-months the child’s date of birth. For July to August 1990 and May to June 1996 mothers we control for the local unemployment rate 24 months post-birth. For July to August 1996 mothers and May to June 2000 mothers we control for the local unemployment rate 18 months after giving birth, and for July to August 2000 mothers we condition on the local labor market situation 30 months after giving birth.

extension of PL benefits. In 1996, 6-months of extra benefits increase benefits receipt by 4.8, and in 2000, the difference in the duration of benefits receipt between the more and less generous regime is 9.1 months. How does extended parental leave affect return to work? The second row of Table 2 reports controlled contrasts of time until return to work right censored at 72 months. The 1990 extension of PL entitlements by 12 months delays return to work by 9 months. In 1996, 6 months of extra benefits appear to delay return to work by 3.6 months. Interestingly, the effect of 6 extra months of benefits in 1996 is less than half of the effect of 12 extra months of benefits and job protection observed in 1990. This suggests that extensions of job protection have an independent effect in delaying women's return to work. The 2000 reform, which added 6 months of protected benefits and 6 months of unprotected benefits, delayed return to work by 4.3 months.

Turning to work experience (row three), we see that the 1990 reform reduces work experience by 3.2 months, the 1996 reform by 2.2 months, and the 2000 reform, reduces experience by 1.9 months.⁹ 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 PL regimes 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, as seen in the fifth row of the table, mothers who face the less generous PL regimes claim about 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.¹⁰

Another interesting finding is that despite the negative impacts of the extended leave regimes on work experience, tenure with 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 are more likely to work for their pre-birth employer (by 5.2 percentage points in 1990 and 4.5 percentage points in 1996) relative to women in the less generous regimes. Note that despite the fact that the longer leave regimes of 1990 and 1996 did not affect the likelihood of returning to the 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.

⁹Further estimates indicate that experience losses are concentrated in the first three years.

¹⁰Unemployment 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.

Table 2: Effects on Post-Birth Labor Market Outcomes

	1990 reform	1996 reform	2000 reform
A. Cumulative outcomes			
PL benefits (months)	10.960 *** (0.243) [19.851]	4.724 *** (0.217) [22.922]	9.319 *** (0.163) [17.086]
Return to work (months) (censored at t=72)	9.071 *** (0.471) [30.111]	3.600 *** (0.474) [29.787]	4.325 *** (0.462) [30.765]
Experience since child's birth	-3.170 *** (0.395) [22.562]	-2.210 *** (0.433) [26.713]	-1.932 *** (0.407) [25.232]
Total tenure	1.802 (1.334) [52.728]	1.527 (1.306) [53.353]	-2.954 ** (1.302) [55.207]
Unemployed (months)	-2.803 *** (0.215) [8.299]	-0.580 *** (0.149) [4.200]	-0.559 *** (0.141) [3.960]
B. Outcomes in year 5			
Employed	-0.004 (0.010) [0.404]	-0.004 (0.011) [0.513]	-0.017 (0.010) [0.486]
Earnings	0.550 (0.482) [16.691]	0.351 (0.578) [22.377]	-1.297 ** (0.539) [21.693]
Daily wage (Euros)	1.216 ** (0.561) [41.309]	1.115 * (0.584) [43.624]	-0.670 (0.590) [44.962]
Growth in daily wage $\ln(\text{wage}(t=5))-\ln(\text{wage}(t=-1))$	0.041 *** (0.015) -[0.098]	0.025 (0.015) -[0.203]	-0.015 (0.014) -[0.292]
Working for pre-birth firm	0.052 *** (0.014) [0.374]	0.045 *** (0.014) [0.388]	-0.010 (0.014) [0.400]
Observations	10815	10514	9103

Notes: This table reports controlled differences in outcomes between the cohort with access to more generous parental leave rules and the cohort with access to the less generous regime for the 1990, 1996, and 2000 reforms. Estimates come from regressions that control for age at birth, and the following indicators for mothers' labor market performance measured 12 months before the child's birth: tenure, experience, months of unemployment, cumulative income, daily wages, and indicators for industry, region and white collar occupation. Regressions also control for the unemployment rates in the region of pre-birth employment at the end of the job protection and benefits payments periods. Robust standard errors are reported in parentheses. Means of the comparison group (i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Panel B in Table 2 reports effects on employment, and daily earnings and wages observed in year 5 after child's birth. Interestingly, despite delaying return to work, the more generous leave regimes of post-July 1990 and pre-July 1996 do not reduce employment in the medium-run. This is even more striking given that return to work profiles plotted in Figures 2 and 3 show that a slightly larger proportion of women in the more generous regimes were 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.

Another interesting finding is that despite the delay in return to work and loss in work experience, we find no differences in daily earnings or wages for mothers affected by the 1990 and 1996 reforms. If anything, it appears that mothers in the more generous leave regimes of 1990 and 1996 have higher daily wages in year 5 relative to those exposed to the less generous regimes. Women giving birth under the more generous PL regime earn about 1.2 EUR more per day (or 3% more) relative to women subjected to the short leave regime. The picture is similar for the 1996 reform, albeit not statistically significant.

In contrast to the patterns observed for the 1990 and 1996 reforms, 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 implies 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 ($t=-1.61$). Estimates on daily wages are also negative (67 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 experience sizeable reductions in daily wages after the birth of their first child that range between 9.8 percent in 1990 up to 29.2 percent in 2000. Recall, however, that daily wages combine daily work hours and hourly wages. Wage growth therefore reflects both, changes in hourly wages and changes in hours worked (with the latter probably being more important than the former). Results indicate that the 1990 reform has a 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, 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. We also examine labor market outcomes in the longer run, by looking at the effects of the 1990 and 1996 reforms in year 10 and 9 after birth respectively. Results, not reported here to save space, show no significant differences in employment rates or wages between pre- and post-July mothers. 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 these 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 guaranteed by job protection. As we saw in Figures 3 and 5, this new regime induced some women to delay the return to work beyond 24 months and to lose the job protection entitlement. Further evidence on the effect of loss of the job protection entitlement is also reflected in Figure 6 c where we showed that a lower share of post-July mothers return to their pre-birth employer in 2000. The contrast between the impacts of the 1990 and 1996 reform versus the 2000 reform suggests that the job protection entitlement might play a key role in securing women against wage losses after child's birth. We will explore this issue at a further extent in the next session.

6.1 Heterogeneous effects on labor market outcomes

As discussed 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 and skills. We therefore explore the presence of heterogeneous effects of each of the reforms by stratifying the samples by women's pre-birth wages. We perform a median split using mothers' wage recorded one year prior to birth.¹¹ Table 3 reports controlled contrasts between pre- and post-July mothers stratified by pre-birth wage levels. Duration of benefits take-up appears to be similar for high and low wage women. This is driven by the fact that the vast majority of mothers fully exhaust the leave period covered with benefits payments. Yet, we see that time until return to work is significantly higher among low wage mothers as they stay at home for about 8 additional months relative to high wage mothers. Nevertheless, both high and low wage mothers respond to the extensions of PL entitlements by delaying their return to work.

Again we observe that longer leaves of high and low wage mothers in the more generous regimes are not one-to-one translated into losses in work experience accumulated until year 5. This is partly because earlier returns to work in the less generous regimes are partially offset by additional months of unemployment upon return. Both low and high wage women in the less generous PL regimes accumulated more months of unemployment upon return to work relative to mothers in the more generous regimes while low wage women tend to do so to a larger extent.

Tenure with current employer for high and low wage women is not affected by changes in parental leave in 1990 or 1996. This finding suggests that while longer parental leaves do partially translate into reduced accumulation of work experience they do not necessarily reduce tenure. In contrast to the findings for the 1990 and 1996 reforms, the extended leave induced by the 2000 reform, generated losses in tenure, especially for high wage women. Effects on tenure are driven by the probability of working for the pre-birth employer. Interestingly, only one in four low wage women works for her pre-birth employer five years after giving birth while almost one in two do so among high wage women. Longer leave mandates in the

¹¹We also explored the presence of heterogeneous impacts of the PL reforms by stratifying the sample by mother's pre-birth residual wage. Our conjecture was that a high residual pre-birth wage might proxy for a good job match. Interestingly, the results of the stratification by residual wages are highly similar to those obtained when stratifying the sample by wages.

1990 and 1996 reforms increase the likelihood of employment with the pre-birth employer for both high and low wage women. In contrast, the 2000 reform, does have a negative effect (-3.3 percentage points) on the likelihood of working for pre-birth employer among high wage women although the estimate is only marginally significant ($t=-1.65$).

Panel B in Table 3 show differences in employment rates, and daily earnings and wages. In terms of employment, there are no differences between pre- and post-July mothers in 1990 or 1996. In contrast, the 2000 reform appears to reduce employment rates among high wage women by 4.6 percentage points. Daily earnings of high wage women are also reduced by the 2000 reform by 3 EUR (a reduction of 10%) 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. While the 1990 and 1996 reforms do not affect daily wages, the 2000 reform decreases daily wages for high wage women by 1.5 EUR (a reduction of 3%).

Turning to wage growth, we first note that wage growth is very different between low wage and high wage women. Pre-to-post birth wage changes are 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 larger adjustments to their employment situation than women with low pre-birth wages. Moreover, we find that wage growth of high wage women is more responsive to extensions in parental leave provisions relative to low wage women. Whereas the 1990 reform increases wage growth by 4.4 percent, the 2000 reform reduces wage growth by 3.4 percent.

6.2 Effects for women giving birth at higher parities

The results presented above 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.¹² We therefore examine the effects of extended leaves among women who gave birth at higher parities at the time of the policy change as they are less likely to have additional children.

Table 4 reports controlled contrasts of labor market outcomes five years after child's birth for women giving birth at parities higher than one. 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 one 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 between high and low wage women giving birth at parities higher than one. While low wage women experience a positive growth in wages in the range of 13 to 22 percent. High

¹²About 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 15 % for women at parity 2 or higher. The reforms did not affected the probability of having additional children among women of parity 2 and higher.

Table 3: Heterogeneous Effects by Mother's Pre-Birth Wages

	1990		1996		2000	
	Lo Wg	Hi Wg	Lo Wg	Hi Wg	Lo Wg	Hi Wg
A. Cumulative outcomes						
PL benefits (months)	11.421 *** (0.338) [19.920]	10.439 *** (0.351) [19.779]	4.832 *** (0.303) [22.657]	4.577 *** (0.312) [23.190]	9.450 *** (0.210) [17.190]	9.232 *** (0.249) [16.982]
Return to work (months) (censored at t=72)	9.707 *** (0.674) [34.335]	8.391 *** (0.655) [25.683]	4.299 *** (0.677) [33.077]	2.764 *** (0.665) [26.474]	4.111 *** (0.667) [35.221]	4.622 *** (0.637) [26.275]
Experience since child's birth	-3.479 *** (0.535) [20.235]	-2.722 *** (0.581) [25.001]	-1.712 *** (0.608) [24.591]	-2.620 *** (0.617) [28.849]	-1.172 ** (0.557) [21.380]	-2.826 *** (0.596) [29.115]
Total tenure	1.402 (1.576) [37.828]	2.411 (2.031) [65.403]	0.453 (1.553) [38.859]	2.799 (2.008) [65.840]	-1.998 (1.546) [39.649]	-3.659 * (1.986) [67.075]
Unemployed (months)	-3.678 *** (0.338) [10.553]	-2.051 *** (0.266) [5.936]	-0.984 *** (0.242) [5.700]	-0.280 (0.181) [2.691]	-0.698 *** (0.237) [5.570]	-0.399 *** (0.152) [2.338]
B. Outcomes in year 5						
Employed	-0.009 (0.014) [0.366]	0.003 (0.014) [0.444]	0.004 (0.016) [0.483]	-0.013 (0.016) [0.544]	0.009 (0.015) [0.421]	-0.046 *** (0.015) [0.552]
Earnings	-0.069 (0.530) [12.206]	1.180 (0.806) [21.391]	0.699 (0.674) [16.793]	0.053 (0.921) [27.997]	0.353 (0.585) [14.388]	-3.028 *** (0.903) [29.052]
Daily wage (Euros)	0.582 (0.703) [33.327]	1.417 * (0.832) [48.216]	0.955 (0.703) [34.792]	1.292 (0.883) [51.522]	0.170 (0.693) [34.505]	-1.513 * (0.902) [52.973]
Growth in daily wage ln(wage(t=5))-ln(wage(t=-1))	0.021 (0.022) [0.061]	0.044 ** (0.020) [-0.237]	0.015 (0.022) [-0.041]	0.029 (0.019) [-0.347]	0.007 (0.020) [-0.128]	-0.034 * (0.018) [-0.417]
Working for pre-birth firm	0.057 *** (0.021) [0.255]	0.053 *** (0.020) [0.477]	0.048 ** (0.020) [0.262]	0.044 ** (0.020) [0.500]	0.017 (0.020) [0.282]	-0.033 (0.020) [0.491]
Observations	5406	5409	5257	5257	4550	4553

Notes: This table reports controlled differences in outcomes between the cohort with access to more generous parental leave rules and the cohort with access to the less generous regime for the 1990, 1996, and 2000 reforms. Regression estimates come from models that include the control variables specified in Table 2. 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 are reported in parentheses. Means of the comparison group (i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

wage women experience a wage loss of about 10 percent.

The effects on labor market outcomes are generally in line with the results for parity one both in qualitative and quantitative terms. With tenure being an exception. Whereas tenure was reduced only with the 2000 reform for women at parity one, women at parity two 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 (-1.9 months) and not precise enough to be statistically significant ($t=-1.09$). 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 one 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 6 percentage points among high wage women in 1990).

Finally, results on employment and wages for women at parities greater than one, are highly in line with those obtained for women at parity one. 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.

6.3 Exploring the role of job protection

The set of results presented in the previous section suggest that extended parental leave does not affect medium-run labor market outcomes of mothers in 1990 and 1996. In contrast, the 2000 reform which extended benefits payments beyond the job protection period, appears to have generated employment and wage losses among high wage women. Is job protection the key factor that prevents losses in wages and employment? Job protection may be crucial since it ensures that mothers' pre-birth labor market positions are kept upon their return to work. To explore the role of job protection, we would ideally compare the impacts of extended career interruptions between women who are protected and women who are not protected. Unfortunately, such comparison is not feasible since women's pre-birth employment ensures almost universal access to job protection at parity one. At parities higher than one, endogeneity of eligibility to the job protection guarantee is a crucial concern.

We therefore propose to address the role of job protection by examining the causal effects of the PL reforms on two different groups of mothers: mothers who return to work within the job protected period (*early returners*) and mothers who return after the job protected period (*late returners*). The basic idea that motivates this stratification is that early returners can go back to an employment situation that is very similar to the situation before going on leave. In contrast, late returners forego the option to return to previous jobs and might be more strongly affected by delayed return to work.¹³

Our objective is to devise an identification strategy that cleanly separates the pre-reform population

¹³Longer leaves might still negatively affect labor market outcomes of mothers entitled with job protection in the longer run as they can be fired a few weeks upon re-entry or have a limited wage growth.

Table 4: Sensitivity Analysis: Effects on Post-Birth Labor Market Outcomes for Women at Parity 2 or Higher
(A) 1990 Reform (B) 1996 Reform (C) 2000 Reform

	(A) 1990 Reform			(B) 1996 Reform			(C) 2000 Reform		
	All	Lo Wg	Hi Wg	All	Lo Wg	Hi Wg	All	Lo Wg	Hi Wg
PL benefits (months)	10.776 *** (0.283) [12.866]	11.526 *** (0.398) [13.433]	10.132 *** (0.408) [12.310]	5.542 *** (0.259) [6.928]	5.889 *** (0.327) [7.202]	5.263 *** (0.392) [6.664]	10.422 *** (0.200) [16.102]	10.688 *** (0.246) [16.434]	10.168 *** (0.320) [15.761]
Return to work (months) (censored at t=72)	6.634 *** (0.731) [30.524]	5.937 *** (1.058) [35.291]	6.807 *** (1.029) [25.848]	3.451 *** (0.782) [28.530]	4.118 *** (1.188) [33.668]	2.597 ** (1.048) [23.565]	4.826 *** (0.607) [27.355]	4.648 *** (0.907) [33.053]	4.979 *** (0.810) [21.495]
Experience since child's birth	-3.013 *** (0.681) [28.827]	-3.051 *** (0.953) [25.502]	-2.510 ** (0.981) [32.089]	-3.511 *** (0.760) [33.344]	-3.244 *** (1.099) [29.071]	-3.557 *** (1.067) [37.474]	-4.146 *** (0.604) [33.726]	-3.458 *** (0.854) [29.192]	-4.745 *** (0.865) [38.391]
Total tenure	-3.535 * (1.933) [72.424]	-3.180 (2.475) [58.651]	-3.291 (2.918) [84.171]	-1.557 (2.292) [70.104]	0.881 (3.151) [56.095]	-3.897 (3.316) [81.356]	-1.872 (1.713) [63.850]	-1.064 (2.255) [53.482]	-2.514 (2.571) [73.065]
Unemployed (months)	-2.125 *** (0.368) [8.175]	-1.621 *** (0.511) [8.497]	-2.612 *** (0.528) [7.860]	-0.761 *** (0.280) [4.844]	-0.467 (0.395) [4.747]	-0.848 ** (0.394) [4.937]	-0.357 (0.232) [4.547]	-0.809 ** (0.326) [5.266]	0.017 (0.328) [3.808]
Employed	-0.005 (0.015) [0.548]	0.007 (0.022) [0.501]	-0.006 (0.021) [0.595]	-0.008 (0.018) [0.660]	0.002 (0.027) [0.596]	-0.013 (0.024) [0.722]	-0.039 *** (0.014) [0.667]	-0.030 (0.021) [0.609]	-0.048 ** (0.020) [0.726]
Earnings	-0.370 (0.730) [22.909]	0.551 (0.786) [15.006]	-0.811 (1.235) [30.661]	-0.832 (0.946) [29.057]	-0.977 (1.084) [19.502]	-0.844 (1.553) [38.289]	-2.783 *** (0.738) [29.362]	-1.354 * (0.773) [18.718]	-3.957 *** (1.267) [40.310]
Daily wage (Euros)	-0.074 (0.671) [41.785]	0.551 (0.841) [29.955]	-0.439 (1.036) [51.558]	-0.972 (0.820) [44.010]	-1.845 (1.114) [32.723]	-0.794 (1.207) [53.007]	-1.278 ** (0.623) [44.345]	-1.024 (0.740) [31.057]	-1.476 (0.961) [55.734]
Growth in daily wage $\ln(\text{wage}(t=5))-\ln(\text{wage}(t=-1))$	0.012 (0.018) [0.022]	0.024 (0.027) [0.179]	0.002 (0.025) [-0.108]	-0.021 (0.020) [0.032]	-0.046 (0.033) [0.221]	-0.011 (0.025) [-0.118]	-0.034 ** (0.015) [-0.003]	-0.025 (0.022) [0.127]	-0.035 * (0.020) [-0.114]
Working for pre-birth firm	0.020 (0.020) [0.519]	-0.004 (0.030) [0.449]	0.062 ** (0.027) [0.577]	-0.015 (0.022) [0.519]	-0.029 (0.035) [0.431]	-0.009 (0.029) [0.589]	0.010 (0.018) [0.465]	0.017 (0.027) [0.405]	0.006 (0.025) [0.517]
Observations	4449	2224	2225	3856	1928	1928	4351	2174	2177

Notes: This table reports controlled differences in outcomes between the cohort with access to more generous parental leave rules and the cohort with access to the less generous regime for the 1990, 1996, and 2000 reforms. The

samples include women giving birth at parity 2 or higher in the years of the policy change. Regression estimates come from models that include the control variables specified in Table 2. 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 are reported in parentheses. Means of the comparison group

(i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

into two sub-populations that differ in terms of their return-to-work times and to find comparable samples of these two groups in the post-reform cohort. Assuming that early returners have equal characteristics in the pre- and post- reform periods, the contrast of labor market performance of early returners in the more and the less generous PL regimes provides an estimate of the effects of extensions of PL that are guaranteed by job protection. Under an equivalent assumption, the contrast between late returners in the more and less generous regimes provides an estimate of the effects of extensions of PL that are not guaranteed by job protection.

The key empirical challenge derives from the fact that the PL reforms affected return to work times so that we cannot simply compare mothers who return within a certain period in the pre- and post- reform cohorts. Our identification strategy proposes to select the sample of early returners in the less generous leave regime and to select a comparable sample from the more generous leave regime by choosing an equal proportion of mothers starting with those with the smallest return-to-work times.¹⁴ This strategy will provide comparable groups of early returners in the more and less generous regimes if and only if extended parental leave preserves the rank of return-to-work times. That is, if return-to-work times of mothers i , j , and k in the less generous regime are ordered as $r_{0i} \leq r_{0k} \leq r_{0j}$, then return-to-work times with extended policy are also ordered as $r_{1i} \leq r_{1k} \leq r_{1j}$.

Under the assumption of weakly rank preserving effects of the reforms, we estimate the causal effect of PL extensions on early returners in the following way. We first identify the set of early returners in the less generous leave regime, i.e. $F_0(\tau_0)$ where τ_0 is the date when job protection ends in the baseline policy. We then find Δ such that the share of early returners is the same with extended benefits as with the baseline policy, i.e. $F_1(\tau_1 + \Delta)$ where τ_1 is the end of job protection period in the new regime (note that $\tau_0 = \tau_1$ for both the 1996 and 2000 reforms), and $\Delta = F_1^{-1}(F_0(\tau_0)) - \tau_1$. We then contrast between outcomes of early returners with extended benefits and outcomes of early returners with baseline benefits, i.e.

$$\begin{aligned}
& E(Y|D = 1, r_1 \leq \tau_1 + \Delta) - E(Y|D = 0, r_0 \leq \tau_0) & (2) \\
& = E(Y_1|D = 1, r_1 \leq \tau_1 + \Delta) - E(Y_0|D = 0, r_0 \leq \tau_0) \\
& = E(Y_1|D = 1, r_0 \leq \tau_0) - E(Y_0|D = 0, r_0 \leq \tau_0) \\
& = E(Y_1 - Y_0|D = 1, r_0 \leq \tau_0)
\end{aligned}$$

The fourth line follows directly from the assumption of rank preserving effects of extended leave. Note that the effect on early returners in equation (2) is a *lower bound* for the effects of job protection since the group with the more generous leave includes a mixture of women returning with job protection and women returning after job protection. Equivalently, we define the causal effect on late returners as

¹⁴This strategy is inspired by Lee (2002) who proposes trimming in the context of sample selection to recover bounds on treatment effects.

$$\begin{aligned}
& E(Y|D = 1, r_1 > \tau_1 + \Delta) - E(Y|D = 0, r_0 > \tau_0) \\
& = E(Y_1 - Y_0|D = 1, r_0 > \tau_0)
\end{aligned} \tag{3}$$

This contrast captures the effects of extended parental leave on late returners. Note that in the sample of late returners very few mothers are covered by job protection. This follows directly from the shift in return to work profiles for the 1996 and 2000 reforms but it is not necessarily true for 1990 since this reform extended also the duration of the job protection period.

A comparison of the causal effect of PL extensions on early returners and late returners would therefore provide some evidence on the role of job protection. Note that this comparison will have to take three issues into account. First, the early returner and late returner groups differ in terms of pre-birth characteristics. This means that the PL effects on early and late returners might differ if extended leaves have different impacts on women according to their pre-birth or unobserved characteristics. Indeed, as we saw in the analysis of the effects of PL stratified by mothers pre-birth wages, there is some evidence of heterogeneity for the 2000 reform but much less so for the 1990 or the 1996 reforms. Second, these contrasts only provide causal evidence if there is weak rank preservation in return to work times. But even if rank preservation fails, the contrasts can still be used to construct bounds on the underlying treatment effects. To see this, note that the late returners contrast (4) will capture

$$\begin{aligned}
& E(Y|D = 1, r_1 > \tau_1 + \Delta) - E(Y|D = 0, r_0 > \tau_0) \\
& = E(Y_1 - Y_0|D = 1, r_1 > \tau_1 + \Delta, r_0 > \tau_0)P(r_0 > \tau_0|D = 1, r_1 > \tau_1 + \Delta) \\
& + BP(r_0 < \tau_0|D = 1, r_1 > \tau_1 + \Delta)
\end{aligned} \tag{4}$$

where B is a term that captures the difference in the potential outcomes of "switchers", i.e. mothers whose return to work time with extended policy exceeds $\tau_1 + \Delta$ but who would return to work on or earlier than τ_0 with the short policy. This means that we can bound the causal effect of extended parental leave in the sub-group with preserved rank by using information on the late returner contrast, the maximum and minimum of Y , at varying levels of violations of rank-preservation (i.e. by varying $P(r_0 > \tau_0|D = 1, r_1 > \tau_1 + \Delta)$).

A last issue for consideration in the comparison between early and late returners is that labor market outcomes in year 5 among late returners could be mechanically driven by those mothers who are still on leave and have not returned to work yet. Therefore, to distinguish between participation effects and wage effects among late returners, we split this group into two: late returners and very late/never returners. In practice, we split the full population of mothers in the less generous regimes into three groups: (i) early returners (those who return before the end of the job protection period), (ii) late returners (those who return after job protection but before the child's fourth birthday), and (iii) very late/never returners. We then stratify the samples of mothers in the more generous regimes by selecting equivalent proportions according to their ranking with respect to return times.

The following set of tables report the results for early and late returners. We do not focus on the population of very late/never returners as most of them have not returned to work at the end of year 5 after birth. Table 5 presents balancing tests of pre-birth characteristics for pre- and post-July mothers in the early and late returners samples. Columns 1-3 report differences in means between pre- and post-July early returners for the three policy reforms. Columns 4-6 report the equivalent comparison among the late returners samples.

Balancing tests for the 1990 samples indicate that pre-birth means are balanced in most cases except for average daily earnings (early and late returners). Estimates for the 1996 samples indicate that most characteristics are balanced, except for the proportion of blue/white collar workers. Estimates for the 2000 samples indicate that most characteristics are balanced, except for tenure (early returners) and daily wage (late returners). While the existence of some imbalances between treated and comparison groups caution against a causal interpretation of raw differences in outcomes, the fact that these imbalances do not show any consistent pattern of selection make us to believe that controlled contrasts in outcomes could still be informative. Moreover, as we will see later, our labor market results for mothers at parity one and for mothers at parity greater than one are highly consistent with each other despite that balancing tests in each of the samples sometimes showed small imbalances in opposite directions.

Table 6 provides key results of the effects of the PL reforms on human capital accumulation and labor market outcomes in year 5 for early and late returners. Early returners represent between 45 percent (1990 sample) to 62 percent (1996 and 2000 sample) of the overall population of women giving birth to a child during the three reform periods. The share of early returners is smaller in the 1990 sample because job protection in the less generous regime ends after 12 months rather than 24 months.

Early returners delay their return to work considerably when exposed to more generous leave regimes. Nevertheless, the share of early returners who return to work within the job protected period decreases only slightly (by 3.4 percentage points) as a result of the 1990 reform since the job protected period was extended in parallel with the extension of benefits. The share returning with a job protection guarantee decreases more substantially in 1996 (by 10.8 percentage points) and even more strongly, by 30 percentage points, in 2000. Estimates for early returners in 1990 confirm that our strategy cleanly stratifies pre- and post- reform samples into groups with and without access to job protection. Therefore, results for early returners in 1990 will provide evidence on the effect of longer absences from work for mothers who are entitled with job protection. In contrast, results for early returners in 1996 and 2000 will provide a lower bound on the effects of job protection as some early returners with extended PL return to work after the end of the job protected period.

The effect of extended benefits on return-to-work are sizeable. Treated early returners delay their return to work by about 3.0 additional months (1996 reform) to 8.2 additional months (1990 reform) relative to the comparison group. Early returners also accumulate less labor market experience when benefits are extended, with the effects ranging from 1.4 months (1990 reform) to 4.5 months (1996 reform). Tenure with current employer is not affected by the 1990 and 1996 reforms but there is a reduction in tenure for early returners in 2000. Results for the 1990 reform also indicate employment

Table 5: Testing the Trimming Split: Parity 1

	Early returners			Late returners		
	1990	1996	2000	1990	1996	2000
age	0.131 (0.123) [25.685]	-0.004 (0.111) [27.113]	-0.105 (0.130) [27.847]	0.170 (0.144) [24.491]	-0.012 (0.211) [26.326]	0.184 (0.280) [26.702]
Labor market history						
Tenure (years)	0.090 (0.099) [3.785]	-0.048 (0.083) [3.566]	-0.242 *** (0.094) [3.971]	-0.076 (0.106) [3.127]	0.131 (0.161) [3.347]	0.112 (0.193) [3.313]
Experience (years)	0.124 (0.111) [6.236]	0.037 (0.104) [6.587]	-0.121 (0.116) [7.329]	-0.027 (0.126) [5.914]	0.307 (0.196) [6.638]	0.156 (0.256) [6.895]
Unemployment (years)	0.020 (0.012) [0.178]	-0.016 (0.016) [0.363]	-0.012 (0.019) [0.431]	0.019 (0.017) [0.254]	-0.024 (0.033) [0.437]	-0.025 (0.044) [0.562]
Avg. daily Earnings	1.594 ** (0.797) [36.528]	-0.015 (0.692) [41.345]	-4.500 (4.693) [51.741]	2.419 ** (1.194) [30.967]	-1.386 (1.413) [37.899]	1.509 (0.987) [38.535]
White collar	-0.017 (0.014) [0.671]	0.023 * (0.012) [0.656]	0.000 (0.012) [0.724]	-0.030 * (0.017) [0.571]	0.050 ** (0.023) [0.585]	-0.027 (0.028) [0.641]
Daily wage	0.513 (0.502) [45.621]	-0.411 (0.507) [52.004]	-0.474 (0.627) [57.544]	0.848 (0.519) [39.079]	1.385 (0.891) [46.586]	2.759 ** (1.112) [47.767]
N treated	2'507	3'172	2'851	1'738	850	625
N comparison	2'275	3'363	2'757	1'576	901	608

Notes: This table compares pre-birth characteristics between treated (=eligible for generous policy) and comparison (=eligible for less generous policy) groups for the *early* and *late returners* samples. *Early returners* in the comparison group are women returning to work before the end of the job protection period. *Early returners* in the treated group are the women returning to work with the earliest return to work time such that their share is identical to the share of early returners in the comparison group. *Late returners* in the comparison group include women who return after the end of the job protection period but before the child's fourth birthday. *Treated late returners* are selected to match the comparison share of late returners. Robust standard errors are reported in parentheses. Means of the comparison group (i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

gains (5 %), earnings gains (3.6 EUR), increases in daily wage (1.6 EUR) and stronger wage growth (5.3 percentage points). The 1996 reform also increases daily wages for early returners (1.3 EUR) but leaves wage growth and employment unchanged. Consistent with our previous results we see that mothers who gave birth in the more generous regimes of 1990 and 1996 are more likely to work for their pre-birth employer 5 years after birth. Again, we do not find this for women in the more generous regime of 2000.

The effects of PL extensions on late returners reveal a different picture. By construction, late returners in the less generous PL regimes return to work after the guaranteed period of job protection has been exhausted and, as expected, we see that late returners in the more generous regimes also return to work after the end of the job protection period. Extended benefits delay return to work of late returners by 5.9 months (1996 reform) to 14.7 months (1990 reform) – effects that are about twice the size of the effects on early returners. Delayed return to work is translated into losses in work experience that range between 2.6 (1996 reform) to 6.3 months (1990 reform). In contrast to the results for early returners, tenure with current employer appears to be significantly and sizeable reduced by extended leaves among late returners.

Estimates of the effects on daily wages reveal that late returners in the more generous regimes earn significantly less than their counterparts in the less generous regimes. Wage growth is also negatively affected, especially in the 2000 reform. While effects on earnings, wages, and pre to post birth wage growth are not significantly different from zero for the 1990 and 1996 reforms, point estimates are typically negative and in some cases (1990 reform) close to conventional levels of significance. Interestingly, late returners in the more generous regimes are more likely to work for their pre-birth employer. Further analysis (not shown) indicates that the higher fraction of women returning to the pre-birth employer results from automatic PL renewal due to childbirth.

A comparison of the results for early and late returners suggests that late returners have substantially larger losses in general and specific human capital as a result of extensions in PL durations. In addition, while longer PL durations do not appear to reduce wages of early returners, they do have detrimental effects on wages of late returners.

The analysis on early and late returners relies on the assumptions that pre- and post-July early returners are comparable, that parental leave induces a monotonic shift in return times, and that fertility interactions can be neglected. Although these identifying assumptions cannot be tested, the examination of the impacts among women of parity greater than one provides valuable insights regarding the sensitivity of our results with respect to these assumptions. First, with data on women giving birth to children of parity higher than one, we can assess to what extent treated and comparison women are balanced with respect to return to work times after previous births while both groups of mothers were subject to the same PL regime. Second, we can assess whether early returners also return early in their previous birth. Lastly, given that the likelihood of having an additional child is much lower for women at parity greater than one, results on these samples are less likely to be affected by policy interactions with fertility.¹⁵

¹⁵We also examined the effects among early and late returners when restricting the samples to mothers who do not have additional children within the period of interest and obtained virtually the same results. While results based on samples that condition on post-reform fertility outcomes are likely to suffer from selection bias,

Table 6: Effects of extended parental leave on early and late returners: sample of women giving birth at Parity 1

	Early returners			Late returners		
	1990	1996	2000	1990	1996	2000
Returned in JP period	-0.034 *** (0.004) [1.000]	-0.108 *** (0.006) [1.000]	-0.301 *** (0.008) [1.000]	–	–	–
Months until return to work (censored at t=72)	8.226 *** (0.180) [9.117]	2.977 *** (0.204) [15.224]	4.503 *** (0.202) [14.596]	14.771 *** (0.418) [28.726]	5.892 *** (0.342) [35.451]	7.805 *** (0.393) [35.737]
Experience since child's birth	-1.402 ** (0.591) [32.831]	-1.967 *** (0.505) [35.340]	-1.560 *** (0.474) [34.398]	-6.309 *** (0.526) [24.270]	-2.617 *** (0.672) [24.336]	-4.709 *** (0.719) [24.080]
Tenure	1.928 (1.881) [68.552]	2.070 (1.570) [60.797]	-3.158 ** (1.567) [62.998]	-6.338 *** (1.674) [38.935]	-1.211 (2.486) [38.710]	-5.154 * (2.620) [38.930]
Employed	0.052 *** (0.015) [0.502]	0.015 (0.014) [0.608]	-0.005 (0.013) [0.600]	-0.007 (0.018) [0.516]	0.048 * (0.026) [0.634]	0.035 (0.028) [0.615]
Earnings	3.558 *** (0.832) [23.111]	1.277 (0.787) [28.550]	-0.942 (0.748) [28.864]	-1.156 (0.782) [18.964]	1.568 (1.187) [22.680]	-0.752 (1.199) [21.674]
Daily wage (Euros)	1.549 ** (0.766) [46.080]	1.298 * (0.688) [46.996]	-0.335 (0.693) [48.493]	-1.318 (0.800) [36.716]	-0.340 (1.080) [35.850]	-3.614 *** (1.129) [35.713]
Wage growth	0.053 *** (0.019) [-0.054]	0.024 (0.017) [-0.151]	-0.006 (0.016) [-0.253]	-0.037 (0.025) [-0.115]	-0.006 (0.032) [-0.303]	-0.086 ** (0.035) [-0.372]
Working for pre-birth firm	0.022 (0.020) [0.515]	0.039 ** (0.017) [0.456]	-0.021 (0.017) [0.453]	0.046 ** (0.021) [0.221]	0.047 * (0.027) [0.215]	0.009 (0.030) [0.227]
Observations	4'782	6'535	5'608	3'314	1'751	1'233

Notes: This table reports controlled differences in outcomes between the cohort with access to more generous parental leave rules and the cohort with access to the less generous regime for the 1990, 1996, and 2000 reforms. Regression estimates come from models that include the control variables specified in Table 2. *Early returners* in the comparison group are women returning to work before the end of the job protection period. *Early returners* in the treated group are the women returning to work with the earliest return to work time such that their share is identical to the share of early returners in the comparison group. *Late returners* in the comparison group include women who return after the end of the job protection period but before the child's fourth birthday. *Treated late returners* are selected to match the comparison share of late returners. Robust standard errors are reported in parentheses. Means of the comparison group (i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 7 presents descriptive statistics for early returners and late returners who gave birth at parity 2 or higher. The first line shows contrasts between pre- and post-July mothers with respect to return to work times at the previous birth. Note that there is no information on return to work times in previous birth for the 1990 sample since our extract only starts in 1990. Results indicate that treated early returners are no different than comparison early returners in terms of return to work behavior at the previous birth. Results on late returners also indicate no difference in terms of return to work times. This suggests that treated and comparison women are similar in terms of return to work decisions in the absence of differences in terms of incentives. Moreover, we see that early returners also return to work before late returners at the previous birth. Average return to work time at the previous birth ranges from 20.1 months (2000 reform) to 20.3 months (1996 reform) for early returners, whereas the equivalent data for late returners ranges between 27.7 months (2000 reform) to 28.4 months (1996 reform). This descriptive pattern of duration until return to work at previous birth suggests that return to work times do appear to shift in a monotonic way as a response to extended benefits.

Treated and comparison samples appear to be also balanced along most additional pre-birth dimensions. Exceptions refer to higher unemployment for treated early returners in the 1990 reform, lower average daily earnings for treated late returners in 1996, and lower daily wages for treated late returners in 1990. Again, these few departures from balance appear to reflect problems with multiple testing rather than to signal violations of the identifying assumptions of the early and late returner split.

Table 8 reports controlled contrasts of labor market outcomes in year 5 after birth for early and late returning women at parity two or higher. Results for early returners indicate that extended benefits decrease accumulation of both general and specific human capital. Yet, except for the 2000 reform, early returners do not experience reductions in daily earnings, wages or wage growth. In contrast, results for late returners show reductions in human capital accumulation that are accompanied also by reductions in earnings and wage outcomes. Overall, results for parity two or higher confirm the pattern found for parity one.

Results for early and late returners hint to the important role of job protection in maintaining post birth labor market careers. Whereas early returners experience no negative effects, late returners experience deteriorations of their labor market outcomes.

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 extended from 12 months to 24 months. In 1996 the allowance duration was shortened by 6 months, and in 2000 the allowance duration was extended, again, by 12 months while keeping the duration of the job protection period unchanged. We

it is reassuring to see that we obtain a very similar picture.

Table 7: Testing the Trimming Split: sample of women giving birth at Parity 2 or higher

	Early returners			Late returners		
	1990	1996	2000	1990	1996	2000
Time until return to work in previous birth		-0.459 (0.594) [20.329]	0.329 (0.558) [20.116]		0.832 (1.465) [28.405]	-0.515 (1.263) [27.722]
age	0.017 (0.188) [29.805]	0.060 (0.178) [30.890]	-0.106 (0.161) [31.414]	0.075 (0.253) [28.332]	-0.400 (0.336) [30.566]	0.460 (0.331) [30.714]
Tenure (years)	0.208 (0.162) [4.343]	0.169 (0.154) [3.901]	-0.141 (0.132) [3.901]	-0.198 (0.205) [3.340]	-0.280 (0.288) [3.494]	-0.003 (0.242) [3.066]
Experience (years)	0.230 (0.164) [8.140]	-0.032 (0.179) [8.366]	-0.102 (0.156) [8.464]	-0.224 (0.211) [7.540]	-0.402 (0.324) [8.459]	0.236 (0.304) [8.202]
Unemployment (years)	0.049 * (0.029)	-0.034 (0.042)	0.027 (0.038)	0.056 (0.052)	-0.149 (0.099)	-0.014 (0.096)
Avg. daily Earnings	0.30 -0.595 (0.674) [37.719]	0.64 0.686 (0.866) [39.443]	0.61 -0.632 (0.882) [42.710]	0.53 -0.725 (0.712) [31.738]	1.00 -2.188 ** (0.960) [34.144]	0.97 -1.738 (1.344) [36.638]
White collar	-0.026 (0.021) [0.669]	-0.011 (0.019) [0.649]	0.001 (0.018) [0.669]	-0.025 (0.030) [0.548]	0.023 (0.039) [0.545]	0.001 (0.038) [0.538]
Daily wage	-0.262 (0.853) [41.417]	-0.411 (0.833) [43.378]	-1.086 (0.820) [45.089]	-2.294 ** (0.902) [35.296]	-0.573 (1.324) [36.028]	-1.080 (1.256) [35.644]
N treated	1086	1242	1421	567	324	334
N comparison	1029	1229	1452	538	323	342

Notes: This table compares pre-birth characteristics between treated (=eligible for generous policy) and comparison (=eligible for less generous policy) groups for the *early* and *late returners* samples. Samples are restricted to women giving birth at parity 2 or higher around the months of the policy change. *Early returners* in the comparison group are women returning to work before the end of the job protection period. *Early returners* in the treated group are the women returning to work with the earliest return to work time such that their share is identical to the share of early returners in the comparison group. *Late returners* in the comparison group include women who return after the end of the job protection period but before the child's fourth birthday. *Treated late returners* are selected to match the comparison share of late returners. Robust standard errors are reported in parentheses. Means of the comparison group (i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 8: Effects of extended parental leave on early and late returners: Parity 2 and Higher

	Early returners			Late returners		
	1990	1996	2000	1990	1996	2000
Returned in JP period	-0.034 *** (0.004) [1.000]	-0.101 *** (0.010) [1.000]	-0.338 *** (0.012) [1.000]	0.040 *** (0.009) [0.000]	–	–
Months until return to work (censored at t=72)	8.423 *** (0.276) [8.806]	2.541 *** (0.347) [14.996]	4.852 *** (0.292) [14.450]	8.546 *** (0.643) [29.832]	6.548 *** (0.635) [35.437]	7.904 *** (0.511) [34.934]
Experience since child's birth	-3.065 *** (0.836) [44.007]	-3.483 *** (0.768) [43.726]	-4.132 *** (0.618) [43.114]	-4.385 *** (0.956) [28.787]	-4.166 *** (1.103) [28.140]	-7.404 *** (0.887) [29.384]
Tenure	-3.349 (2.403) [91.587]	-2.589 (2.539) [79.300]	-3.485 * (1.983) [72.722]	-5.907 * (3.101) [50.101]	-2.475 (4.697) [46.720]	-5.158 (3.555) [45.815]
Employed	0.037 * (0.019) [0.734]	0.012 (0.019) [0.789]	-0.020 (0.016) [0.784]	0.045 (0.029) [0.660]	0.020 (0.041) [0.759]	-0.063 * (0.035) [0.766]
Earnings	1.468 (1.102) [33.884]	0.788 (1.198) [36.769]	-2.233 ** (0.935) [36.985]	-0.329 (1.247) [23.487]	-3.536 * (1.975) [27.322]	-3.220 ** (1.392) [25.826]
Daily wage (Euros)	0.068 (0.807) [46.182]	-0.305 (0.931) [46.586]	-1.197 (0.718) [47.524]	-2.472 ** (1.193) [35.595]	-5.109 *** (1.891) [36.020]	-2.011 * (1.093) [33.971]
Wage growth	0.014 (0.020) [0.078]	0.000 (0.022) [0.047]	-0.035 ** (0.016) [0.019]	-0.070 * (0.038) [-0.040]	-0.143 *** (0.049) [-0.011]	-0.026 (0.034) [-0.066]
Working for pre-birth firm	0.018 (0.024) [0.652]	-0.003 (0.025) [0.581]	-0.003 (0.021) [0.527]	-0.037 (0.032) [0.315]	-0.031 (0.047) [0.318]	0.013 (0.041) [0.271]
Observations	2115	2471	2873	1105	647	676

Notes: This table reports controlled differences in outcomes between the cohort with access to more generous parental leave rules and the cohort with access to the less generous regime for the 1990, 1996, and 2000 reforms. Samples are restricted to women giving birth at parity 2 or higher around the months of the policy change. Regression estimates come from models that include the control variables specified in Table 2. *Early returners* in the comparison group are women returning to work before the end of the job protection period. *Early returners* in the treated group are the women returning to work with the earliest return to work time such that their share is identical to the share of early returners in the comparison group. *Late returners* in the comparison group include women who return after the end of the job protection period but before the child's fourth birthday. *Treated late returners* are selected to match the comparison share of late returners. Robust standard errors are reported in parentheses. Means of the comparison group (i.e., the group with access to the less generous regime) are reported in brackets. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

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 these samples.

We find that a longer duration of parental leave benefits induces a significant delay in mother's return to work time. 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-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. We also observe that women with low earnings potential are almost indifferent to the loss of the job protection entitlement while women with high earnings potential do respond more strongly to this policy instrument. In addition, removing job protection while receiving benefits appears to be as important as removing job protection while no longer receiving benefits.

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 extensions of parental leave benefit and / or job protection delay time until return to work considerably, 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. Losses in 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 general equilibrium effects in the longer-run. For example, prolonged job protected parental leave mandates might induce employers to offer lower starting salaries, or to limit 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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