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Parental Leave Take-up and its Intensity. Do Partners' Workplace Characteristics Matter?

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Abstract

In the current article, we explore the effect of partners' workplace characteristics on the take-up and intensity of parental leave by mothers and fathers. We use social security records data from 2004 to 2015 for Luxembourg. The results of the analysis reveal that the probability of taking full-time leave is substantially lower among mothers and fathers working in very small companies than among their counterparts in larger firms, whereas working in a small-sized company is related to higher probability of taking part-time leave. Mothers working in companies in predominantly female-dominated sectors, such as education, health, and social services, are more likely to take parental leave than their counterparts employed in other sectors. With regard to the effect of partners' workplace characteristics, fathers' take-up of parental leave is associated with the economy sector of their partner, whereas mothers' take-up correlates with their partners' workplace size.

Introduction

Childbirth is an event that significantly affects the personal and professional life of parents, and childbirth and subsequent childcare continue to have a more pronounced impact on the labor market participation of mothers than that of fathers (EIGE, 2021). Parental leave policies are designed to reduce the negative consequences of parenthood by providing a temporary career break, allowing both parents to dedicate some time to childcare, whilst retaining the right to return to their previous job. These policies aim to promote gender equality in the division of paid labor and childcare by facilitating the employment of mothers and the greater involvement of fathers in childcare. Meeting these objectives is conditional on the policy being viewed positively by the target population, and it being used by eligible parents to the greatest possible extent. If the usage among mothers or father is lower than expected, the general underlying policy objectives may not be met. By identifying the factors associated with leave take-up, it is possible to specify the groups of

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eligible parents that exhibit a lower likelihood of leave taking, and accordingly to design a targeted adjustment of the policy for these groups.

The existing literature on the determinants of parental leave take-up has extensively explored the relationship between leave take-up and its duration, and individual parents' characteristics. There is also a wealth of research regarding the effect of the policy context and parental leave parameters on macro-level factors affecting leave take-up. Comparatively less comprehensive qualitative evidence is available regarding the role of workplace characteristics, even though it is acknowledged that employers and workplaces play an important gate-keeping role in the implementation and usage of statutory work-family policies, including parental leave. Even though employees may be officially entitled to benefit from these policies, in practice, they can strongly discourage or encourage feelings of deservingness. In turn, this can affect the implementation of parental leave policy and the take-up among people working for particular types of employers. Hence, being able to identify which groups of companies or workplaces are systematically associated with lower leave take-up, while controlling for all other take-up determinants, may facilitate a suitably-targeted response by policymakers.

Despite growing interest in this topic, there are issues due to the fact that existing studies dealing with the relationship between workplace characteristics and parental leave take-up mainly focus on the individual workplace characteristics of parents. Further, these characteristics are frequently used to explain only fathers' take-up behavior (Haas and Hwang, 1995; Brandth and Kvande, 2002; Haas *et al.*, 2002; Bygren and Duvander, 2006; Naz, 2010; Escot *et al.*, 2012; Romero-Balsas *et al.*, 2013; Tremblay and Lazzari Dodeler, 2015; Aunkofer *et al.*, 2018). Studies dealing with the effect of workplace characteristics on take-up among women are scarce (Lapuerta *et al.*, 2011; Samtleben *et al.*, 2019; Van Breeschoten *et al.*, 2019). Even rarer are studies providing direct comparisons of the influence of workplace characteristics on leave usage between mothers and fathers (for exceptions, see Samtleben *et al.*, 2019; Van Breeschoten *et al.*, 2019) and how couples decide on the duration of parental leave (Samtleben *et al.*, 2019). In addition, most of the existing quantitative studies (for exceptions, see Bygren and Duvander, 2006; Lappegard, 2012) rely either on a representative sample of individuals where information about employers is incomplete, or on case studies including a limited number of individuals or managers from a somewhat selective group of employers. The latter can be a source of several types of selection bias, adversely affecting the quality of the obtained results (Van Breeschoten *et al.*, 2019; Pettigrew and Duncan, 2017). Consequently, very little is known about the effect of partners' workplace characteristics on leave take-up (for an exception, see Bygren and Duvander, 2006, who nevertheless focus solely on fathers).

The present article addresses these gaps and contributes to the literature on workplace-related determinants of parental leave usage by analyzing the case of Luxembourg and answering the following research questions: First, how are the workplace characteristics (such as the size of company and economy sector) of parents and their partners associated with parental leave take-up (i.e. whether leave is taken)? Second, how do the workplace characteristics of parents and their partners relate to the intensity of parental leave take-up (whether people take full-time, part-time, or no leave) by those eligible? To address these questions, we use

administrative data from Luxembourg covering the period from 2004 to 2015, and control for a wide range of other theoretically relevant predictors of parental leave take-up.

Luxembourg is an ideal case study to explore the relationship between leave usage and workplace characteristics, due to the particular parameters of the country's parental leave policy. First, Luxembourg has exhibited relatively low take-up rates among both mothers and fathers, at least compared with other Northern European countries. For parents of children born in 2003, mothers' leave take-up was 66 percent and for fathers, the figure was 13 percent. For the first-time parents of children born between 1999 and 2007, the average leave take-up rate was 46 percent among mothers compared with 11 percent among fathers (Zhelyazkova *et al.*, 2015). Hence, it is relevant to analyze and identify which groups of eligible parents respond to the policy less than others.

Luxembourg's parental leave scheme also has two particular features that advance the need to explore the role of employers' characteristics in take-up strategies, and that call for a couple-dynamic approach. The first feature relates to the timing of take-up among parents living in a couple. Despite the fact that parental leave in Luxembourg is an individual right for anyone eligible, mothers and fathers living in a couple must comply with one condition stipulated by law, which is that one of them is obliged to take parental leave immediately after the maternity leave. If this condition is met, then the second eligible parent can take the leave at any time until the child reaches 5 years of age. If this condition is not met, only one of the eligible parents may take a period of leave up to the time the child reaches the age of five. Hence, partners need to negotiate and coordinate their take-up strategies. This feature of Luxembourg's system calls for the use of the couple-dynamic approach to explore the role of partners' characteristics in leave take-up among eligible parents.

The second feature is related to the flexibility of leave. Under Luxembourg law, parents can choose between two forms of leave in terms of intensity and duration – full-time leave of six months or part-time leave of 12 months. However, the part-time form can be taken by employees only with the approval of their employer. Hence, it is plausible to assume that workplace characteristics (e.g. the economy sector and company size) will affect not only take-up in general, but also the choice between the part-time and full-time forms (in line with Lapuerta *et al.*, 2011). Compared with full-time leave, the use of the part-time alternative, which allows parents to remain attached to their workplace, may relate to parents' different workplace profiles (e.g. those where temporary replacement of employees is limited and costly).

The article contributes to existing quantitative evidence on the factors associated with mothers' and fathers' take-up in several ways. First, it explores the role of the workplace characteristics of not only individuals but also partners, in their parental leave take-up in the context of one country. This allows us to quantify how the workplace characteristics of both partners relate to leave-taking decisions. Second, it analyzes the role of these workplace characteristics on both the extensive and the intensive margin of take-up, while controlling for a wide range of other characteristics of both parents. This contributes to the precision of the estimations for the effects of interest, because only rarely have previous studies simultaneously explored both the take-up and its intensity. Considering the latter is important in

gaining an understanding of which groups of parents tend to benefit more from particular modes of leave, in terms of more subtle inequalities in take-up behavior. Third, it uses social security register data from Luxembourg covering the entire population of parents corresponding to our selection criteria, as well as providing information about their employers. This helps us to avoid the limitations typical of studies based on survey data (both at the individual and the company level) that is frequently subject to selection bias. Company-level surveys often face the problem of self-selection into the sample by companies with good family-work reconciliation practices, whilst individual-level surveys are confronted with the issue of nonrandom missing information on employees on leave or on a career break due to childcare (Van Breeschoten *et al.*, 2019; Pettigrew and Duncan, 2017).

Theoretical framework and existing evidence

Factors related to leave take-up

A comprehensive assessment of the use of parental leave ideally includes two indicators: the proportion of those eligible out of all parents, and the take-up rates of leave among those eligible. Information regarding take-up (i.e. whether a parent took leave) provides researchers and policymakers with accurate information about which groups of parents benefit from the policy more than others, and helps them to explore the determinants of take-up and non-take-up.

In existing literature, we can distinguish three main groups of factors that relate to the parental leave take-up rate among those eligible: micro-level, meso-level, and macro-level determinants.

Macro-level factors

Macro-level factors are those relating to a country's cultural norms, policies, and gender regime, as well as to the existing design of parental leave policy. In countries where more-traditional norms are dominant, homemaking is seen as a more appropriate status for women with children than being employed. In such a context, it is more likely for women to withdraw from the labor market after childbirth (Pfau-Effinger, 2004). Similarly, in countries with family policy regimes that have strong breadwinner features, such as joint taxation, promoted cash-for-care policies, and limited statutory affordable childcare provision, the probability of parental leave take-up, particularly among men, will be lower (Sainsbury, 1996; Lapuerta *et al.*, 2011).

The design of parental leave schemes is also strongly related to their use among eligible individuals. For example, unpaid parental leave leads to lower overall take up, particularly among fathers. Flat-rate benefits provide motivation for people to take parental leave more than unpaid leave. However, if the leave benefits are significantly lower than the salary, eligible higher-income parents (usually fathers) may not be motivated enough to take the leave. When parental leave is paid and benefits are income related, both men and women are more motivated to use it (Hardy and Adnett, 2002; Moss, 2015; Lapuerta *et al.*, 2011). For example, the extension of the duration of paid leave was found to increase leave duration among new mothers in Austria (Lalive and Zweimüller, 2009).

Another relevant parameter is the flexibility of leave, as schemes that provide greater flexibility incentivize take-up (Anxo *et al.*, 2007; Moss, 2015; Lapuerta *et al.*, 2011). This can include the timing of take-up until a child reaches a certain age, the choice between part-time and full-time leave, the possibility of taking leave in one continuous block or several shorter breaks, the option for parents to take leave at the same time, the availability of individual non-transferable rights for each parent, and the existence of so-called fathers' quotas.

In countries with flexible parental leave provision, where parents may choose the duration of leave or between part-time and full-time, different groups of parents opt for different durations. During a leave period, beneficiaries may suffer losses related to lower gains from work experience, promotion, and training. Thus, parents with greater human capital are not only less likely to take leave, but if they do, it will be for shorter durations (Lapuerta *et al.*, 2011), to minimize their detachment from the workplace. Hence, flexibility may have a greater effect on the take-up of parents with stronger labor market attachment, or those employed in workplaces where longer absences are not desirable, either due to the nature of the work or the employer's lower capacity to replace a worker on leave.

Micro-level factors

Among the most widely analyzed factors associated with parents' leave take-up are individual characteristics, including education level, salary or income, gender of the child, age and number of the child's siblings, nationality, job tenure, seniority and experience, being a low or high-skilled worker, and gender-role attitudes (Nielsen, 2009; Han *et al.*, 2009; Geisler and Kreyenfeld, 2019; Ekberg *et al.*, 2013; Sundström and Duvander, 2002; Lapuerta *et al.*, 2011; Zhelyazkova and Ritschard, 2018; Duvander, 2014; Van Breeschoten *et al.*, 2019; Kaufman and Bernhardt, 2015).

In many European countries (Eurofound Cabrita and Wohlgemuth, 2015), including Luxembourg, parental leave is an individual right, justifying the focus on individual determinants of its usage. However, widely established theories claim that for parents living in a couple, decisions on employment and career interruptions are not made in isolation, but in the intra-couple or household context and via a couple-bargaining process (Becker, 1981; Amilon, 2007; Lundberg and Pollak, 2001; Geisler and Kreyenfeld, 2019).

This approach stems from the theoretical premise of Becker (1981), defining the family as a unit following the economic assumption of maximizing behavior. It is also in line with couple-bargaining theories, suggesting that the partner with the greater resources (e.g. income, education level, or social class) will use their power to constrain the other partner to fulfil what is considered as unpleasant unpaid domestic labor (Amilon, 2007; Lundberg and Pollak, 1996).

Another group of micro-level factors comprise the household and partner characteristics. Empirical studies have found that partners of better-educated women (Sundström and Duvander, 2002) and younger and higher-educated men (Lapuerta *et al.*, 2011; Geisler and Kreyenfeld, 2019) are more likely to take parental leave. Further, a higher income level for both parents increases the rate of fathers' parental leave take-up (Sundström and Duvander, 2002). As men generally have greater financial resources than women, the potential economic loss for a family

is higher when men rather than women take leave. The family is therefore more likely to opt for only the mother using parental leave (Haas and Hwang, 1995; Duvander, 2014). Fathers are more likely to take parental leave when mothers work full-time and have the same or higher education level or income (Naz, 2010; Lappegard, 2008; Geisler and Kreyenfeld, 2019).

Meso-level workplace factors

As already outlined in the introduction, leave take-up among employees also depends on workplace characteristics: the most frequently used meso-level determinants (Bygren and Duvander, 2006; Haas *et al.*, 2002). Two main streams can be distinguished in literature dealing with the interplay between workplace characteristics and use of parental leave. One focuses on the role of the structural workplace characteristics and the second on the organizational culture and norms. Due to the aims of this article and its limited scope, we focus only on the structural characteristics, while acknowledging the important role of organizational norms and culture – as well as the attitudes of employers, line managers, and work colleagues – in leave usage (Haas and Hwang, 2019; Cramer and Pearce, 1990; Acker, 1990; Escot *et al.*, 2012).

The structural characteristics include the company size in terms of number of employees (Bygren and Duvander, 2006; Anxo *et al.*, 2007; Lapuerta *et al.*, 2011; Van Breeschoten *et al.*, 2019), the public or private status (Bygren and Duvander, 2006; Anxo *et al.*, 2007; Van Breeschoten *et al.*, 2019; Geisler and Kreyenfeld, 2019), the economy sector (Anxo *et al.*, 2007; Whitehouse *et al.*, 2007; Lapuerta *et al.*, 2011), the proportion of short-term employment contracts (Anxo *et al.*, 2007), the proportion of women in the workforce (Bygren and Duvander, 2006; Anxo *et al.*, 2007; Naz, 2010; Van Breeschoten *et al.*, 2019), and the age composition of employees. The findings regarding some factors are not always consistent across studies. For example, Naz (2010) shows that fathers working in female-dominated workplaces tend to use more gender-neutral leave than fathers working in male-dominated environments, whereas Anxo *et al.* (2007) find a negative link between the proportion of women in a company and the use of parental leave by fathers. By comparison, studies (both case studies and cross-country comparisons) reach a consensus that fathers and mothers working in the public sector are more likely to take parental leave. Bygren and Duvander (2006) suggest that this can be explained by the fact that costs related to the longer-term absence of employees on parental leave are differently perceived in sectors that are not driven by profit, and that do not rely on generated income (i.e. the public sector). Moreover, leave take-up may be more accepted and organizationally facilitated (such as by routinized replacement human resources procedures) in sectors that are traditionally female dominated, where taking parental leave is more common. Working in a large company appears to be one of the strongest determinants of take-up. This may be explained by the greater societal pressure for larger companies to gain social legitimacy, and also by the fact that implementing the policy is less demanding in larger companies. Further, larger companies imply less pressure on human resources management, as well as fewer issues related to the costs of replacing people on leave and reintegrating people returning after taking it (Bygren and Duvander, 2006; Van Breeschoten *et al.*, 2019; Amjahad *et al.*, 2022).

Anxo *et al.* (2007) used data from company-level cross-country surveys and note that the economy sector with notably high leave take-up rates among staff is that of education, health, and social services. When the effect of country, establishment size, and composition of the workforce by gender is controlled for, the economy sectors with the higher incidence of parental leave take-up are public administration, finance intermediation, business services, and retail. By contrast, a low incidence of leave usage is observed for the hotel and catering, construction and transport, storage, and communications sectors.

Relatively little qualitative evidence is available regarding the association between parents' leave take-up and the partners' workplace characteristics. Bygren and Duvander (2006) explored the effect of the partners' workplace factors (public or private sector company, the proportion of women, male leave take-up rate, and company size) on fathers' parental leave take-up in Sweden, and show it is significantly associated with the proportion of women in the partner's company. Lappgaard (2012) analyzed the relationship between couples' leave practices and their workplace situation in Norway, and suggests that the effect of partners' workplace characteristics is different for different leave practices. Specifically, workplace characteristics are not related to leave practices that involve only exclusive rights for fathers (i.e. fathers' quota). However, fathers' take-up exceeding the relevant quota appears to be greater when partners are employed in workplaces with higher costs of long absences from work; that is, working in the private sector, and male-dominated and large-sized workplaces.

There is a lack of empirical evidence regarding the role of the partners' workplace context on parental leave take-up by mothers. However, the literature regarding micro-level factors shows that some partners' characteristics (such as income and education level) significantly affect both mothers' and fathers' take-up behavior. Hence, it is plausible to assume that the partners' workplace characteristics are also substantially associated with the leave-taking behavior of both mothers and fathers, although there is a gap in quantitative empirical evidence on this issue.

Gender and workplace characteristics

In most countries, including Luxembourg, mothers are substantially more likely to take parental leave than fathers (Moss, 2015; Han *et al.*, 2009), although there is substantive heterogeneity between countries in this regard. It also has to be noted that this gender gap has been diminishing over time, with men increasingly taking parental leave (Eurofound Cabrita and Wohlgemuth, 2015). Because of the gender difference, the usage of parental leave and its determinants have been analyzed separately for mothers and fathers.

The role of the workplace in the decision-making process differs between men and women. The findings of some qualitative studies (Fusulier *et al.*, 2011; Tremblay and Lazzari Dodeler, 2015; Samtleben *et al.*, 2019) reveal that, in general, parental leave is perceived in companies as more legitimate and "normal" for mothers than for fathers. This finding is more prevalent in companies where the management aligns with traditional gender norms. Fathers have to deal with a different approach by their managers and colleagues when considering taking leave, and may foresee

somewhat more demanding negotiation and adjustment processes in the workplace than mothers (Naz, 2010; Van Breeschoten et al., 2019; Amjahad et al., 2022). Van Breeschoten et al. (2019) suggest that when negotiating parental leave take-up with employees, managers tend to accommodate men informally (e.g. offering worktime flexibility or working from home), without needing prescribed arrangements such as formal parental leave. By contrast, women are more encouraged to use formal arrangements. Naldini and Solera (2018) argue that even in couple negotiations regarding the division of domestic and paid labor, the father's work context is given more weight than that of the mother.

Bygren and Duvander (2006) claim that the issue of possible sorting of employees into employers should be taken into account, because a particular type of employee may have a preference for employers that are more generous in approving parental leave. Employers may also "select" particular types of employees based on productive characteristics that may be correlated with their parental leave take-up behavior (Ruhm, 1998; Huebener et al., 2021). Therefore, a higher take-up rate among particular categories of workplaces may be due to their specific observed and unobserved characteristics, but may also be due to the above sorting or self-selection effects. The relationship between the analyzed workplace characteristics and take-up rates should thus not be interpreted as causal.

Luxembourg context

Parental leave parameters

A universal scheme for parental leave was introduced in Luxembourg in 1999 and underwent a substantive reform in December 2016. This relaxed the eligibility criteria, raised the level of compensation, increased the modalities of flexible use of leave, and extended the leave period. For the purposes of the current article, we refer to the position prior to the 2016 reform, as data are not yet available that would allow us to examine the entire period during which those eligible have been entitled to take parental leave. Due to the limited scope of the paper, more information about the country's context is available in Appendix 1.

Leave is designed as an individual and non-transferable right – hence, if a parent does not use the allowance, it cannot be passed on to their eligible partner. Leave is fully job protected, meaning that parents are guaranteed the right to subsequently return to the same (or an equivalent) work position to the one they held before taking parental leave. The eligibility requirements are a minimum of one year's employment with the same employer prior to the start of the leave, and a reduction of at least 50 percent of working hours in the case of taking part-time leave. The parent must be employed at the time of the childbirth. Self-employed workers are also eligible if they have been self-employed for at least one year and for at least 20 hours per week.

In terms of leave duration, each eligible parent can take either a period of six months full-time or twelve months part-time leave. Hence, no matter which type parents choose, the sum of time spent on leave is identical, but can be spread over different periods of time. The part-time form of leave can be taken only with the employer's approval, whereas no such approval is needed for full-time leave.

Parental leave can be taken directly after the mandatory maternity leave (i.e. two months after childbirth if the mother does not breastfeed, or three months after childbirth if the mother does) up to the child's fifth birthday or after the adoption of a child. When both parents in a couple are eligible, there is a requirement that one of them – either the mother or father – has to take parental leave directly after maternity leave (the so-called first leave) and the other eligible partner may take the leave at any time to the fifth birthday of the child (the so-called second leave). If neither of eligible parents in a couple takes parental leave directly after maternity leave, then the eligible couple can only benefit from one period of leave, which can be taken at any time until the child turns five. In couples with two eligible parents, parents are not allowed to take parental leave at the same time. Single parents are entitled to only one period of parental leave; however, they do not necessarily have to take it immediately after maternity leave. Parental leave is paid, and the flat-rate benefit up to 2006 was equal to 1,496 euros for the full-time leave per month. In 2007, the benefit increased to 1,778 euros: approximately equal to the minimum wage for an unqualified worker in Luxembourg.

Between 1999 and 2015, the total number of parents using the leave increased markedly, particularly among fathers. The greater participation of men is evident in the increasing proportion of male users out of the total number of those taking parental leave: up from 6.3 percent at the end of 1999 to 24.7 percent in 2014. In 1999, taking part-time leave was less common than the full-time alternative, as 25 percent of all female beneficiaries and 41 percent of all male beneficiaries took this option. However, over the years, the part-time form has become more used by men than the full-time equivalent. In 2014, some 65 percent of male beneficiaries opted to take part-time leave (compared with 41 percent of the total female users) (MIFA, 2015). Information about take-up rates was mentioned in the Introduction.

Hypotheses

Based on the above theoretical framework and previous research findings with regard to the role of *individual workplace characteristics* in the leave take-up by mothers and fathers, we hypothesize that mothers and fathers working in small companies will have a lower likelihood of taking parental leave than their counterparts employed in large businesses. For the economy sector, we hypothesize that mothers and fathers working in traditionally female-dominated and non-profit sectors, such as education, health, social services, and public administration, will be more likely to take parental leave. By comparison, mothers and fathers working in economy sectors that are known as male-dominated, such as construction, will be less likely to take parental leave.

With regard to the role of *partners' workplace characteristics*, we hypothesize that if fathers work in a small company, they will have less opportunity to take leave: consequently, the take-up rate will be higher among mothers. A similar effect will be observed regarding the influence of company size on mothers' take-up, although we expect this effect to be weaker.

If fathers work in an economy sector that is more likely to be male-dominated, such as construction, transport, or ICT, the take-up of leave may be more

complicated and less common than in other sectors. Therefore, the partner will be more likely to take leave, because the father's likelihood of doing so will be relatively lower. Mothers' take-up rate for parental leave may be affected by their partners working in a more male-dominated sector, although to a lesser extent than we assume among fathers.

With regard to the relationship between the workplace characteristics and intensity of take-up (i.e. taking part-time leave of 12 months, full-time leave of 6 months, or no leave at all), we expect that the association between workplace characteristics and the probability of taking full-time or part-time leave will follow the hypotheses proposed for the general take-up. By comparison, the role of workplace characteristics will be more pronounced among parents opting for part-time leave compared with those choosing the full-time option.

Data

We use administrative social security records from Luxembourg for the period from 2004 to 2015. The information was generated, anonymized, and provided by the General Inspectorate of Social Security (IGSS). The dataset contains information about children and their parents, including employment, social-security benefits, workplace, and other key socio-economic information necessary for the intended analysis. The data used in the present paper were made available to the authors via the "Luxembourg Microdata Platform on Labour and Social Protection," managed by the IGSS.

Our analysis only includes eligible mothers and fathers, and eligibility was calculated based on the IGSS data to proxy the legally-defined criteria. Further, we use a pooled sample of first-time parents of children born in the period between 1 January 2005 and 31 December 2010, and who had no additional children during the subsequent five years. Focusing on first-time parents is common in the analyses of parental leave usage and its effects (e.g. Mari and Cutuli, 2020; Lappegard, 2012; Bygren and Duvander, 2006); however, for us, the restriction to first-time parents is also pragmatic, because in the case of multiple parenthood, the IGSS data prior to 2016 do not allow the information on parental leave take-up to be linked to a specific child.

As the available data contain the key variables that allow us to calculate parental leave eligibility only from 1 January 2005, we start our observation period from that date. Since this particular dataset contains information only up to 31 December 2015, we can only include a pooled sample of parents of children who were born between beginning of January 2005 and the end of 2010, to be able to observe the take-up rates in the five years following the childbirth.

Further, we only include parents with available information for both the mother and father, to be able to analyze the effect of partners' characteristics. Hence, single parents are inevitably excluded from our analyses. Additionally, only mothers and fathers residing in Luxembourg are included. Cross-border workers (i.e. workers residing in other countries but commuting daily to Luxembourg to work) are not included in our analyses due to the unavailability of data for partners. In line

with conventional practices described in relevant literature (Mari and Cutuli, 2020), the sample is restricted to dependent employees, as self-employed individuals also had missing or non-comparable information for several key variables.

The dataset includes 4405 **first-time parents** living in couples at the time of childbirth. After excluding parents who were self-employed, we were left with data for 4059 first-time mothers and 4059 first-time fathers. Of the mothers, 2710 (67 percent) were eligible for parental leave and 1349 (33 percent) were not. Out of the entire sample of eligible mothers, about 75 percent took leave. Out of the fathers, 3358 (83 percent) were eligible and 701 (17 percent) were not. Of the entire sample of eligible fathers, 17 percent took leave. Of the 1349 ineligible mothers, 76 were employed shortly before childbirth and 158 of the 701 ineligible fathers were similarly employed shortly before childbirth. Due to earlier specified reasons, the ineligible individuals were not included in our analyses.

Our primary aim is to estimate the effects of individual and partners' workplace characteristics on the leave take-up of mothers and fathers, while controlling for a range of other factors. Therefore, in the sample of mothers eligible for parental leave we retained those whose partner was employed prior to the childbirth (workplace information is available only for employed partners). Similarly, for fathers eligible for parental leave, we retained only those whose partner was employed shortly before the childbirth. This left us with data for 2500 mothers and 2500 fathers. Among the eligible mothers with an employed partner, about 76 percent took leave. Among eligible fathers whose partner was employed, approximately 19 percent took leave.

Methods

To answer our research questions, we estimate a series of regression models. The first two focus on the extensive margin of leave usage and use mother's and father's take-up as dependent variables (M1). "Take-up" measures whether a mother or a father took parental leave in the course of five years following the childbirth. A value of 1 is attributed to individuals who took parental leave and 0 otherwise. Due to the binary nature of the dependent variable, logistic regression is used to estimate the effect of key variables of interest while controlling for a wide range of factors. The key results are presented in the form of marginal effects, in line with Mood (2010) and Williams (2012).

The other two models aim to estimate the intensive margin of leave-taking (M2). During our observation period, Luxembourg had only two forms of leave in terms of intensity: full-time leave lasting 6 months and part-time lasting 12 months. The duration of chosen leave is fixed and must be taken by an eligible parent in its entirety without any interruption and delays from the requested start date. Hence, we use a dependent variable for the intensity of take-up that comprises three categories: full-time leave take-up, part-time leave take-up, and no take-up (reference category). A multinomial logistic model is estimated for mothers and fathers separately, and the results of the analyses for the key independent variables are presented in the form of marginal effects.

The key independent variables

The key independent variables are the workplace characteristics of mothers and fathers (to estimate their respective take-up) and the workplace characteristics of their partner. 1) Economy sector category, measured by a re-categorized NACE 2 classification (categorical variable): education, health, and social services; public administration and defense; wholesale and retail trade; transport and ICT; hotels and catering; agriculture, winery, fishery, and electricity and water services; construction; finance and insurance; collective services and specialized activities such as science, technical, and administrative assistance; and real-estate and business services. 2) Company size (categorical variable): 1–9, 10–49, 50–99, 100–249, and 250 and more employees. All these variables refer to the position at the time of childbirth.

The sets of theoretically relevant control variables (shown below) were used in each estimated model:

Other characteristics of the analyzed parents and their partner

(i) Nationality (categorical variable): Luxembourg, Portuguese, French, other EU-27, and non-EU. (ii) Age at the time of childbirth (continuous variable). (iii) Number of hours worked per week prior to the childbirth (categorical: 35 hours or more; fewer than 35 hours). (iv) Work experience (categorical: 0–5 years, 6–10 years, 11 years or more). (v) Feminization level at the workplace (categorical: more than 60 percent female employees or not). (vi) Proportion of white-collar workers at the workplace (categorical: more than 60 percent white-collar workers or not). (vii) Private employee or civil servant (categorical). (viii) Hourly wage prior to the childbirth, as a proxy of the earning potential of each parent. As the number of hours worked varies notably between parents, the monthly salary would not correctly indicate the earning potential. The hourly wage is expressed as a multiple of the Minimum Social Salary (MSS) of an unqualified worker adapted to the inflation indexations, and comprises four categories: less than 1.25 times the MSS, between 1.25 and 2 times the MSS, between 2 and 3 times the MSS, and 3 times the MSS and above. This wage categorization also proxies the wage replacement rate of the leave benefit, which is approximately equal to the MSS in Luxembourg.

Joint couple characteristics

Child's year of birth (categorical: 2005–2010) accounting for the period effect, and child's sex (categorical).

Descriptive analyses of all the variables included in the analysis are presented in Appendix 2 (Tables 1–2).

Results

The descriptive analysis of parental leave take-up shows that out of all the analyzed eligible mothers, about 24 percent did not take leave at all, 58 percent took full-time leave, and 18 percent took part-time leave. Hence, the general take-up rate is about 76 percent. Among the fathers, approximately 81 percent did not take leave, about

11 percent took full-time leave, and 8 percent took the part-time form. The general take-up among eligible fathers is therefore about 19 percent, which is substantially lower than for mothers. Both mothers and fathers are more likely to take the full-time form of leave than the part-time alternative. More information is available in Appendix 1.

The effect of workplace characteristics among mothers

Mothers' workplace characteristics

We use logistic regression to explore the effect of mothers' workplace characteristics – and those of the partner – on parental leave take-up (extensive margin), and use multinomial regression to investigate the intensity of take-up (intensive margin). We control for other relevant individual, partner-related, and couple-related factors. For easier interpretation, we present the results as average marginal effects, thereby facilitating not only identifying the direction of any effect, but also its substantive and practical significance. The average marginal effects for a binary independent variable can be interpreted as the percentage point difference in the probability of obtaining category 1 in the outcome variable between individuals who belong to category 1 of an independent variable and those who are in the reference category, when all other independent variables are held at their means.

In our analyses we work with the total sample of the mothers and fathers fulfilling our selection criteria, thus this is not a random sample. Further, as the sample we use has the same number of observations as the population, it is more appropriate to see the significance tests as indicators of the robustness of the coefficients, in line with Bygren and Duvander (2006).

The results of our analyses are shown in Table 1 below. Due to the limited scope of the paper, the table presents only the key independent variables. Complete binary and multinomial regression models, including key independent and all control variables, are available in Appendix 2 (Tables 3–6).

For company size, we find that compared with mothers employed in firms with fewer than 10 employees, the probability of take-up is non-negligibly higher among mothers working in firms with 10–49 employees (9 percentage points) and in those with 50–100 employees (11 percentage points). The association between take-up and other categories of company size is relatively weak, but remains positive. Focusing on the intensity of take-up, the data reveal that mothers in companies with more than 10 employees have a substantially higher likelihood of taking full-time leave than those working in smaller firms (about 18 percentage points higher in companies with 50–99 employees and about 14 percentage points higher in the remaining size categories). Interestingly, we find that the company size relates to part-time leave take-up in an opposite way. The probability of taking part-time leave is substantially lower in larger firms than in those with fewer than 10 employees, and particularly in companies with 100 and more employees (where the probability of part-time leave take-up is about 10 percentage points lower than in very small companies).

With regard to the effect of the economy sector on take-up of parental leave, we compare the probability between analyzed economy sectors to the reference (base-line) category, which is the sector including education, health, and social services.

Table 1 Marginal Effects (ME): Regression Estimates of the Effect of Workplace Characteristics on the Leave Take-up of Mothers and Fathers

	Mothers			Fathers		
	M1-Extensive margin	M2-Intensive margin		M1-Extensive margin	M2-Intensive margin	
	ME-logistic	ME-multinomial		ME-logistic	ME-multinomial	
	General take-up	Full-time take-up	Part-time take-up	General take-up	Full-time take-up	Part-time take-up
Key characteristics	(baseline: non-take up)			(baseline: non-take up)		
Sector: Education, health, social services_p1 (ref.)						
Construction_p1	-0.163*	-0.228**	0.035	-0.057	-0.043	0.001
	(0.086)	(0.098)	(0.070)	(0.075)	(0.044)	(0.058)
Trade_p1	-0.049	-0.056	-0.002	-0.070*	-0.009	-0.060**
	(0.037)	(0.049)	(0.038)	(0.041)	(0.028)	(0.026)
Transport and ICT_p1	-0.059	-0.059	-0.007	-0.105**	-0.036	-0.059**
	(0.052)	(0.063)	(0.044)	(0.048)	(0.034)	(0.027)
Horeca_p1	-0.046	0.002	-0.061	-0.072	-0.016	-0.047
	(0.046)	(0.063)	(0.048)	(0.056)	(0.037)	(0.036)
Finance and insurance_p1	0.001	0.028	-0.025	-0.085**	-0.014	-0.060**
	(0.036)	(0.047)	(0.035)	(0.043)	(0.031)	(0.025)
Real estate and company services_p1	-0.050	-0.071	0.008	-0.109***	-0.041	-0.058**
	(0.030)	(0.045)	(0.036)	(0.038)	(0.025)	(0.025)

(Continued)

Table 1 (Continued)

	Mothers			Fathers		
	M1-Extensive margin	M2-Intensive margin		M1-Extensive margin	M2-Intensive margin	
Public administration and defence_p1	-0.120** (0.058)	-0.141 (0.065)	0.011 (0.044)	-0.018 (0.050)	-0.003 (0.039)	-0.028 (0.031)
Agriculture_p1	-0.054 (0.053)	0.011 (0.065)	-0.070* (0.042)	-0.138*** (0.050)	-0.037 (0.038)	-0.082*** (0.026)
Collective services_p1	-0.116* (0.061)	-0.240*** (0.074)	0.108* (0.065)	-0.057 (0.057)	-0.010 (0.039)	-0.043 (0.033)
Size: 1-9 employees_p1 (ref.)						
10-49_p1	0.090*** (0.034)	0.126*** (0.044)	-0.038 (0.040)	0.008 (0.032)	0.018 (0.021)	-0.011 (0.018)
50-99_p1	0.109*** (0.039)	0.178*** (0.052)	-0.070 (0.045)	0.027 (0.041)	0.032 (0.029)	-0.009 (0.021)
100-249_p1	0.052 (0.041)	0.140*** (0.050)	-0.092** (0.042)	-0.005 (0.035)	0.011 (0.023)	-0.013 (0.019)
250 and more_p1	0.043 (0.037)	0.145*** (0.045)	-0.108*** (0.040)	0.010 (0.032)	0.013 (0.021)	-0.007 (0.019)
Sector: Education, health, social services_p2 (ref.)						
Construction_p2	-0.018 (0.063)	-0.032 (0.075)	0.012 (0.051)	-0.031 (0.052)	-0.014 (0.043)	-0.027 (0.021)

(Continued)

Table 1 (Continued)

	Mothers			Fathers		
	M1-Extensive margin	M2-Intensive margin		M1-Extensive margin	M2-Intensive margin	
Trade_p2	0.007 (0.059)	-0.042 (0.070)	0.052 (0.048)	-0.043 (0.047)	-0.025 (0.039)	-0.021 (0.020)
Transport and ICT_p2	0.036 (0.060)	0.024 (0.070)	0.017 (0.045)	0.022 (0.051)	-0.019 (0.041)	0.030 (0.024)
Horeca_p2	0.028 (0.069)	0.027 (0.087)	0.003 (0.064)	0.089 (0.073)	0.010 (0.053)	0.068 (0.049)
Finance and insurance_p2	0.050 (0.061)	0.068 (0.071)	-0.011 (0.044)	-0.050 (0.050)	-0.049 (0.040)	-0.002 (0.023)
Real estate and company services_p2	-0.032 (0.061)	-0.054 (0.070)	0.021 (0.045)	0.015 (0.051)	-0.027 (0.040)	0.025 (0.026)
Public administration and defence_p2	0.037 (0.064)	0.034 (0.074)	0.006 (0.045)	0.005 (0.053)	-0.051 (0.041)	0.034 (0.026)
Agriculture_p2	0.025 (0.061)	0.006 (0.073)	0.022 (0.048)	-0.004 (0.051)	-0.026 (0.041)	-0.021 (0.022)
Collective services_p2	0.034 (0.111)	0.038 (0.133)	0.004 (0.087)	-0.012 (0.097)	-0.061 (0.067)	0.011 (0.041)

(Continued)

Table 1 (Continued)

	Mothers			Fathers		
	M1-Extensive margin	M2-Intensive margin		M1-Extensive margin	M2-Intensive margin	
Size: 1-9 employees_p2 (ref.)						
10-49_p2	-0.028 (0.030)	0.011 (0.045)	-0.042 (0.037)	-0.023 (0.035)	0.012 (0.017)	-0.050* (0.029)
50-99_p2	-0.140*** (0.044)	-0.088 (0.056)	-0.063 (0.041)	0.008 (0.043)	0.033 (0.024)	-0.046 (0.033)
100-249_p2	-0.023 (0.033)	-0.014 (0.050)	-0.012 (0.041)	0.051 (0.041)	0.075*** (0.024)	-0.054* (0.031)
250 and more_p2	-0.064** (0.032)	-0.035 (0.047)	-0.033 (0.038)	-0.012 (0.036)	0.049** (0.020)	-0.069** (0.030)
Observations	1,993	1,993	1,993	1,987	1,987	1,987

Source: IGSS data, 2004-2015.

Notes: ME when all other independent variables are held at their means and only for key independent variables. In the models we control for the following variables: nationality, age at the time of birth, number of hours worked per week prior to the childbirth, work experience, feminization level at the workplace, proportion of white-collar workers at the workplace, private employee or civil servant, hourly wage prior to the childbirth, child's year of birth, child's sex.

Models including all independent variables available in the Appendix (Table 3-4).

p1=mother; p2=father.

ref.=reference category.

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

Compared with the baseline, mothers working in all other sectors show a lower probability of take-up overall, while a notably lower probability is found in the construction (16 percentage points lower), public administration, and business services (both 12 percentage points lower) sectors. However, the finding of relatively low take-up in the public administration sector is not in line with evidence from other countries. One possible explanation could be that in Luxembourg, employees in public administration can benefit from some sector-specific family-work arrangements (for example, a part-time work arrangement with a subsidized contribution to pension benefits) that are not available to other employees.

For the intensity of take-up, we observe that the direction of the relationship between full-time take-up and economy sectors mirrors the results for overall take-up. We find that the probability of take-up is substantially lower in the construction, business services, and public administration sectors (23, 24, and 14 percentage points, respectively). For part-time leave take-up, the data reveal that the associations between sectors and part-time leave are relatively weak, with the exception of agriculture and business services, where the directions are opposite to those found for full-time leave take-up.

With regard to the effect of the *partner's workplace characteristics* on mothers' use of parental leave, the probability of take-up is notably lower when the mother's partner works in a company with 50–99 employees or with 250 or more (14 and 6 percentage points, respectively) than in companies with fewer than 10 employees. Similar trends, although relatively weaker, are found when looking at the intensity of take-up and the partners' company size. However, we do not find a notable association between the partners' economy sector and either general take-up or the intensity of it.

The effect of workplace characteristics among fathers

The role of individual workplace characteristics on fathers' take-up of parental leave

For the role of individual workplace characteristics on fathers' take-up of parental leave, the results of the regression analysis do not reveal any substantial association between the company size and fathers' overall parental leave usage. However, when looking at the effect of company size on the intensity of take-up, we observe that the probability of taking full-time leave is higher (by 8 percentage points) among fathers working in companies with more than 100 employees than among fathers working in firms with fewer than 10 employees. Interestingly, the relationship between company size and part-time take-up appears to work in the opposite direction, as the probability of part-time usage decreases with the size of the company. This shows that part-time leave is more likely to be used in very small firms than in larger ones. It can be explained by the fact that small companies cannot afford to replace a worker who takes full-time leave, but are more likely to agree to part-time (more flexible) arrangements. For the economy sector, we observe no substantial association with the intensity of take-up by fathers. Compared with the education, health, and social services sector, general parental leave take-up appears to be lower in all other sectors. However, in terms of magnitude, the variation is negligible with the exception of the sectors of finance, and hotels and catering.

Partners' workplace characteristics

When focusing on the partners' workplace characteristics, the data suggest that fathers' take-up (both overall and in terms of intensity) is not associated with the size of the company their partner is employed in. With regard to the different economy sectors, we find that when the father's partner works in the education, health, and social services sector, the probability of general leave take-up and full-time leave take-up is higher than for fathers with a partner working in other sectors. Compared with the baseline, a particularly lower likelihood of take-up is observed among fathers whose partner works in the sectors of agriculture (14 percentage points lower), transport and ICT, or real estate (both 11 percentage points lower). Similar trends in terms of the direction of the effect are observed when focusing on the intensity of take-up (i.e. on part-time or full-time leave take-up). Nevertheless, the effect of economy sectors appears to be more pronounced in the case of part-time take-up.

Conclusions

The current article contributes to quantitative literature analyzing the determinants of parental leave take-up by exploring how the extensive and intensive margins of parental leave usage among eligible mothers and fathers are associated with their and their partner's "structural" workplace characteristics, while controlling for a wide range of relevant individual, partner-related and contextual factors.

For the main results regarding *individual workplace characteristics*, we find that the economy sector plays a substantive role in the parental leave take-up behavior of mothers. Those working in the education, health and social services sector are more likely to take parental leave than those working in all the other analyzed sectors, and the probability of general and full-time leave take-up is substantially lower in sectors such as construction, public administration, and business services. With regard to fathers, those working in the sector of education, health, and social services are more likely than all other fathers to take parental leave. However, in terms of magnitude, the variation in the probability of leave take-up when related to the economic sector is very small, except for the sectors of finance, and hotels and catering. These findings are in line with the previous research of Anxo *et al.* (2007) and Lapuerta *et al.* (2011), and are explained by the feminization of the labor force and the institutionalization of this right in the education, health, and social services sector.

With regard to the company size, the probability of taking full-time leave is substantially lower among mothers working in small companies (fewer than 10 employees) compared with those employed in larger firms. Conversely, the probability of part-time leave take-up appears to be highest among mothers in small-sized firms, and comparatively lowest in larger companies. Similar, although weaker, associations between company size and take-up are also observed among fathers. Hence, when we look at general take-up (the extensive margin) and full-time take-up of parental leave, our findings are in line with earlier published evidence (e.g. Van Breeschoten *et al.*, 2019; Byrgen and Duvander, 2006; Lapuerta *et al.*, 2011) arguing that larger companies face greater societal pressure to support statutory policies, and at the same time it is cheaper and easier for them to implement

efficient procedures related to the adoption of these policies. However, it appears that a more flexible form of leave (for example, part-time), which allows people to reconcile work and childcare duties, is more common among employees of small firms than among those working in larger ones. From a policy perspective, it would therefore be advisable to increase parental leave flexibility to make it more compatible with the organizational situation of companies in order to stimulate take-up in small firms.

With regard to the effect of *partners' workplace characteristics* on take-up, the economy sector in which the partner works does not substantially affect mothers' take-up; however, it does appear to be associated with fathers' usage of parental leave. Fathers' take-up is notably more likely if their partner works in the sector of education, health, and social services. Our data also reveal that mothers' overall take-up, as well as its intensity, varies substantially depending on the size of the company in which their partner works. Mothers with a partner working in a small firm are more likely to take parental leave.

To sum-up, the findings of this paper are in line with existing literature suggesting that after accounting for all other possible factors, individual workplace characteristics are strongly associated with parental leave take-up, as employers represent important stakeholders in the implementation of the policy (e.g. Bygren and Duvander, 2006; Haas *et al.*, 2002; Haas and Hwang, 2019; Cramer and Pearce, 1990; Acker, 1990). In Luxembourg, the position of employers is strengthened by the fact that using the part-time form of leave is conditional on their approval. Our study, providing comparable analyses for men and women, additionally shows that workplace characteristics – particularly the company size – are related to the leave usage of both mothers and fathers. The company size is associated strongly with both the extensive and the intensive margin of take-up for mothers and for fathers, whereas the economy sector is only substantially associated with mothers' take-up.

Our findings also suggest that the relationship between parental leave and the workplace characteristics are not only direct (meaning that the workplace only affects the leave-taking behavior of employees), but also indirect (in that the workplace characteristics of an employee also affect the take-up decisions of his or her partner). The non-negligible association between some partners' workplace characteristics (mainly company size) can be found among both mothers and fathers. Hence, it appears that it is not only mothers who reflect the workplace situation of their partner, but also that the behavior of fathers is affected. These findings are in line with and add to the existing empirical evidence regarding the effect of partners' characteristics on parents' leave take-up behavior (Sundström and Duvander, 2002; Lappégard, 2008; 2012). Consequently, they corroborate the relevance of the theories of couple dynamics and bargaining (Pollak, 2005; Katz, 1997; Lundberg and Pollak, 1996) in the context of workplace and leave-taking behavior of both mothers and fathers.

When presenting the findings, we are aware of certain limitations of the analyses stemming from the nature of the available data. One of these limitations concerns the non-availability of some control variables in the estimated models, such as education level, work–family preferences, and gender-role attitudes, as these are important determinants of leave-taking behavior. Another possible limitation is that due

to the missing link between the information on parental leave and children in the available data, the sample used in the article is restricted to first-time parents. Therefore, there is a potential problem with external validity and the possibility to generalize to a broader category of mothers and fathers. However, the potential issue of external validity is compensated for by the internal validity of our findings, as we cover the entire population of selected first-time parents with children born during the given period in Luxembourg. It should also be noted that our findings are bound and affected by the particular context of Luxembourg.

Further research would be needed, as and when data is available, to explore how the policy reform of December 2016 – which substantially increased the flexibility of using parental leave – has affected take-up behavior. This would be particularly relevant regarding small-sized companies, where the flexible alternatives offer an avenue to fit leave time into work schedules, and where longer absences from work are considered as costly by the employer.

Supplementary material. To view supplementary material for this article, please visit <https://doi.org/10.1017/S0047279422000885>

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