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Abstract: One of the major reasons for a gendered division of parental leave is the financial compensation during leave. Swedish national parental leave benefit provides 77.6 % of earlier earnings up to a ceiling, but collective agreements between employer and unions have over time developed to cover the income loss during leave. We focus on the importance of such agreements for fathers' parental leave take-up. The main division of agreements is between the 1) state, 2) municipality and county and 3) private sector. The difference in agreements for different segments of the labor market is likely to influence parental leave use, especially for parents with income over the ceiling and who would otherwise lose a lot financially while on leave. We compare how parental leave is used in the beginning of the 2000s and a decade later, when agreements have been expanded. Our focus will be on men in different sectors and with different income levels, thus differently affected by the change in the agreements. We focus on first born children. Results indicate that high-income fathers increase their use over the time period. Especially in the private sector a polarization can be seen, where fathers with high income increase their leave use over time while fathers with lower incomes fall behind. However, we find only small differences in trends in leave take-up between fathers' in different sectors. The study deepens our understanding of how and whether the level of financial compensation during leave matters for take-up, even in an already generous statutory system.

Keywords: Parental leave, top-ups, collective agreements, fathers, Sweden

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Introduction

The Swedish parental leave system is considered to be amongst the most gender equal of all systems, but fathers still take much less leave than mothers. This paper aims to investigate the limited take up of leave by Swedish fathers by exploring variation in financial compensation between different groups of fathers.

In comparative parental leave policy research, leave is often considered as being 'well paid' and thus providing sufficient economic compensation if the benefit received is above the 66 percent wage replacement level. However, some argue that if fathers are to see taking leave as a viable financial option for their family, leave should be paid much closer to the 100 percent wage replacement level (Javornik and Kurowska, 2017). In addition, if a relatively high wage replacement rate is subject to a ceiling, this ceiling will bring down the wage replacement rate for higher income fathers quite considerably, which may lead to the perception by these fathers that taking much leave may lead to financial constraints (e.g., as regards mortgage or rent payments).

In Sweden, the replacement rate is 77.6 percent, subject to a ceiling. However, collective agreements have developed over time to allow for a top-up, in many cases up to 90 percent of wages, without a ceiling. This paper examines whether this extra payment, from 77.6 percent to around 90 percent and above the ceiling, has affected take up for different categories of fathers. By focusing on those fathers who have benefitted most from more recent changes, by using information on variation in collective agreements across sectors over time (that is to say those above the ceiling, and particularly those in the private sector), we try to explore what difference the extra amount, to an already relatively high level, might have.

This paper considers a time period during which, on average, Swedish working fathers were continuing to increase their leave uptake over time (Ma et al., 2019; Swedish Social Insurance Agency, 2019). This might have been supported by the leave being paid closer to wage replacement level – or there may be other explanations. In terms of our theoretical framing, we expect that the level of financial compensation is important, but that it does not constitute the whole story. Workplace culture and characteristics are likely to play a role, as well as other cultural factors, including social class dynamics. There may also be a time lag between a policy change and cultural attitudes to leave taking by fathers. In addition, the availability of a certain level of financial compensation and more gender equal attitudes towards parenting are likely to mutually reinforce one another. Hence, the latter may well to some extent have an impact on the former.

Many statutory systems, if not all, are 'topped up', by occupational benefits paid for by employers, but it is extremely difficult to know about these top-ups, as often these benefits are considered to be commercially sensitive and not publicly available information. Also, comparative studies are very difficult as the structure of top-ups are different (Greve, 2018). This paper draws on hitherto unavailable archive data providing a rare insight into such top-ups of parental leave benefits based on negotiated collective agreements. It has been argued that reliance on top-ups may explain at least part of the gap between fathers' entitlement to and uptake of statutory leave, as such benefits are not routinely available to all parents. There is a positive correlation between income and leave use, which mirrors the positive correlation between income and access to top-ups in countries such

as the UK (Koslowski and Kadar-Satat, 2019). However, the situation with the collective agreements in Sweden presents the opportunity to explore the effect of top-ups when they are in theory becoming accessible across the population.

As the division of parental leave is known to be a major watershed for the continued division of labor and income development in couples (Almqvist and Duvander, 2014), it is of interest to study what measures are efficient in attaining such sharing, and so to better understand why fathers do not use more leave than they do. We focus on fathers' leave use as mothers' leave use is hardly ever in question. Practically all mothers use parental leave whereas fathers' leave is less inevitable and likely still more negotiable both between the parents and with workplaces.

Another argument for studying the variation in collective agreements and their effect on parental leave uptake is that even in within a generous and overall national system such as the Swedish one there may be important internal variations. This is a case of leave policy design that is likely to influence use and thus the broader implication is about how and whether a certain level of income loss and/or earnings-related benefits matter for use, and if so what sort of level and for whom.

We will start with a brief introduction of the Swedish parental leave system and labor market structures to situate the top-ups through collective agreements and their importance.

Background to the Swedish parental leave system and its relation to labor market

Since 2001 the Swedish statutory parental leave gives parents earnings-related benefits of 77.6 percent of the income they have before using the leave. Reflecting general welfare retrenchment, prior to this date the amount was slightly higher at 80 percent and before the economic crisis in the early 1990s the benefit had been at 90 percent. In addition, a significant proportion of fathers would not receive this amount of wage replacement due to the constraint of the ceiling.

Since 2002, mothers and fathers are individually entitled to eight months of paid parental leave each when they have a child, or a combined total of 16 months (480 days). The length of the leave entitlement has been extended in several steps since 1974, when parents were granted a combined total of six months of leave but from the 1990s and up to 2001 the leave was 15 months to share. For children born before 2014, these parental benefit days can be used at any time until the child reaches eight years old (see www.forsakringskassan.se). Parents who had a low or no income prior to having a child receive a low flat rate for the whole leave period. In 1995, one month of leave was reserved for each parent. This reform, which was aimed at increasing the uptake of leave by fathers, is often referred to as the "daddy month" (or the "mummy month"). A second month was reserved for each parent in 2002, and a third month was reserved for each parent in 2016. Since these months were reserved, the share of leave taken by fathers has increased substantially (Duvander and Johansson, 2012). None reserved months can be transferred to the other parent. Today, nine out of ten fathers use some parental leave, and fathers use an average of slightly more than 1/4 of all of the parental benefit days taken in a year (Forsakringskassan.se). Thus, mothers still use 3/4 of the leave days.

In addition to the statutory available benefits, most of the labor market is covered by collective agreements that stipulates extra payments during parental leave which are paid for by the employers. Such agreements and their change over time are the focus here.

Collective agreements are forged between the unions and the employers' organizations, but they cover all employees in workplaces that are connected to an agreement, not just the union members. Around 90 percent of the Swedish labor market is covered by such agreements today. The main categories of agreements (reflecting the main divisions in the labor market) are the sectors: state; municipality and county (hereafter referred to as municipal); and the private sector where agreements are somewhat different for white- and blue-collar workers. The state sector employs about 5 percent of all employees in Sweden and about as many women as men (Swedish Social Insurance Agency, 2011). It consists of government authorities, which includes universities and for example the National Social Insurance Agency which administers social insurance. Municipality and county employs almost a quarter of all those employed but is heavily gendered in that 4/5 of all these employed persons are women. Health sector, preschool and school are included here. The rest of the labor market consists of the private sector where approximately 40 percent of the employees are women, albeit gender distribution is very skewed by occupational sector (Halldén, 2014).

In the 2000s, collective agreements stipulating extra payment during parental leave developed to be more generous in the municipal and private sectors. These sectors then caught up with the state sector that was already at the present level of generosity by the turn of the century and extra benefits have not changed much since. Both the state and the municipal sectors have agreements that cover all employees. However, as the private sector is organized by industry and divided by white- and blue-collar workers, there is variation (Sjögren Lindquist, 2018). The expansion of collective agreement happened for most of the private sector during the 2000s. The agreements in the private sector arrived as late as 2000 in many cases still only covering women, but by 2010 these were generally extended to men as well.

Make note that the term "generosity" may be ill suited as the agreements are results of negotiations and a generous top-up is possibly related to a less generous wage development in the industry (Greve, 2018). It is noteworthy that many male sectors are late to receive top-ups during parental leave while typically female sectors have seen them earlier, but also had a less positive wage development. The extra benefits can be seen as complementary to cover welfare retrenchment, and there has been little mentioning of consequences such as inequality, dualisation and an in-outsider division. In addition to an occupational involvement in welfare, in the case of parental leave, collective agreements have implications for the family-work balance (Ibid.) and thus emphasize the importance of being covered by an agreement, that is, having a stable employment in an established work place.

The top-up is generally comprised of two parts; the first part implies extra payment of 10 percent on income in addition to the payment from the national social insurance, while the second part covers the income loss over the ceiling, with 90 percent of the income in most cases. In practice this means for many agreements that compensation will be 90 percent of full wage, also over the ceiling. There are variations in the terms and conditions

of these agreements, in particular in the number of months for which they are available. The speed of the expansion of agreements with extra payment has varied by sector and industry, whereas mentioned typical male manual jobs have been the last to be covered. The variations in the collective agreements for different segments of the labor market is likely to influence parental leave use, especially for parents with income over the ceiling and who would otherwise lose a lot of income while on parental leave.

There are almost 700 collective agreements in the Swedish labor market. However, there are neither any annual mapping of these agreements nor any information on payments in registers. The major collective agreements between 2000 and 2020 are documented by Sjögren Lindquist (2018) and can as mentioned be categorized to the main sectors, keeping in mind variations within these sectors.

One problem with regard to the effectiveness of collective agreements is that they are not always known; in many cases both employer and employee are unaware of their existence (LO, 2017; National Social Insurance Board, 2003). This is an issue since payments only come after requests in some cases. Nevertheless, among high income earners, who would lose a lot by being on parental leave without extra payments, the awareness of these agreements is likely to be higher. A lack of differentiating effects by agreements may thus signal information problems. The aim of this paper is to examine whether collective agreements matter, for all fathers or for only some groups. The results will help us discuss the effectiveness of employers' strategies for gender equality and the pros and cons of diversified benefits or rights for different parts of the labor market.

In sum we are attempting to capture the development of top-ups in leave payments in addition to the 77.6 percent of earlier income up to a ceiling. We investigate the period 2000 to 2011. For the state sector the top-ups consisted of 10 percent extra under the ceiling and 90 percent over the ceiling for about a year of leave, consistently for the period. For the municipality the top-up over the ceiling of 90 percent existed in 2000, but the 10 percent extra under the ceiling was extended to apply for one month to about 5 months in steps during the period. For the private sector the situation has been more varied but similarly to the municipal sector the 10 percent under the ceiling was extended in length during the period. For large parts of the private sector the benefits above the ceiling increased to 90 percent for an extended number of months between 2000 and 2011, which is the most dramatic change during the period.

Theoretical underpinnings and expectations

A key aspect of policy design that strongly determines uptake by fathers (more than mothers) is the wage replacement level of statutory payments (Duvander et al., 2019; Haas and Rostgaard, 2011; Ray et al., 2010). There is a perception by fathers in particular, that leave is not financially viable for them, unless it is well paid, whilst cultural practices support mothers' 'need' for leave, regardless of benefit level (Koslowski and Kadar-Satat, 2019). Bringing the benefit level closer to the level of usual earnings for both partners supports the household and undermines leanings towards a breadwinner model.

However, a persistent gender pay gap (men earning more than women on average), high levels of occupational sex segregation (men working in sectors and industry with higher

wages on average), and male partners being older than their female partners on average (thus with more seniority and so higher wages on average), all contribute to enduring gendered perceptions for whom leave taking is 'reasonable'. Iceland provides an example of how enduring these gendered perceptions are, with leave taking by fathers declining following the 2009 economic crisis, in particular those (higher earners) most hit by the implementation of a ceiling on the flat rate payment (Júlíusdóttir et al., 2018). Another example of enduring gendered behavior is that when the quota is reduced (Norway) or even abolished (Denmark), fathers' use of parental leave immediately is reduced (Borchorst, 2005; Schou, 2019). Furthermore, in Sweden for fathers to children born in the early 1990s (and so before the top-up became widespread) there was a clear positive association between income and leave use, for incomes up to the ceiling but then a flattening out (Sundström and Duvander, 2002).

If more fathers perceive leave as a financially viable proposition, and take leave for this reason alone, it may set in motion a virtuous circle. To the extent that fathers may be influenced by the leave use of other fathers in the workplace (Bygren and Duvander, 2006), with workplace cultural norms shifting, as more fathers take leave (Dahl et al., 2014). Arguably, the extra-benefit is more than just a 'top-up'; it is rather a conversion factor for take up by fathers (Koslowski and Kadar-Satat, 2019).

Discussions of leave policies tend to focus on statutory provision, in no small part due to a data gap: It is very difficult to know the range of extra benefits available as such information may be considered to be commercially sensitive and would require a census of employers. In the same way that every country manages to have distinct statutory parental leave systems (Blum et al., 2018), there is likely to be much variation within a country across employers, sectors, and industry, and mapping this information is challenging for researchers. It is also challenging for both parents and employers to have full knowledge about entitlements. This is likely to matter more for some sectors and workplaces than others.

The difference between the statutory and top-up benefit level can be stark in countries such as UK or Australia, so the effect of the extra benefits might be expected to have a strong effect for those eligible fathers, though if the group of eligible fathers remains relatively small across a population, a tipping point towards less gendered parenting practice may not occur. As such, Sweden provides a particularly interesting case as the extra benefits are now widespread across the population.

Factors at the workplace are often mentioned as reasons to not go on leave, or to reduce leave length (Tremblay and Harvey, 2019) and extra payments from the employer may be considered as a signal from the employer to the employee that leave is encouraged (Koslowski and Kadar-Satat, 2019).

Hypotheses

Our main hypothesis is that improvements in collective agreements rendering extra payment during parental leave will affect male parental leave use over time. Such extra payment will affect groups of fathers differently. Extra payments have increased

differently by sector and income groups over the period of investigation, 2000 to 2011, which leads to the hypotheses below:

H1. Men's use of parental leave will increase more in the **private sector, compared to the state and municipality sectors**. The reason being that top-ups in the private sector have improved the most.

H2. Men's use of parental leave will increase most for men with **high income** (**i.e., above the ceiling threshold) compared to those with lower income**, as top-ups have the most substantial influence on income loss at high income levels.

H3. Men's use of parental leave will increase more for men with **high income (i.e., above the ceiling threshold) in the private sector compared to high income earning men in other sectors**. The reason being that the extra payments have increased the most for private sector employed men with income above the ceiling threshold.

H4. Men's use of parental leave will increase more for men with **high income (i.e., above the ceiling threshold) in the private sector compared to men in the private sector with incomes below the ceiling threshold**. Again, the reason being that their top-ups have increased the most for those employed in the private sector with an income above the ceiling threshold.

Analytical strategy and data

Data used in this study come from the Swedish national population register which is connected to the administrative registers of parental leave use and the labor market registration of employment in various sectors as well as income. Parents are connected to their children and over time we know the annual leave use, education, earnings and sector of the individual parents.

To study the potential effects of collective agreements on parental leave use we compare trends in fathers' parental leave take up across time. Our time range starts with fathers to children born in December 1999/January 2000 and then every year ending with those having children in December 2010/January 2011. As we have access to annual register data we are restricted to births around the New Year as to follow the parental leave use for the same length of time.

There are different ways to consider father's increase in leave uptake. One is simply to consider the proportion of fathers who take leave. Another is to consider the number of days taken. In this paper, we consider both but with the emphasis on the latter as leave use among fathers is so common in Sweden and can be considered strongly normative. It has become a question of when and how long the leave is to be rather than whether it should be used.

We use linear probability models to estimate the probability of using any leave at all during the first two years of the child's life and OLS regressions to estimate the number of days used during the first two years among fathers who used leave. To capture the change over time for various subgroups of fathers we use interactions between year and

sector or year and income category. This indicates change over time and constitutes the main focus of the study.

The sample consists of children with two registered parents, and the child has to be the first born for both parents. If the parents have a second child within the two following years the father is not included in our sample (as to not confuse leave use for a first and second child which we cannot separate in our data). As we are interested in how fathers' top-ups influence their parental leave take up we focus on individuals active in the labor market in the age range of 20-60 years. Hence, only those in employment at t_{-1}, i.e., the year prior to the birth (i.e., year 1999 for those having a child in 2000) are included. The independent variables and controls are measured at t_{-1} (if not stated otherwise). Individuals with missing information on any of the variables the relevant years are excluded. It should be noted that we in this study do not consider the parental leave use of the other parent or her characteristics.

Since the changes regarding the top-ups received through collective agreements when being on parental leave only affected those having incomes above the floor, individuals below the floor are not included in the sample.

Dependent variable

Any parental leave uptake (>0) is a dummy variable indicating if the father used any net paid parental leave the two following years after child birth, e.g., for a child born in December 1999/January 2000 we monitor parental leave take up in 2000 and 2001.

Parental leave days is a continuous variable indicating the number of paid days of parental leave the two following years after child birth. Non-users of parental leave are excluded from these analyses. The absolute majority of days are taken during the first two years and later days are often taken to extend summer holidays or other breaks. Such leave can be viewed as different from staying at home alone for an extended period to take care of a child before preschool starts.

Note that we are basing our analysis on the registered parental leave benefit days. However, it is also possible in Sweden to use unpaid leave. A common pattern is to mix paid and unpaid days but we have no possibility to capture such behavior in this study (Duvander and Viklund, 2019).

Main independent variables

Income

We use an income measure based on yearly gross earnings (i.e., not including any transfers or income from own business). The income indicator consists of a dummy variable which takes the value 1 for *income above the income ceiling (high income)* as regards the parental leave insurance implying a yearly income above 273 000 SEK for those with children born in December 1999/January 2000 and 424 000 SEK for those with children born in December 2010/January 2011 respectively. This dummy takes value 0 for *income between the floor and the ceiling (middle income category),* for incomes at 21 600 SEK and more (up to the ceiling) for those with children born in December 1999/January 2000 and at 64 800 SEK and more (up to the ceiling) for those with children born in December 2010/January 2011. The levels changed stepwise across time which

this variable takes into account. Individuals are assigned to an income category based on their earnings at t_{-1}.

Sector
Three dummy variables constitute the sector measure: *private sector, state sector* (including state owned firms and organizations and other public departments) and *municipality sector* (including the county sector).

Year is a continuous variable ranging from 0–11 based on the year the child is born. A child born in December is counted to the next coming year (i.e., a child born in December 1999 is counted as January 2000 etc.).

Year2 is a squared term of the continuous variable *year*.

Control variables
Education
The educational measure consists of three dummy variables: *high education* (tertiary level implying three years or more of post-secondary education), *intermediate level of education* (three years of secondary education or post-secondary education shorter than three years) and *basic or no education* (less than three years of secondary education) which also includes those where it is indicated that information about education is lacking. Those with no information are coded as missing.

Labor market attachment is a dummy variable taking the value 1 if the individual had an income above two price base amounts in both t_{-3} and t_{-2}. For those with children born in December 1999/January 2000 this implies an income above 72 600 SEK in 1997 and 72 800 SEK in 1998 and above 85 600 SEK in 2009 and 84 800 SEK in 2010 for those with children born in December 2010/January 2011. Two price base amounts have been used earlier as a threshold for participating in the labor market to a somewhat substantive degree (Duvander et al., 2015).

Parental age is a continuous variable.

Swedish citizenship is a dummy variable that is indicating acquaintance with the parental leave system and knowledge about collective agreements, as such knowledge is likely to increase with time and integration in the country.

Results

We start with presenting our sample (cf., Appendix Table 1). We see that a majority of all fathers (84 percent) used some parental leave with the average of 81 parental leave days. The private sector is by far the most common sector of employment (80 percent), whereas approximately 10 percent of the fathers in our sample work in the state and the municipality sectors respectively. 46 percent of the fathers have intermediate level of education, while 29 and 25 percent have basic and high education, respectively. The category with incomes above the ceiling constitutes 28 percent, and most fathers are Swedish citizens and attached to the labor market (94 and 81 percent respectively). The average paternal age is 32 years.

If we turn to changes across time comparing the first time point (year 2000) to the last (year 2011), we find that both the share using parental leave during the first two years as well as the number of days have increased across time. The change is particularly pronounced as regards the length of the parental leave. While the numbers employed in different sectors is fairly stable over this time, there is a shift towards higher education and a larger share have a solid labor market attachment two years before having a child. The income grouping indicates that there are fewer fathers earning above the ceiling in 2011, but this is caused by the raised ceiling in the benefit in 2006. Also, these first-time fathers are somewhat older in 2011 compared to 2000. It is as common to be a Swedish citizen at both time points.

As to get a clearer picture of how fathers' parental leave has developed between 2000 and 2011, we present a number of figures with the descriptive trend in using any parental leave and average number of days used based on descriptive statistics. We present this trends by sector (Figure 1 and 2), for those above and below the income ceiling (Figure 3 and 4), as well as for those above and below the income ceiling in different sectors (Figure 5 and 6) We find that the share of users increases in all sectors and also the number of parental leave days increase. The change is not as steep in the municipality and private sectors compared to the state sector. High income earning fathers have increased their use and the length of leave more compared to those below the ceiling. When looking at only fathers with income above the ceiling by sector we also see an increasing trend for using the leave (the randomness is caused by small sizes, e.g., the municipality sector in 2007-2010). Furthermore, among the fathers with high income the number of days is increasing in all sectors, but this increase is less strong in the private sector.

Analysis

We continue with a baseline regression to become orientated in the basic associations of leave use for men in recent decades in Sweden. The probability to use leave is higher for men in the state sector compared to the private sector. There is no significant difference in leave take between fathers in the municipality compared to the other sectors (not shown). Parental leave take-up has increased in general across time (cf., Appendix Table 2). Higher educational level indicates a higher probability of using any leave and fathers in the middle-income category, i.e., above the floor and below the ceiling, use leave more often than fathers in the high-income class (i.e., above the ceiling). Also, labor market attachment before becoming a parent increases the probability of using leave for fathers. Among the demographic characteristics we see that Swedish citizenship increases probability of using leave.

As regards the length of leave we find that both men employed in the state sector and the municipal sector use more days than men in the private sector; almost two weeks more among state employed and approximately eight days more among employees in the municipality. State sector employees also use longer parental leave than individuals working in the municipality sector (not shown). The number of leave days have increased on average 6.5 days per year during the time period studied and long leave is especially common among the highly educated. Middle income earners use more leave than men above the ceiling. Also, older fathers and those that are Swedish citizens use more days.

Figure 1-6. Descriptive trends.

Figure 1. Fathers' parental leave use by sector (%)

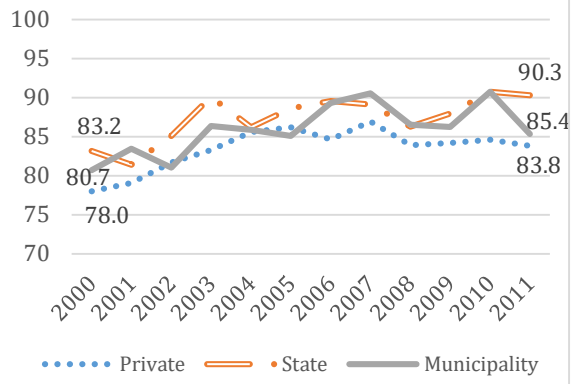


Figure 2. Fathers' average number of parental leave days (among users) by sector

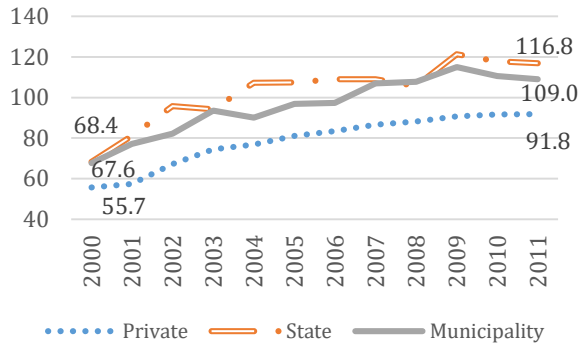


Figure 3. Fathers' parental leave use by income category (%)

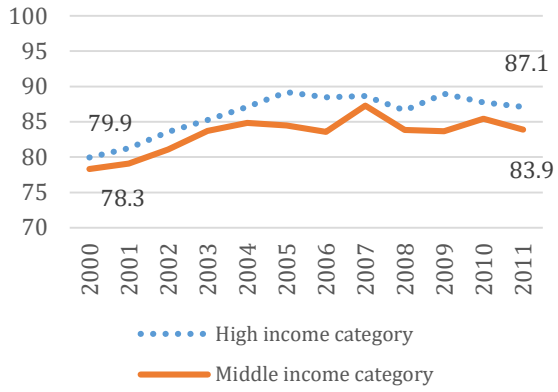


Figure 4. Fathers' average number of parental leave days (among users) by income category

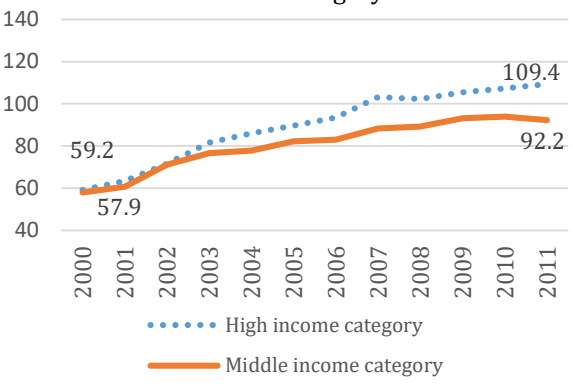


Figure 5. High income earning **f**athers' parental leave use by sector (%)

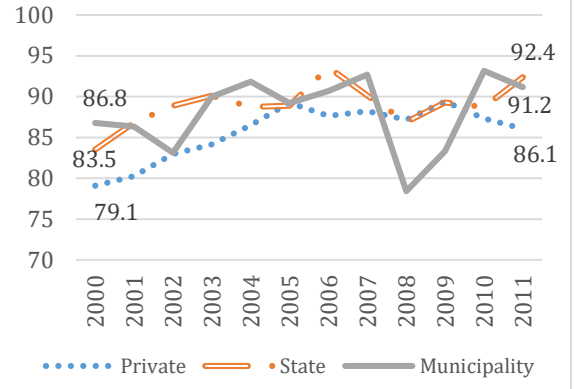
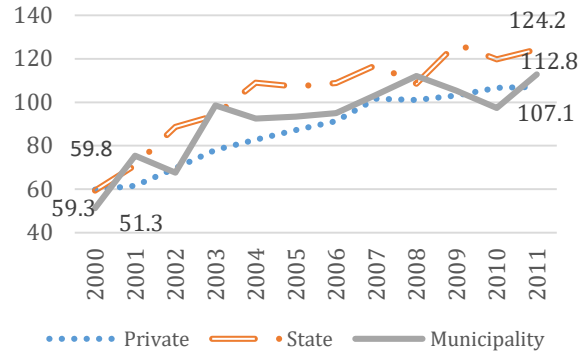


Figure 6. High income earning fathers' average number of parental leave days (among users) by sector



In sum, the determinants of leave that we use in this study shows patterns similar to earlier studies on Sweden (see for example Ma et al., 2019; Sundström and Duvander, 2002).

We now continue testing our hypotheses of changes in parental leave use among employees that differ in terms of sector of employment and income across the decade of 2000 when many top-ups expanded as regards parental leave benefits. Our analytical strategy is to use a baseline regression and then add interaction terms between the year indicator and the specific factor we are interested in (i.e., sector and income).

We are interested in changes across sectors that could be attributed to expanded top-ups to the statutory parental leave benefit. As top-up expanded most in the private sector, we expect most change in leave here (H1). Table 1 presents the interaction terms that indicate the change over time by sector. We find no significant higher or lower probability to use leave in any of the sectors across time for fathers. However, fathers in the state sector increase their leave length the more compared to fathers in the private sector. To summarize, hypothesis 1 is not supported.

Table 1. Fathers' parental leave usage by sector across time. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
State sector	0.0121	(0.0107)	9.592***	(2.104)
Municipality sector	0.00567	(0.0101)	6.311***	(1.879)
Year	0.0186***	(0.00184)	5.796***	(0.330)
Year2	-0.00126***	(0.000153)	-0.273***	(0.0284)
Year*State sector	0.00112	(0.00152)	0.635*	(0.316)
Year*Municipality sector	0.000569	(0.00146)	0.315	(0.289)
Basic education	-0.0367***	(0.00415)	-5.471***	(0.751)
High education	0.0470***	(0.00384)	25.02***	(0.788)
High level of income	-0.00811*	(0.00383)	-1.752*	(0.723)
Labor market attachment	0.0812***	(0.00457)	-0.972	(0.874)
Parental age	0.000247	(0.000358)	0.711***	(0.0669)
Swedish citizen	0.145***	(0.00846)	5.208***	(1.580)
Constant	0.581***	(0.0143)	26.53***	(2.621)
Observations	52383		44110	
Adjusted R^2	0.030		0.084	

Standard errors in parentheses $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Our second expectation was that high-income fathers increased their use of leave more compared to other fathers (H2). In Table 2 we find that the probability of using leave is indeed changing more across time for high income fathers compared to those below the ceiling. Also, the increase in number of leave days is faster among high income earners than among those with lower income. Hence, these results support hypothesis 2.

Table 2. Fathers' parental leave usage by income across time. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
State sector	0.0187***	(0.00522)	13.38***	(1.083)
Municipality sector	0.00883	(0.00511)	8.108***	(1.024)
Year	0.0180***	(0.00185)	5.538***	(0.333)
Year2	-0.00125***	(0.000153)	-0.267***	(0.0284)
High education	0.0465***	(0.00385)	24.77***	(0.790)
Basic education	-0.0371***	(0.00415)	-5.648***	(0.752)
High level of income	-0.0208**	(0.00711)	-7.961***	(1.231)
Year*High level of income	0.00242*	(0.00108)	1.166***	(0.194)
Labor market attachment	0.0818***	(0.00457)	-0.726	(0.875)
Parental age	0.000235	(0.000358)	0.706***	(0.0668)
Swedish citizen	0.145***	(0.00846)	5.193**	(1.581)
Constant	0.584***	(0.0144)	27.91***	(2.625)
Observations	52383		44110	
Adjusted R^2	0.031		0.084	

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Our third hypothesis (H3) expects that among high income earning fathers the increase is larger among private sector fathers than among fathers in the state and municipal sector. Table 3 indicates that the trends as regards leave use and the length of the leave taken do not differ between high income earners fathers employed in different sectors. Thus, hypothesis 3 gains no empirical support.

Table 3. Fathers' parental leave usage among high income earners by sector across time. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
State sector	0.0494**	(0.0168)	4.099	(3.066)
Municipality sector	0.0418	(0.0221)	-2.337	(3.874)
Year	0.0254***	(0.00335)	7.727***	(0.581)
Year2	-0.00169***	(0.000283)	-0.361***	(0.0508)
Year*State sector	-0.00315	(0.00275)	0.958	(0.544)
Year*Municipality sector	-0.00433	(0.00360)	-0.110	(0.667)
Basic education	-0.00577	(0.00910)	-7.570***	(1.542)
High education	0.0479***	(0.00624)	23.88***	(1.167)
Labor market attachment	0.00676	(0.0111)	0.0371	(2.259)
Parental age	-0.00348***	(0.000675)	0.376**	(0.126)
Swedish citizen	0.0976***	(0.0180)	5.114	(3.414)
Constant	0.786***	(0.0315)	30.47***	(6.159)
Observations	14754		12716	
Adjusted R^2	0.017		0.108	

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finally, our fourth hypothesis states that the high-income earners within the private sector increase their use more than income earners below the ceiling in the same sector. In Table 4 we find that this is the case; high earners in the private sector increase their share of leave use and their number of days compared to those private sector employees with lower earnings. Comparable models for the state and the municipality sector is presented in the Appendix (Table 3 and 4) showing no significant diverging trends for high income earners, except for high income earning fathers in the state sector that had a more rapid increase as regards the length of leave compared to those with lower incomes in the same sector. This gives, at least partial, support to hypothesis 4.

Table 4. Fathers' parental leave usage by income across time in the private sector. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
Year	0.0191***	(0.00211)	5.330***	(0.370)
Year2	-0.00138***	(0.000174)	-0.255***	(0.0316)
Basic education	-0.0350***	(0.00448)	-5.210***	(0.809)
High education	0.0483***	(0.00461)	24.64***	(0.928)
High level of income	-0.0275***	(0.00800)	-5.953***	(1.359)
Year*High level of income	0.00327**	(0.00120)	1.130***	(0.213)
Labor market attachment	0.0808***	(0.00520)	-1.354	(0.983)
Parental age	0.000359	(0.000408)	0.754***	(0.0751)
Swedish citizen	0.144***	(0.00935)	4.186*	(1.725)
Constant	0.581***	(0.0162)	27.90***	(2.912)
Observations	42166		35245	
Adjusted R^2	0.028		0.070	

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Sensitivity analyses

As a compliment to H2 and H4 we also test the importance of the ceiling of the statutory benefit by a regression discontinuity set up (cf. Appendix Table 5 and 6). We compare the fathers with 25 percent highest income below the ceiling, with the fathers above the ceiling both generally (H2) and for the private sector (H4). If the ceiling is important, we would expect more increase in leave use for the fathers above the ceiling compared to just under. This is the general finding as regards to using the leave. When analyzed by sector, it is evident that the general increase in leave use among high income fathers is driven by high income earners in the private sector as there is no matching trend in the state or municipality sectors (not shown). In addition,, the increase in number of days used did not differ significantly between the two groups in general or by sector.

We want to point out that the comparison here is with all fathers above the ceiling and when we compare to the ones just above the ceiling (the 25 percent with lowest income above the ceiling) there is no effect visible. We have also tested cut offs at 10 percent below and above the ceiling with no different results. This may indicate that the effect over the ceiling is generally driven by those with higher incomes rather than having an income just above the ceiling.

We also applied a rank measure of the number of days of parental leave in order to minimize the influence outliers. The results where overall similar to what is presented above and are available on request.

Discussion

This study aimed at investigating the potential effect of top-ups during parental leave for fathers' use of leave. In Sweden such top-ups expanded to almost universality on the labor market during the first decade of 2000, and this in a parental leave benefit system that was already comparatively generous with 77.6 percent earnings-replacement up to a ceiling. Employees in the state sector were already covered by top-ups to 90 percent of the whole income and both the municipal but especially the private sector expanded to similar levels between 2000 and 2011. Our analysis of fathers differentiated by sector and income level may thus be interpreted as potential effects of the top-ups.

In sum our results show that income level is more important than sector here. Fathers with incomes above the ceiling are the ones increasing their leave use the most, especially in the private sector, but also to some extent in the state sector. These higher income fathers are the ones that earlier would lose most financially by taking parental leave. We interpret the finding in the light of changing financial incentives, but such incentives will also be associated with changing norms ad work culture. The top-ups will give more money in the pocket but also signals an encouragement for employees to use the leave, an acknowledgement that work-family conflicts exist and have to be dealt with by both female and male employees.

The analysis in this study may be considered somewhat crude in that we are not able to distinguish between specific changes in agreements by branch and sector due to data restrictions. We do not find clear variation in change by sector as we expected and a likely reason is that the changing top-ups have to be analyzed on a more fine-grained level of detail. Nevertheless, these results indicate an increasing divide in leave use between fathers with higher and lower incomes. The earlier pattern of the ceiling inhibiting leave use (Sundström and Duvander, 2002) has now changed and the higher income fathers are using the leave increasingly.

Still, we need to consider also other reasons for absence of differences between sectors and a possible mechanism here is that the many smaller work places in the private sector are still to a larger degree unaware of the agreements that they are to abide to. If no one asks for top-ups then they are likely to not be paid. The situation in the municipal and state sector are likely different as these larger employers have automatized the paying of top-ups as soon as an employee is on parental leave.

In addition, information flows and behavior change may be gradual and slow. In this case there may also be other factors that are inhibiting fathers leave use here, such as work tasks, workplace norms and culture. However, such factors may also change over time but it is likely that a more generous collective agreement will take time to be able to affect the leave use through such intermediary factors. Perhaps this is what we see in the state sector where fathers are increasing leave the most and where the collective agreements

became generous in the 1990s. Perhaps it takes until the 2010s for the change to be more visible among private sector employees with middle incomes? Such an interpretation would imply a lag in effect from implementation of agreements.

We find support for the importance of the ceiling by comparing fathers just below the ceiling with those above the ceiling. The ones just above the ceiling, and consequently who benefit the most from the top-ups, are increasing their leave taking more than the ones just below the ceiling.

What do these findings imply for efficient policy construction? It seems clear that financial incentives are of importance and this study lends support to the idea that also at relatively high replacement levels, changes in the benefits do indeed matter. Fathers are concerned (perhaps more than mothers) about income loss. The ceiling matters and top-ups make fathers more inclined to use long leave. Thus, the benefit level matters at the higher end.

The combination of occupational and state involvement in benefits seems to lead to more dualization (Greve, 2018). We have here investigated the insiders, that is, the ones benefitting from top-ups in addition to the national benefit. The outsiders, including non-working parents, self-employed, and parents with temporary or unstable positions on the labor market will have much lower leave benefit. For these parents, parenthood is still a risk to the capacity to financially support yourself, and such vulnerable situation becomes even more marginalized when the level of benefit becomes dependent on a stable attachment and position on the labor market. Only just over one percent of fathers in Sweden use the flat rate parental leave benefit, which indicates that they are not working. A substantially larger share of fathers is non-working, and not engaging in the leave system at all. The differentiating system that is created by the combination of state and occupational welfare appears to contribute to enduring inequality in leave taking by fathers. This is the downside of not having truly universally available financial support for all fathers (and mothers) of a level which minimizes income loss during leave taking.

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APPENDIX

Table 1. Descriptive statistics.

	All years 2000-2011					Year 2000			Year 2011		
	count	*mean*	*sd*	*min*	*max*	*count*	*mean*	*sd*	*count*	*mean*	*sd*
Any parental leave	52383	0.84	0.36	0	1	3807	0.79	0.41	4693	0.85	0.36
Parental leave nr. of days	44110	80.9	65.3	0.1	436	2998	55.8	58.6	3969	93.5	67.3
State sector	52383	0.088	0.28	0	1	3807	0.084	0.28	4693	0.090	0.29
Municipality sector	52383	0.11	0.31	0	1	3807	0.12	0.32	4693	0.10	0.30
Private sector	52383	0.80	0.40	0	1	3807	0.80	0.40	4693	0.81	0.39
Basic education	52383	0.29	0.45	0	1	3807	0.47	0.50	4693	0.20	0.40
Intermediate education	52383	0.46	0.50	0	1	3807	0.38	0.48	4693	0.51	0.50
High education	52383	0.25	0.43	0	1	3807	0.15	0.36	4693	0.29	0.46
Intermediate income	52383	0.72	0.45	0	1	3807	0.74	0.44	4693	0.79	0.41
High income	52383	0.28	0.45	0	1	3807	0.26	0.44	4693	0.21	0.41
Labor market attachment	52383	0.81	0.39	0	1	3807	0.83	0.38	4693	0.90	0.31
Parental age	52383	31.5	5.27	20	60	3807	30.7	5.28	4693	31.9	5.51
Swedish citizen	52383	0.94	0.24	0	1	3807	0.94	0.23	4693	0.93	0.26

Table 2. Fathers' parental leave usage. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
State sector	0.0185***	(0.00521)	13.26***	(1.083)
Municipality sector	0.00887	(0.00511)	8.109***	(1.024)
Year	0.0187***	(0.00182)	5.885***	(0.327)
Year2	-0.00126***	(0.000153)	-0.272***	(0.0284)
Basic education	-0.0366***	(0.00414)	-5.420***	(0.750)
High education	0.0470***	(0.00383)	25.05***	(0.788)
High level of income	-0.00812*	(0.00383)	-1.761*	(0.723)
Labor market attachment	0.0813***	(0.00457)	-0.943	(0.874)
Parental age	0.000244	(0.000358)	0.710***	(0.0669)
Swedish citizen	0.145***	(0.00846)	5.233***	(1.580)
Constant	0.580***	(0.0142)	25.96***	(2.609)
Observations	52383		44110	
Adjusted R^2	0.030		0.084	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Fathers' parental leave usage by income across time in the state sector. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
Year	0.0123*	(0.00583)	6.613***	(1.188)
Year2	-0.000510	(0.000465)	-0.355***	(0.0982)
Basic education	-0.0515**	(0.0173)	-12.45***	(3.088)
High education	0.0218*	(0.0101)	25.08***	(2.234)
High level of income	0.0207	(0.0207)	-18.06***	(4.080)
Year*High level of income	-0.00227	(0.00312)	1.912**	(0.646)
Labor market attachment	0.0685***	(0.0144)	2.611	(2.942)
Parental age	-0.00118	(0.00112)	0.585**	(0.225)
Swedish citizen	0.205***	(0.0321)	7.531	(6.664)
Constant	0.610***	(0.0508)	40.88***	(10.10)
Observations	4611		4040	
Adjusted R^2	0.035		0.091	

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Fathers' parental leave usage by income across time in the municipality sector. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2).

	M1. Any use		M2. Days used	
Year	0.0141**	(0.00518)	6.137***	(0.992)
Year2	-0.000818	(0.000437)	-0.284**	(0.0863)
Basic education	-0.0495***	(0.0150)	-6.399*	(2.796)
High education	0.0590***	(0.00997)	23.27***	(2.138)
High level of income	-0.00244	(0.0238)	-16.82***	(4.329)
Year*High level of income	-0.00150	(0.00376)	0.721	(0.715)
Labor market attachment	0.0965***	(0.0127)	1.447	(2.543)
Parental age	0.000324	(0.000989)	0.426*	(0.191)
Swedish citizen	0.106***	(0.0252)	9.925*	(4.792)
Constant	0.616***	(0.0420)	38.85***	(7.847)
Observations	5606		4825	
Adjusted R^2	0.038		0.075	

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Fathers' parental leave usage among high income earners and those just below the ceiling across time. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2)

	1: Any use		2: Days used	
State sector	0.0222***	(0.00669)	10.40***	(1.391)
Municipality sector	0.0161*	(0.00777)	2.655	(1.581)
Year	0.0223***	(0.00257)	6.990***	(0.459)
Year2	-0.00150***	(0.000211)	-0.296***	(0.0393)
Basic education	-0.0125*	(0.00625)	-7.086***	(1.096)
High education	0.0482***	(0.00483)	26.37***	(0.964)
Highest 25% in the intermediate income category	0.0563***	(0.00894)	3.541*	(1.569)
Year*Highest 25% in the intermediate income category	-0.00403**	(0.00132)	-0.339	(0.245)
Labor market attachment	0.00619	(0.00754)	-0.167	(1.590)
Parental age	-0.00224***	(0.000512)	0.575***	(0.0965)
Swedish citizen	0.0962***	(0.0142)	4.660	(2.689)
Constant	0.757***	(0.0241)	24.08***	(4.668)
Observations	24402		21300	
Adjusted R^2	0.016		0.115	

Standard errors in parentheses $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Table 6. Fathers' parental leave usage among high income earners and those just below the ceiling across time in the private sector. Coefficients from Linear Probability Models (model 1) and OLS regressions (model 2)

	1: Any use		2: Days used	
Year	0.0252***	(0.00287)	6.599***	(0.504)
Year2	-0.00173***	(0.000237)	-0.268***	(0.0432)
Basic education	-0.00742	(0.00662)	-7.544***	(1.166)
High education	0.0524***	(0.00546)	25.39***	(1.079)
Highest 25% in the intermediate income category	0.0652***	(0.0101)	1.391	(1.726)
Year*Highest 25% in the intermediate income category	-0.00496***	(0.00148)	-0.241	(0.269)
Labor market attachment	0.00377	(0.00833)	0.444	(1.748)
Parental age	-0.00194***	(0.000578)	0.654***	(0.109)
Swedish citizen	0.0921***	(0.0158)	3.812	(2.955)
Constant	0.743***	(0.0271)	23.81***	(5.201)
Observations	20219		17545	
Adjusted R^2	0.015		0.106	

Standard errors in parentheses $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

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