How effective are reforms promoting fathers' parental leave use?

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Abstract

Since the introduction of the parental leave in Sweden a more gender-equal division of the leave has been aimed for. Various strategies have been tried to reach the goal, and three major reforms have been introduced. In 1995 one month was reserved for each parent, implying that the month was forfeited if not used by the same parent. The reservation of one month was followed by another month in 2002. In 2008, a gender equality bonus was introduced, meaning that tax credits were given to parents who shared the leave equally. This study investigates and compares the effects of these reforms on the division of parental leave. The comparison is done by a natural experiment-approach, using control and treatment groups with parents' to children born just before and after the introduction of each reform. We use register data from the National Social Insurance Agency where parental leave use of all parents residing in Sweden are included. The results indicate a strong effect from the first daddy month, a more modest but clear effect of the second daddy month, and so far, no clear effect from the gender equality bonus. The mean number of days is not influenced but the propensity of using more than 10 weeks increased after the reform.

Introduction

An overarching goal of the Swedish parental leave insurance is to enable shared care and economic responsibility over children, in other words, a gender equal division of parenthood. A number of reforms of the insurance have attempted to strengthen this goal by encouraging fathers' use of parental leave. Whether, or to what degree, the goal is reached is hard to determine. Strong scientific evidence of whether a reform reached its aim is rare. It is even rarer to be able to compare the outcomes of different reforms aiming at the same goal but with different methods. In this study we compare the impact of three reforms in the parental leave insurance aiming at gender equal leave use, but with different means. Our ambition is to make conclusions regarding which policies work most efficiently towards gender equality in the sphere of parenthood. Today fathers use just over one fifth of the leave, but there are considerable variations between sub-groups of fathers.

The parental leave insurance is the part of Swedish family policy that is most closely related to goals of gender equality. Since the introduction of parental leave the goal of a more gender-equal division of the leave has been largely unquestioned and various strategies of reaching the goal have been tried out. The motives for such a goal are more gender equality regarding the division of household work (including childcare) in the homes and an improved position for women in the labour market. Lately children's right to access to both parents has been emphasized as well. In addition gender equality in the use of parental leave is sometimes seen as a way to enable men and women to have the number of children they desire. Gender equal parental leave use may thus be seen as part of policies that are associated with higher fertility (summarized for example in McDonald 2006a). It supports the same gender equity standards in institutions dealing with individuals and families, which is not the case in countries with lowest low fertility (McDonald 2000).

The leave could from its introduction be used by both mothers and fathers, and a number of reforms have been launched to encourage the sharing of the leave. In 1995 one month was reserved for each parent and this month was forfeited if not used by the same parent. The reservation of one month was followed by another month in 2002. In 2008, a gender equality bonus was introduced, meaning that tax credits were given to parents who shared the leave equally.

There are differences in how these reforms were introduced and which group of parents they target. This may lead to variations in efficiency and probably in how fast people react to the change. Furthermore, it should be kept in mind that even if the reforms aim at the same goal they are part of political compromises where considerations also to other goals are taken. The parental leave insurance for instance take into account goals of parents' labour force participation, minimum income to families, welfare of children (interpreted in different ways) and parents' freedom of choice; goals that sometimes are in line and sometimes in conflict with the goal of gender-equal use of parental leave.

It should be remembered that the changes are introduced in a certain temporal order and that for example introducing a bonus without having reserved months may give another effect. All changes emphasize working parents' equal rights while non-working parents are to a large part left out, implying an emphasis on labor market work. The reforms furthermore strive to a gender-neutral responsibility over children with the argument of strengthening children's right

to their fathers' time, speaking more quietly about the reduction of mothers' time with children. By emphasizing both parents' value to the child the reforms may also be seen as emphasizing the value of children for the whole society.

This study investigates and compares the effects of these reforms on the division of parental leave with the intention to add to the knowledge on efficiency of various gender egalitarian incentives. The paper will start with a background of the Swedish parental leave system and a discussion on policy evaluation before data and methods are introduced. The outcomes of the three reforms will be analysed and a discussion will follow on possible interpretations of the results.

Background

In 1974 Sweden introduced parental leave insurance with earnings-related benefits paid during 6 months after childbirth, entitling parents to share leave as they preferred. The leave can be used until the child is 8 years old. The specific aim was to facilitate the combination of time at work and with children for men and women. The question of fathers' participation in the leave was part of the debate from the beginning, and it was suggested that half the leave should be designated to the father; an issue that in the end was seen as too radical (Klinth 2002). Women were expected to use most of the leave and the length was therefore restricted to 6 months, as a longer leave would be to their disadvantage in the labour market.

The benefit was set to 90 percent of earlier earnings, but if the using parent had no previous earnings he or she was replaced at a very low flat rate. The set-up worked as an incentive, especially for mothers, to enter the labour market before entering parenthood. It also encouraged the combination of work and family rather than a choice between work and family.

In the 1980s leave rights were extended in steps to 12 months, and in addition a further 3 months were replaced at a flat rate of 60 SEK (approx. 6 Euro) per day. Cutbacks in the rate of earnings-related benefits were made during the crisis in the 1990s from 90 to 75 percent, later raised to the current level of 80 percent. In 1995, one reserved month for each parent was introduced, which meant that one month would be forfeited if not used by the designated parent, a reform that was initiated by the liberal Social Minister in 1994. At the same time the leave was made formally individual implying that the parent who wanted to use more than

half of the leave needed the signature from the other parent. The reform applies to all parents with joint custody which is the absolute majority in Sweden, also in cases of separated and divorced parents. At the same time a flat-rate home-care allowance was introduced for children up to age 3. The home-care allowance was abolished by the new Social Democratic government 6 months later, but the reserved months, often called daddy month and mummy month, were kept.

In 2002 the leave was extended with one month to 16 months (including flat rate leave), at the same time as another reserved month was introduced by the Social Democratic government. The main difference between the first and second reserved month is thus that in 2002 a month was added to the leave length meaning that an increase in one parents' leave did not necessarily mean a decrease for the other parent.

In 2006 the ceiling on the benefits was raised after a long period of lagging behind in the 1990s, leaving many parents with less than 80 percent income replacement. The raising of the ceiling may also be seen as a reform to encourage fathers' leave use, as parents above the ceiling are dominated by fathers. In addition the flat rate was raised to 180 SEK (approx. 18 Euro) per day.

In 2006 Sweden got a new Conservative-Liberal government which in the summer of 2008 introduced a gender equality bonus. The same government also launched a home-care allowance for children up to 3 years old, voluntary for the municipalities to introduce (see details of both reforms and its consequences on the direction of Swedish family policy in Ferrarini and Duvander, 2010). The gender equality bonus is a tax credit that is paid to the parents' tax account the year after the parental leave is used. In essence, for every day that the parents share the leave more equally, or in practice, for every day that the *mother* goes back to work and the *father* uses the leave, the mother will receive a tax credit of 100 SEK (approx. 10 Euro). The bonus is gender-neutral and is aimed at an equal division of the leave. It does not apply to the reserved months or the days with the low flat rate and can thus be paid for maximum 4.5 months. All parents that have used the leave in a way that seems to entitle them to the gender equality bonus will receive a letter from the National Social Insurance Agency encouraging then to apply for the bonus. Then parents need to prove that the parent not on leave has been at work or studying, a requirement aimed at increasing the labour force participation in Sweden. Work or studies can be proved for example by a salary-receipt or

inscription proof from a school. The bonus is large enough to give incentives to share the leave more equally, especially to low and middle income families where the bonus often covers the loss in household income when the father is home instead of the mother (Duvander 2008a). This applies especially to parents with relatively small income differences in the household. However, the bonus is paid the year after the leave is used which is a disincentive for using it, especially for households with low income and fewer possibilities to wait for the bonus.

It is possible to summarize the reforms introduced by the Conservative-Liberal governments as giving more room to free choice regarding the gendered aspect of parental leave, both encouraging gender equality (by reserved months and a bonus) and allowing a traditional gendered division of leave by supporting exits from the labour market for longer periods (home-care allowance); a policy that is likely to be used by primarily mothers (Ferrarini and Duvander 2010). However the change of government made the first round of reforms in 1995 more one-sided as the home-care allowance was abolished immediately. The introduction of the second reserved month in combination with extending the leave period with one month by the Social democratic government may be seen as more one-sided, but also less disputable as it did not challenge women's length of leave, only strengthened men's possibilities to use leave.

Parental leave is used by practically all mothers and by around nine out of ten fathers (for details see Duvander 2008b). Moreover, for many parents state-legislated benefits are complemented by extra benefits from the employer on the basis of collective agreements. The large flexibility in the parental leave use is often used by parents for example by saving parts of leave to extend summer vacations or reduce work hours during the child's preschool years. Also, leave may be extended by accepting a lower replacement level, a strategy used especially by mothers (Eklund 2004). However, most leave is used during the child's first two years.

Earlier studies show that income is important for the sharing of the parental leave (Sundström and Duvander 2002, Hobson, Duvander and Hallden, 2006). Also other factors are found to have an impact on the sharing of the leave, such as work place characteristics (Bygren and Duvander 2005), not least attitudes at the work place (Haas, Allard and Hwang 2002). Also individual factors that may indicate labour market position, such as age and education are

important for fathers' and mothers' use of leave (for review see Duvander 2008b). Other factors, such as birth order (Sundström and Duvander 2002, Duvander 2006) and parents' country of origin (Duvander and Eklund 2006) are also found to be important. Attitudes to gender roles are found to matter in qualitative studies (Bekkengen 2002). In all, these factors are likely to interact even if parents claim that economic considerations are most important for the division of leave (Duvander and Berggren 2003).

There are two earlier studies evaluating the two first reforms of reserved months in parental leave, using the same method as we do here. The effect of the first reserved month was evaluated in Ekberg et al. (2005). Eriksson (2005) reports the results of the second daddy month after the first 17 months. Both studies indicate an increase in fathers' use of parental leave, but more so for the first reserved month. Ekberg et al. conclude in addition that the long-term effects of the first reserved month, measured by fathers' take-up of benefits for care of sick children later on in the child's life remained unaffected.

What is an efficient policy?

The above mentioned three reforms aim at changing the incentives in the parental leave insurance to increase a gender-equal use. This is done by somewhat different measures. We are in this study interested in the efficiency of different kinds of policies and we are intending to compare the effects of the three reforms. To improve and deepen the understanding of the three reforms we will here relate them to a free interpretation of the principles of good family support set up by McDonald (2006b) for primarily families' welfare and more indirectly enabling a situation where having children are supported. We think these principles can be used also for a discussion of family policy promoting gender equality.

Family policy is in general based on the *social value of children*. Children have a long term economic value to society and to become parent can be seen as a right that should not be followed by penalties. By reserving one month to each parent, fathers' capability to make claim to use this month increased, both in negotiations with mother and work place (Hobson and Fahlén 2009). To some extent claims were be extended by the second daddy month. The gender equality bonus does not in the same way indicate increased capability to claims as time with the child is not forfeited if the bonus is not used, only an extra bonus is added that before was not part of families' calculations. However, the bonus increases *horizontal equity* (Mc Donald 2006b:219) between parents and other men and women, especially when comparing

mothers with women without children as it encourages mothers to go back to work earlier without challenging the Swedish norm of childcare in the home for the first year.

The second principle of *neutrality of working circumstances* indicate that entitlements should be attached to the child and not dependent on work force participation of parents is fundamentally different from the Swedish set-up of an insurance compensating income loss. Work participation can thus be seen as a requirement for benefits. The requirement is strengthened by the bonus as the bonus will only be paid if the one parent is working (or studying) during leave periods.

All three reforms are part of *gender neutral* insurance, encouraging childcare of both parents. The reserved months can be seen as reducing days with the child if leave is not shared, and the bonus reducing economic benefits if leave is not shared. Importantly, the reforms target parents at different levels of use; the first reserved month encouraging fathers to take any leave, the second reserved month encouraging fathers to take more than one month, and the bonus encouraging fathers to take more than two months. The target group has thus changed over time in line with the development of usage of leave, but also in line with that the social norm of fatherhood develops. With reference to Bourdieu's (1996) idea of family policy as constructing family by strengthening one type of family, the reforms construct the idea of how an ideal family share the leave over time, going from father involvement towards gender-equal sharing of parenthood (Klinth and Johansson 2010).

Work place possibilities to use the parental leave benefits are provided equally by legislation in Sweden, but the capability to claim rights are likely to be stronger for the reserved months than the bonus. Nevertheless, the bonus is likely to be claimed by highly educated fathers, that already today use longer leave. They are often working in positions with more autonomy where they have more room for negotiating work conditions than less educated fathers in less flexible positions. The bonus may thus strengthen a group of fathers rather than all fathers.

It is generally seen as positive to the *child's development* with father involvement. A number of studies have found association between early father involvement and later father engagement (Haas and Hwang 2008, Duvander and Jans 2009) but the causality and selection aspects have not been disentangled. Nevertheless the idea of children's right to their fathers is strengthened by all three reforms.

By encouraging fathers' parental leave, mothers' earlier return to work is enabled which is beneficial to her *life time earnings.* The relative difference between mothers and fathers are likely to decrease also as the fathers' earnings will be reduced by his leave. The first reserved month and the bonus are more efficient in this aspect than the second month as the second reserved month was added on and did not challenge mothers' time at home.

The Swedish parental leave insurance can be seen as a model in some ways but not regarding *simplicity and transparency*. Indeed, surveys tell us that sufficient knowledge of the system is lacking among parents, especially fathers (National Social Insurance Board 2003, Swedish Social Insurance Agency, 2010). The first reserved month got a lot of media attention and is mostly known, while the second was introduced with much less publicity. The idea of the reserved months is nonetheless easy to grasp while one of the major critique to the gender equality bonus is that it is difficult to understand.

Regarding *fiscal costs*, all three reforms involve larger costs to the insurance as fathers still have higher earnings than mothers and therefore claim higher benefits. The returns are more abstract, for example child well being and gender equality. Direct costs is however very rarely brought up as an argument against the reforms, but administration costs are more likely to be targeted when the bonus is evaluated. To extend the leave would also include costs that are more debatable.

This study is about one aspect of the *efficacy* of the reforms and an attempt to begin answer which reform is most efficient in direct achievement of goals. It should be remembered that there are many dimensions to the principle of efficacy and it would be to oversimplify to answer with one kind of measure a short period after introduction of reforms.

By introducing the reforms as part of packages, including home-care allowance and extended leave, they have been *politically accepted* and not perceived as too radical. They may also be seen as political compromises, especially the bonus which combines the goal of gender equality with a goal of parents' labour force participation, which is the reason for the qualification that the parent not on leave is working, and the goal of free choice, combining the bonus with the reform of home-care allowance. The compromises may however inflict on the efficiency of the reforms.

All three reforms aim at an *enduring* influence on shared parenthood and increasing gender equality in other areas of society. Nevertheless, if changes in the leave system occur often, the system will lack in transparency and may in the end be perceived as an unreliable system. The abolishing of home-care allowance and change in benefit levels during the 1990s are examples of this. Presently with elections coming up in Sweden, more changes in the parental leave are possible.

In conclusion, the three reforms target different groups of users, work by the incentive of days or economic benefits, and have different degrees of transparency. The long-term effects of temporary exits from the labour market, or alternative childcare cost are not considered in this study but needs to be kept in mind.

Data and methodology

For this study we use register data from the Swedish Social Insurance Agency (Försäkringskassan) covering all parental leave use in Sweden from 1993 to present date. None of the data are self reported; instead the data are assembled from records obtained from local insurance offices. We have information on the starting date of parental leave, the extent of days (in parts of the day if not a full day) and the amount of the parent's cash benefit. The data also contain background information such as gender, date of birth, birth order of the child, geographical location, education of the parents and country of birth of both the child and the parents. As the data includes the entire population as well as a set of background variables it is well suited to evaluate reforms in the parental leave insurance.

Empirically, we make use of the fact that all three reforms was introduced for children born from a specific date. The first reserved month applies for children born from 1st of January 1995, the second reserved month applies for children born from 1st of January 2002, and the gender equality bonus applies for children born from 1st of July 2008. This implies that children born within a few days of each other are treated under different regulations. Thus, all three reforms are examples of natural experiments (see Rosenzweig and Wolpin 2000, Angrist and Krueger 2000).

We construct two subsets of data for parents of children born two weeks before and two weeks after each of the reforms. The part affected by a reform represents the treatment group and the part not affected is the control group. As we use a sample of parents in a span of four

weeks around the three reforms, there should be few, if any, seasonal effects, changes in norms, different macro-economic conditions etc. between control and treatment groups.

From the data we have excluded children whose parents do not have joint custody or are of the same sex. We have also excluded multiple births, foreign-born children, adopted children and children who decease or emigrate during the period of study. The reason is that the reforms only affect children of parents with joint custody and that the parental leave rules for multiple births and adopted children differ from other children. The reason to exclude children whose parents are of the same sex is that we investigate the division of parental leave between women and men. The final samples consist of 3 000 – 4 000 children from each reform being studied.

The empirical results crucially depend on two assumptions. The first is that no other change that affects treatment and control groups differently occurs at the same time as the reforms. The second assumption is that there is no endogenous sorting at the reforms, that is, some parents postpone or bring forward the conception, and thus the birth of the child, as a consequence of the information that the reform will take place. If these assumptions do not hold, estimates may be biased.

Regarding the first assumption, there are other changes in the social security system introduced at the time the first and second reserved month as well as the gender equality bonus was introduced. However, they generally affected treatment and control groups equally.[1]

Turning to the second assumption, if there is any endogenous sorting at the reform thresholds, we investigate if there are any differences between the samples in observed characteristics

[1] There are, however, two exceptions. In 1st of January 1995, replacement rate was lowered from 90 to 80 percent of previous earnings. Although this affected all parents equally, parents with children born before 1st of January 1995 could keep their higher replacement rate until the end of 1996 (the entire period of study in this paper). It should be noted, however, that the reserved days were excluded from this change and still replaced at 90 percent of previous earnings also for children born after 1st of January 1995.
For children born after December 31st 2001, replacement rate for flat rate days was increased from 60 SEK to 120 SEK (approx. 6 and 12 Euro). As the analysis only covers earnings-related days this change is considered to be of minor importance.

(see Appendix A).[2] Comparisons of the groups show that they are very similar to each other, indicating that the reforms are exogenous events.[3]

In this paper we are investigating effects for the first 20 months after the introduction of the reforms but may be that it takes time to change behavior. If a reform change behavior gradually, but nevertheless initiate a change, it may be missed by focusing on the first parents to meet the reform (see similar argument in Ferrarini and Duvander 2010). Nevertheless, to distinguish the effect of a reform from other gradual ongoing processes of changing behaviour the chosen method must, in our view, be seen as superior.

Results

In Table 1, we present a comparison of the means of earnings-related parental leave days for the control and treatment groups 20 months after the child is born for each of the three reforms. Fathers' use of parental leave increased from an average of 25.1 to 34.0 days after the first 20 months following the first reserved month.[4] Also the proportion of fathers who had used parental leave after 20 months increased from 42.6 to 73.5 percent. The first reserved month thus shows a large impact on fathers' use of parental leave after 20 months.

For the first reserved month, a relatively large decline in mothers' use of parental leave in the treatment group can be found compared to the control group, from an average of 317.7 days

[2] Of course, there could be endogenous sorting that does not show up in terms of observables, but that is not possible to investigate in this study.

[3] Despite of this there is significant differences between control and treatment groups according to the second birth order for the second reserved month and country of birth for the second reserved month and the gender equality bonus. We should expect, however, that control- and treatment groups differ significantly in some aspects (0.05 • the number of covariates). We also conducted logit analyses, where the risk of being exposed to a reform was regressed on age of parents, country of birth of parents, birth order, earnings of parents the year before birth, living location at birth and parents education the year before birth. None of the variables nor the combined effect of the variables are significant at 5-percent level, indicating there is no endogenous sorting in terms of observable characteristics. See also Ekberg et al (2005) and Johansson (2010) on the subject.

[4] We have also conducted regression analyses where the dependent variable are number of used earnings related parental leave days, with a dummy variable controlling for being in treatment group as independent variable. The models are being conducted with and without control variables. The results in these models are very similar to the mean values, as may be seen from the table:

Difference in used earnings related parental leave days between treatment groups and control groups

	First reserved month			Second reserved month			Gender equality bonus		
	Observed differnce	Regression without control variables	Regression with control variables	Observed differnce	Regression without control variables	Regression with control variables	Observed differnce	Regression without control variables	Regression with control variables
Men	8.9***	8.9***	8.9***	6.5***	6.5***	6.3***	-0.7	-0.7	-0.1
Women	-26.1***	-26.1***	-25.6***	7.6***	7.6***	7.7***	0.7	0.7	0.2

*** Significant difference (1 percent level) between control and treatment groups.

** Significant difference (5 percent level) between control and treatment groups.

to 291.6 days. This is what one would expect as the first month meant a reduction of benefits for mothers.

Also the second reserved month shows a significant effect on fathers' use of parental leave use. The use in the treatment group is on average 44.5 days versus 38.0 days in the control group during the first 20 months. The proportion using parental leave during the first 20 months increased from 66.9 to 72.3 percent. Note that the share of users decreased between just after the introduction of the first reserved month (73.5 percent), and just before the introduction of the second month.

As the second reserved month meant a general increase in days, also mothers used more days after the reform. The number of days increased from 267.1 in the control group to 274.4 in the treatment group.

In contrast to above changes in behavior, 20 months after the introduction of the gender equality bonus, it is not possible to find any significant difference between the control group and the treatment group in terms of fathers' use of parental leave benefits, neither in terms of the number of used days, nor in the proportion of fathers using the parental leave benefits. In parallel, we find no effect for mothers of the gender equality bonus.

As may be seen from Table 1 practically all mothers use the parental leave and the variation is likely to origin from migration of families from Sweden which hinders the use of the Swedish parental leave system.

Table 1. Parental leave use during the child's first 20 months

	First reserved month		Second reserved month		Gender equality bonus	
Number of days, mean	Control group	Treatment group	Control group	Treatment group	Control group	Treatment group
- Men	25.1***	34.0***	38.0***	44.5***	48.4	47.6
- Women	317.7***	291.6***	267.1***	274.7***	252.6	253.3
Share						
- Men	42.6***	73.5***	66.9***	72.3***	68.7	68.0
- Women	98.3	98.2	97.9	97.4	97.7	97.7

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

Note:
The children in the treatment and control groups are born:

	Control groups	Treatment groups
First reserved month	December 18 - December 31 1994	January 1 - January 14 1995
Second reserved month	December 18 - December 31 2001	January 1 - January 14 2002
Gender equality bonus	June 17 - June 30 2008	July 1 – July 14 2008

Another description of the impact of the reforms is to investigate the share of users at various levels of use. In Table 2 we focus on fathers as the reforms focus on increasing fathers' leave days. The table shows the proportion of fathers who used any earnings-related parental leave days (the same as in Table 1), the proportion that used more than 30 days and the percentage who used more than 60 parental leave days for the control and treatment groups 20 months after the child was born for each of the three reforms.

As the table shows the largest increase after the introduction of the first month is in fathers using any leave. The proportion of fathers who used more than 30 parental leave days increased from 22.5 to 28.6 percent and the difference for the proportion that used more than 60 days parental leave days is negligible.

20 months after the introduction of the second reserved month the proportion of fathers who used over 30 days and over 60 days of parental leave increased. The proportion that used more than 30 days increased from 35.0 percent in the control group to 47.8 percent in the treatment group while the proportion that used more than 60 days increased from 21.4 percent to 25.0 percent.

The results 20 months after the introduction of the gender equality bonus shows that there are no significant differences between the control group in the proportion who had used parental

leave days, neither for more than 30 days nor more than 60 days.

It is also worth noting that the proportion of fathers who use more than 30 days and more than 60 days of parental leave days increased in the period after the introduction of the first reserved month and just before the second reserved month. Similarly, the proportion of fathers who used more than 60 parental leave days increased in the period after the second reserved month and just before and the gender equality bonus was introduced.

Table 2 Share of fathers using parental leave during first 20 months

	First reserved month		Second reserved month		Gender equality bonus	
	Control group	Treatment Group	Control group	Treatment group	Control group	Treatment group
>0 days	42.6***	73.5***	66.9***	72.3***	68.7	68.0
>30 days	22.5***	28.6***	35.0***	47.8***	48.5	47.1
>60 days	14.0	14.5	21.4***	25.0***	30.8	31.4

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

Looking at the use of parental leave graphically, Figure 1a-1f show the distribution of parental leave days for control- and treatment groups for the three reforms 20 months after the introduction of each reform.[5] For the first reserved month, the distribution of fathers' days has clearly shifted to the right, with a peak at around 30 days (4-5 weeks). Likewise, the distribution of mothers' days is shifted to the left as the maximum number of days that may be used by either parent are decreased by 30 as a result of the reserved month. Also the second reserved month shifted fathers' distribution of used parental leave days to the right, with a new peak at around 60 days (7-8 weeks). The distribution is less centered and there is more variation in use after the second month was introduced. For mothers', the numbers using the maximum number of days increased in the treatment group. Turning to the gender equality bonus, there is little evidence of any difference between control- and treatment groups with the exception that the peak around 60 days for fathers' is less emphasized for the control group. The variation in use is even larger after the last reform.

[5] Numbers are shown in Appendix B.

Figure 1a. The distribution of parental leave days for control- and treatment groups, first reserved month, fathers

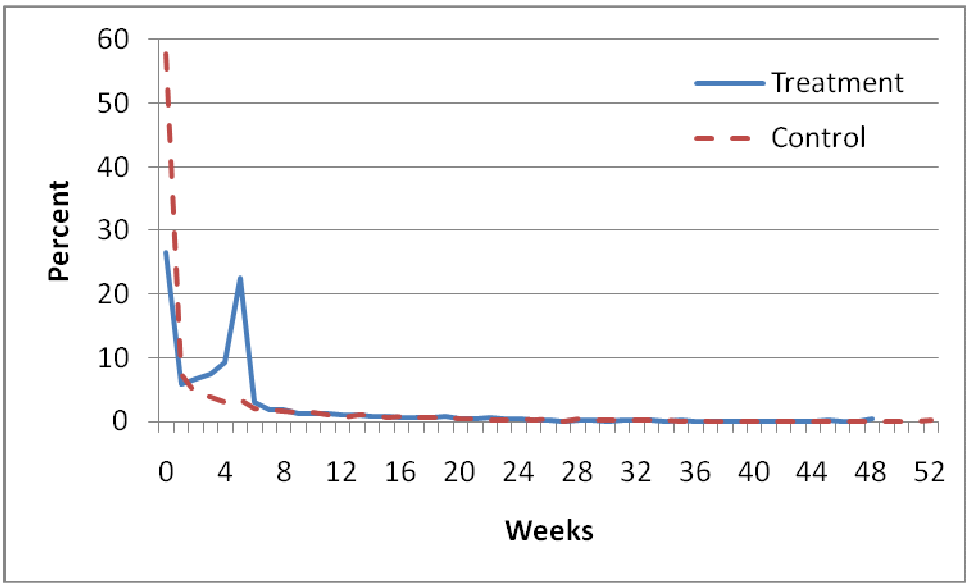


Figure 1b. The distribution of parental leave days for control- and treatment groups, first reserved month, mothers

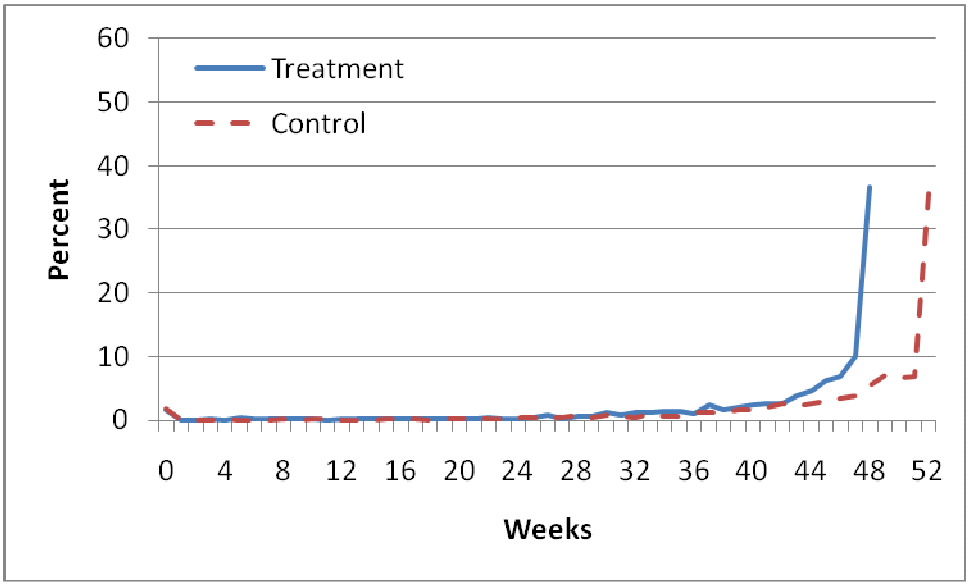


Figure 1c. The distribution of parental leave days for control- and treatment groups, second reserved month, fathers

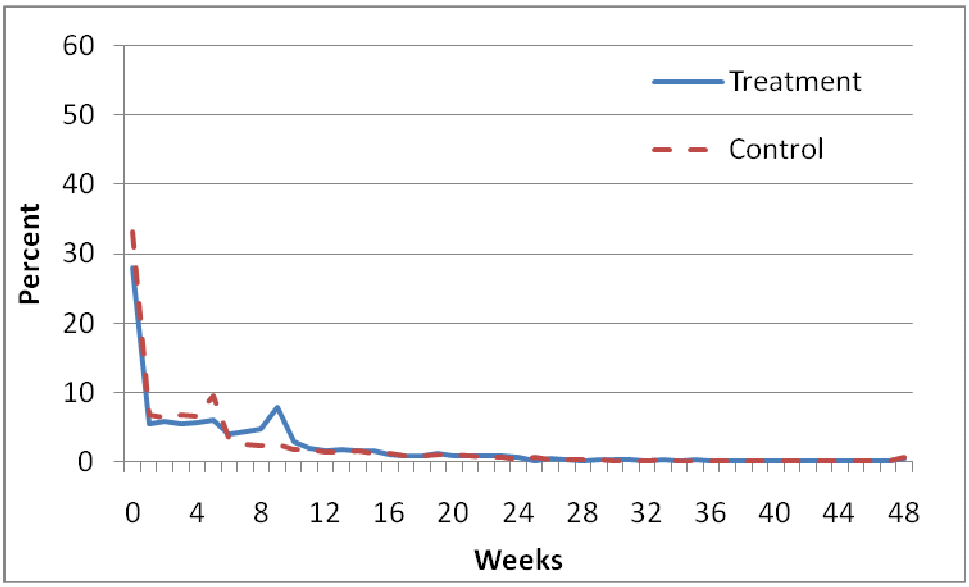


Figure 1d. The distribution of parental leave days for control- and treatment groups, second reserved month, mothers

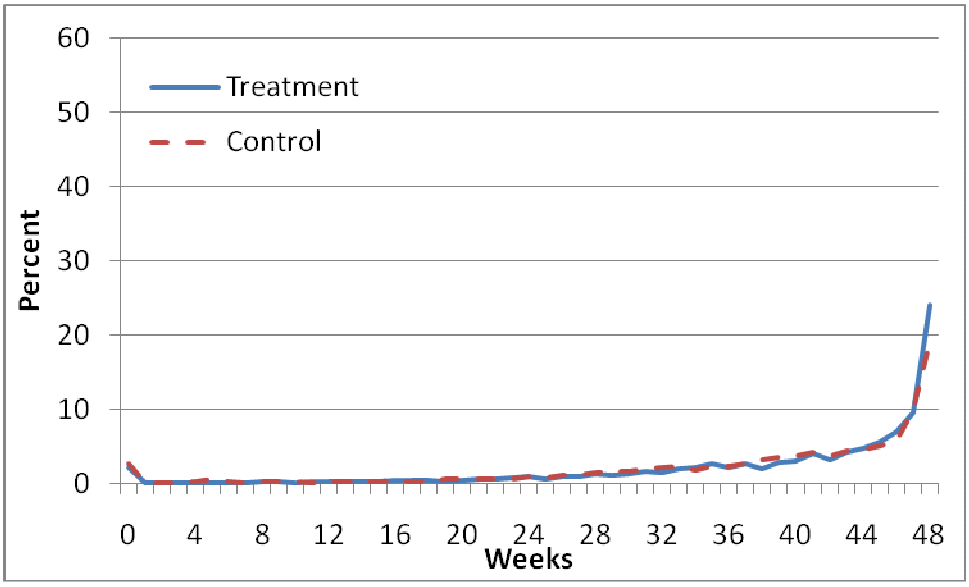


Figure 1e. The distribution of parental leave days for control- and treatment groups, gender equality bonus, fathers

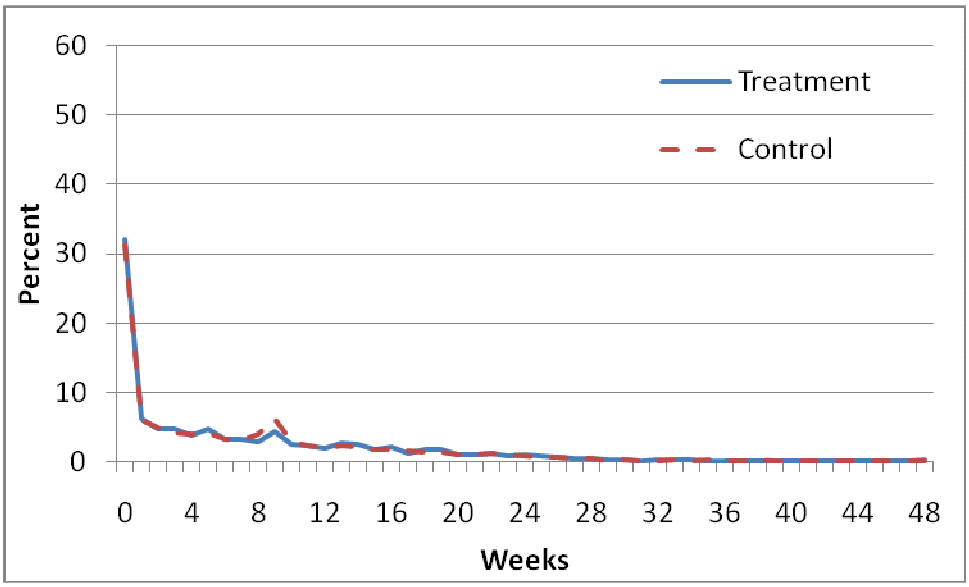
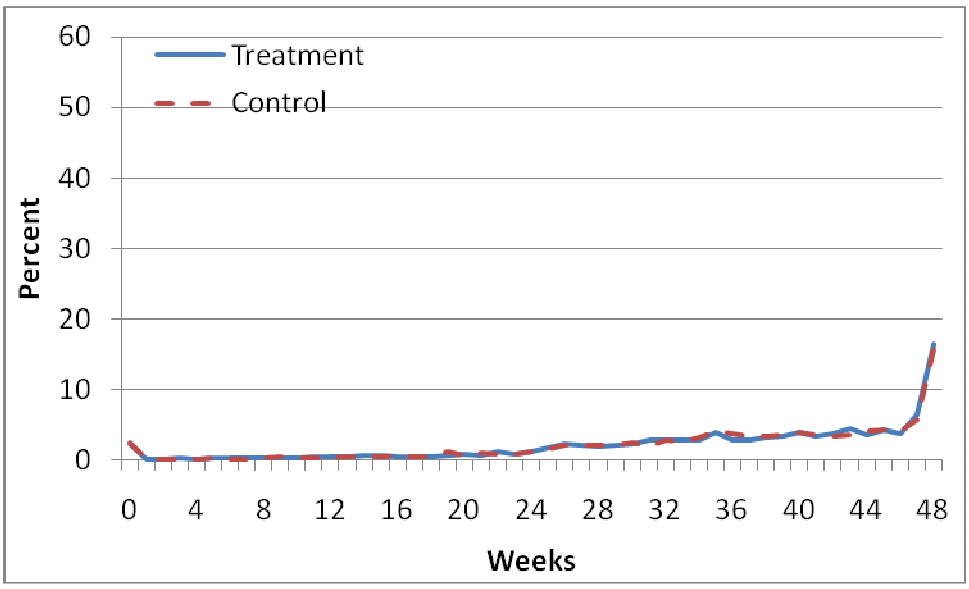


Figure 1f. The distribution of parental leave days for control- and treatment groups, gender equality bonus, mothers



Another kind of analysis is conducted by running logit-models, where the dependent variable express the risk of using more than a certain number of parental leave days.[6] In Table 4, the intervals are set to using more than 0 parental leave days, using more than one week of parental leave days, using more than two weeks of parental leave days, and so on up to using

[6] We have also conducted the same kind of analysis, where the dependent variables are the risk of using a certain number of parental leave days (that is, being in the range of 0, 0.1-1 week, 1.1-2 weeks, …, 13 and more weeks, compared to not being in that range). The results from these models are presented in Appendix C and show very similar results.

more than 13 weeks of parental leave days. The models are specified as (where $_m$ and $_f$ denotes male and female):

$$\begin{aligned}\text{Logit}(Y_{1/0}) = \alpha &+ \beta_1\,\text{Age-30}_m + \beta_2\,\text{Age36}_m + \beta_3\,\text{Age-30}_f + \beta_4\,\text{Age36}_f + \beta_5\,\text{Maleolder} + \\ &\beta_6\,\text{Femaleolder} + \beta_7\,\text{Bornabroad} + \beta_8\,\text{BornmSwA} + \beta_9\,\text{BornmAwS} + \\ &\beta_{10}\,\text{Birthorder1}_m + \beta_{11}\,\text{Birthorder3}_m + \beta_{12}\,\text{Incflatrate}_m + \beta_{13}\,\text{Inclow}_m + \beta_{14} \\ &\text{Inchigh}_m + \beta_{15}\,\text{Incflatrate}_f + \beta_{16}\,\text{Inclow}_f + \beta_{17}\,\text{Inchigh}_f + \beta_{18}\,\text{Incsharemale020} + \beta_{19} \\ &\text{Incsharemale2040} + \beta_{20}\,\text{Incsharemale6080} + \beta_{21}\,\text{Incsharemale80100} + \beta_{22}\,\text{Cities} \\ &+ \beta_{23}\,\text{RestofSweden} + \beta_{23}\,\text{Edprimary}_m + \beta_{24}\,\text{Edtertiary}_m + \beta_{25}\,\text{Edunknown}_m + \\ &\beta_{23}\,\text{Edprimary}_f + \beta_{24}\,\text{Edtertiary}_f + \beta_{25}\,\text{Edunknown}_f + \beta_{26}\,\text{Edmalehigher} + \\ &\beta_{26}\,\text{Edfemalehigher} + \beta_{27}\,\text{Treatment}\end{aligned}$$

All variables are dummy variables that take the value 1 if the individual belongs to the group and 0 if the individual does not belong to the group. The variable *Age-30* indicates that the mother/father is 30 years or younger and *Age36* that the mother/father is 36 years or older, *Maleolder* indicates if the father is more than five years older than the mother, *Femaleolder* indicates that the mother is more than five years older than the father, *Bornabroad* indicates that both parents are not born in Sweden, *BornmSwA* indicates that the father is born in Sweden and the mother is born abroad, *BornmAwS* indicates that the father is born abroad and the mother is born in Sweden, *Birthorder1* indicates birth order one, *Birthorder3* indicates birth order three or higher, *Incflatrate*, *Inclow* and *Inchigh* indicates earnings levels[7], *Incsharemale020*, *Incsharemale2040*, *Incsharemale6080*, *Incsharemale80100* indicates that the fathers share of mothers and fathers earnings is 0-20 percent, 20-40 percent, 60-80 percent and 80-100 percent respectively, *Cities* indicates that the child lives in or around the three largest cities in Sweden, *RestofSweden* indicates that the child lives in mainly rural Sweden, *Edprimary* indicates that the mother/father has primary education, *Edtertiary* indicates that

[7] Parents are divided into four groups according to their yearly earnings. Earnings are expressed in price base amounts the year before each reform (1994 for the first reserved month, 2001 for the second reserved month and 2007 for the gender equality bonus. The price base amount follows the price trend in the country each year and is set by the government. The amount is used for calculating different kinds of benefits. The amount of benefit changes automatically when the price base amount is changed.
The price base amount was 35 200 SEK (approx 3 520 Euro) in 1994, 36 900 SEK (approx 3 690 Euro) in 2001 and 40 300 SEK (approx 4 030 Euro) in 2007.
The first group, flat rate, have earnings below the flat rate compensation at the time of each reform (60 SEK per day at the time of the introduction of the first and second reserved month, and 180 SEK per day for the gender equality bonus).
The earnings of the second, low earnings, group is over the flat rate compensation, and up to 5 price base amount.
The earnings of the third group, medium earnings, is over 5 price base amount but below the highest compensation rate at the time of each reform (7.5 price base amount at the time of the introduction of the first and second reserved month, and 10 price base amount for the gender equality bonus).
The fourth group, high earnings, have earnings above the ceiling of the parental leave benefits.

the mother/father has tertiary education, *Edunknown* indicates that the education of the mother/father is unknown, *Edmalehigher* indicates that the education of the father is higher than the education of the mother and *Edfemalehigher* indicates that the education of the mother is higher than the education of the father.

Finally, the model includes a variable that indicates if the child belongs to the control group or to the treatment group. That is, if the child is born just before or just after each reform. It is the estimated value of this variable that is presented in Table 4.[8] The results are expressed in odds ratios, which mean that they may be interpreted as percent changes.

As a sensitivity analysis, we also conducted logit models without control variables, and logit models with children born one week and three days around the reform cut-offs, instead of two weeks. We also conducted regressions for various subgroups. In neither of the cases the results differ significantly from the main results.

As may be seen from Table 4, there is a clear effect from the first reserved month. The risk of using more than zero days is about four times higher in the treatment group compared to the control group. Also, there is a significantly higher risk of the treatment group to use more than 30 days, but not more than five weeks of parental leave. The effect is to a large extent depending on that there is a shift from not using any or only a few days of parental leave before the reform, to using around 30 parental leave days after the reform.

The results for the second reserved month are presented in the second column of Table 4. There is a significantly higher risk to use more than nine weeks of parental leave in the treatment group compared to the control group. Similarly to after the introduction of the first reserved month there is a shift, but instead of using one month, the fathers are to a larger degree using two months of parental leave.

Turning to the effects of the gender equality bonus, the effects are smaller. However, there is a significantly higher risk of using more than 10 weeks, more than 11 weeks, and more than 12 weeks of parental leave for the treatment group compared to the control group. The results indicate that there has been a shift from using around 60 days to use more days. This is supported by the results from models where the dependent variables are the risk of using a

[8] Examples of the full model are being presented in appendix D.

certain number of parental leave days (see Appendix C). In these models there is a statistically lower risk of being in the range of using 7-9 weeks of parental leave for fathers in the treatment group compared to the control group. As there are no significant differences for fathers using less than seven weeks of parental leave, the results may indicate that the reform mainly affects fathers who are using relatively many parental leave days.

Table 4. Risk of least number of leave days after reform, odds ratios, all fathers. Logit models

	First reserved month	Second reserved month	Gender equality bonus
>0 days	4.26***	1.32***	1.01
>1 week	4.28***	1.34***	1.00
>2 weeks	3.86***	1.36***	1.00
>3 weeks	3.37***	1.44***	0.97
>4 weeks	2.66***	1.48***	0.98
>30 days	1.38***	1.76***	0.97
>5 weeks	1.10	1.79***	0.96
>6 weeks	1.03	1.77***	0.95
>7 weeks	1.03	1.68***	0.94
>8 weeks	1.02	1.54***	0.99
>60 days	1.04	1.22***	1.06
>9 weeks	1.04	1.16**	1.09
>10 weeks	1.08	1.10	1.12**
>11 weeks	1.05	1.10	1.13**
>12 weeks	1.02	1.09	1.13**
>13 weeks	1.04	1.06	1.10

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

Discussion

This study focuses on the effects of reforms to encourage an equal division of leave in the parental leave insurance. The outcomes of the first and the second reserved months for each parent, and the gender equality bonus are evaluated and compared. We investigate fathers' and mothers' leave use during the first 20 months after the introduction of each reform. Although it should be remembered that the parental leave can be used until the child is 8 years old and fathers often use a larger share of leave later on in the child's life, the vast majority of parental leave days are used when the child is 20 months old. The study thus focuses on short-term effects and does not rule out effects that appear later on in the child's life. It also focuses on short-term effects in the sense that it analyses only the first parents to meet the new reform and thus misses gradual changes in behavior initiated by the reform. Nevertheless the results

in this study tell us something about how different reforms operate and affect parents' patterns of usage.

The results show that the first reserved month clearly has most effect on both fathers' and mothers' use. Mothers' use of parental leave days decreased by 23 days while fathers increased by 9 days. Also the share of fathers using the leave increased from 43 to 74 percent. The reason that fathers' leave does not increase as much as mothers' decrease is probably that fathers to a larger extent take their leave later in the child's life. We find that the propensity among fathers to use around one month of leave increase sharply, while the propensity to use longer leaves are mainly unaffected.

The second reserved month has a much more moderate effect, increasing fathers' days from 42 to 48 days and mothers' days from 300 to 307 days. Remember that the leave was extended by 30 days at the same time and this extension could also be used by mothers. Here we find that the dominant pattern is that fathers' use of around two months increase, while other lengths of leave are less affected.

So far we have not seen any effects on mean used days from the gender equality bonus which may seem somewhat puzzling. However, the logit models show that fathers' usage of extended lengths, more than 70 days, are more likely after the reform was introduced.

We interpret the results to indicate that the three reforms affected different groups of fathers using different lengths of leave, and that these groups of fathers change in size over time. The gender equality bonus target fathers who already use two months of leave and the reason for lack of change in mean parental leave days used may be that this group is still too small.

When comparing the effects of the three reforms it seems that the efficacy of the first reform, the first reserved month, is much higher that the two other reforms, and that the second reserved month is clearly more effective than the gender equality bonus. It is not possible to conclude that the first month therefore is a reform that is superior to the other two, as they can be seen as stepping stones towards the same goal. They all promote the social value of children, especially children to working parents and they aim at a gender neutral, or gender equal parenthood. The reserved months, entitling days and not just economic benefits may however be more efficient for making claims at the workplace, which may be a reason for a

more obvious effect. To have more time with your child at the expense of work is a more valid claim than earning a bonus (or loosing less income) according to Swedish norms.

All three reforms emphasize father involvement for the child's development and all three work positively towards women's life time earnings, perhaps the second month less so as it also extends her leave period.

Our interpretation of the absence of a clear effect from the gender equality bonus is that the information about the bonus has not reached parents and that the system is complicated to understand. Thus transparency of policy is largely lacking. The lag in the tax credit is also likely to work as a disincentive to usage. It may also be that the gender equality bonus is a kind of reform that takes time before it enters the decision-making process of parents. It is less straight forward than the reserved months, and it was also given much less attention in media and the public debate. An additional possibility may be that other factors influencing the leave decision may be so strong that a bonus at the economic level of the present one may be too small to have any influence.

All three reforms have been politically accepted by being introduced as part of packages, a possible reason also to that the effect of the reforms are in some case smaller than expected. By comparing the use of leave of fathers to children born in 1995, 2002 and 2008 we see that the effect of the reforms to a large part have been enduring for the first and second month. It is too early to talk about enduring effects from the gender equality bonus

It is also possible that a reform encouraging gender equality in the parental leave may have most effect the first time it is introduced, but that it is hard to reach the same effect when it is repeated. In addition, even if the reform aim for gender-neutral parenthood, the bonus does so by encouragements while the reserved months reduce leave days if not used more equally. The bonus is also complemented with the option to not share the parenthood equally by home-care allowance (also gender-neutral but not its implication and use). It seems that when the goal of gender equality has to compete with goals of free choice, only some grab the chance to be more gender equal.

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Appendix A.

Table A1. Characteristics, men

	First reserved month		Second reserved month		Gender equality bonus	
	Control	Treatment	Control	Treatment	Control	Treatment
Age						
-30 years	48.5	49.5	39.2	39.7	30.2	30.3
31-35 years	28.0	28.5	33.0	33.2	34.1	35.3
36+ years	23.4	22.0	27.7	27.0	35.7	34.4
Country of birth						
Sweden	83.9	84.1	81.3**	83.6**	79.4**	78.1**
Foreign born	16.1	15.9	18.7**	16.4**	20.6**	21.9**
Birth order						
First child	41.4	41.9	48.0	45.5	40.6	41.0
Second child	35.2	36.1	32.1**	35.0**	37.1	37.6
Third+ child	23.4	22.0	19.9	19.6	22.3	21.4
Earnings[x]						
Flat rate	4.8	4.1	5.6	6.0	9.5	9.8
Low	23.5	22.1	21.0	20.3	19.8	20.6
Medium	43.0	44.9	41.4	39.7	51.9	50.0
High	28.7	28.8	32.0	34.0	18.8	19.6
Living location						
Cities	31.5	30.9	32.2	32.5	37.7	38.1
Larger towns	29.2	28.8	28.7	28.5	27.8	26.3
Rest of Sweden	39.4	40.3	39.0	39.1	34.5	35.6
Education						
Primary education	17.5	17.7	12.7	11.3	12.0	12.2
Secondary education	53.5	52.7	54.1	53.4	46.5	47.4
Tertiary education	26.4	27.1	31.3	33.5	38.8	38.0
Unknown education	2.5	2.5	1.9	1.8	2.7	2.4
Observations	3 021	3 184	2 557	2 912	3 967	4 160

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

[x] See footnote 7.

Table A2. Characteristics, women

	First reserved month		Second reserved month		Gender equality bonus	
	Control	Treatment	Control	Treatment	Control	Treatment
Age						
-30 years	66.9	68.1	55.9	56.4	46.6	48.3
31-35 years	23.9	22.0	29.9	29.5	35.3	33.9
36+ years	9.2	9.9	14.2	14.0	18.1	17.7
Country of birth						
Sweden	84.9	84.3	81.3	83.2	80.0	77.8
Foreign born	15.1	15.7	18.7	16.8	20.0	22.2
Birth order						
First child	41.6	41.1	47.0***	43.5***	39.2	40.3
Second child	36.5	37.5	33.0***	37.3***	39.8	38.2
Third+ child	21.9	21.4	19.9	19.2	21.0	21.5
Earnings[x]						
Flat rate	8.9	8.2	11.4	10.9	16.1	16.0
Low	62.8	62.1	46.6	45.9	39.8	41.0
Medium	22.8	24.3	32.0	32.5	36.4	35.8
High	5.5	5.4	10.0	10.8	7.7	7.3
Living location						
Cities	31.6	31.2	33.1	32.1	37.7	38.0
Larger towns	29.4	29.2	28.2	29.6	28.1	26.5
Rest of Sweden	39.0	39.6	38.7	38.3	34.2	35.5
Education						
Primary education	14.8**	12.8**	11.8	11.5	9.4	10.1
Secondary education	54.9	56.5	48.4	48.5	38.3	38.6
Tertiary education	28.0	27.6	36.9	37.2	48.7	47.3
Unknown education	2.4**	3.2**	2.9	2.8	3.6	4.0
Observations	3 021	3 184	2 557	2 912	3 967	4 160

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

[x] See footnote 7.

Appendix B.

Table B1. The distribution of parental leave days for control- and treatment groups, fathers

	First reserved month		Second reserved month		Gender equality bonus	
	Control	Treatment	Control	Treatment	Control	Treatment
0 days	57.6	26.6	33.1	28.0	31.3	32.0
0-1 week	7.4	5.9	6.8	5.5	6.0	6.3
1-2 weeks	4.4	6.6	6.4	5.8	4.8	4.7
2-3 weeks	3.9	7.4	6.7	5.5	4.2	4.8
3-4 weeks	3.0	9.2	6.6	5.6	4.1	3.9
4-5 weeks	3.5	22.5	9.5	6.0	4.2	4.6
5-6 weeks	2.1	3.1	3.4	4.0	3.2	3.2
6-7 weeks	1.8	1.8	2.6	4.3	3.0	3.3
7-8 weeks	1.6	1.8	2.3	4.6	4.1	2.9
8-9 weeks	1.5	1.3	2.4	7.8	6.2	4.4
9-10 weeks	1.4	1.1	1.7	2.9	2.9	2.4
10-11 weeks	1.0	1.3	1.8	2.0	2.3	2.3
11-12 weeks	0.7	0.9	1.4	1.6	2.0	2.0
12-13 weeks	1.0	0.9	1.3	1.8	2.3	2.7
13+ weeks	9.2	9.5	14.0	14.6	19.5	20.5

Table B1. The distribution of parental leave days for control- and treatment groups, mothers

	First reserved month		Second reserved month		Gender equality bonus	
	Control	Treatment	Control	Treatment	Control	Treatment
0-34 weeks	11.1	15.1	25.5	22.6	34.4	34.9
34-35 weeks	0.7	1.5	2.3	2.7	4.0	3.8
35-36 weeks	1.2	1.1	2.3	2.1	3.6	2.8
36-37 weeks	1.1	2.4	2.7	2.6	3.3	2.7
37-38 weeks	1.1	1.7	3.1	1.9	3.3	3.2
38-39 weeks	1.7	2.1	3.5	2.8	3.5	3.2
39-40 weeks	1.6	2.4	3.7	3.0	3.9	3.8
40-41 weeks	2.0	2.7	4.2	4.0	3.6	3.2
41-42 weeks	2.5	2.7	3.6	3.1	3.3	3.6
42-43 weeks	2.3	3.9	4.4	4.2	3.5	4.4
43-44 weeks	2.7	4.7	4.5	4.8	4.1	3.5
44-45 weeks	3.1	6.3	5.1	5.6	4.2	4.3
45-46 weeks	3.5	6.9	5.8	7.0	4.0	3.8
46-47 weeks	3.9	10.1	9.9	9.6	5.7	6.3
> 47 weeks	61.5	36.7	19.2	24.0	15.7	16.4

Appendix C.

Table C1. Risk of number of leave days after reform

Range	First reserved month	Second reserved month	Gender Equality bonus
0 days	0.23***	0.76***	0.99
0-1 week	0.75***	0.84	1.03
1-2 weeks	1.46***	0.88	0.99
2-3 weeks	1.95***	0.77**	1.18
3-4 weeks	3.40***	0.88	0.94
4-5 weeks	8.22***	0.61***	1.10
5-6 weeks	1.50**	1.24	1.05
6-7 weeks	1.03	1.67***	1.08
7-8 weeks	1.10	1.99***	0.74**
8-9 weeks	0.88	3.54***	0.69***
9-10 weeks	0.77	1.57**	0.82
10-11 weeks	1.33	1.07	0.99
11-12 weeks	1.45	1.09	1.02
12-13 weeks	0.90	1.34	1.30
>13 weeks	1.04	1.06	1.10

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

Appendix D.

Table D1. Logistic regression models, odds ratios, dependent variable using parental leave

	First reserved month	Second reserved month	Gender Equality bonus
Age			
Age -30 years, father	0.94	0.97	0.99
Age 31-35 years, father (ref.)	1	1	1
Age 36+ years, father	0.99	1.03	0.97
Age -30 years, mother	1.17	1.10	1.06
Age 31-35 years, mother (ref.)	1	1	1
Age 36+ years, mother	0.91	0.96	0.90
Father > 5 years older	1.01	0.96	0.83**
Father and mother about same age	1	1	1
Mother > 5 years older	1.06	1.14	1.22
Country of birth			
Both parents born in Sweden (ref.)	1	1	1
Both parents born abroad	0.35***	0.40***	0.42***
Father born in Sweden, mother born abroad	0.96	1.03	0.84
Father born abroad, mother born in Sweden	0.68***	0.68***	0.66***
Birth order (father)			
First	1.31***	1.61***	1.44***
Second (ref.)	1	1	1
Third or higher	0.92	0.97	0.83***
Earnings[x]			
Flat rate, father	0.56**	0.29***	0.18**
Low, father	0.55***	0.47***	0.68***
Medium, father (ref.)	1	1	1
High, father	1.02	0.81**	0.69***
Flat rate, mother	1.00	0.99	0.77
Low, mother	0.90	0.77***	0.87
Medium, mother (ref.)	1	1	1
High, mother	1.49***	1.04	1.28
Fathers share of earnings 0-20 %	0.49***	0.34***	0.82
Fathers share of earnings 20-40 %	0.69**	0.66***	0.79**
Fathers share of earnings 40-60 % (ref.)	1	1	1

Fathers share of earnings 60-80 %	0.81***	0.85	0.72***
Fathers share of earnings 80-100 %	0.65***	0.65***	0.54***
Living location			
Cities	0.98	1.03	1.08
Larger towns (ref.)	1	1	1
Rest of Sweden	0.98	1.03	1.00
Education			
Primary, father	0.69**	1.11	0.90
Secondary, father (ref.)	1	1	1
Tertiary, father	1.13	0.70	1.23
Unknown, father	0.29***	0.83	1.04
Primary, mother	0.81	0.57***	1.18
Secondary, mother (ref.)	1	1	1
Tertiary, mother	1.10	1.88***	1.62***
Unknown, mother	1.14	0.73	1.39
Father higher education than mother	0.93	1.56**	1.06
Father and mother same education (ref.)	1	1	1
Mother higher education than father	1.36	0.75	0.98
Treatment			
Treatment group	4.26***	1.32***	1.01
Control group (ref.)	1	1	1
Log likelihood (starting model)	-4212.22	-3350.34	-5072.75
Log likelihood (final model)	-3570.73	-2919.32	-4497.08
R2	0.152	0.129	0.114
Number of observations	6 205	5 469	8 127

*** Significant difference (1 percent level) between control and treatment groups.
** Significant difference (5 percent level) between control and treatment groups.

Huber/White/sandwich estimator of variance

[x] See footnote 7.