

# A Comparison of Single and Cohabiting Mothers' Utilization of the Temporary Parental Leave Insurance

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*Preliminary version of 2005-01-15*

## **Abstract**

In this study, the utilization of temporary parental leave (leave from work to take care of a sick child) of single and cohabiting women is compared, both as regards the probability of taking temporary parental leave and the number of days taken. Since cohabiting women have the possibility of sharing the temporary parental leave needed with their partners, we would expect them to have a lower utilization. However, this is not the case. On the contrary, we find that being single has a negative effect on the utilization of temporary parental leave. In addition, we find that single and cohabiting women differ substantially regarding the effect of various socio-economic factors on the utilization.

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Financing from the Swedish Insurance Board (RFV) and The Crafoord Foundation is gratefully acknowledged.

## 1. Introduction

In the literature of economics of the family, the decision-making unit normally is modelled as consisting of two spouses who either cooperate, or do not cooperate, in the production of household public goods. However, the impact of being single, but still a part of a household, has to a large extent been neglected in the literature. In most modern households, the idea of joint responsibility as regards the chores associated with everyday life prevails. In spite of this, there are large differences between men and women in the amount of time allocated to household work.<sup>1</sup> In this study we ask whether women really have any advantage from being a part of a couple, compared to being single, as regards the production of a particular household public good. That is, can a cohabiting woman, to a larger extent than a single woman, share the responsibility for the production of a household public good with her partner and therefore to a larger extent avoid negative effects on her labour market outcomes? The particular household public good that we focus on is temporary parental leave.

The parental leave system in Sweden is one of the most generous in the world and one of the few systems that applies the same rules for both mothers and fathers. The system includes parental leave (föräldraledighet) (a total of 15 months that can be used by either of the parents from the birth of the child until the child is eight years old), and temporary parental leave (tillfällig föräldraledighet).<sup>2</sup> The temporary parental leave insurance compensates parents financially when they have to be absent from work in order to take care of a sick child. The temporary parental leave insurance covers parents of children 0 to 12 years old for up to 60 days a year.<sup>3</sup> Both when it comes to parental and temporary parental leave, women take the majority of the compensated days. Still, there is a large difference in the shares taken by men and women of compensated days of parental and temporary parental leave. During the nineties, women have taken on average 90% of the compensated days of parental leave, whereas the corresponding figure is 65% for the compensated days of temporary parental leave. The equality is thus much more prominent when it comes to the distribution of temporary parental leave, in spite of the government's efforts to incite fathers to take more parental leave.<sup>4</sup>

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<sup>1</sup> See Statistics Sweden [http://www.scb.se/templates/tableOrChart\\_27499.asp](http://www.scb.se/templates/tableOrChart_27499.asp) for an overview of household work done by men and women in different family types in Sweden. (Link existed 2004-03-03).

<sup>2</sup> The replacement rate in the parental insurance is 80%, with an income ceiling at 289,500 Swedish crowns a year.

<sup>3</sup> In special cases the insurance period can be extended with another 60 days and, in cases of serious illnesses, parents of children in the ages 12 to 16 can be compensated through the insurance.

<sup>4</sup> For example, the so-called "daddy-month" was introduced in 1995 and extended to two months in 2002. It means that the law reserves at least two months of the total parental leave available per child to the father and

In this study, we focus on differences between single mothers and cohabiting (or married)<sup>5</sup> mothers as regards the utilisation of the temporary parental leave insurance. We will compare *i)* the probability of taking temporary parental leave and *ii)* the number of days of temporary parental leave taken by single women to that of women who are cohabiting. We argue that child sickness is exogenously given and should therefore not differ between single parent and two-parent households when controlling for the number of children and their age distribution. Potentially, if single mothers are less likely and/or less able to invest in temporary parental leave (which might be seen as a proxy for investments in child health), children of single mothers might get lower health-investments than other children.

The paper is outlined as follows: In section two we discuss previous studies in which single and cohabiting mothers are compared as regards outcomes on child health. Predictions regarding the utilisation of temporary parental leave of single and non-single women are presented in section three. In section four descriptive statistics, the data and estimation methods are described. In section five we present and discuss the results of the estimations. Section six concludes.

## **2. Previous studies on comparisons between single mothers and two-parent households**

It has been very difficult to find studies that compare the situation of single mothers to that of cohabiting mothers as regards the production of household goods. In fact, we have not been able to find any such study. The previous studies that have compared single mother households to two-parent households usually focus on different outcomes for the children and not on differences in the production of household goods. Even though child outcomes are not our focus, we will briefly discuss a number of such studies in this section.

In general, the outcomes of interest as regards children of cohabiting mothers, compared to children of single mothers, concern either health or education-related factors. We will only discuss studies focusing on child health outcomes, since such outcomes are related to temporary parental leave. Curtis et al. investigate the influence of family structure and

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was passed to increase the proportion of parental leave taken by men (Ekberg et al. 2003, "Nya Livet," No 2, 2002).

<sup>5</sup> In the empirical estimation we only know whether a woman lives together with a man or not, and whether there are any children in the household or not. We do not have any information on marital status or on biological parenthood.

permanent income on child health in Canada. They find that being a lone-mother had a negative effect on the emotional health and the health utility score<sup>6</sup> of the child, even when controlling for low permanent income. These results show that having a single mother has a negative effect on the health status of the child *per se*, even when controlling for the usually lower income in single-mother households. Heck & Parker (2002), using US-data, hypothesise that children of lower socio-economic status (SES) with single mothers should have relatively worse access to care compared to lower SES children in two-parent families. They also hypothesise that there would be no differences by family structure among children in higher SES families. Their outcome variables were *i*) having no physician visit in the past year, *ii*) having no usual source of health care and *iii*) having unmet health care needs. When controlling for health insurance access, there was no significant socioeconomic variation in the relationship between family structure and outcomes *i* and *ii*. For unmet needs (outcome *iii*), there were no family structure effects at low levels of maternal education, whereas children of single mothers with high education level had more unmet needs compared to children of highly educated mothers in two-parent families. For the Swedish case, Brolin-Låftman & Östberg (2004) find no significant difference in psychological wellbeing and psychosomatic wellbeing between Swedish children (10-18 years old) who live with both parents and children who live with either one parent or with one parent and a step parent.

The discussion above shows that previous results regarding the effect of having a single mother on child health are somewhat inconclusive. It should be noted though, that the purpose of this study is *not* to compare child health outcomes in single mother households to those in two-parent households, but rather to investigate whether mothers in two-parent families have any advantage from having a partner in the production of the household public good of temporary parental leave. Due to the close connection between the particular household public good that we are focusing on and child health, it is inevitable that a discussion of child health and the evaluation of it is included in our analysis. After having read our literature survey above, the assumption of child health being exogenously given might seem problematic. However, we argue that although it is possible that children of single mothers might have, for example, on average more emotional problems than the corresponding children in two-parent households, (although we have found no evidence of this in the literature), we argue that these sorts of problems are not of the type that make temporary parental leave necessary. It is more likely that these children will get extra support at their day-care centre, or at school, but not

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<sup>6</sup> The health utility score is a classification system in which the child's ability in seven different areas (sensation (i.e. vision, hearing and speech), mobility, emotion, cognition, self-care, pain and fertility) are translated into cardinal scores on the scale of no impairments (=1.00) to dead (=0).

that they will require more care at home than other children. We argue that temporary parental leave, in general, is taken for (mostly short-lived) children's diseases, which should be equally common among children of single as among children of cohabiting parents. The fact that all medical care in Sweden is financed through taxes, and consequently available to all children for free, further supports our assumption. We have not been able to find any study that compares children of single mothers to children of married or cohabiting mothers as regards the type of health outcomes thought to make temporary parental leave necessary. However, given that our assumption is correct, the need for temporary parental leave should not differ between two-parent and single mother households (when controlling for the number and ages of the children in the household). This is one reason for focusing on temporary parental leave instead of some other household good, for which the need may vary depending on family type. Another advantage with focusing on temporary parental leave is the availability of data regarding the production, due to the compensation from the Swedish National Social Insurance Board.

### **3. What determines the utilization of temporary parental leave of single and cohabiting mothers?**

In this section, we discuss a number of factors that might influence the decision to take temporary parental leave in single parent and two parent households. Since the decision-making processes and the factors of influence might differ between household-types we start out by discussing single parent and two parent households separately. We thereafter discuss some factors that we believe will have equal effects in both household types.

#### *3.1 The demand for temporary parental leave of the single mother*

In Sweden, approximately 75% of all children in the ages 0-17 years live with both their biological parents.<sup>7</sup> In addition, 93.8% of all children with divorced parents have parents with joint custody.<sup>8</sup> However, only 17% of the children with divorced parents spend equal amounts of time with their mother and father. It is probably safe to assume that the majority of the remaining 83% spend most of their time with their mothers. This is our main reason for focusing on single mothers (instead of single individuals in general). Since most children of divorced parents in Sweden spend most of their time living with their mothers and a lot of

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<sup>7</sup> Statistics Sweden, [http://www.scb.se/Statistik/BE/LE0102/2002A01/LE0102\\_2002A01\\_BR\\_05\\_BE51ST0307.pdf](http://www.scb.se/Statistik/BE/LE0102/2002A01/LE0102_2002A01_BR_05_BE51ST0307.pdf) (link existed 2004-03-04)

these children only spend time with their fathers during weekends (when no temporary parental leave can be taken), we expect the number of days of child sickness occurring in single mother households to be (on average) approximately equal to, or slightly lower than, that occurring in two-parent households.

Temporary parental leave can be thought of as a household public good produced with the time of either of the spouses as only input. In a single-mother household, the entire production of temporary parental leave has to be undertaken by one person.<sup>9</sup> Therefore, *ceteris paribus*, we expect single mothers to take (on average) more temporary parental leave than cohabiting mothers, simply because single women alone must produce what cohabiting women can produce together with their partners.

The utility function of the single female (*sf*) is given by

$$U_{sf} = v(c_{sf}) + g(h_{sf}) \quad (1)$$

Where  $c_{sf}$  represents the single female's private consumption and  $h_{sf}$  denotes an increase in child health.<sup>10</sup> We assume that

$$v'(c_{sf}), g'(h_{sf}) > 0$$

$$v''(c_{sf}), g''(h_{sf}) < 0 \quad (2)$$

$$v'''(c_{sf}), g'''(h_{sf}) = 0$$

i.e. the utility functions are strictly concave and any third order effects are sufficiently small to be excluded from the analysis.

The single mother faces the following constraints

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<sup>8</sup> The mother has own custody for 5.9% of the children with divorced parents. Statistics Sweden, [http://www.scb.se/templates/publdb/publikation\\_2725.asp&plopnr=1487](http://www.scb.se/templates/publdb/publikation_2725.asp&plopnr=1487) (link existed 2004-03-04)

<sup>9</sup> A single mother may share custody of her child(ren) with their father. However, we assume that the decision to take temporary parental leave on a particular day is taken by the mother individually if the child is staying with her on that day.

<sup>10</sup> The demanded child health will depend on the number of children and their ages. We choose to model the demand of temporary parental leave for a given number and a give age structure of children. In the empirical section, we address this by holding the number of children and the age of the youngest child constant in the estimations.

$$T_{sf} = t_{sf}^m + t_{sf}^l$$

$$h_{sf} = f(t_{sf}^l) \tag{3}$$

$$c_{sf} = (T_{sf} - t_{sf}^l)w_{sf} + \bar{w}_{sf}t_{sf}^lp - N_{sf}$$

where  $T_{sf}$  represents the total time of the single female, which can be spent on either market work ( $m$ ) or on temporary parental leave ( $l$ ). Improvements in child health,  $h_{sf}$ , are produced with the time of the single mother as only input. The level of private consumption,  $c_{sf}$ , depends on the amount of market work times the market wage of the single female,  $w_{sf}$ . The second term in the budget constraint represents the compensation from the temporary parental leave insurance, which is influenced by  $\bar{w}_{sf}$ , which equals the wage of the female for incomes below the ceiling in the insurance, and equals an income corresponding to the ceiling for incomes above it. The constant  $p$  represents the replacement rate in the temporary parental leave insurance. Lastly, private consumption of the single female depends negatively on the constant  $N_{sf}$  which represents all necessary household expenditures.

The expected future wage of the single mother is assumed to be a function of the amount of temporary parental leave that she takes, her education level, her age (as a proxy for experience), the labour market sector in which she works and her present wage, i.e.

$$w_{sf}^e = w_{sf}^e(t_{sf}^l, e_{sf}, a_{sf}, s_{sf}, w_{sf}) \tag{4}$$

Further, we assume that time spent taking temporary parental leave has a negative effect on the expected future wage of the single female, i.e.

$$\frac{\partial w_{sf}^e(t_{sf}^l, e_{sf}, a_{sf}, s_{sf}, w_{sf})}{\partial t_{sf}^l} < 0 \tag{5}$$

Taking temporary parental leave is therefore associated with both a direct and an indirect cost. The single mother will choose an amount of temporary parental leave for which the marginal benefits equals the marginal cost. This condition is given by

$$g'(h_{sf}) = w_{sf} - \bar{w}_{sf} p + \frac{\partial w_{sf}^e(t_{sf}^l, e_{sf}, a_{sf}, s_{sf}, w_{sf})}{\partial t_{sf}^l} \quad (6)$$

Therefore, the demand for temporary parental leave of the single female will be a function of her present wage, the ceiling and replacement rate of the temporary parental leave insurance and of her education level, age and labour market sector. It will also be a function of the number of children and the age of the youngest child.

### 3.2 The demand for temporary parental leave of the cohabiting mother

The cohabiting mother shares the responsibility of producing temporary parental leave with her partner. However, we do not know how a particular couple determines the sharing of temporary parental leave.<sup>11</sup> We view temporary parental leave as a household public good and assume that both parents have the same productivities as regards the production of temporary parental leave. The utility function of the cohabiting male and female takes the following form (*cf* indicates the cohabiting female and *cm* indicates her spouse).

$$U_{cf} = v(c_{cf}) + g(h_c) \quad (7)$$

$$U_{cm} = v(c_{cm}) + g(h_c)$$

I.e., we assume equal utility functions for the male and the female spouse. The notation corresponds to that used in the equations for the single female. The cohabiting individual faces the following constraints:

$$T_{ci} = t_{ci}^m + t_{ci}^l$$

$$h_c = f(t_{cf}^l + t_{cm}^l) \quad (8)$$

$$c_{ci} = (T - t_{ci}^l)w_{ci} + \bar{w}_{ci}t_{ci}^l p - N_{ci}$$

The cohabiting woman faces, in principle, the same constraints as the single woman, but for a few notable differences. Firstly, improvements in child health are produced with the time inputs of both the cohabiting female and the cohabiting male. These time inputs are perfect

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<sup>11</sup> For a study on the intra-household sharing of temporary parental leave, see Meyer (forthcoming)

substitutes in the production of child health. Regarding the budget constraint, the share of household-expenses paid by the cohabiting woman,  $N_{cf}$ , are assumed to be smaller than the corresponding expenses of the single woman, i.e.  $N_{cf} < N_{sf}$ . Since consumption is private, both spouses on cohabiting households will prefer to lay the production of child health on the other spouse. As for the single mother, the expected future wage of the cohabiting individual is a function of his/her age, sector and education and of the amount of temporary parental leave taken.

$$w_{ci}^e = w_{ci}^e(t_{ci}^l, a_{ci}, s_{ci}, e_{ci}, w_{ci}) \quad (9)$$

As for single females, we assume a negative relationship between the expected future wage and the amount of temporary parental leave taken for the cohabiting male and female, i.e.

$$\frac{\partial w_{ci}^e(t_{ci}^l, a_{ci}, s_{ci}, e_{ci}, w_{ci})}{\partial h_{ci}} < 0 \quad (10)$$

For cohabiting women, we have the same trade-off between utility from an increase in child health and utility from consumption as for single women. However, the cohabiting mother might share the production of temporary parental leave with her partner. As can be seen from the utility functions, the spouses receive no utility from the other spouse's consumption, which means that they will prefer to lay the production of temporary parental leave on the other spouse. The extent to which temporary parental leave is shared between the spouses is likely to depend on their respective bargaining powers, which are assumed to be given by the utility as divorced. The utility as divorced is thought to be influenced by the same factors that influence the future wage, i.e. age, labour market sector, education level and the present wage. Therefore, for the cohabiting female, the utilisation of the temporary parental leave insurance is a function of her, as well as her spouse's, education level, labour market sector, age and future wage.

### *3.3 Factors that influence the demand for temporary parental leave, regardless of family type*

We assume that child sickness is exogenously given and that the propensity for child sickness is equal in both single parent and two-parent households. However, it should be noted that the evaluation of whether the child is too sick to attend day-care or school or not is made by the parents. The parents will compare the costs and benefits of taking temporary parental leave

and choose the amount of leave in which the marginal cost equals the marginal benefit. This means that although child sickness is exogenously given, the demand for temporary parental leave is not, and the characteristics of the parents will influence this demand via its influence on expected future wages. We assumed in the previous section that the effect of taking temporary parental leave on present consumption and on future wages was negative. The magnitude of the latter negative effect is likely to depend on the other arguments in the wage equation. For example, the negative effect of temporary parental leave on future wages might be smaller for parents of higher age since they might have a stronger position on the labor market. Age can therefore be expected to have a positive influence on the probability to take temporary parental leave as well as on the number of days of temporary parental leave taken. Working in the private sector is likely to enhance the negative effect on wages of taking temporary parental leave compared to working in the public sector due to lower demands for profit and flatter wage profiles in the former. As regards the effect of education, it is possible that individuals with higher education levels might have more to lose from being absent from work in terms of depreciating human capital (if the absence period is extended) or from the risk of sending signals of low productivity to the employer. However, it is possible that this latter effect might be equally strong (or stronger) for workers of lower education. The effect of education on the demand for temporary parental leave is therefore hard to predict.

In addition, the direct cost of taking temporary parental leave will depend on the present wage of the spouses. If we assume that increases in child health (produced with time on temporary parental leave) is a normal good, we expect demand to increase as income increases. Therefore, wealthier parents might invest more in temporary parental leave in the sense that they let their children stay at home one or a couple of days extra instead of risking sending them to school or day-care one day too early. If this indeed is the case, we expect higher wages to have an influence, especially on the number of days of temporary parental leave. However, since taking a day off from work due to temporary parental leave means a loss of income, and since this income loss increases with higher incomes, there might be an offsetting substitution effect to the income effect discussed above. Whether the income or substitution effect is stronger remains a question for the empirical analysis. In addition, the ceiling in the temporary parental leave insurance might lead to non-linear effects of income on the utilization of the insurance. We will return to this in the empirical estimations.

The number of children in the household and their characteristics can be expected to influence the demand for temporary parental leave. Although the demand for temporary parental leave

is likely to increase with the number of children in the household, it is likely that this increase will be less than proportional, due to economies of scale in the production of temporary parental leave, (i.e. if there are siblings in the household, it is likely that they will be sick simultaneously at least some of the time). As regards characteristics of the children that might influence the demand for temporary parental leave we only have access to one such characteristic, namely the age of the child. Research shows that the age of the child has a large influence on the probability of child sickness. In Sweden, the number of days of temporary parental leave utilized peaks when the child is 2 years old, and continues to be relatively high until the child is approximately 6 years old. Thereafter the days of temporary parental leave utilized decline (see RFV 2001:12).

In addition to the factors discussed, a number of psychological and cultural preferences are likely to have effects on the evaluation of child health and, consequently, on the utilization of temporary parental leave. However, we are forced to disregard any such factors in the empirical estimation due to data limitations.

#### *3.4 Differences between single and two-parent households in the demand for temporary parental leave*

In a single-mother household there are no opportunities to share the production of temporary parental leave, i.e. the single mother has to carry the total income loss and the expected indirect costs from being absent from work herself. Hence, a single mother might try to avoid taking temporary parental leave to avoid losing income. It might be the case that the number of days of temporary parental leave that the single mother takes is more affected by this income-loss problem, than the probability of taking temporary parental leave at all. Therefore, we argue that single-mothers might choose to go to work earlier than cohabiting mothers, i.e. that this opportunity cost effect foremost will affect the number of days of temporary parental leave taken (and not the probability of taking temporary parental leave).

In this study, the focus is on differences between single and cohabiting mothers as regards the production of temporary parental leave. We have noted that cohabiting women have the opportunity to share the production of temporary parental leave with their partner. However, we do not know to which extent, or even if, such sharing actually takes place. We assume that the spouses bargain to decide who shall be responsible for taking temporary parental leave. The factors that are assumed to influence the bargaining power of the spouses were described

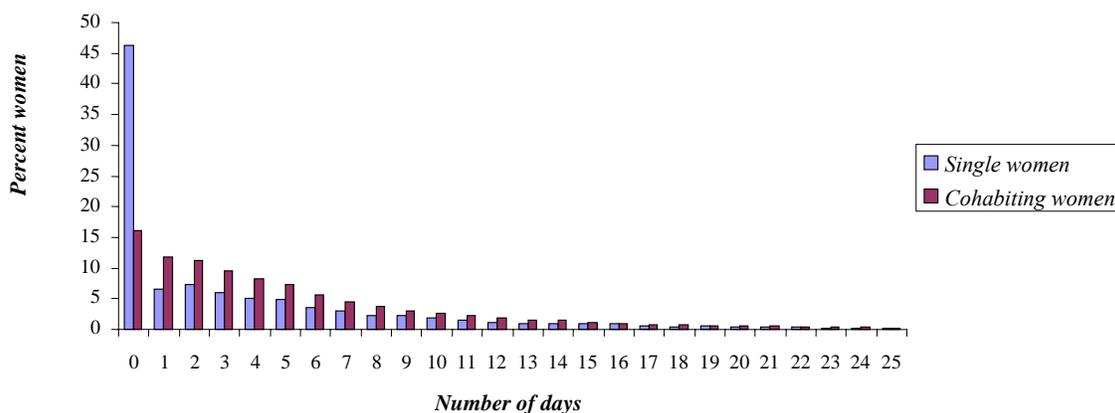
in section 3.3. Therefore, when investigating the number of days of temporary parental leave of a cohabiting female, it might be important to control for the characteristics of her partner as well as for her own characteristics. In the empirical estimation, we will control for the differences in age, education, labour market sector and income between the spouses. We will return to this in section 5.

#### 4 Data, Descriptive Statistics and Estimation Method

We use data from the National Social Insurance Board (RFV) and from Statistics Sweden from 1999. Our data set has a number of advantages. For example, it is relatively large (covers more than 250,000 individuals) and contains many variables of interest. We have detailed information on a number of socioeconomic variables of the parents, such as age, education level, labour market sector and income. In addition, all days of temporary parental leave taken during 1999 are registered in our data set. However, we do not have access to a number of important variables. For example, we have no information on biological parenthood and no information on child health.<sup>12</sup> In addition, we do not know if there are any other persons (for example grandparents) who are able to assist the parent(s) when the child(ren) get sick. Neither do we know anything about the intra-household distribution and sharing of resources.

In graph 1 we present descriptive statistics on the utilization of temporary parental leave of single and cohabiting women with less than 26 days of utilization (98 percent of the sample).

*Graph 1. The utilization of temporary parental leave*



<sup>12</sup> However, we do know the age of the child, which might serve as a proxy for average child health.

As can be seen from *graph 1*, single women are much more likely to not use the temporary parental leave insurance than are cohabiting women (46 and 16 percent respectively). The differences are smaller when comparing single and cohabiting women who do use the insurance, although cohabiting women are dominating on all levels of utilization.

In table 1 we present descriptive statistics on the number of days of temporary parental leave taken for single and cohabiting men and women.

**Table 1. The average number of days of temporary parental leave taken in 1999.**<sup>13</sup>

	Days (mean)	Standard Deviation	Individuals
<i>Cohabiting women</i>	3.27	6.15	71,867
<i>Cohabiting men</i>	2.42	5.48	71,050
<i>Single women</i>	3.12	6.08	12,691
<i>Single men</i>	3.03	6.10	1,653
Total	2.42	5.49	157,261

As can be seen from table 1, the average number of days of temporary parental leave taken is highest for cohabiting women and lowest for cohabiting men. Single women and single men take approximately equal amounts of temporary parental leave. Comparing the number of single individuals by sex, it seems to indicate that it is more common for single men than for single women to enter new relationships. From table 1, it does not look as if cohabiting women gain from having a partner as regards the production of temporary parental leave. However, the table indicates that there might be some sort of specialisation going on in the production of temporary parental leave among couples. From table 1, one gets the impression that there might be under-investments in temporary parental leave in single-mother households. However, it might be the case that singles on average have fewer children than couples and that the demand for temporary parental leave therefore is lower in single parent households. Even if this really is the case, there are probably economies of scale in the production of temporary parental leave since siblings are likely to be sick simultaneously, which will reduce the number of days of temporary parental leave needed per child.

We present the number of children of single and cohabiting men and women in table 2.<sup>14</sup>

**Table 2. The average number of children of single and cohabiting men and women (1999).**

	Children (mean)	Standard Deviation
<i>Cohabiting women</i>	1.91	0.83
<i>Cohabiting men</i>	1.91	0.83
<i>Single women</i>	1.65	0.80
<i>Single men</i>	1.50	0.68
Total	1.58	1.03

<sup>13</sup> “Days” is the total amount of net-days of temporary parental leave rounded of to the closest number of whole days. See footnote 17 for more information.

<sup>14</sup> Note that only individuals with children are included in the analysis.

Singles do indeed have on average fewer children than cohabiting individuals and the differences are larger for men than for women.

Due to the presumed economies of scale in the production of temporary parental leave, we present the average number of days of temporary parental leave taken per child for single and cohabiting men and women in table 3.

***Table 3. The average number of days of temporary parental leave taken per child in 1999.***

	Days per child (mean)	Standard Deviation
<i>Cohabiting women</i>	1.96	4.10
<i>Cohabiting men</i>	1.39	3.46
<i>Single women</i>	2.26	4.79
<i>Single men</i>	2.26	5.02
Total	1.73	3.91

It is apparent from the table that single individuals on average take more days of temporary parental leave per child. This result can be explained by the lower number of children in single parent households (see table 2) and therefore supports the idea of economies of scale in the production of temporary parental leave. Taken together, tables 1, 2, and 3 seem to indicate that men who stay single seem to take more responsibility for their children as regards the utilisation of temporary parental leave than cohabiting men do. However, we still do not know whether cohabiting women do have an advantage or not from having a partner as regards the production of temporary parental leave. Therefore, we will now investigate the utilisation of temporary parental leave by single and cohabiting women econometrically. Descriptive statistics of the variables used in the empirical estimation are given in table A1 in the appendix.

#### 4.2 *Estimation Method*

Our dependent variable, the number of net days of temporary parental leave taken by single and cohabiting women, is coded to be ranging from 0 to 50.<sup>15</sup> Since a large proportion of women do not use the temporary parental leave insurance, we use a sample selection maximum likelihood model. The probability of belonging to the sample that does take temporary parental leave is estimated in the first step and in the second step we investigate what affects the probability of utilization of the women who do use the insurance i.e.

$$y = x\beta + u_1$$

where  $y$  is observed if

$$Z_g + u_2 > 0$$

where  $u_1 \sim N(0, \sigma)$

$$u_2 \sim N(0, 1)$$

$$\text{corr}(u_1, u_2) = \rho$$

The variables in  $Z_g$  determine whether  $y$  is observed or not. In order for the sample selection model to be identified, there should be at least one explanatory variable in the selection equation that has no explanatory power on (and can therefore be excluded from) the second equation. We have access to one such variable: a dummy variable indicating whether there is a child in the household who is at least fifteen years old or not.<sup>16</sup> The presence of such a child in the household significantly reduces the probability of the mother taking temporary parental leave. Most Swedish adolescents between fifteen and seventeen go to school, and therefore this result is somewhat surprising. Part of the explanation to the effect of this variable might be that although the older sibling goes to school, he / she is likely to come home relatively early in the afternoon and maybe he / she might also have the opportunity to check on the younger sibling during lunch-break.

## 5. Estimation results

We want to compare single and cohabiting women as regards the utilization of the temporary parental leave insurance. Therefore, we start out by running a selection model in which we have included a dummy variable indicating whether the woman is single or not, together with the factors thought to influence the demand for temporary parental leave, discussed in section 3.3. The results of this estimation are presented in columns one and two in table A2 in the appendix. As can be seen from the table, being single has a significant negative effect on the probability of belonging to the sample that does take temporary parental leave. However, being single has no effect on the sample-equation, *ceteris paribus*. We therefore conclude that single women are less likely to use the temporary parental leave insurance than other women,

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<sup>15</sup> We chose an upper level of 50 days and consequently individuals with higher amounts of days were coded as having taken 50 days. Only 1.15% of the sample had taken more than 50 net days of temporary parental leave.

<sup>16</sup> The oldest child in the households investigated in this survey was seventeen years old.

but the single women who do belong to the sample that takes temporary parental leave do not differ from cohabiting women as regards the utilization.

To more thoroughly investigate the utilisation of temporary parental leave for single and cohabiting mothers we construct interaction-dummies between our variables and the variable indicating whether the woman is single or not. We will compare the estimation results of single women to that of cohabiting women and focus on possible explanations for the differences between the two groups. The estimation results are presented in columns three and four in table A2.

#### *Effects related to children*

Having two children (compared to having only one child) increases the probability of belonging to the sample that does take temporary parental leave. However, the interaction-variables show that this effect is weaker for single women. We can think of at least two reasons for this effect. Firstly, it is possible that single mothers with more than one child are more sensitive to income losses than single mothers with only one child. Secondly, it is possible that single mothers with more than one child get more help from their parents and other relatives and therefore use the insurance to a lower degree. In addition, women with a child at least fifteen years old are less likely to take temporary parental leave.

Cohabiting women are, surprisingly enough, more likely to use the temporary parental leave insurance as the age of the youngest child increases. The effect of the interaction variable is negative and larger than the “pure” variable, indicating that single women are less prone to use the insurance as the age of the youngest child increases. This result is to be expected, partly because children tend to be less sick as they grow older, but also because older children might be able to stay home alone. It is possible that single women use this latter opportunity to a larger extent than cohabiting women.

#### *Effects of education*

For cohabiting women, education seems to have a hump-shaped positive effect, where women with upper secondary education have the highest utilization and women with elementary school only, and women with more than three years of university education (i.e. the lowest and the highest education categories) have the lowest utilization. For single women, we find a negative effect of education, and this negative effect gets stronger the higher the education level. One interpretation is that single women are more sensitive to the higher losses

connected to taking temporary parental leave when the education level is high<sup>17</sup> compared to cohabiting women, since the latter might be able to share such losses with their partners. This conclusion is partly contradicted by the fact that single women with less than three years of university education take on average more temporary parental leave than other women.

#### *Effects of labour market sector*

For all women, working in the municipality or county country sector increases the probability of belonging to the sample that does take temporary parental leave. However, women belonging to the municipality sector take fewer days than women working in other sectors. One possible reason for this effect is that financial constraints within this sector often imply that replacement workers are not hired when an ordinary worker is absent from work and this might incite women working in this sector to return to work earlier.

#### *Effects of income*

For both single and cohabiting women, individual income has a positive effect on the probability of utilizing the temporary parental leave insurance and this effect is particularly strong for single women. This indicates a positive income effect of temporary parental leave, i.e. the higher the income, the higher the “consumption”. However, having an income above the ceiling in the temporary parental leave insurance has a negative effect on the probability of utilization, and again this negative effect is strengthened by being single. Women with incomes above the ceiling who do use the insurance tend to use it to a larger extent than other women. To summarize the effect of income, we conclude that there is a positive income effect and an offsetting negative substitution effect in the utilization of temporary parental leave and that the latter effect is especially strong for single women.

#### *Effects of age*

Age has a positive effect for cohabiting women as regards selection. However, our interaction variable is negative in both equations, although the negative effect on selection is not large enough to outweigh the first mentioned positive effect. We expected age to have a positive effect on the utilization of temporary parental leave, since the attachment to the labour market is likely to increase with age. We have no explanation for the negative effect for single women who do use the insurance.

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<sup>17</sup> We expect the costs of absence to be higher when the education level is high for a number of reasons. Women with higher education levels might be more likely to be competing in more male dominated areas and are

## 5.1 *Estimation results for cohabiting women*

In order to control for the effects of different education-levels and different labour market sectors of the male and female spouse, which might be indicators of differences in bargaining power, we include one final specifications in which such factors are being taken into consideration. The results from these estimations are presented in table A3 in the appendix.

The variables related to education indicate whether the male or the female has the highest education and the reference level is having the same education.<sup>18</sup> Since the effect of differences in education might differ with the absolute level of education, we include the individual education levels of the female as well. As regards sector, we have defined sectors three and four (municipality and county council) as female dominated (approximately 80 percent of the individuals working in these sectors are female) and the remaining sectors (private companies, government administration and public companies) as male dominated, although the male dominance is less pronounced compared to the female dominances in sectors three and four (approximately 60 percent are males in the male dominated sectors). The reference category for sector differences is female working in the female dominated sector and male working in the male dominated sector. The results are presented in the last two columns of table A3 in the appendix.

Our results show that having two children has a positive effect on both equations, whereas having more than two children has a small negative effect. There are several reasons for this result. As we discussed earlier, it is likely that there are economies of scale in taking temporary parental leave, and maybe this only becomes apparent in families with more than two children. However, it is also possible that men in families with more children are more “family oriented” and therefore are more prone to take temporary parental leave, and consequently reduce the female’s utilization. Of course, these explanations are not mutually exclusive.

The estimation results show that if the female has the higher education level, she has a lower probability of belonging to the sample that does take temporary parental leave and she has a lower utilization, given that she is in this sample. If the male has the higher education level we find the opposite effect. This result is consistent with bargaining between the spouses.

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therefore more likely to be overlooked in contexts of promotions if they are absent from work. In addition, the losses from depreciating human capital are more severe when the education level is high.

For sector differences, we find that the cohabiting female has a higher probability of taking temporary parental leave, and she takes on average more days, if both spouses work in a male dominated sector. One possible explanation might be that the woman compensates the male for the lack of prestige that he might experience when both spouses work in a male dominated sector, by doing more of the household work. However, if this was the case, we should have the same effect for category one (where the male works in a female dominated and the female in a male dominated sector). Another possible explanation might lay in differences in occupation between males and females in the male dominated sector, i.e. it is possible that men working in this type of sector have, on average, jobs that are more difficult to be away from. We have no way of knowing if this is really the case.

Age- and income differences have no effect on the female's utilization of the temporary parental leave insurance. Nor have the variables indicating whether only the female or only the male has an income above the ceiling. This result goes against what we would have expected from a bargaining power perspective. We find that females in families in which both spouses have an income above the ceiling have a higher probability of belonging to the sample that does take temporary parental leave, and that these females take on average more days of temporary parental leave.

## **6. Conclusion**

This study shows that cohabiting women do not gain from having a partner compared to single women as regards the production of temporary parental leave, when controlling for socio economic factors such as income, education, labour market sector, individual age, and family related factors such as the number of children and the age of the youngest child. Single women have a lower probability of belonging to the sample that takes temporary parental leave and they take fewer days, given that they are in this sample. This indicates that children of single women get lower investments in health (in terms of temporary parental leave), although it is possible that the fathers of some of these children make up for the lower investments of the mother, partly indicated by the descriptive statistics in tables 1 and 3. Whether this has any implications for the health outcomes (or potentially other child outcomes as well) of these children remains an unanswered question. Single women and cohabiting women differ in almost all aspects as regards the influence of the socio-economic

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<sup>18</sup> The spouses are coded as having the same education if they are in the same education category, or less than

factors supposed to have an impact on the utilisation of temporary parental leave. For example, the effect of education is negative for single women, and this negative effect increases with higher education levels, whereas education has a positive effect for cohabiting women. The effect of working in other sectors than the private is insignificant for cohabiting women, but for single women the municipality and county council sectors have a positive effect on the utilization. For individual income we find a strong positive effect for women in general and for single women in particular. However, having an income above the ceiling has a particularly strong negative effect for single women.

When analysing cohabiting women it is vital to include the characteristics of the partner in the model. We show that differences in education that matter for the utilization of temporary parental leave of the female. The effect of differences in education indicates that the bargaining power of the spouses might matter when determining the sharing of temporary parental leave. However, the bargaining hypothesis is contradicted by the insignificant effects of only one of the spouses' having an income above the ceiling.

The study shows that single women have a disadvantage as regards the utilisation of temporary parental leave in the sense that they use the insurance to a lower extent than cohabiting women. We also find that single women seem to be much more sensitive to economic factors than cohabiting women, although income is a largely determining factor for the utilization of temporary parental leave for all women. An increase in the replacement rate in the temporary parental leave insurance and an increase in the ceiling might incite single women to take more temporary parental leave. Such a measure might also increase the well being of the children of single mothers.

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## Appendix

Table A1.

<b>Variable (definition)</b>	<b>Single Women (st.dev.)</b>	<b>Cohabiting women (st.dev.)</b>
<i>Net-day (Number of days of tpl, rounded to closest integer)</i>	3.93 (6.60)	5.89 (7.27)
<i>Child1 (1 if 1 child under 12 in the family) Reference</i>	0.53 (0.50)	0.26 (0.44)
<i>Child2 (1 if two children under 12 in the family)</i>	0.37 (0.48)	0.55 (0.50)
<i>Child3 (1 if three or more children under 12 in the family)</i>	0.10 (0.30)	0.19 (0.39)
<i>Youngest (Age of the youngest child)</i>	6.66 (3.31)	4.85 (3.16)
<i>Education1 (1 if elementary-school highest level) Reference</i>	0.21 (0.41)	0.10 (0.29)
<i>Education2 (1 if lower secondary highest education level)</i>	0.43 (0.50)	0.40 (0.49)
<i>Education3 (1 if upper secondary highest education level)</i>	0.12 (0.33)	0.15 (0.35)
<i>Education4 (1 if &lt; 3 years of university)</i>	0.15 (0.36)	0.21 (0.41)
<i>Education5 (1 if &gt; 3 years of university including PhD)</i>	0.09 (0.29)	0.15 (0.36)
<i>Education-diff1 (1 if the female has the highest education level)</i>	<i>n.a.</i>	0.14 (0.35)
<i>Eudcation-diff2 (1 if both spouses have the same education) Reference</i>	<i>n.a.</i>	0.76 (0.43)
<i>Education-diff3 (1 if the male has the highest education level)</i>	<i>n.a.</i>	0.10 (0.30)
<i>Maleeduc1 (1 if male has elementary-school only) Reference</i>	<i>n.a.</i>	0.15 (0.36)
<i>Maleeduc2 (1 if lower secondary the male's highest education)</i>	<i>n.a.</i>	0.41 (0.49)
<i>Maleeduc3 (1 if upper secondary the male's highest education)</i>	<i>n.a.</i>	0.12 (0.32)
<i>Maleeduc4 (1 if &lt; 3 years of university for the male)</i>	<i>n.a.</i>	0.17 (0.37)
<i>Maleeduc5 (1 if &gt; 3 years of university or PhD for the male)</i>	<i>n.a.</i>	0.16 (0.36)
<i>Sector1 (1 if working for private company)Reference, male dominated.</i>	0.44 (0.50)	0.43 (0.49)
<i>Sector2 (1 if working in government administration) Male dominated.</i>	0.04 (0.20)	0.04 (0.20)
<i>Sector3 (1 if working in municipality sector) Female dominated.</i>	0.40 (0.49)	0.37 (0.48)
<i>Sector4 (1 if working in county council) Female dominated.</i>	0.08 (0.27)	0.11 (0.32)
<i>Sector5 (1 if working for public company) Male dominated.</i>	0.05 (0.21)	0.04 (0.20)
<i>Sector-diff1 (1 if fem. in male dom. &amp; male in fem. dom sector)</i>	<i>n.a.</i>	0.03 (0.18)
<i>Sector-diff2 (1 if both spouses in female dominated sector)</i>	<i>n.a.</i>	0.07 (0.26)
<i>Sector-diff3 (1 if both spouses in male dominated sector)</i>	<i>n.a.</i>	0.48 (0.50)
<i>Sector-diff4 (1 if fem. in fem. dom and male in male dom.) Reference</i>	<i>n.a.</i>	0.41 (0.49)
<i>Malesector1 (1 if male is working for private company) Reference</i>	<i>n.a.</i>	0.77 (0.42)
<i>Malesector2 (1 if male is working in government admin.)</i>	<i>n.a.</i>	0.06 (0.24)
<i>Malesector3 (1 if male is working in municipality sector)</i>	<i>n.a.</i>	0.08 (0.27)
<i>Malesector4 (1 if male is working in county council sector)</i>	<i>n.a.</i>	0.03 (0.16)
<i>Malesector5 (1 if male is working for pubic company)</i>	<i>n.a.</i>	0.07 (0.25)
<i>Individual income (in thousands of sek, 1 sek= )</i>	163.30 (75.67)	177.36 (68.62)
<i>Male's income (in thousands of sek)</i>	<i>n.a.</i>	277.63 (146.18)
<i>Income differences (male's inc. – female's inc. in thousands of sek)</i>	<i>n.a.</i>	99.80 (149.14)
<i>Household income (male's inc. + female's inc. in thousands of sek.)</i>	<i>n.a.</i>	454.52 (173.02)
<i>Over_ceiling_fem (1 if income is above ceiling in parental insurance)</i>	0.04 (0.20)	0.04 (0.20)
<i>Over_ceiling (1 if female's income above and male's below ceiling)</i>	<i>n.a.</i>	0.01 (0.10)
<i>Over_ceiling_m (1 if male's income above and female's below ceiling)</i>	<i>n.a.</i>	0.17 (0.38)
<i>Both_over_ceiling (1 if both spouses' incomes above ceiling)</i>	<i>n.a.</i>	0.03 (0.18)
<i>Age (age in years)</i>	35.71 (6.03)	35.40 (5.18)
<i>Male's age</i>	<i>n.a.</i>	37.54 (5.49)
<i>Age differences (male's age – female's age in years)</i>	<i>n.a.</i>	2.12 (3.70)
<b>Observations</b>	<b>9,469</b>	<b>34,576</b>

Table A2.

	Effect of being single		Interaction Variables	
	sample	select	Sample	select
<i>Single</i>	0.346 (0.240)	-0.830 (0.017)***	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>
<i>Child2</i>	-0.014 (0.117)	0.169 (0.017)***	0.030 (0.123)	0.087 (0.020)***
<i>Child3</i>	-0.229 (0.151)	0.022 (0.022)	-0.151 (0.163)	-0.059 (0.026)**
<i>Youngest</i>	-0.009 (0.019)	-0.001 (0.003)	-0.017 (0.021)	0.011 (0.003)***
<i>Education2</i>	-0.149 (0.165)	0.110 (0.022)***	-0.167 (0.189)	0.149 (0.028)***
<i>Education3</i>	-0.078 (0.194)	0.095 (0.027)***	-0.099 (0.217)	0.158 (0.033)***
<i>Education4</i>	0.039 (0.186)	0.071 (0.026)***	-0.051 (0.210)	0.151 (0.032)***
<i>Education5</i>	0.062 (0.207)	-0.040 (0.030)	0.050 (0.230)	0.050 (0.036)
<i>Sector2</i>	0.026 (0.239)	0.014 (0.037)	0.081 (0.260)	-0.015 (0.044)
<i>Sector3</i>	-0.343 (0.111)***	0.058 (0.016)***	-0.308 (0.121)**	0.038 (0.019)**
<i>Sector4</i>	-0.244 (0.164)	0.102 (0.026)***	-0.167 (0.175)	0.059 (0.029)**
<i>Sector5</i>	0.004 (0.230)	0.055 (0.035)	-0.011 (0.251)	0.035 (0.042)
<i>Indintheousand</i>	1.339 (1.292)	4.543 (0.129)***	1.227 (1.191)	4.089 (0.155)***
<i>Age</i>	0.006 (0.011)	0.008 (0.002)***	0.017 (0.013)	0.010 (0.002)***
<i>Over_celing_allfem</i>	1.299 (0.335)***	-0.935 (0.041)***	1.266 (0.326)***	-0.843 (0.049)***
<i>Oldest</i>	<i>n.a.</i> <i>n.a.</i>	-0.112 (0.023)***	<i>n.a.</i> <i>n.a.</i>	-0.131 (0.023)***
<i>Singeduc1</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	1.504 (1.085)	-0.381 (0.120)***
<i>Singeduc2</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	1.565 (1.082)	-0.457 (0.121)***
<i>Singeduc3</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	1.604 (1.127)	-0.530 (0.125)***
<i>Singeduc4</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	2.133 (1.189)*	-0.598 (0.131)***
<i>Singeduc5</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	1.353 (1.264)	-0.622 (0.140)***
<i>Singchild2</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	0.677 (0.464)	-0.267 (0.055)***
<i>Singchild3</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	0.480 (0.442)	-0.044 (0.053)
<i>Singyoungest</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	0.031 (0.054)	-0.037 (0.006)***
<i>Singsek2</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	-0.418 (0.666)	0.087 (0.081)
<i>Singsek3</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	-0.217 (0.302)	0.059 (0.036)*
<i>Singsek4</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	-0.633 (0.488)	0.153 (0.060)**
<i>Singsek5</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	0.079 (0.623)	0.058 (0.077)
<i>Singinc</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	0.370 (3.002)	1.567 (0.283)***
<i>Singage</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	-0.053 (0.029)*	-0.007 (0.003)**
<i>Singover</i>	<i>n.a.</i> <i>n.a.</i>	<i>n.a.</i> <i>n.a.</i>	0.297 (0.851)	-0.371 (0.095)***
<i>Constant</i>	6.875 (0.551)***	-0.201 (0.056)***	6.548 (0.528)***	-0.247 (0.070)***
LR test of rho=0	-142473.91		-142365.46	
<i>Observations</i>	44045	44045	44045	44045

Standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table A3.

	Cohabiting women	
	Sample	Select
<i>Child2</i>	0.362 (0.123)***	0.040 (0.013)***
<i>Child3</i>	-0.268 (0.161)*	-0.029 (0.018)*
<i>Youngest</i>	0.104 (0.017)***	0.011 (0.002)***
<i>Education2</i>	0.588 (0.184)***	0.064 (0.020)***
<i>Education3</i>	0.813 (0.215)***	0.089 (0.024)***
<i>Education4</i>	1.143 (0.218)***	0.125 (0.024)***
<i>Education5</i>	1.395 (0.229)***	0.152 (0.025)***
<i>Largeediff1</i>	-0.276 (0.167)*	-0.030 (0.018)*
<i>Largeediff3</i>	0.495 (0.180)***	0.054 (0.020)***
<i>Incdif</i>	-0.181 (0.359)	-0.020 (0.039)
<i>Agediff</i>	-0.012 (0.014)	-0.001 (0.001)
<i>Secdif1</i>	0.175 (0.288)	0.019 (0.032)
<i>Secdif2</i>	0.004 (0.208)	0.000 (0.023)
<i>Secdif3</i>	0.422 (0.112)***	0.046 (0.012)***
<i>Over_celing</i>	-0.689 (0.500)	-0.075 (0.055)
<i>Both_over_celing</i>	1.358 (0.298)***	0.203 (0.033)***
<i>Over_celing_m</i>	0.184 (0.139)	0.020 (0.015)
<i>Constant</i>	3.437 (0.236)***	0.266 (0.026)***
<i>LR test of rho=0</i>	-110209.73	
<i>Observations</i>	34576	34576

Standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%