Family illness, work absence and gender

Begoña Alvarez*
Departamento de Economía Aplicada
Universidade de Vigo

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Abstract

Combining family and work demands has become a tough challenge for many workers in modern societies. Using data from a random sample of Spanish employees, this paper investigates the effects of attending to family health needs on work absence decisions of working individuals. The estimates reveal that men and women respond in a different way to several forces influencing work absence due to family illness. The analysis also shows that workers declaring to have used working time to attend to ill relatives are more prone to report sickness absence episodes. Estimates from bivariate probit equations shows that controlling for endogeneity removes this relationship for men, but the effect of absence due to family illness on sickness absence reporting remains positive and significant for women, leaving room for causal explanations.

Keywords: sickness absence; caregiving; family-work conflict; gender differences; bivariate probit

JEL Classification: J22, J29, J16, J35

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1. INTRODUCTION

The analysis of the personal and economic implications of the attention to family health needs is focusing an increasing interest on part of social researchers. Contrary to popular belief, in most countries, the time devoted to attend to ill relatives is still mostly provided within the family. For instance, in Spain, about 72% of cases of sickness and 79% of disabled people are looked after by relatives (Carrasco and Rodríguez, 2000). Gender appears to be particularly significant in this respect because the responsibility for the care of ill family members of all ages tends to fall on women to a greater degree than on men (Blau et al., 1998; Folbre and Nelson, 2000). With the changing family structures based on most women in paid work, most citizens struggle with the demands of integrating work and caregiving activities.

A number of studies reveal that conflict between family and work demands is linked to a variety of negative personal outcomes such as poor health, troublesome family relationships or life dissatisfaction, as well as to on-the-job consequences such as lack of work commitment, unscheduled absences, late arrivals/early departures, changes from full-time to part-time jobs, foregoing promotions or even quitting (Thomas and Ganster, 1995; Roehling et al. 2001; Kemp and Rosenthal, 2001). All this evidence suggests that difficulties in combining work and caregiving responsibilities translates to considerable financial costs to employers[1] and governments. Hence, it is not just an issue for working families, it is an issue affecting the whole community.

This paper considers further the on-the-job consequences of family caregiving responsibilities, by investigating the effects family health demands on work absence decisions for a random sample of Spanish employees. The case of Spain illustrates a traditional society that has not yet accommodated to the needs imposed by the rapid, though late, increase in

[1] In 1997, the U.S. National Alliance for Caregiving estimated the cost of providing family caregiving to older adults to be about 29 billion dolars. These costs included replacement costs for employees who leave their jobs, absenteeism, late arrivals/early departures, workplace interruptions, and supervisory costs to arrange coverage for absent employees and provide support to workers affected by caregiving reponsibilities. See http://www.caregiving.org/content/reports/finalreport.pdf for more information.

women's participation in the labor force. Employers and politicians have largely ignored the problem, offering little support to facilitate workers and, especially in the case of women, the performance of caregiving activities while retaining a career-oriented employment. In fact, Spain belongs to the group of so-called "Southern countries" (jointly with Italy, Ireland, Greece and Portugal) in which the implementation of the European Directives for the reconciliation of employment and family life is more modest (Lewis and Smithson, 2001). Behind this lack of concern is the assumption that families, and in particular women, can and should struggle on their own with work and family demands.

The aim of the paper is twofold. Firstly, we explore the profile of workers who need to use time off work to attend to family needs. Although there exists extensive literature on work absence determinants, few articles have attempted to link caregiving activities to this behavior. Moreover, most of them focus on the link between parenthood and work absence (Mastekaasa, 2000; Vistness, 1997; Leigh, 1986, among others). An exception to this is Allen (1996) who specifically addresses the issue of family illness and work absence. The data set used in the analysis (the 1991 Work Situation and Use of Time Survey carried out by the Spanish Institute for Women's Affairs) contains considerable detail on work absence of workers as well as on individual and job characteristics. Moreover it is specially suitable to perform gender comparisons given that the sample was designed to eliminate male dominated and female dominated professions, minimizing in this way self-selection problems related to occupational gender segregation.

The second objective of the paper is to explain a striking fact which can be observed in the data set: on average, workers who declared to use working time to assist ill relatives are roughly twice as likely as other workers to report sick leave episodes during the same reference period. A natural question which rises from this evidence is whether this observed correlation is causal or not. Assessing this question is relevant to understanding how conflict between work and family demands affects organizational outcomes. This knowledge could provide a basis for better intervention to help workers balance of such demands.

We may think of different non-causal links between worker's absence to care for sick relatives and sick leave episodes. A first non-causal channel is suggested by studies showing

certain caregiving responsibilities, such as nursing ill relatives negatively affects caregivers' health (Roehling et al, 2001). A second non-causal channel is more simple and may arise when the same illness affects both the worker and any of his/her relatives (e.g. contagious illnesses), causing a short-run sequence consisting of worker's sick leave and the provision of assistance to the ill relative.

Nonetheless, there are also reasons to suspect that the apparent correlation between those two outcomes may be causal. For instance, it may be that conflicts or interferences between family and work (e.g. a child's illness prevents attendance at work), instead caregiving activities as such, are the responsible for losses in the psychological and physical well-being of workers (Kinnunen and Mauno, 1998). Another causal channel is related to the well-known fact that sick leave episodes are not always due to true health problems. The worker may use sick leave to hide unavoidable family-related absence in order to avoid disciplinary action at the firm. In fact, though most employers admit that workers face intractable conflicts in keeping their jobs and meeting family needs, the use of job sanctions -lost wages, denied promotions, warnings, etc.- to prevent on-the-job consequences of these situations are common (Tobío, 2001; Dodson et al, 2002).

The paper addresses those issues as follows. Section 2 presents a theoretical model to explain the mechanisms that drive work absence decisions. This model covers causal and non-causal explanations for the relationship between absences due to family needs and sick leave incidence. Section 3 details the data from the 1991 Work Situation and Use of Time Survey, and provides an overview of sick leave incidence and absence due to family illness and discusses potential explanations for the observed positive association between these two outcomes. In the light of the theoretical model, Section 4 presents an econometric model to analyze the determinants of absence due to family illness. Section 5 includes probit and bivariate probit estimates of the impact of absence due to family illness on workers' sickness absence reporting. Results show that the use of working time to attend to family health needs remains positively related to sickness absence reporting, even after controlling for endogeneity and other exogenous variables in the female sample which leaves room for causal explanations. The last section is devoted to some concluding remarks.

2. THEORETICAL FRAMEWORK

To model the decision on work absence, consider workers who sign enforceable employment contracts which specify a wage, w, in return for a specific scheduled number of working hours, t^w, and a set of non-wage characteristics. Income is denoted by I and consists of labor income (wt^w) and non-labor income. Leisure time is represented by t^l. Preferences depend on two random variables: health , denoted by h, and the occurrence of certain personal events which are time consuming (e.g. family illness), denoted by a. Illnesses and certain time-consuming personal events increase the marginal utility of leisure.[2] This implies that certain realizations of h and a encourage workers to increase leisure time over contracted level by incurring work absence episodes. Assume these variables have a bivariate probability distribution $\pi(a, h)$. Note that when $cov(a, h) \neq 0$ decisions on sickness absence and absence due to other events will also be correlated. This is a plausible hypothesis in the case of events as family illness. For instance, a serious illness affecting a family member may act as a source of tensions which are likely to reduce the psychological and the physical well-being of the worker and so his/her health. More direct links arise when workers are exposed to infectious diseases caught by their children/relatives or *vice versa*.[3] Let us denote t^h the time absent from work due to illness and t^a the absence time to run personal errands. For our purposes, it is assumed that t^a represents absence time net of paid time to attend to other personal needs.

Legal frameworks for these two types of work absence are different. Workers are legally entitled to receive sickness subsidy s, $0 < s \leq w$, if ill-health is certified by a doctor. To obtain a medical certificate, the worker must incur in a cost denoted $c(h)$, such that $c'(h) > 0$, i.e. the better the worker's health status, the higher the cost of obtaining

[2] This assumption follows Viscusi and Evans (1990) who analyze the empirical and economic implications of utility functions which depend on health status by estimating health-state dependent utility functions. In our case, utility functions depend on health but also on other personal events.

[3] According to the 1993 Spanish National Health Survey, about 32% of those who missed work due to illness during the two weeks previous to the interview declared respiratory diseases (many of which are contagious) as the cause.

medical accreditation. Contrary to sickness absence, missed working time t^a, which cannot be referred to as statutory leisure time or legal time off the work is not remunerated.

Considering all those elements, the worker's expected utility function can be written as

$$EU = \int_a \int_h \left[U_{a,h} \left(I - (s-w)t^h), t^l + t^a + t^h \mid \mathbf{Z} \right) - 1(t^h > 0).c(h) \right] d\pi(a,h).$$

where 1(.) is the indicator function taking value 1 if the event in parentheses holds and zero otherwise; $\mathbf{Z}$ denotes a vector of individual and job characteristics (e.g. gender, age, family structure, education, job satisfaction, work-schedule flexibility, etc.) that condition preferences.

Apart from lost earnings, non-statutory absence has negative implications over future utility levels of the worker. Let us denote $\overline{V}_{t+1}$ the expected future utility stream attainable at the current job, that is,

$$\overline{V}_{t+1} = (1-q)\theta \mathrm{E}V_{t+1} + q\bar{u}_t,$$

here, q denotes that the worker leaves the firm by quitting or dismissal. We assume that this probability increases with non-statutory work absence, t^a, and with job dissatisfaction and decreases with the cost associated with finding and hiring a replacement for a dismissed worker and the ability of workers individually or collectively to resist dismissal (Green and Weisskopf, 1990). If the worker leaves the firm, s/he obtains the value of being on the open market, $\bar{u}_t$, which is mainly determined by wages in other firms, the level of unemployment benefit and the chances of employment (Machin and Manning, 1992). With probability $(1-q)$ the worker stays in the current job. In this case, s/he receives the expected value of a job in this firm in year $t+1$, denoted by $\theta \mathrm{E}V_{t+1}$, where $\theta = \theta(t^a)$, $\theta' < 0$, $\theta \in [0,1]$ represents the chances of promotion at the firm, and $\mathrm{E}V_{t+1}$ denotes the expected value of following the optimal decision during the next period.

Every period, the individual chooses between attending work or not, conditional on the realization of health $\bar{h}$ and other personal needs $\bar{a}$. But in the case of absence t^a the worker faces a further decision of how to fit it within the scheduled working time. The worker will try to minimize sanctions applied over this type of absence. A first option to achieve this

goal is that s/he does not declare the absence to the firm. The employer has a probability p of detecting this behavior and penalizing it (this probability measures the effectiveness of monitoring systems at the workplace). But with probability $(1-p)$ the worker increases leisure time at zero cost. The *ex-post* valuation function for a worker who opts for this alternative is

$$V_t^A = p\left\{U_{\bar{a},\bar{h}}\left(I - wt^a,\ t^l + t^a \mid \mathbf{Z}\right) + \delta\overline{V}_{t+1}\right\} + (1-p)\left\{U_{\bar{a},\bar{h}}\left(I,\ t^l + t^a \mid \mathbf{Z}\right) + \delta\overline{V}^0_{t+1}\right\} \quad (1)$$

where δ is the discount rate and $\bar{V}^0_{t+1}$ denotes the future utility attainable under zero penalization, being $\overline{V}_{t+1} \leq \overline{V}^0_{t+1}$.

A second option, is to hide non-statutory absence under the appearance of an acceptable and non-penalized reason for not working, for instance a sickness absence episode. The *ex-post* valuation function for a worker who incurs in this behavior is given by

$$V_t^M = U_{\bar{a},\bar{h}}\left(I - (w-s)t^a,\ t^l + t^a \mid \mathbf{Z}\right) - c(\bar{h}) + \delta\overline{V}^0_{t+1}. \quad (2)$$

If we define the temptation to misuse sickness absence by $m = V^M - V^A$, then the worker will declare a sick leave episode to hide other absence when $m > 0$. This would lead to a causal link between working time used to attend to family needs and sick leave reporting.

Note that the provision of sick leave benefits increases the temptation to this behavior. However, in some countries, the first days of sickness absence are not remunerated[4]. A simple static analysis of the above functions above reveals that as far as the benefits of avoiding sanctions, in terms of future utility levels at the firm, compensate current costs derived from lost earnings and obtaining medical certification faking a sick leave even if not remunerated is more advantageous than ordinary absence. Nonetheless, this incentive decreases as monitoring becomes less effective.

[4]In Spain employees have to wait one day to receive sickness benefit if they suffer from on-the-job illness or injury and three days in the case of off-the-job illness or injury. These waiting days are not covered by the regulations and imply an economic risk for workers who suffer from sickness episodes. Nonetheless, there exists the possibility of particular agreements between employers and employees to remunerate this uncovered period.

This framework provides some intuition about gender differences regarding decisions on absences due to family needs. Since women are more involved with dependant care than men, the opportunity costs of working time tends to be higher when family demands arise, therefore they are more likely to use working time to attend those needs. As the incidence of absenteeism increases, sanctions tend to be higher, especially in terms of promotion possibilities within the firm. A simple static analysis over function m shows that this circumstance, jointly with the poorer prospects for women in the open labor market, increase the temptation to hide absences due to family responsibilities under the appearance of statutory absences (e.g. sick leave).

3. INSTITUTIONAL SETTING AND DATA

3.1 Institutional setting

Time off work to care for relatives has recently been regulated in Spain to adapt European Directives to the national law. Regarding the attention to ill relatives, changes have been small. According to the new law (39/1999, 5 November), paid absences to care for a family member are restricted to two days in the case of the serious health condition or hospitalization of relatives (four days if it requires travelling). Hence, unless workers reach private agreements with employers, they are not entitled to paid absences to attend to non-serious illness episodes affecting children or relatives, even though the presence of the worker be considered essential, something that is contemplated as a minimum standard by the European Directive 96/34.

Workers are entitled to up to 12 months leave without pay to care for a family member with a serious health condition or disability, with no loss of employment status or benefits. As Tobío (2001) points out, the main problem is that as leave is unpaid, few people will be able to benefit from it.

Spanish law also contemplates the possibility of reducing the number of working hours to provide assistance to a son/daughter under 6 years of age or a disabled relative with the consequent proportional reduction in the worker's salary.

The provision of institutional care or formal home-help is still an expensive and relatively limited option in Spain. The difficulties in gaining access to formal care services implies that many working men and women with caregiving responsibilities have to rely on their family networks to alleviate pressures.

3.2 The data

The data are from responses to the 1991 Work Situation and Time Use Survey (WSTUS), carried out by the Institute for Women's Affairs (a section of the Ministry of Labor and Social Affairs). The objective underlying the development of this survey was to recover information to allow a "fair" comparison between male and female performance in paid labor. For that purpose, they firstly selected activity sectors in which male and female participation rates were similar. Secondly, sectors and occupations were crossed and equal gender quotas were established in every cell. Although the data set is clearly not representative of the Spanish national labor force, the fact that the sample is restricted to non-gendered professions makes it very suitable for a gender-based comparison of labor performance. Baseline interviews were conducted at respondents' workplaces in six regions: Andalusia, Catalonia, Galicia, Madrid, the Basque Country and Valencia. The total sample size of the survey is of 2,054 employees, from which 1,049 are women and 1,005 are men. The WSTUS constitutes a very comprehensive source of information concerning individual characteristics of workers and their allocation of time between paid and unpaid activities. It also contains information on job-related variables and employer characteristics.

Work absence information.-

Interviewed workers were asked about unpaid absences used to run personal errands. Data on the incidence of family illness were recorded through the following sequence of questions: 1) *During the last 30 days, have you been affected by any of the following circumstances? Looking after an ill child/other relative, accompanying a child/other family member on a visit to the doctor.* Those responding affirmatively to this question were then asked: 2) *Sometimes, contracted leisure time is not enough to tackle these responsibilities. Did you*

use any scheduled working time to run these errands? (exclude statutory non-attendance). Answers included early departures, late arrivals and not going to work for days. Neither was there information about the way these absences were fitted to scheduled working time, nor about the existence of particular agreements between the worker and the employer.

Table 1 about here

From Table 1 we have a preliminary look at the incidence of family illness and its effect in terms of work absence in our sample. The percentages of men and women who had to attend to an ill child or to the doctor are more or less equal (5.5% and 8.5% respectively). Differences, however, arise in the incidence of work absence due to these events. For instance, about 42% of the women who had to look after an ill child declared the use of non-statutory time off work to carry out this task. This percentage is reduced to 34% in the male sample. As for the attention to ill relatives other than children, men in our sample seem to have been more affected by this responsibility (8.3%) than women (7.1%). Moreover, they had to accompany relatives to the doctor more often than women. This is not so surprising as the percentage of married men in our sample (50%) is higher than the percentage of married women (39%). Nonetheless, the incidence of work absence due to those events follows the same patterns than before. Roughly 37.5% of women who had to attend an ill relative used working time to do it, while this percentage falls to 25% in the male case. Gender differences are lower when the responsibility is to accompany the relative to the doctor.

In this analysis, the four types of caregiving activities described in Table 1 are grouped under the same heading of family illness. Therefore, an individual declaring absence due to family illness is someone declaring to have used non-statutory time off work to attend an ill relative (including children) or to accompany him/her to the doctor. We observe that 8.9% of women and 7.5% of men declared this time use in the survey.

Information on workers sickness absence is collected in the stage of the survey devoted to statutory absences. The wording of the question was: *During the last 30 days have you missed work due to illness? (*In the case of women*: please, exclude pregnancy related absences).* About 13.2% of women and 12% of men in our sample declared to have missed

work due to their own illness during the reference period. Contrary to other evidence (Allen, 1981; Leigh, 1986; Drago and Wooden, 1992; Johansson and Palme, 1996), the data does not show a significant variation in work absence incidence over sex. According to Paringer (1983), a reason for gender differences in absence rates is the difference in the occupational distribution of men and women. Therefore, the results may be due to the special sample design of the WSTUS focused on non-gendered sectors and occupations.

Table 2 about here

Table 2 presents cross-tabulations of the incidence rates of family illness and work absence due to this event and to sickness absence incidence. The patterns in this table suggest a positive association between these two outcomes among workers in our sample. It is of note that 22.5% of women (21.5% of men) of those who needed to use working time to look after relatives also declared sick leave episodes during the same reference period, compared to 12.3% (11%) of those women (men) who did not declare the use of working time for that purpose. Smaller, but also significant, differences in sickness absence incidence occur when we control by the occurrence of family illness episodes, regardless of its consequences in terms of absence.

Sample characteristics.-

This application is restricted to a subsample of 1,774 workers (903 women and 871 men) who answered all questions relevant to the analysis. To give the reader an idea of the composition of the sample, Table 3 and 4 report definitions, mean values and standard deviations of individual characteristics of workers, contractual conditions and health conditions at work by gender.

Tables 3 and 4 about here

Overall, we observe that the composition of male and female subsamples are quite similar in terms of these characteristics. About 7% of respondents declared to have no formal contract with the firm. Workers in this situation are not eligible for paid sick leave, unless

they have particular agreements with the employer. Most interviewees are full-time workers (85.8% of men and 82.8% of women). Roughly half of the workers have working schedules with split-shifts, which implies higher restraints when designating their free time.

For the purpose of this study, workers have been classified into four groups: manufacturing, clerical, professional and managerial workers, and service employees. Due to the specific sample design of the survey, distribution of men and women across occupational groups is similar. As for educational levels, on average, we do not observe either significant differences between men and women in our sample. The survey includes information on a set of job physical conditions, including temperature, noise, pollution, physical strain of the work and the degree of injury risk perceived by the worker. Interviewed women perceive significantly higher levels of noise and physical strain in their current activity than men. Regarding the rest of health conditions, gender differences are insignificant.

Job satisfaction is measured by means of the answers to the question: *Do you like your job?* The variable ranges from 1 to 4 according to whether the worker declares s/he likes her/his work very much, so-so, very little or nothing, respectively. Table 4 shows that men and women in our sample are, on average, satisfied with their jobs, though a closer look at the whole distribution of answers reveals that nearly 14% of workers declare to be very little or not satisfied with their jobs.

4. DETERMINANTS OF ABSENCE DUE TO FAMILY ILLNESS

Who are more likely to use non-statutory time off work to attend to ill relatives? To consider this, workers demand for non-statutory time off work to deal with family illness is specified as the following linear function

$$t_i^{a*} = x_i^{a\prime}\delta + \varepsilon_i^a. \tag{3}$$

In our data set, t_i^{a*} is unobservable. Instead we observe the binary variable A_i that relates to the previous one through the following observability rule $A_i \equiv 1(t_i^{a*} > 0)$, where $1(.)$ is the indicator function taking the value 1 if the worker declares to have used working time to attend to family health needs and zero otherwise. The row vector $x_i^{a\prime}$ includes the

covariates capturing the independent effects of individual and demographic attributes (age, marital status, family composition, level of education, worker's job satisfaction), contractual conditions (wage, working time and schedule), employer characteristics (firm size) and the effectiveness of disciplinary actions applied to absenteeism behavior (here proxied by the occupational category of the worker and the educational level) on work absence due to family illness. In the model, ε_i^a is a normally distributed random error with mean zero and unit variance. This term accounts for immeasurable random variable a in the theoretical model, but it may also include other variables which are unobservable for the econometrician. Assuming a correct specification of the model, consistent estimations of parameters δ may be obtained by probit maximum likelihood.

Results

Maximum likelihood estimates of the absence due to family illness model for women, men and the whole sample are reported in columns 1, 3 and 5 of Table 5, respectively. To measure the qualitative importance of all right-hand-side variables, the table displays the marginal effect, $\partial \Pr(A_i = 1)/\partial x_i^a$, for a reference individual[5] in columns 2, 4 and 6.

Tables 5 about here

The estimations obtained with the whole sample shows that women are more prone to absence due to family illness than men. In particular, the reference individual's probability is 2.6 percentage points higher for a woman than for a man. However, there are important differences between men and women that are not evident when pooled sample is analyzed. Gender interacts with the marginal effect of other explanatory variables, as we observe in

[5]The marginal effects are computed for a blue collar or catering/commercial employee, working full-time with split-shift in a firm of more than 50 employees, single, without children and with age, wage, job satisfaction and schooling fixed at their sample means. In the case of the whole sample, the reference gender is female. The marginal effects corresponding to dummy variables measure the change in the probability of absence for discrete change of the dummy variable from 0 to 1. The variance of the marginal effects are computed by the "delta method".

the results from separate samples. The effect of age is positive for both men and women, but it is only significant for women. Being married increases significantly the reference individual's probability of work absence due to family illness by 10 percentage points in men and 3.2 percentage points in women.

As expected, the presence of children aged under 3 years in the household has an important positive impact on the probability of absence due to family illness of men and women. This effect is related to the fact that small children are generally more demanding than older children, and parental care is difficult to substitute at those early ages. Note that the estimated marginal effect of this variable for our reference individuals is about twice as high for men as for women.

Interestingly, the educational level seems to increase the probability of men taking time off work to attend to ill relatives. Literature on time allocation within the household stresses the idea that highly educated individuals are more likely to exhibit egalitarian gender role orientations, which makes them more prone to share traditional "feminine" tasks such as housework and caregiving activities. The results found here seem to be in line with this hypothesis. Women's behavior, however, is not affected by the educational level.

Regarding the constraints imposed by the working time schedule, the estimates show that the man-reference probability of absence is 8.9 percentage points higher if working full-time than if working part-time. This evidence is consistent with other findings in literature suggesting that part-time workers exhibit low absence (Chaudhury and Ng, 1992; Drago and Wooden, 1992). Although women are not significantly affected by this variable, they are shown to be sensitive to the distribution of working time during the week. In particular, the woman-reference probability of absence is about 3.8 percentage points higher with split-shift. This enhances the crucial role played by flexibility in the determination of absence decisions.

Working in certain occupations significantly affects female propensity to absence. In particular, the coefficients for clerical and professional indicates that these female workers have a higher probability of missing work due to family illness than blue-collar and catering/commercial workers. The occupational categories, jointly with the years of schooling are

proxies for qualification. A higher level of qualification is expected to lessen the probability of dismissal due to the greater cost to the employer of replacing more highly-skilled workers. Further, the effect of disciplinary actions is lower for more qualified workers, because they face lower unemployment rates in the open labor market. Both aspects are likely to reduce absenteeism costs. The findings for women seem to be consistent with this hypothesis and with patterns found in other studies showing that women are more sensitive than men to changes in the cost of being absent from work (e.g. Henrekson and Persson, 2001).

Finally, estimates show the different effects of firm size on workers' behavior. While working in a small size firm significantly increases the woman-reference probability of absence by 4 percentage points, the same circumstance decreases the man-reference probability by 7.7 percentage points. In the literature on absenteeism, firm size is considered to be negatively related to workers' uncertain prospects of being caught in their evasive behavior and so the expected cost of work absence (Winkelman, 1999). Male behavior in our sample seems to be consistent with this hypothesis. However, large firms can often afford to be more flexible because they have more workers to share the work, a luxury smaller firms do not always have. This would facilitate workers re-structuring their working time to attend urgent family health needs, which would explain the positive effect of working in small firms on female absence due to family illness.

5. THE EFFECT OF ABSENCE DUE TO FAMILY ILLNESS ON SICKNESS ABSENCE REPORTING

The second issue explored in the analysis concerns the relationship between non-statutory work absence due to family illness and sickness absence reporting. The descriptive analysis revealed a significant positive association between this two variables, for both men and women. In order to disentangle the reasons behind this association we should check whether this association remains after checking on other determinants of sickness absence. The statistical model for sickness absence reporting should take into account the discrete and binary nature of the sickness absence variable. Therefore, a probit model seems appro-

priate. However, this specification does not correct potential problems of endogeneity due to correlation between unobservables. Then, a bivariate probit estimations that account for both endogeneity and the binary nature of decision is also considered.

5.1. Single equation model

According to the theoretical model, the time of sickness absence reported by the worker should be specified as a function of the demand for true sickness absence and the demand of time to attend other personal errands hidden under the appearance of sickness absence. Therefore we can assume the following linear function

$$H_i^* = x_i^{h\prime}\beta + \alpha A_i + \varepsilon_i^h, \tag{4}$$

where H_i^* denotes time of sickness absence reported by the worker. We do not observe it in the data set, but we do observe the binary outcome H_i which is related to the previous one by the following rule of observability $H_i \equiv \mathbf{1}(H_i^* > 0)$. The row vector $x_i^{h\prime}$ contains a standard set of covariates determining the benefits and costs of sickness absence to a worker in a poor health state. These include variables determining illness and its subjective perception such as individual and demographic characteristics (age, marital status and level of education); contractual conditions and job dissatisfaction which are likely to generate stress at work; physical health conditions at work (see Table A in the Appendix describes these variables); a variable indicating whether the worker has a formal contract and then whether s/he is eligible for sick leave subsidy; and a set of occupational variables that, in this case, proxy for specific occupational diseases. The variable $A_i = 1(t_i^{a*} > 0)$ is the observable counterpart of the demand for working time to attend to ill family members. Its effect on sickness absence reporting is measured by the parameter α. Assuming the random error ε_i^h is normally distributed with $var(\varepsilon_i^h) = 1$, estimations of parameters α and β are obtained by probit maximum likelihood. Note that this specification considers A_i as an exogenous variable.

Lines (1) and (6) in Table 6 report the average treatment effects of absence due to family illness on male and female sickness absence reporting, respectively (Table B in the

Appendix presents the probit coefficient estimates). This average effects are computed as $(1/n)\sum_i[\Phi(x_i^{s\prime}\hat{\beta}+\hat{\alpha})-\Phi(x_i^{s\prime}\hat{\beta})]$, where n is the sample size, $\Phi(.)$ is the standard normal cdf, and $\hat{\beta}$ and $\hat{\alpha}$ are the maximum likelihood probit estimations of parameters. Note that, while the sample difference in sickness absence incidence between workers who went absent to attend to ill relatives and workers who did not is about 7.9 percentage points for women and 9.3 percentage points for men (Table 2), these differences increase slightly up to 10 and 9.5 percentage points, respectively when we control for other covariates. What does this positive effect account for? It may account for two things. On the one hand, the theoretical model suggests that a positive effect of A_i on H_i^* may be considered evidence for the hypothesis of misusing of sickness absence. On the other hand, since positive values of t^{a*} are likely to reflect a certain degree of conflict between family and work demands, and these conflicting situations are shown to be linked to losses in the workers' health (Frone et al., 1996), the variable A_i could be interpreted as a proxy for these negative health outcomes, and so would explain true sickness absence.

Table 6 about here

A first concern about these results is whether the specification omits important (measurable) characteristics of the worker or working conditions that are correlated with the incidence of worker absence due to family illness and that, as a consequence, we obtain biased estimates of the effect of this variable on sickness absence reporting. Unfortunately, the WSTUS does not offer any further information that could be use to measure the temptation to misuse sickness absence. However, it includes a variable that can be used as a proxy for the psychological distress related to the work-family conflict. In particular, the survey asks for the degree of work-family conflict perceived by the worker through the question: *Do you consider that your work troubles your family life?* The model (4) was re-estimated by adding a workers' answers to this question as an additional variable. Its coefficient estimates (standard errors) were -0.043 (0.057) for the female sample and 0.015 (0.058) for the male sample. Lines (2) and (7) of Table 6 report the average treatment effects of the variable of absence due to family illness after the inclusion of this variable. The reduction

of the average treatment effects of absence due to family illness in the new specifications it is too small to be considered relevant. This is not surprising, given the insignificance of the work-family conflict variable.

A second concern with probit results is that they do not prove there is a causal relationship between absence to care for ill relatives and workers' sickness absence reporting. In fact if unobserved factors determining the propensity to sickness absence are correlated with unobserved factors determining the propensity of absence to nurse relatives single probit estimations would be subject to bias. This possibility is analyzed in the following section.

5.2 Controlling for endogeneity

In order to account for potential endogeneity problems, we consider the following simultaneous system

$$H_i^* = x_i^{h'}\beta + \alpha A_i + \varepsilon_i^h \quad (5)$$

$$t_i^{a*} = x_i^{a'}\delta + \varepsilon_i^a \quad (6)$$

where ε_i^h and ε_i^a are distributed according to a bivariate normal, with $E(\varepsilon_i^a) = E(\varepsilon_i^h) = 0$, $var(\varepsilon_i^a) = var(\varepsilon_i^h) = 1$ and $cov(\varepsilon_i^h, \varepsilon_i^a) = \rho$. Since the decisions we model are dichotomous, a bivariate probit specification seems appropriate.

To identify the model above, at least one variable in x_i^a should not be contained in x_i^h. That is, we need to have determinants of family-related absence which are not related to sickness absence propensity, and this implies to impose exclusion restrictions on equation (5). In this application, two variables are tested as instruments. The first is the indicator variable that is equal to one if the worker is at a worksite with less than fifty employees, and zero otherwise. The second instrument is the variable capturing the presence of pre-school aged children at home.

Table 7 presents the results of investigating the validity of these variables as instruments. Column (1) displays the p-values of testing for the exclusion of these variables on the probit model of absence due to family illness presented in Table 5. The instruments are shown to be individual and jointly significant at usual significance levels.

Finding theoretical arguments to exclude these instruments from the set of explanatory variables of sick leave incidence is, however, difficult. Therefore, as it is usual in this methodology, the matter becomes an empirical issue. Certainly, literature provides evidence about the weak association between the number of children as well as their age and sickness absence, for both men and women but, as Mastekaasa (2000) argues, this result does not necessarily mean that parenthood has no effect on health. It is possible that parenthood has both negative and positive effects, for instance both role enhancement (more self-esteem, stimulation, social identity, etc.) and role overload (having too much to do). These effects may coexist in the same individual causing a net effect close to zero. Regarding firm size, some empirical analysis have shown that establishment size is correlated with a variety of employer-sponsored health promotions (Evans et al., 1999). Unfortunately, we have no data to explicitly test for this hypothesis. We can, however, observe that in our sample health conditions at work indicators (see Tables 3 and 4) are not significantly correlated with firm size[6].

To explore whether it is sensible to exclude these variables from the set of predictors of sickness absence reporting, equation (4) was reestimated including small firm and the presence of pre-school aged children as additional explanatory variables. In column (2) of Table 7 the results of testing for the validity of excluding these variables as direct determinants of the decision to report sickness absence are presented. In this case, the proposed instruments were neither individually nor jointly significant. As Evans and Schwab (1994) point, "this is not a formal test since if the correct specification is a bivariate probit then single equation models are misspecified, but it offers a clear sense of the patterns in the data."

Table 7 about here

The inclusion of the two instruments leads to models that are overidentified. Following Evans and Schwab (1995) we can construct specification tests such as the test of overidenti-

[6]Tests for the equality of means of variables measuring health at work (toxic and dirty environment, extreme temperature, high level of noise, risk of injury and physical strain of work) between small and large firms do not reject the null hypothesis with p-values greater than 0.2.

fying restrictions (Newey, 1985) to evaluate whether the instruments can be jointly excluded from the equation of sickness absence[7]. The p-values of the test are shown in Column (3) in Table 7. The results indicate that we cannot reject the null hypothesis that the model is properly specified for women, but we do reject it in the male sample at the 5% level.

To investigate the robustness of the results, bivariate probit estimates have been carried out by using each of the two instruments both separately and jointly. Different instruments would provide different estimates of the effect of absence due to family illness on sickness absence reporting. This is because the estimated effect of absence due to family illness on the incidence of sickness absence reporting should be interpreted as the average 'return' to family related absence for an employee who changed this behavior only because of having pre-school children or working in a small firm, but would not have changed otherwise (Angrist et al., 1996).

The bivariate probit results for the female sample are summarized in lines (3) to (5) of Table 6, and for the male sample in lines (8) to (10). Once we control for endogeneity, the average treatment effect of absence due to family illness on sick leave incidence remains positive and significant for women, whilst it becomes negative and insignificant for men. Interestingly, the estimated effect for women is considerably higher than that obtained from the single-probit model and it does not vary considerably across the different instruments. Bivariate probit estimates show that, on average, female workers who used time off work due to family illness have about 66 to 75 (depending on the instrument) percentage points higher probability of reporting sickness absence than other working women. Consistent with this finding is that the estimation of the correlation coefficient ρ is negative and statistically significant. This unexpected sign means that some unobserved variables that positively affect family absence incidence reduce, however, the likelihood of reporting sickness absence at the firm. This finding may be related to Leigh's (1986) assertion that women with family

[7]The application of these tests in a context of discrete dependent variables is motivated by Angrist's (1991) results showing that least-squares estimates of the structural equation, obtained ignoring the fact that the dependent variable is discrete, are very close to the marginal effects (average treatment effects) generated by a bivariate probit model.

responsibilities are more conscious about their health and, therefore, less prone to illnesses. Another explanation for the negative correlation found in the female sample may be related to the search of an equilibrium between absences due to their own illness and other absences. That is, a worker who has suffered from a work absence episode (due to his/her own illness or due to family illness) during the current period, would try to minimize other absence episodes during the same period in order to avoid being "classified" as a frequent absentee.

In the case of male workers, the estimated ρ takes on a positive sign and it is statistically significant. In the single-equation version of the model, the coefficient of family illness absence was positive, large and statistically significant, while it is negative and insignificant in the bivariate model. These two findings suggest that once endogeneity is controlled for, the spurious correlation between absence due to family illness absence and sick leave incidence disappears.

In summary, bivariate probit estimates are in line with the hypothesis of a causal link between absence due to family illness and sickness absence reporting in the female case. Of course, a problem with this analysis is that it is not possible to account for the effect of all unobservable heterogeneity that might be positively correlated with absence due to family illness and sickness absence reporting. This is of special concern in the female sample where the magnitude of the average treatment effect is enormous. Therefore, causality conclusions should be taken cautiously. Nevertheless, our results suggest that the combination of health consequences generated by conflicts between time demands of work and family, the institutional and workplace restrictions that create incentives for workers to misuse sickness absence to hide family-related absence, and the unobservable characteristics of workers with caregiving responsibilities, are associated with higher reporting of sickness absence episodes at the firm.

Apart from these results, the estimations also show a significant effect of personal characteristics, dissatisfaction at work, working schedules and health at work indicators on sickness absence incidence (see Table C in the Appendix). In keeping with the focus of this paper these results will not be discussed in detail, but it should be noted that the broad patterns are consistent with previous studies.

6. CONCLUDING REMARKS

That combining work, family and caring has become an important challenge for workers is common knowledge, but assessing how this challenge is affecting personal life and on-the-job outcomes still requires a considerable amount of research. This paper attempts to contribute to the existing literature by analyzing the impact that the responsibility for care of ill relatives has on work attendance of caregivers, by using a random sample of Spanish employees.

Results from this paper show that, since the burden of providing assistance to ill relatives is still more likely to fall on women, they experience higher absenteeism rates due to these reasons. Nevertheless, gender differences are shown to be more complex. The estimates reveal that men and women respond in a different way to several forces influencing work absence to provide this type of care. In particular, substantial differences are observed in their responses to variations in job-related characteristics, such as flexible schedules, working time, firm size or occupational position.

A second concern addressed in the paper is to explain the observed positive association between the incidence of absence due to family illness and the incidence of workers' sick leave. The aim of this analysis has been to determine whether causal or non-causal channels drive this apparent relationship. A simultaneous equation model that control for potential endogeneity of absence due to family illness is estimated. To identify the model, the size of the firm and the presence of pre-school children at home are used as instruments. The results of simultaneous equations models show that, once we control for potential biases, the effect of absence due to family illness on sick leave incidence disappears for men, but it remains positive and significant for women.

Subject to the many drawbacks of the econometric methodology used in the analysis, these empirical findings suggest that the apparent effects of absence due to family illness on sick leave incidence are not only due to third variables, allowing them to be causal. Although it is very complicated to uncover the channels through which this causality operates, existing research provides support for two explanations. Firstly, the use of time off work to attend to

personal needs reflects the conflict between work and family demands which has been linked to lowering the level of workers' health which would explain a higher incidence of sickness absence. Secondly, the lack of generosity of the Spanish law with respect to statutory time off work to attend to ill relatives places workers affected by this circumstance at greater risk of incurring in sanctioned absence. This situation creates incentives for workers to hide these episodes under the appearance of statutory absence, the most common being sickness absence.

In summary, these results suggest there is no gender equality in the workplace if the question of providing adequate caring remains unresolved. Employers and politicians are urged to develop family-supportive policies including flex-time or subsidized dependent-care assistance to help workers, especially women, to balance family and work demands. Evidence drawn form this paper shows that these measures would not only improve the workers' well-being but would also save company money by reducing the level of absenteeism and its subsequent negative impact on productivity.

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TABLE 1 : Incidence of family illness and work absence by gender

	Women n=903		Men n=871		All n=1774	
	% Affected	% Absence [% over affec.]	% Affected	% Absence [% over affec.]	% Affected	% Absence [% over affec.]
(a) Looking after an ill son/daugther	5.5	2.3 [42]	5.4	1.8 [34]	5.5	2.1 [38.1]
(b) Accompanying the child to the doctor	8.5	3.7 [42.8]	8.4	2.3 [27.4]	8.5	3.0 [35.3]
(c) Looking after an ill relative other than a child	7.1	2.7 [37.5]	8.3	2.1 [25]	7.7	2.4 [30.9]
(d) Accompanying the relative to the doctor	8.0	3.1 [39]	9.1	3.2 [35.4]	8.5	3.2 [37.1]
Family illness (a+b+c+d)	20.5	8.9 [43.2]	20.3	7.5 [36.7]	20.4	8.2 [40.1]

TABLE 2 : Incidence of sickness absence reporting by family illness status and gender)

		Family illness			
		Event		Absence	
% declaring sickness absence	Total sample	Yes	No	Yes	No
Women	13.2	20.0	11.42	22.50	12.27
Men	11.7	17.51	10.23	21.54	10.92
All	12.5	18.78	10.84	22.07	11.6

TABLE 3 : Description of variables

Variable	Description
Age	Age of the interviewed worker
Married	1 if married or cohabiting, 0 otherwise
Divorced/separated	1 if divorced or separated, 0 otherwise
Schooling	Years of schooling completed
Pre-school children	1 if there is at least one child under age 3 living in the household
Dissatisfaction at work	Do you like your work? 1=very much; 2=so-so; 3=very little; 4=none
No formal contract	1 if the job is not covered by a formal contract
Wage	Monthly wage in units of 100,000 pts.
Full-time worker	1 if the number of weekly working hours >=35
Industrial	1 if occupation is in the industrial category which includes food, beverage, clothing
Clerical	1 if occupation is in the clerical category
Professional	1 if occupation is in the professional category: government, managers, teaching, health diagnosing and treatment
Catering/commercial	1 if occupation is in the services category: sales, commodities, hostel
Split-shift	1 if scheduled working time including split-shift
Small firm	1 if firm size < 50 employees
Health conditions at work perceived by the worker	
Toxic environment	1=always, 2=frequently, 3=sometimes, 4=never/almost never
Dirty environment	1=always, 2=frequently, 3=sometimes, 4=never/almost never
Extreme temperature	1=always, 2=frequently, 3=sometimes, 4=never/almost never
High level of noise	1=always, 2=frequently, 3=sometimes, 4=never/almost never
Risk of injury	1=always, 2=frequently, 3=sometimes, 4=never/almost never
Physical strain of work	1=always, 2=frequently, 3=sometimes, 4=never/almost never

TABLE 4 : Sample characteristics

	Women		Men		All	
	Mean	Std	Mean	Std	Mean	Std
Age	30.60	9.51	32.21	10.90	31.39	10.24
Married	0.39		0.50		0.44	
Divorced/separated	0.04		0.02		0.03	
Schooling	6.60	3.06	6.67	3.09	6.63	3.07
Pre-school children	0.08		0.16		0.12	
Dissatisfaction at work	1.65	0.85	1.66	0.87	1.65	0.86
No formal contract	0.06		0.06		0.06	
Wage	10.63	6.04	13.29	8.51	11.94	7.47
Full-time worker	0.83		0.86		0.84	
Blue collar	0.19		0.20		0.19	
Clerical	0.28		0.26		0.27	
Professional	0.23		0.23		0.23	
Catering/commercial	0.29		0.30		0.30	
Split-shift	0.46		0.50		0.48	
Small firm	0.47		0.47		0.47	
Toxic environment	3.74	0.69	3.71	0.73	3.73	0.71
Dirty environment	3.76	0.68	3.79	0.62	3.77	0.65
Extreme temperature	3.32	1.03	3.38	0.99	3.35	1.01
High level of noise	3.40	1.01	3.51	0.94	3.45	0.97
Risk of injury	3.68	0.74	3.63	0.80	3.66	0.77
Physical strain of work	3.30	1.03	3.43	0.92	3.36	0.98

Standard deviations are only reported for non-dichotomous variables.

TABLE 5 : Single probit models for work absence due to family illness

	Women		Men		All	
Independent variables	Coeff.	Marg. effect*	Coeff.	Marg. effect*	Coeff.	Marg. effect*
Age	0.019	0.001	0.0009	0.0002	0.010	0.001
	(0.008)	(0.0006)	(0.008)	(0.0017)	(0.005)	(0.0008)
Married	0.382	0.018	0.511	0.077	0.425	0.046
	(0.154)	(0.010)	(0.197)	(0.034)	(0.118)	(0.015)
Divorced or separated	0.243	0.021	0.180	0.041	0.226	0.041
	(0.309)	(0.032)	(0.563)	(0.124)	(0.267)	(0.051)
Schooling	−0.004	−0.0003	0.074	0.015	0.034	0.005
	(0.029)	(0.002)	(0.031)	(0.008)	(0.020)	(0.003)
Pre-school children	0.485	0.033	0.310	0.064	0.359	0.052
	(0.181)	(0.014)	(0.157)	(0.031)	(0.115)	(0.017)
Small firm	0.402	0.040	−0.510	−0.077	−0.003	0.0004
	(0.161)	(0.018)	(0.183)	(0.031)	(0.115)	(0.016)
Clerical	0.625	0.075	−0.155	−0.029	0.294	0.050
	(0.201)	(0.025)	(0.226)	(0.045)	(0.144)	(0.025)
Professional	0.615	0.074	−0.089	−0.017	0.303	0.054
	(0.244)	(0.035)	(0.261)	(0.048)	(0.172)	(0.031)
Wage	−0.004	−0.0002	−0.006	−0.001	−0.007	−0.0009
	(0.012)	(0.0009)	(0.010)	(0.002)	(0.007)	(0.001)
Full-time worker	0.302	0.015	0.650	0.090	0.411	0.043
	(0.204)	(0.009)	(0.292)	(0.034)	(0.161)	(0.015)
Split-shift	0.385	0.038	0.240	0.056	0.333	0.057
	(0.142)	(0.018)	(0.154)	(0.039)	(0.102)	(0.021)
Dissatisfaction at work	0.060	0.004	−0.049	−0.010	0.020	0.003
	(0.074)	(0.005)	(0.088)	(0.016)	(0.055)	(0.008)
Female		—		—	0.204	0.026
					(0.095)	(0.012)
Intercept	−3.248		−2.671		−3.003	
	(0.426)		(0.463)		(0.310)	
Log-likelihood	-240.9		-204.1		-462.63	
N	903		871		1774	

Standard errors are in parentheses.

*Reference couple: blue collar or hostel/commerce employee, working full-time with split-shift in a firm of more than 50 employees, single, without children and with age, wage, job satisfaction and schooling fixed at their sample means. In the case of the whole sample, the reference gender is female. The marginal effects corresponding to dummy variables measure the change in the probability of absence for discrete change of the dummy variable from 0 to 1. The variance of the marginal effects are computed by the "delta method"

.

TABLE 6 : Maximum likelihood probit and bivariate probit estimations of the effect of absence due to family illness on sickness absence reporting

Sample		Est. Method	Instruments	Average Treatment Effect (std. error)	ρ
Women	(1)	Probit (a)	——	0.095 (0.048)	
	(2)	Probit (b)	——	0.093 (0.048)	
	(3)	Bivariate probit	Small firm	0.719 (0.122)	-0.875 (0.165)
	(4)	Bivariate probit	Pre-school children	0.663 (0.133)	-0.792 (0.169)
	(5)	Bivariate probit	Small firm and pre-school children	0.753 (0.087)	-0.913 (0.104)
Men	(6)	Probit (a)	——	0.103 (0.051)	
	(7)	Probit (b)		0.102 (0.051)	
	(8)	Bivariate probit	Small firm	-0.092 (0.072)	0.695 (0.427)
	(9)	Bivariate probit	Pre-school children	-0.078 (0.054)	0.611 (0.294)
	(10)	Bivariate probit	Small firm and pre-school children	-0.089 (0.048)	0.743 (0.269)

Standard errors are in parentheses. Lines (1) and (6) shows probit estimations corresponding to the specifications presented in Table B of Appendix. Probit (b) in lines (2) and (7) includes an additional explanatory variable created from the answers to the question: *Do you consider that your work troubles your family life?* Answers to this question range from 1 to 5 according to the worker reporting: always, frequently, sometimes, never-almost never, respectively.

TABLE 7 : Validity of instruments

Sample	Instrument	Probit: family illness (P-value test for exclusion) (1)	Probit: sickness absence (P-value test for exclusion) (2)	Test for over ident. (P-value) (3)
Women	Small firm	0.021	0.242	
	Pre-school children	0.013	0.381	
	Small firm and pre-school children	0.003	0.371	0.176
Men	Small firm	0.004	0.192	
	Pre-school children	0.052	0.178	
	Small firm and pre-school children	0.004	0.123	0.041

Column (1) shows the p-values of tests for exclusion restrictions on the probit specification of absence due to family illness in Table 5. Column (2) shows the p-values of tests for exclusion restrictions on the probit specification of sickness absence that includes as additional explanatory variables those used in Table B of the Appendix. Overidentification tests in Column (3) are based on two-stage least squares estimation of equation (5). The test statistic is constructed by regressing the estimated errors from this equation on all exogenous variables in the system. The number of observations times the uncentered R^2 from this regression is distributed as a $\chi^2(1)$.

APPENDIX

TABLE A : Measuring health at work: loadings for the three first principal components

Variables	PC1	PC2	PC3
Toxic environment	0.402	-0.653	0.047
Physical strain of work	0.357	0.404	0.811
Dirty environment	0.446	-0.303	0.163
Extreme temperature	0.388	0.520	-0.427
High level of noise	0.411	0.204	-0.227
Risk of injury	0.437	-0.075	-0.279
(Variance/Total variance) in %	0.446	0.139	0.124

*In order to reduce the dimension of the information offered by workers' perceived health conditions at work (see Tables 3 and 4 for description of these variables) a principal component analysis was performed. The first component is a weighted average of all variables. The second component takes greater values for those jobs which are less physically demanding but in which the worker is exposed to polluted environments. As for the third component, its meaning is not clear

.

TABLE B : Effect of absence due to family illness on sickness absence reporting: single probit estimates

	Women	Men
Independent variables	Coeff. (std. error)	Coeff. (std. error)
Family illness absence	0.406 (0.174)	0.488 (0.198)
Age	−0.001 (0.007)	−0.139 (0.038)
$\text{Age}^2 \times 10^{-2}$		0.155 (0.047)
Married	−0.082 (0.135)	0.153 (0.158)
Divorced or separated	0.323 (0.277)	1.088 (0.359)
Schooling	0.004 (0.026)	0.021 (0.024)
Clerical	0.330 (0.162)	0.838 (0.191)
Professional	0.404 (0.207)	0.537 (0.214)
Wage	−0.003 (0.011)	0.007 (0.008)
Full-time worker	0.209 (0.162)	0.146 (0.199)
Split-shift	0.077 (0.117)	0.242 (0.128)
No formal contract	−0.642 (0.324)	0.023 (0.277)
Health at work: PC1	−0.038 (0.036)	−0.067 (0.039)
Health at work: PC2	−0.255 (0.064)	−0.103 (0.069)
Health at work: PC3	0.016 (0.059)	−0.146 (0.075)
Dissatisfaction at work	0.142 (0.065)	0.155 (0.070)
Intercept	−1.779 (0.325)	0.151 (0.661)
Log-likelihood	-330.18	-276.68
N	903	871

TABLE C : Effect of absence due to family illness on sickness absence reporting: bivariate probit estimates using small firm and pre-school children as instruments

	Women		Men	
	Sickness absence	Family illness	Sickness absence	Family illness
Independent variable	Coeff. (std. error)	Coeff. (std. error)	Coeff. (std. error)	Coeff. (std. error)
Family illness absence	2.257 (0.327)		−0.836 (0.494)	
Age	−0.0009 (0.006)	0.022 (0.007)	−0.125 (0.035)	0.0001 (0.008)
Age$^2\times 10^{-2}$			0.139 (0.042)	
Married	−0.196 (0.124)	0.345 (0.147)	0.335 (0.171)	0.484 (0.203)
Divorced or separated	0.193 (0.290)	−0.007 (0.311)	1.041 (0.369)	0.145 (0.434)
Schooling	0.005 (0.024)	−0.005 (0.027)	0.040 (0.026)	0.079 (0.032)
Clerical	0.246 (0.152)	0.688 (0.176)	0.766 (0.208)	−0.192 (0.217)
Professional	0.318 (0.197)	0.636 (0.213)	0.525 (0.207)	−0.133 (0.244)
Wage	−0.007 (0.012)	−0.007 (0.011)	0.004 (0.008)	−0.005 (0.008)
Full-time worker	0.188 (0.154)	0.388 (0.184)	0.279 (0.198)	0.627 (0.282)
Split-shift	0.025 (0.108)	0.445 (0.123)	0.242 (0.121)	0.222 (0.158)
No formal contract	−0.485 (0.326)		0.010 (0.253)	
Health at work: PC1	−0.047 (0.032)		−0.062 (0.036)	
Health at work: PC2	−0.207 (0.070)		−0.094 (0.065)	
Health at work: PC3	0.004 (0.054)		−0.123 (0.069)	
Dissatisfaction at work	0.095 (0.066)	0.018 (0.076)	0.140 (0.066)	−0.025 (0.079)
Pre-school children		0.470 (0.155)		0.335 (0.138)
Small firm		0.454 (0.139)		−0.538 (0.162)
Intercept	−1.585 (0.316)	−3.363 (0.394)	−0.164 (0.618)	−2.652 (0.457)
ρ	−0.913 (0.104)		0.743 (0.279)	
Log-likelihood	-566.62		-479.1	

Bivariate probit estimates using either pre-school children or small firm as the only instrument are also available.