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Part-time sick leave as a treatment method for individuals with musculoskeletal disorders

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Abstract: There is increasing evidence that staying active is an important part of a recovery process for individuals on sick leave due to musculoskeletal disorders (MSDs). It has been suggested that using part-time sick-leave rather than full-time sick leave will enhance the possibility of full recovery to the workforce, and several countries actively favor this policy. However, to date only few studies have estimated the effect of using part-time sick leave in contrast to full-time sick leave. In this paper the effects of being on part-time sick leave compared to full-time sick leave is estimated for the probability of returning to work with full recovery of lost work capacity and uses a sample of 1,170 employees from the RFV-LS database of the Social Insurance Agency of Sweden. A two-stage recursive bivariate probit model is used to deal with the endogeneity problem. The first step estimates the probability of being assigned to part-time sick leave, and the second step estimates the likelihood of recovery with part-time sick-leave as an explanatory variable together with a set of other individual characteristics. The results indicate that employees assigned to part-time sick leave do recover to full work capacity with a higher probability than those assigned to full-time sick leave. The average treatment effect of part-time sick leave is 25 percentage points. Considering that it may also be less expensive than assigning individuals to full-time sick leave, this would clearly imply efficiency improvements from assigning individuals, when possible, to part-time sick leave.

Keywords: Sick-leave; Part-time; Musculoskeletal; Endogenous regressors.
JEL-Codes: I12; J21; J28.

1. Introduction

At the end of the 1990s and the beginning of the 2000s sickness absence in Sweden increased dramatically and the total expenditures for the state rose by about 50 percent from 1999 to 2002 (Hogstedt, Bjurvald, Marklund, Palmer, & Theorell, 2004). Since 2002 the expenditure on sickness cash benefits has decreased by about one-third up until 2007 (Försäkringskassan, 2008). One reason for this is likely the stricter interpretation of the eligibility rules for sickness benefits. Still, in 2007, government expenditure on sickness cash benefits were approx. 27.1 billion Swedish kroner (approx. €2.5 billion)[1] (Försäkringskassan, 2008). Musculoskeletal and mental disorders (MSD) are the most common causes of sickness absence in Sweden (SBU, 2003). Further, in a European context, MSD is the major cause of work-related health problems. According to a European survey conducted in 2005, about 25 percent of the workers in the European Union countries reported back pain problems and 23 percent reported muscular pain problems. The problems were generally more common among blue-collar workers compared to white-collar workers (OSHA, 2008). Hence, determinants, treatments and consequences of sickness absence due to MSD are important issues in terms of individual health, population health and costs for the social insurance and health care systems.

There is increasing evidence that staying active is an important part of a recovery process for individuals with MSD and related disability, and that total absence from work delays recovery (Cheng & Hung, 2007; Gross, Goldsmith, Hoving, Haines, Peloso, Aker et al., 2007; Hagen, Jamtvedt, Hilde, & Winnem, 2005; Schonstein, Kenny, Keating, Koes, & Herbert, 2003; van Tulder, Becker, Bekkering, Breen, Gil de Real, Hutchinson et al., 2006). Hence, a partial return to work from a sick-leave due to MSD may be

[1] Exchange rate (2009-06-04) 1 Swedish krona = €10.78.

beneficial for the individual's health and lead to a quicker recovery of the lost work capacity (Franche, Cullen, Clarke, Irvin, Sinclair, & Frank, 2005). Further, most of the employees are also satisfied with being on part-time sick leave (Sieurin, Josephson, & Vingård, 2007). Nevertheless, part-time sick leave is a complex "treatment", which requires an initial joint decision made by the individual, the employer, the physician, and the social insurance administrator (Andrén & Andrén, 2008), and actions and decisions (of the employee, colleagues and employer) to adjust both work time and work demands (during the treatment period).

More and more governments are also promoting part-time sick leave, expecting possibly to reduce the costs of the social insurance system by considering part-time sick leave as a "treatment" for individuals with certain conditions, such as MSD. For example, all the Scandinavian countries promote the use of part-time sick leave in various forms. In Sweden it has been possible to be on part-time sick leave of 50% since the beginning of the 1960s (extended to also include 25% and 75% in July 1990), although this policy did not receive much attention until the end of the 1990s when expenditure on sickness cash benefits increased dramatically as described above. In Sweden as well as in Norway and Denmark it is possible to start a part-time sick leave without any preceding history of full-time sick leave (Martimo, Kaila-Kangas, Kausto, Takala, Ketola, Riihimäki et al., 2008). In Finland, employees can combine sick leave and working 40–60% of the daily working time only after the full-time sick leave has lasted for almost three months.

Despite the interest in and use of part-time sick leave as a treatment for individuals on sick leave, there are hardly any studies evaluating the impact on recovery. A Norwegian cluster-randomized study on "active sick leave", which implies returning to an adjusted work environment with the assistance of social security, showed no beneficial effects (Scheel, Hagen, Herrin, Carling, & Oxman, 2002). A recent example is Andrén & Andrén (2008) who used observational data to study part-time sick leave as a treatment method in Sweden for individuals on sick-leave. They used a discrete choice one-factor model and instrumental variables to control for the non-random assignment of individuals into part-time and full-time sick leave. Their results indicate that part-time sick leave is associated with an increase in the likelihood of recovery to full work capacity for sickness spells longer than 150 days. We use a somewhat similar approach to Andrén & Andrén (2008), but we focus on individuals on sick leave with MSD by analyzing part-time sick leave (rather than full-time) as an intervention to affect the outcome (full recovery of the lost work capacity) for employees who were on sick leave due to MSD in Sweden at the beginning of the 2000s.

The rest of the paper is structured as follows: Section two describes the data. Section three introduces the empirical strategy, with the main aim of handling the problem caused by using observational data, i.e., that the treatment (part-time sick leave) is endogenous to the outcome (full recovery) and a standard regression will lead to biased estimates of the treatment. Section 4 shows the results of the two-stage recursive bivariate probit model as well as the calculations of average treatment effects and treatment effects on the treated. Section five concludes the paper.

2. Data

We analyze a subsample of 1,170 employed people who were on (part-time or full-time) sick leave due to musculoskeletal disorders. They were selected from the 2002 sample of the RFV-LS database of the National Agency of Social Insurance in Sweden, which contains data on 5,000 individuals and is representative for all the residents registered with the social insurance office in Sweden. All individuals in the analyzed sample, were 20-64 years old, were employed and started a sickness spell due to musculoskeletal disorders between 1and16 February 2001. We excluded all employees who ended their sick leave because of incarceration, emigration, or participation in a rehabilitation program. Table 1 contains means and standard deviations for the variables used in the estimations.

[Table 1 about here]

The outcome variable (*Full recovery*) is a dummy variable taking the value 1 if the individual is back at work on a certain day in the future with full recovery of the lost capacity. We analyze whether or not full recovery is reached within different time periods after the spell started (30, 90, 150, 210, 270 and 330 day), which are calibrated with general guidelines used for sick listing. Table 2 in shows summary statistics of this variable for full-time and part-time sick leave. These two categories are defined by the degree of sick leave at day 15, the first day when the sickness insurance covers the employees' sick leave (after 14 days covered by the employer). The *part time* dummy variable takes the value 1 for all employees who started their period covered by the sickness insurance with 25%, 50%, or 75% sick leave, and it takes the value 0 for all employees that started with a 100% sick leave. Only 12 % of the employees who were on sick leave due to musculoskeletal disorders, started their period covered by sickness insurance on part-time (Table 1), and their recovery is much slower than their "peers" who started with full time as seen in Table 2 below.

[Table 2 about here]

3. The Empirical Strategy

The process of sick listing is complex, and its output in the form of the duration and the degree of sick leave, cannot be considered exogenous factors for the recovery process. This means that there are unobserved or omitted variables in the equation of interest that are correlated with the part-time dummy (treatment) variable that affects the outcome (Full recovery). If there is endogeneity, this implies inconsistency and biased estimates in finite sample sizes. Therefore, we consider that the response binary variable (*Full recovery*) is simultaneously determined with a dichotomous regressor (the degree, or the type of sick leave: part-time or full-time) (Heckman, 1978; Maddala, 1983). In this setting, it is important to analyze the relative performance of alternative exogeneity tests since their finite sample properties are unknown. In this way, we can analyze whether or not an association between part-time sick leave and full recovery is due to a causal effect or to selection. For example, if it is found that full-time sick-leave is associated with quicker recovery (as the raw summary statistics in Table A2 suggest), this may be due to the beneficial effect of being on full-time sick leave (causal) or to a selection effect such that individuals with a higher likelihood of recovery are assigned to full-time sick-leave. For example, given the general guidelines, an individual with a broken leg may be assigned to full-time sick leave regardless of his/her job task, but has a higher probability of full recovery regardless of the degree of sick leave for some job tasks. Whereas an individual with back-pain may be assigned to part-time sick leave but have bleaker chances of recovering to full work capacity. If it is a selection effect that drives the association, a policy prescription of assigning more individuals to part-time or full-time sick-leave will not have any beneficial effect on recovery. On the other hand, if it is a causal relationship, a policy prescription of assigning more individuals to part-time or full-time sick-leave is likely to have beneficial effects on recovery times.

This paper uses a two-stage recursive bivariate probit model to try to address the problem of an endogenous regressor.[2] The recursive structure builds on a first reduced form equation for the potentially endogenous dummy and a second structural form equation determining the outcome of interest:

$$y_{1i}^* = \beta_1' x_{1i} + u_{1i}, \qquad (1)$$
$$y_{2i}^* = \beta_2' x_{2i} + u_{2i} = \delta_1 y_{1i} + \delta_2' z_{2i} + u_{2i},$$

where y^*_{1i} and y^*_{2i} are latent variables, y_{1i} (the part-time indicator) and y_{2i} (the full recovery indicator) are dichotomous variables observed according to the rule:

$$\begin{cases} y_{ji} = 1 \text{ if } y_{ji}^* > 0, \\ y_{ji} = 1 \text{ if } y_{ji}^* \leq 0, j = 1, 2. \end{cases} \qquad (2)$$

x_{1i} and z_{2i} are vectors of exogenous variables,[3] β'_1, $\beta'_2 = (\delta_1\ \delta'_2)$ and δ_2 are parameter vectors, δ_1 is a scalar parameter, and the error terms (u_{1i}, u_{2i}) are identically distributed as bivariate normal with zero mean, unit variance and correlation coefficient ρ,

[2] See e.g. Jones (2007) for more details about the econometric framework prented in this Section.
[3] Wilde (2000) shows that identification is achieved even if the same exogenous regressor appears in both equations, provided this regressor is sufficiently variable, so that theoretical identification does not require availability of any additional instrument in x_{1i}.

independently across observations. Inference on the (K×1) parameter vector β=(β'_1, β'_2, ρ)$'$ can be made by the maximum-likelihood method.

The main difficulty in the statistical approach is finding appropriate instruments in equation (1). A good instrument needs to have a causal effect on the behavioral variable, i.e., selection into part-time or full-time sick leave, but not a direct causal effect on the outcome variable, i.e. full recovery (Maddala, 1983). We argue that the type of employer is important for the possibility of being assigned to part-time sick leave or not. Certain jobs have conditions that make it very difficult for employees to be on part-time sick leave. These may be in small establishments with only one or very few employees, but may also be larger offices or labs that have only one employee who can perform certain tasks, i.e., the job requires full-time attendance. In these cases, the employer can pose two alternatives to the employee, either continue to work full-time (more than the health capacity allows) or being on full-time sick leave. This implies that the type of employer can have an effect on the likelihood of being assigned to part-time sick leave when working capacity is less than 100%. Further, we (expect and) assume individuals do not self-select into different types of employers due to the possibility of (in the future) being on part-time sick leave. However, it seems unlikely that individuals would base their job careers on such considerations. The conclusion from these arguments is that the type of employer -(can) have a direct causal effect on the likelihood of being assigned to part-time sick leave, but it cannot have a direct systematic effect on the likelihood of full-recovery from the sick-leave. The variables of occupational type (see Table A1) are the closest to the employer type in our data, and therefore we use them as instruments in our model.

Further, the evaluation of interest is to use the estimates from equations (1) and (2) above to say something about the average treatment effect (ATE) and the treatment on the treated effect (TT).We have that:

$$ATE = \Pr(y_1 = 1 \mid x) - \Pr(y_0 = 1 \mid x), \qquad (3)$$
$$TT = \Pr(y_1 = 1 \mid d = 1, x) - \Pr(y_0 = 1 \mid d = 1, x),$$

where y is the outcome variable, x are covariates and d is the treatment (here part-time sick leave). The ATE is computed by utilizing the partial effects of all individual observations and taking the sample means. The ATE tells us the average difference between the probability that the individual will fully recover after part-time sick leave and the probability that the individual will fully recover after full-time sick leave. The TT is just the average effect of treatment only on those who have been treated.

4. Results

4.1 Selection into treatment

Table 3 shows the estimated coefficients of the probit model of the selection into treatment, which offers a straightforward way to examine the presence of non-random selection into treatment.

[Table 3 about here]

Several of the estimated coefficients are statistically different from zero, which indicates that individuals under treatment differ significantly from non-participants with respect to observable characteristics.

The oldest age-group (56-65) is more likely to be on part-time sick leave, which is also true for the youngest age group for longer spells. Otherwise there are no statistically significant differences between the age groups. Females are more likely and married people less likely to be on part-time sick leave. People born in Sweden are also more likely to be on part-time sick leave. Individuals who are sick-listed by a company physician (compared to a public one) are more likely to be on part-time sick leave, while individuals who are sick listed by private and specialist physicians (compared to public ones) are less likely to be on part-time sick leave.

The estimated parameters for the occupational type (our instruments) are statistically different from zero for four out of six occupational groups: Legislators/senior officials (positive), Craft and related trades (positive), Plant/machine operators (negative), Elementary occupations (positive). Thus, we passed the first test of having a valid instrument only for these occupations: The instrument should be correlated with the treatment decision, and not affect the outcome directly, but only indirectly through the treatment variable. In order to ensure the validity of the instruments, we also tested the collective significance of all the instrumental variables in the first-stage regression, with the likelihood of being on part-time sick leave as the outcome variable. We rejected (p=0.017), using a standard rule of thumb, the fact that the instruments jointly do not have any explanatory power regarding the likelihood of being assigned to part-time sick leave (Staiger & Stock, 1997). Further, we performed an informal test for the exclusion of the instruments in a probit model for full recovery (at 30 days – 330 days) based on including the instruments together with the part-time dummy (Buddin & Kapur, 2005). In this model the instruments should be jointly insignificant, which we cannot reject, with p=0.27 to p=0.54. Taken together, this gives us some confidence about the validity of our instruments.

4.2 Outcome Equation

The outcome equation is the second step in the bivariate recursive probit regression and shows the impact on full recovery within a specific time period. As explained in section three, the part-time variable is instrumented by the occupational type variables. Table 4 below shows the results.

[Table 4 about here]

The impact of the part-time variable is positive, large in magnitude and highly statistically significant. This implies that being assigned to part-time sick leave seems to increase the likelihood of full recovery. The coefficient is relatively similar across the different lengths of time analyzed, from 1.50 for spells lasting equal to or less than 30 days to 1.20 for spells lasting equal to or less than 330 days. The results, using our specification and instrumental variables, go against the raw data (Table 2) that showed that individuals on part-time sick leave have a lower likelihood of recovery within each time period.

Other results in Table 4 show that males are more likely to recover from sick leave and the age-pattern shows an expected one, i.e., older individuals are less likely to recover (compared to the youngest age-group). The lowest likelihood of full recovery is found among the oldest individuals (age-group 56-65), while being married is positively associated with full recovery. Having been on sick leave the previous year (Previous sick) is negatively associated with full recovery. Also, being sick-listed by a company physician (compared to public) is associated with a lower likelihood of full recovery.

4.3 Average Treatment Effects and Treatment on the Treated

As stated in section three, the evaluation measures that we calculate are ATE as well as TT. The calculations of the treatment effects are shown in Table 5.

[Table 5 about here]

The results show strong positive average treatment effects that are also statistically significant. The ATE is highest for the shorter time period (0.52 for 30 days or less) but also substantial for the longest time period analyzed (0.25 for 330 days or less). The ATE is the average of the individual treatment effects in the relevant population and should be interpreted here to mean that, on average, individuals who are sick-listed for a musculoskeletal disorder have a 0.25 higher likelihood of full recovery if assigned to part-time sick leave rather than full-time sick leave (330 days or less). The TT results are not statistically significant, and hence we cannot reject the hypothesis that they are equal to zero.

That ATE is positive and significant, while TT is not, may be explained by the fact that the observable characteristics of people in the treatment (part-time) group are generally strongly associated with a lower likelihood of full recovery. Hence, this implies that their treatment effect is less than would be the case for a random pool of patients who are sick-listed (Aakvik, Holmas, & Kjerstad, 2003).

5. Conclusions

This paper estimates average treatment effects and treatment effects on the treated, with regard to on part-time sick leave rather than full-time sick leave for patients with musculoskeletal disorders. The interest in this question stems from the research findings that activity and some connection to the labor market may be beneficial for the recovery of patients with musculoskeletal disorders, and from the fact that it is an advocated policy in the Swedish institutional setting to use part-time sick leave for this patient population when deemed possible.

The results indicate that the average treatment effect for full recovery within 330 days or less is 25 percentage points. The effect on the treated population is smaller, which we would not expect if patients could rationally self-select into the different alternatives. However, this decision is a complex procedure involving the individual, the employer, the physician, and the social insurance administrator. We find that individuals on part-time sick leave have observable characteristics that are associated with a generally lower likelihood of full recovery, which may explain the result that TT<ATE.

This study obviously has some limitations. Even though the instrumental variables used to handle the endogeneity problem were jointly significant in the first stage of the regression they were fairly weak, which creates a potential problem of bias that may be quite large, e.g. theoretically IV estimators may be more biased than standard OLS estimators (Bound, Jaeger, & Baker, 1995; Cameron & Trivedi, 2009). Further, in future research it would be beneficial to have a larger sample size, considering that the number of individuals with part-time sick leave in our sample is rather limited (133 individuals). Also, to overcome the difficulties with observational data in general, using randomized controlled trials (RCT) to evaluate part-time sick leave as a treatment method would handle the endogeneity problem (but may of course create other problems). A study protocol of an RCT to evaluate part-time sick leave has been published, but to our knowledge no such study has yet published any results (Martimo et al., 2008).

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Table 1 Descriptive statistics

Variables	Description	Mean	(s.d.)
Part-time	=1 if on part-time sick-leave 25, 50 or 75 percent	0.12	(0.32)
Swedish	=1 if born in Sweden	0.85	(0.36)
Male	=1 if male (otherwise 0)	0.40	(0.50)
Age 16-25	=1 if age between 16 and 25	0.06	(0.23)
Age 26-35	=1 if age between 26 and 35	0.19	(0.39)
Age 36-45	=1 if age between 36 and 45	0.25	(0.44)
Age 46-55	=1 if age between 46 and 55	0.29	(0.45)
Age 56-65	=1 if age between 56 and 65	0.21	(0.41)
Income	Income in 100 Swedish kronor	1,979.45	(483.77)
Married	=1 if married	0.51	(0.50)
Previous sick	=1 if on sick-leave previous year	0.26	(0.44)
Low-skilled	=1 if job requires little or no education	0.11	(0.32)
Physician type			
Private physician	=1 if consulting with private physician	0.16	(0.37)
Public physician	=1 if consulting with public primary physician	0.50	(0.50)
Company physician.	=1 if consulting with company physician	0.13	(0.34)
Specialist physician.	=1 if consulting with specialist physician	0.20	(0.40)
Living region			
Upper northern Sweden	=1 if living in upper northern Sweden	0.07	(0.26)
Stockholm	=1 if living in Stockholm region	0.19	(0.40)
East mid-Sweden	=1 if living in east mid-Sweden	0.17	(0.37)
Småland with the islands	=1 if living in Småland county or the islands	0.09	(0.28)
Southern Sweden	=1 if living in the south of Sweden	0.13	(0.33)
West Sweden	=1 if living in the west of Sweden	0.19	(0.39)
Northern mid-Sweden	=1 if living in northern mid-Sweden	0.12	(0.33)
Lower-northern Sweden	=1 if living in lower part of northern Sweden	0.04	(0.20)
Occupational type			
Legislators and managers	=1 if legislators, senior officials or managers	0.01	(0.10)
Professionals	=1 if professionals	0.07	(0.26)
Clerks	=1 if clerks	0.11	(0.31)
Service and shop sales	=1 if service and shop sales	0.27	(0.45)
Craft and related trades	=1 if craft and related trades	0.16	(0.37)
Plant/machine operators	=1 if plan/machine operators	0.14	(0.34)
Elementary occupations	=1 if elementary occupations	0.22	(0.41)

Note: Occupational type is only used in the selection equation as instruments for the part-time variable. Number of observations is 1,170.

Table 2 Share of employees who finished with full recovery (in percent), by type of sick leave

Type of sick-leave	≤30 days	≤90 days	≤150 days	≤210 days	≤270 days	≤330 days
Full-time	34.24	65.47	73.42	77.01	78.86	79.24
Part-time	17.27	39.57	51.08	56.83	59.71	59.71

Table 3 Coefficient estimates for selection equation (dependent variable: part-time sick leave)

	≤30 days	≤90 days	≤150 days	≤210 days	≤270 days	≤330 days
Male	-0.52***	-0.42***	-0.48***	-0.59***	-0.58***	-0.58***
Swedish	0.41**	0.37**	0.50***	0.46***	0.44***	0.46***
Age 16-25	-	-	-	-	-	-
Age 26-35	0.29	0.37	0.42	0.43*	0.45*	0.46*
Age 36-45	0.12	0.15	0.18	0.17	0.19	0.18
Age 46-55	0.14	0.14	0.20	0.22	0.23	0.23
Age 56-65	0.56**	0.48**	0.55**	0.57**	0.60**	0.60**
Income	2.5E-04**	1.9E-04*	1.77E-04	2.19E-04*	2.49E-04**	2.39E-04*
Married	-0.29***	-0.27***	-0.21**	-0.19*	-0.20**	-0.22**
Previous sick	0.09	0.09	0.12	0.09	0.08	0.09
Low-skilled	-0.41**	-0.45**	-0.24	-0.23	-0.24	-0.30
Municipality sector	-0.14	-0.16	-0.15	-0.15	-0.15	-0.11
Public physician	-	-	-	-	-	-
Company physician	0.37***	0.36***	0.39***	0.38***	0.37***	0.37***
Private physician	-0.20	-0.36***	-0.38***	-0.37***	-0.37***	-0.34**
Specialist physician	-0.21	-0.29***	-0.35***	-0.38***	-0.40***	-0.40***
Upper northern Sweden	-	-	-	-	-	-
Stockholm	0.06	0.10	-0.02	0.05	0.04	0.04
East mid-Sweden	-0.09	-0.02	-0.05	0.01	0.01	0.01
Småland with the islands	-0.06	0.05	0.01	0.06	0.11	0.12
Southern Sweden	-0.09	-0.01	-0.14	-0.10	-0.10	-0.11
West Sweden	0.12	0.12	0.02	0.11	0.12	0.12
Northern mid-Sweden	-0.17	-0.13	-0.13	-0.12	-0.12	-0.12
Mid-northern Sweden	0.11	0.21	0.05	0.11	0.14	0.14
Professionals	-	-	-	-	-	-
Legislators/ officials	0.28	0.49***	0.59	0.34*	0.32*	0.30*
Clerks	0.19	0.24	0.34	0.08	0.10	0.08
Service and shop sales	0.12	0.19	0.18	-0.06	-0.02	-0.06
Craft & related trades	0.25	0.25*	0.22	0.01	-0.00	-0.01
Plant/machine operators	-0.16	-0.05	-0.06	-0.36*	-0.37*	-0.41**
Elementary occupation	0.49*	0.59***	0.49*	0.23	0.23*	0.25*
Log-likelihood	-1,083.7	-1,098.21	-1,023.5	-978.16	-953.64	-946.29

Notes: *** p<0.01, **p<0.05, *p<0.10. Number of observations is 1,170.

Table 4 Coefficient estimates for outcome equation
(dependent variable: full recovery within the time-period)

	≤30 days	≤90 days	≤150 days	≤210 days	≤270 days	≤330 days
Part-time	**1.50*****	**1.29*****	**1.25*****	**1.22*****	**1.21*****	**1.20*****
Male	0.29***	0.26***	0.25***	0.28***	0.27***	0.26***
Swedish	0.03	0.03	-0.02	-0.01	0.01	0.01
Age 16-25	-	-	-	-	-	-
Age 26-35	-0.15	-0.36**	-0.62***	-0.67***	-0.58***	-0.57**
Age 36-45	-0.06	-0.28	-0.57***	-0.69***	-0.62***	-0.61***
Age 46-55	-0.24	-0.42**	-0.69***	-0.75***	-0.68***	-0.67***
Age 56-65	-0.54***	-0.84***	-1.10***	-1.20***	-1.14***	-1.14***
Income	-5.50E-05	-1.00E-04	-1.2E-04	-1.83E-04**	-1.96E-04**	-2.12E-04**
Married	0.18**	0.16	0.19**	0.17**	0.15*	0.15
Previous sick	-0.09	-0.14	-0.18**	-0.14*	-0.17**	-0.17**
Low-skilled	-0.14	0.01	-0.03	-0.08	-0.02	-0.02
Municipality sector	-0.01	0.03	0.11	0.10	0.09	0.08
Public physician	-	-	-	-	-	-
Company physician	-0.38***	-0.43***	-0.45***	-0.47***	-0.42***	-0.43***
Private physician	-0.20*	0.12	0.18	0.15	0.12	0.13
Specialist physician	-0.17*	0.06	0.20**	0.21**	0.27**	0.26**
Upper northern Sweden	-	-	-	-	-	-
Stockholm	-0.01	0.22	0.41**	0.29*	0.33**	0.32**
East mid-Sweden	0.02	0.03	0.09	0.00	0.02	0.01
Småland with islands	0.23	0.13	0.14	0.03	0.04	0.01
Southern Sweden	0.03	-0.01	0.15	0.02	0.09	0.05
West Sweden	-0.01	0.07	0.21	0.12	0.15	0.12
Northern mid-Sweden	-0.04	0.15	0.22	0.19	0.28*	0.25
Mid-northern Sweden	-0.07	-0.18	-0.05	-0.14	-0.06	-0.09

Notes: *** p<0.01, **p<0.05, *p<0.10. Number of observations is 1,170.

Table 5 Average treatment effects and treatment effects on the treated (std. dev. in parenthesis)

Treatment effects	≤30 days	≤90 days	≤150 days	≤210 days	≤270 days	≤330 days
ATE	0.52	0.35	0.29	0.27	0.25	0.25
	(0.03)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)
TTE	-0.18	-0.01	-0.01	-0.01	0.00	-0.01
	(0.10)	(0.04)	(0.05)	(0.06)	(0.03)	(0.06)

Notes: ATE stands for the average treatment effect and TTE is the treatment effect of the treated. The effects are the higher probability of recovering if on part-time sick-leave compared to full-time sick-leave.