WORKING PAPER

4/2011

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Daniela Andrén

Economics

ISSN 1403-0586

http://www.oru.se/Akademier/Handelshogskolan/Forskning/Working-papers/
Örebro University
Swedish Business School
701 82 Örebro
SWEDEN

"Half empty or half full": The importance of the definition of part-time sick leave when estimating its effects

Daniela Andrén*
Swedish Business School at Örebro University, Örebro, Sweden
E-mail: Daniela.Andren@oru.se

March 2011

Abstract

This paper analyzes the impact of the definition of part-time sick leave (PTSL) when analyzing the effect of PTSL on employees' probability to fully recover lost work capacity. Using a random sample of 3,607 employees, we estimate an econometric model that aims to answer the hypothetical question of what happens to an employee who has lost his/her work capacity if he/she instead of continuing to be sicklisted full time starts working some hours. The estimated treatment parameters vary across definitions, yet all results show that, regardless of the timing of the intervention, PTSL had a positive effect on the probability of full recovery of lost work capacity one year after the spell started. Moreover, the most attractive definition shows the highest impact: About 48% of those with a reduced degree of sick leave from full time to part time during the spell were recovered about one year after the spell started, and only about 6% of them would have been better off had they remained on full-time.

Key words: part-time sick leave, full-time sick leave, selection, treatment and control groups, unobserved heterogeneity, treatment effects

JEL Classification: I12; J21; J28

* This research was supported by funds from the Swedish Council for Working Life and Social Research (Forskningsrådet för arbetsliv och socialvetenskap, FAS).

1 Introduction

In Sweden, as well in other countries with a generous social insurance system, policies targeting workers with a reduced work capacity are focusing more and more on what people *can* do instead of what they *cannot* do. For example, some people may be able to work some of their contracted hours if they have not lost their entire work capacity, and combine this with paid sick leave. While the state of sick leave is relatively easy to define, it is much more difficult to define the exact degree of sick leave and the related type of sick leave, i.e., part-time sick leave (PTSL) and full-time sick leave (FTSL. Therefore, any analysis that aims to estimate the effects of PTSL on a given outcome, should start by clearly defining the "treatment" and the control, groups taking into account the degree of sick leave at the beginning and at the end of as well as during the analyzed sick leave. Additionally, in order to draw conclusions about the effects of PTSL on a given outcome by comparing cases of PTSL and FTSL, the cases have to be (assumed to be) otherwise equivalent; that is, "identical individuals" are offered different degrees of sick leave. Such a setting can help answer the hypothetical question of what happens to an employee who has lost his/her work capacity if he/she instead of continuing to be sicklisted full time starts working some hours. A special econometric framework is needed in order to answer this question. We use the econometric framework of Andrén and Andrén (2009), which estimates a discrete choice one-factor model that evaluates the effect of part-time sick leave on the probability of full recovery of lost work capacity, when outcomes are discrete and responses to treatment vary among observationally identical persons. We use a Swedish sample of 3,607 persons (aged 20-64 years) who started a sickness spell 1-16 February 2001. The same sample has been used in some of the previous studies that estimated the impact of PTSL on full recovery of lost work capacity. First, we present descriptive statistics for four possible definitions of PTSL. Second, using treatment and control groups constructed from the four definitions, we estimate the impact of PTSL on full recovery of lost work capacity and find that the magnitude of the estimates of the impact is sensitive to the definition of the treatment group (i.e., those on PTSL) and control groups. However, all results show that the share of individuals who are indifferent positive between the two states is relatively large (around 50%), which suggests that there is potential for increasing the share of people on PTSL, which implies reduced budget costs.

The study is organized as follows. The next section presents a concise presentation of the empirical specification, while Sections 3 and 4 present data and the institutional settings of sick leave in Sweden and the estimated results, respectively. The final section summarizes the findings and draws conclusions.

2 Empirical framework

There is an increasing demand for economic and/or econometric evaluation of public policies, which might explain the increasing number of such studies. Microeconomic programs are evaluated using either the treatment effect approach or the structural approach. The treatment effect literature focus primarily on the policy evaluation problem, i.e., on evaluating whether an existing policy "works," and not on forecasting its effects in a new environment or on forecast the effects of a new policy (which requires a structural approach). The policy evaluation approach is used to compare outcomes of a currently policy in place with outcomes of alternative policies. As pointed out by Aakvik et al. (2005), a substantial amount of research in the evaluation literature assumes that outcomes are continuous or makes special assumptions for analysis of discrete data outcomes. An index model or latent variable model for the selection (variable) had been suggested to be used.. The key restriction in this methodology is the index function restriction, i.e., the assumption that the propensity to “participate” or “take up” the treatment, when it is offered, can be described by a single function with a single unobservable. However, results can be obtained, in modified form, without an index function restriction yet when imposing restrictions, the index function model has great expository and intuitive value in the analysis of treatment effects models (Heckman and Vytlacil, 1999).

We use the econometric framework of Andrén and Andrén (2009),which estimates a discrete choice one-factor model that evaluates the effect of part-time sick leave on the probability of full recovery of lost work capacity, when outcomes are discrete and responses to treatment vary among observationally identical persons. Andrén and Andrén (2009) followed the econometric model of Aakvik et al. (2005), which is based on discrete choice models with unobservables generated by factor structures. Responses to treatment vary among persons who are observationally identical, and agents participate in the program on the basis of their idiosyncratic response to treatment. Aakvik et al. (2005) applied the model to study the Norwegian

Vocational Rehabilitation training program, which was designed for individuals unable to return to work after 52 weeks on sickness benefits. They used employment three years after application to training as outcome measure, and reported both mean treatment effects and the distribution of treatment effects for discrete outcomes.

Andrén and Andrén (2009) assume an employed individual with a diagnosed health condition and an accompanying reduced work capacity and the choice between part-time and full-time sick leave. The choice of the degree of sick leave is a joint decision made by the individual, the employer, the physician, and the social insurance administrator. This implies that there needs to be an agreement among the parties before a final decision can be made, meaning that the selection into part-time or full-time sick leave can be represented by just one indicator. The common objective of the four parties is to choose the alternative (part-time or full-time sick leave) with the highest likelihood of recovery of the lost work capacity in the shortest amount of time. A relevant outcome is therefore the propensity to return to work with full recovery of lost work capacity. Thus, a suitable structure for the empirical framework is a discrete choice switching regression model with an endogenous switch between the two states, defined by the following equations:

$$Y_1^* = X\beta_1 + \xi\theta_1 + \varepsilon_1,\ Y_1 = 1\ if\ Y_1^* \geq 0, \text{and}\ Y_1 = 0 \text{ elsewhere,} \qquad \text{(part-time sick leave) (1)}$$

$$Y_0^* = X\beta_0 + \xi\theta_0 + \varepsilon_0, Y_0 = 1\ if\ Y_0^* \geq 0, \text{and}\ Y_0 = 0 \text{ elsewhere,} \qquad \text{(full-time sick leave) (2)}$$

$$D^* = Z\beta_D + \xi\theta_D + \varepsilon_D U_D, D = 1\ if\ D^* \geq 0, \text{and}\ D = 0 \text{ elsewhere,} \qquad \text{(selection rule) (3)}$$

with (1) and (2) being equations for the potential outcome in each state and (3) an equation for the single index decision rule of sorting into either of the two states. More specifically, Y_1^* and Y_0^* are two latent measures for the propensity to return to work with full recovery of lost work capacity when starting the sick leave part time and full time, respectively. D^* is a latent measure for the propensity to start the sick leave part time. Hence, when D^* is large, the propensity to start the sick leave part time is high, which is equivalent to having a low propensity to start the sick leave full time, and vice versa when D^* is small. One important extension of the basic model is to control for unobserved heterogeneity, which is done using a one-factor structure (ξ) on the stochastic terms. From a technical point of view, the factor loadings $(\theta_1, \theta_0 \text{ and } \theta_D)$ serve the purpose of reducing the dimensionality of the problem.

If the degree of sickness and the propensity to recover differ among individuals with identical observable characteristics, the unobserables have an important role. The degree of sickness and the propensity to recover within a given time period are most likely negatively correlated since the more sick an employee is initially, the lower his/her propensity to recover within a given time span is. However, recovery time could also be affected by the degree of sick leave at the beginning of a spell; that is, being placed on part-time sick leave when severely sick might extend the sick leave, since working could worsen the sickness. On the other hand, if the employee has a residual work capacity, working part-time might help avoid losing contact with the job and the labor market, which could otherwise extend the sick leave. Hence, the degree of sickness and the choice of state are related and should be matched. In the present study, only 10 percent started their sickness spell on part-time leave, and the important question to answer is whether this number could be increased in order to avoid the "long-term trap" and therefore decrease the welfare costs in the economy. Since the selection equation is a measure of the propensity to choose part-time sick leave, the unobservables will most likely have a relatively high value for those with a relatively low degree of sickness, while they will have a relatively low value if the degree of sickness is relatively high. If a high degree of sickness implies a higher probability of starting the sick-leave on full-time, and the chosen state increases the likelihood to recover within a given time span, we expect the correlation between the selection residual and the outcome equation's residual to be negative.

3 Data and institutional settings

This study uses the 2002 sample of the RFV-LS database of the Social Insurance Agency of Sweden. The database includes exact dates when sickness spells began and ended, as well as the states before and after sickness (work, education, unemployment, temporary or permanent disability, etc.). It also contains information about individual characteristics (age, marital status, citizenship, etc.), the job (employer type, occupation), the social insurance (local and regional office), and the type of doctor evaluating the health status of the employee (generalist, specialist, private, company doctor and “other”). The sample also contains information about the sickness history the year before (number of compensated cases and the duration of the longest spell). Table A1 in the Appendix presents descriptive statistics of all variables used in the empirical analysis, by definition and "treatment" (TG) and control (CG) groups.

The 2002 sample includes 5,000 persons and it is representative for all 20-64 year-old residents of Sweden who were registered with the social insurance office and started a sickness spell 1-16 February 2001. Given the aim of this paper, to estimate the effect of combining work with sick leave on the probability to fully recover the lost work capacity, we analyze only people who were employed the day before starting the selected sickness spell, yielding a sample of 3,607 employees.

3.1 Some institutional rules

In Sweden, *both* full-time and part-time workers can be on FTSL or PTSL (since the beginning of the 1960s), and since 1990 even on 25% and 75% sick leave. Thus a person who did not lose more than 75% of his or her work capacity can be on sick leave part-time and work part-time. The right to compensation of income lost due to sickness or disability is based on the medical evaluation of the person’s loss of work capacity due to the disease, sickness, or injury. However, it has been observed that physicians often give in to patient demand for sicklisting, even in cases when sicklisting is contrary to the physician’s own judgment (Englund & Svärdsudd, 2000).

Following the physician’s evaluation, it is the administrators at the social insurance office who decide whether an individual is entitled to compensation, and if so what type (i.e., 25%, 50%, 75%, or 100%). However, there is a clear distinction between these two deciding parties: the certifying physician determines to what extent disease or injury is impairing a patient’s ability to perform his or her work, while the case manager at the local social insurance office formally determines whether the patient is entitled to monetary sickness benefits. Nevertheless, the social insurance officers do experience a lack of control over the decision process, as regulations and other stakeholders restrict their work (Ydreborg, Ekberg, & Nilsson, 2007). A problem in this process is that not all jobs are suitable for a temporary or permanent part-time work solution since it might force employers to hire more people, reorganize the working place and working conditions for employees with partially-reduced work capacity, and change the working arrangements for other employees.

Although PTSL can fulfill the goal of keeping in contact with the job, it might also function as replaced leisure. In most cases, people on sick leave lose only a relatively small amount of money. In fact, the sickness insurance and the collective agreement replace 90% of the income lost due to sickness or disability. However, an annual income that exceeds 7.5 base amounts (which equaled SEK 297,750 in 2006) is not covered by the social insurance, but is covered by the collective agreement (usually up to a higher ceiling).

In 2002 the government proposed, among other measures aimed to help employees who risk being marginalized due to long sick leave, the use of partial sick leave as the starting point for sick leave. It was expected that PTSL would help employees maintain contact with their work and thus keep them from totally leaving the labor market before the mandatory retirement age. Using data from 2001, we analyze the effects of PTLS on full recovery of lost work capacity before the PTSL started to be more and more recommended and/or debated by policy makers.

3.2 The definition of PTSL

In our empirical analysis we connect the intervention or "treatment" decision to the fact that the employee was sicklisted part-time. The intervention could occur in the beginning or during the analyzed spell, and in some cases even at the very end of the spell. Using this information, we present in Table 1 four definitions of the PTSL intervention and the corresponding the "treatment" (TG) and the control (CG) groups for each definition. The PTSL intervention is defined according to the degree of sick leave (PT or FT) at the beginning and at the end of the analyzed spell of sick leave.[1] *Definition* 1: The employee started the analyzed spell with 25%, 50%, or 75% sick leave; the control group contains all cases that started with 100% sick leave). *Definition* 2: The employee started and/or ended the analyzed spell with 25%, 50%, or 75% sick leave; the control group contains all cases that started and ended with 100% sick leave). *Definition* 3: The employee started and ended the analyzed spell with 25%, 50%, or 75% sick leave; the control group contains all cases that started and/or ended with 100%

[1] Despite the policy makers' interest in using PTSL more often, few studies have evaluated its impact on recovery in general (e.g., Andrén and Andrén, 2008, 2009; Andrén and Svensson, 2009; Andrén, 2010, Høgelund et al., 2010), and only a few studies (Andrén and Palmer, 2004; Palmer et al., 2008 and Andrén, 2010), to our knowledge, have considered alternative definitions. Palmer et al. (2008) present the same definitions and some descriptive statistics for 1995, and even more detailed information (i.e., FT-PT-FT, PT-FT-PT) for all spells that started in 2002 (97% where finished in 2007, the end of observation period).

sick leave). *Definition* 4: The employee started the analyzed spell with 100% sick leave and ended with 25%, 50%, or 75% sick leave; the control group contains all cases that started and ended with 100% sick leave).

Table 1 The treatment and control groups, by definition

Type of spell, by the degree of sick leave		Definition 1		Definition 2		Definition 3		Definition 4	
	PT	In the beginning		In the beginning and/or end		During the whole spell		In the end, given that started on full time	
	T& C groups	TG	CG	TG	CG	TG	CG	TG	CG
	n	375	3232	1015	2592	305	3302	640	2592
PT-PT	305	YES		YES		YES			
PT-FT	70	YES		YES			YES		
FT-PT	640		YES	YES			YES	YES	
FT-FT	2592		YES		YES				YES

Table 1 suggests that there are considerably more observations in the treatment group when the degree of sick leave is considered both at the beginning and at the end of the spell (Definitions 2-4). However, this is not unexpected if the PTSL policy was design to be applied for easier transition back to work, which implies transition from FTSL to PTSL combined with part-time work. Moreover, it is not surprising that almost 45% of the spells longer than one year are part-time (Definition 2). More descriptive statistics of the spells by degree of sick leave at the beginning and at the end are presented in Tables A2 and A3 in the Appendix. Given that the aim of the present study is to evaluate the effect of PTSL on the probability of fully recovering the lost work capacity by answering the hypothetical question of what happens to an employee who has lost his/her work capacity if he/she instead of continuing to be sicklisted full time starts working some hours, Definition 4 is the best candidate for our analysis. However, it is not of less importance to present the results across different definitions, along with the corresponding message that can be sent to policy makers.

3.3 The definition of the outcome

The outcome variable is the health status of the employees at the end of their spell of sick leave. More exactly, we use an discrete outcome variable that takes the value one when the individual fully recover the lost work capacity, and zero otherwise. Relatively more cases ended with full recovery of lost work capacity among those who started with FTSL than among those who started with PTSL, and vice versa, i.e., relatively more cases ended without full recovery among those who started with PTSL (Table A4 in the Appendix).

3.4 The definition of the instrumental variables

Our model requires one (or more) variable (instrument) that causally affects the behavioral variable but does not have a direct causal effect on the outcome. The instrument is for that reason only included in the selection equation. RFV(2004) reports that there might exist obstacles to PTSL (the physicians praxis towards full time, the difficulty to reorganize the workplace, and the limited marginal for individual adaptation of working time).[2] Due to the fact that some employers have specific conditions related to the execution of the job task that make it difficult to contend with part-time employment, we chose type of employer as a candidate for instrument. The first reaction against this instrument was an intuitive scenario that type of employer is related to type of work, and type of work is related to type or severity of injury, which in turn may be related to the likelihood of full recovery; hence there may be a correlation between type of employer and likelihood of full recovery. We know only the occupation and not the working place. Given that in Sweden, all employers are obliged to offer their employees a good work environment, we decided to use occupation as instrument. However, we identified some more problems with this instrument. Some jobs simply require full-time employee attendance. When this is the case, the employer is unable to run the business with an employee who works part-time and is on PTSL the rest of the contracted work time. The employer therefore leaves the employee with the choice between working above his/her work capacity and being on FTSL with a compensation that covers more than then lost of work capacity.. Hence, the probability of being on PTSL or FTSL differs between different employers. The individual might be aware of these differences among employers, but there is not yet any empirical evidence in the literature that suggests that knowledge of this fact should be a driving force for choosing a specific employer. Hence, it is not very likely that the individual will act on this in the sense that it will affect the outcome variable. It is therefore

[2] This report analyzes data about attitudes to PTSL collected in 2003 from a representative sample of employers, union representatives at workplaces, employees at social insurance and employment offices, physicians (general practitioners, private physicians, orthopedists and psychiatrists), and individuals included in a representative survey on health, working conditions, Life situation and sick leave (RFV-HALS 2002) who stated that they could answer further questions.

plausible to say that some occupations (e.g., professionals) have a causal effect on the propensity to be on PTSL or FTSL (Table A5 in the Appendix), while there should be no such direct effect on the probability of recovering the lost working capacity within a given time.

4 Results

The outcome for an individual might depend on how treatment is assigned to the person as well as on how treatment is assigned across persons. The same policy (the use of PTSL) may have different assignment mechanisms. The one factor model contains a selection equation for the degree of sick leave and two outcome equations, which estimate the probability to return to work with the lost work capacity fully recovered for employees on FTSL and PTSL, respectively.[3] Even though the "initial conditions" for the analyzed individual are not the same, the decision for the degree of sick leave follows just about the same process every time and, hence, we use the same model specification for all four definitions. The results suggest that assignment to PTSL was related to the individual health status (diagnosis, sick leave experience in the previous year, type of physician) but also to gender, occupation, and region. Constructing individual-level parameters of the treatment effect for a given person is a difficult task because we cannot observe the same person in both FTSL and PTSL. We therefore followed the conventional approach in the treatment effect literature, and computed some summary measure of the population distribution of treatment effects. The conventional parameters of interest, and the focus of many investigations in economics, are the average treatment effect (or ATE) and the average effect of treatment on the treated (or TT). All of our estimated treatment parameters are defined for the population of employees who were on sick leave due to lost work capacity. Thus, ATE is the average treatment effect for applicants chosen at random from the pool of accepted applicants, and not from the pool of all applicants or the pool of all eligible employees.

4.1 Mean treatment effects

Table 2 reports the ATE and TT by definition about one year after the sick leave spells started. The ATE parameter suggests a positive effect of PTSL for a randomly chosen

[3] Tables A6 and A7 in the Appendix present the estimated coefficients of the selection equation by definition and the estimates of the outcome equations, by definition, respectively.

individual from the population. However, with ATE being a hypothetical parameter, this finding is of less interest from a policy point of view since PTSL cannot be aimed at the total population but only at a selected group who did not lose more than 75% of their work capacity and have jobs (or could find other jobs) that allow them to work part time. The statistically significant ATE parameters suggest that, on average, an employee on PTSL had a nearly 15% higher probability of full recovery of lost work capacity than if she/he would have been on FTSL during the entire spell (Definition 3). The magnitude of the effect is a little bit lower (i.e., 12.6%) for Definition 1, which compares employees who started their spell of sick leave on part-time with those who started on full-time.

Table 2 Mean treatment effects of PTSL after about one year, by definition

	PT in the beginning Definition 1	PT in the beginning and/or the end Definition 2	PT in the beginning and at the end Definition 3	FT in the beginning and PT at the end Definition 4
ATE	0.126 *	0.040	0.153 ***	0.063
	(0.072)	(0.121)	(0.010)	(0.150)
TT	0.386 ***	0.342 ***	0.421 ***	0.413 ***
	(0.033)	(0.025)	(0.034)	(0.025)
TT-ATE	0.260	0.302	0.268	0.350

The TT parameter is of more interest since it measures the effect of PTSL on those who were actually on PTSL (i.e., the recover probability of the two states is adjusted by the probability of being "treated with part-time work"). All estimates are statistically significant and suggest that the PTSL had a positive effect (0.342-0.412) on the probability of full recovery of lost work capacity.

4.2 Distributional effects

Table 3 presents the estimates for the distributional treatment effects with respect to the treatment on the treated. We report four measures: 1) positive effect (the share that gained from PTSL); 2) indifferent positive (the share with no effect at all, but did recover). 3) indifferent negative (the share with no effect at all, and did not recover); and 4) negative effect (the share that lost from being on PTSL). Both the ATE and TT results show that the estimates vary across definitions, yet the TT variation is relatively smaller. Of all employees who were on sick leave, 15-19% gained from PTSL, 1-16% lost from it, 56-77% were indifferent positive, and 6-8% were indifferent negative (which means that they either would have recovered without the part-time alternative or would not have recovered in any case). The TT results show much larger numbers for those who gained from PTSL (41-48%) and those who were indifferent negative (19-29%), and smaller numbers for those who lost from it (1-9%) and those who were indifferent positive (26-29%).

Table 3 Distributional treatment effects of PTSL after about one year, by definition

	PT in the beginning Definition 1	PT in the beginning and/or the end Definition 2	PT in the beginning and at the end Definition 3	FT in the beginning and PT at the end Definition 4
ATE				
Positive	0.151	0.199	0.158	0.183
Indifferent positive	0.749	0.559	0.773	0.625
Indifferent negative	0.075	0.084	0.064	0.072
Negative	0.025	0.159	0.005	0.120
TT				
Positive	0.414	0.434	0.433	0.477
Indifferent positive	0.282	0.289	0.270	0.264
Indifferent negative	0.279	0.185	0.287	0.195
Negative	0.027	0.091	0.012	0.064

7 Summary and conclusions

PTSL is expected to be a way to combat early permanent exits from the labor market by helping people with reduced work capacity not lose contact with their work place. The descriptive statistics show that anybody aiming to evaluate the part-time sick "treatment" should start by defining as clear as possible both the PTSL "intervention", the treatment and control groups, and the outcome to be analyzed. However, not all possible definitions of the treatment and control groups seem to be suitable for evaluating the effects of PTSL on a given outcome. Only results from studies where treatment and control groups were selected from a pool of "identical persons", can be used to make a forecast about the effects of increased or reduced use of PTSL.

Using a random sample of 3,607 employees, we estimated an econometric model that aims to answer the hypothetical question of what happens to an employee who has lost his/her work capacity if he/she instead of continuing to be sicklisted full time starts working some hours. Given both the size and the information of the available data, and all the changes in the sickness insurance rules since the beginning of the 1990s, our results cannot (easily) be used for forecasting; yet they can be use as reference points when building policy recommendations for part-time sicklisting.

Our results show that the magnitude of the estimates of the effect of PTSL on full recovery of lost work capacity is sensitive to the definition of the treatment group (i.e., those on PTSL) and the control groups. However, all results show that the share of individuals who are positive indifferent between the two states is relatively large (around 50%), which suggests that there is potential for increasing the share of people on PTSL, which can reduce the budget cost. Nevertheless, the results based on the definition that comes near the "identical persons" requirement (a sample of 3,232 employees who started their sick leave on full time, and 640 of them decreased their degree of sick leave during the spell) show that reducing the degree of sick leave during the spell has a relatively strong positive effect about one year after the spell started: nearly 48% of the "treated" were recovered, and only 6% would have been better off had they continued their sick leave on full-time.

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Appendix

Table A1 Mean values, by definition

	PT in the beginning Definition 1		PT in the beginning and/or the end Definition 2		PT in the beginning and at the end Definition 3		FT in the beginning and PT at the end Definition 4	
	TG	CG	TG	CG	TG	CG	TG	CG
	375	3232	1015	2592	305	3302	640	2592
Income from employment								
Earnings in 100 SEK	2099.3	2004.6	2079.5	1988.9	2099.6	2006.5	2067.9	1988.9
SGI income in 100 SEK #	2109.0	2020.1	2096.9	2002.8	2110.2	2021.8	2089.9	2002.8
AGE	45.104	43.744	45.011	43.444	46.023	43.688	44.956	43.444
Swedish born	0.925	0.863	0.905	0.855	0.918	0.865	0.894	0.855
NUTS regions								
Stockholm	0.205	0.220	0.189	0.230	0.187	0.221	0.180	0.230
East Central	0.176	0.160	0.177	0.155	0.170	0.161	0.178	0.155
Married	0.451	0.490	0.490	0.485	0.466	0.488	0.513	0.485
Physician								
Primary care	0.485	0.467	0.463	0.471	0.492	0.467	0.450	0.471
Company	0.163	0.095	0.157	0.080	0.170	0.095	0.153	0.080
Private	0.128	0.125	0.120	0.127	0.134	0.124	0.116	0.127
Specialist	0.224	0.313	0.260	0.321	0.203	0.313	0.281	0.321
Employer								
Private	0.413	0.511	0.445	0.522	0.390	0.511	0.464	0.522
Municipality	0.309	0.298	0.307	0.296	0.318	0.298	0.306	0.296
Occupation that requires longer higher education	0.237	0.118	0.197	0.105	0.233	0.121	0.173	0.105
Diagnosis								
Mental disorder	0.211	0.170	0.256	0.142	0.220	0.170	0.283	0.142
Circulatory organs	0.024	0.038	0.026	0.041	0.020	0.038	0.027	0.041
Musculoskeletal	0.371	0.319	0.342	0.318	0.390	0.318	0.325	0.318
Pregnancy and birth complications	0.075	0.028	0.034	0.032	0.046	0.031	0.011	0.032
Injuries and poisoning	0.053	0.095	0.084	0.093	0.049	0.094	0.102	0.093
Other	0.261	0.345	0.254	0.368	0.269	0.342	0.250	0.368

#The amount of benefit is based on a theoretical income, *sjukpenninggrundande inkomst* (SGI), which is calculated based on current or earlier earnings. The lowest possible SGI is 24 percent of a base amount, which is set every year by the government. The highest possible SGI is 7.5 times the base amount.

Table A2 The distribution of the spells of PTSL, by status at the end

Degree of sick-leave at the beginning and at the end of the sickness spell	All n=3607	Censored n=419	Recovered N=2953	Not recovered n=235
a) Full-time, full-time	0.719	0.563	0.745	0.609
b) Full-time, part-time (Definition 4)	0.177	0.260	0.166	0.221
c) Part-time, full-time	0.019	0.036	0.016	0.034
d) Part-time, part-time (Definition 3)	0.085	0.141	0.073	0.136
On part-time sick leave				
When the spell started				
c+d (Definition 1)	0.104	0.177	0.089	0.170
When the spell started and/or ended				
b+c+d (Definition 2)	0.285	0.437	0.255	0.391

Table A3 Mean and median duration of sickness spells,* by degree of sick leave

	All n=3607		Recovered n=2953		Not recovered n=235	
	mean	median	mean	median	mean	median
Degree of sick-leave at the beginning and at the end of the sickness spell						
a) Full-time, full-time	85.5	33.0	49.6	28.0	142.4	84.0
b) Full-time, part-time	156.1	101.0	103.3	81.0	172.9	165.5
c) Part-time, full-time	172.8	125.0	100.0	85.0	203.8	248.5
d) Part-time, part-time	148.1	83.0	80.5	59.0	167.5	125.5
All types of spells	105.2	45.0	61.5	35.0	154.6	109.0

Note: *the censored spells (i.e., 419 spells) are not considered.

Table A4 Outcome variable at various cutoff points, by definition

	PT in the beginning Definition 1		PT in the beginning and/or the end Definition 2		PT in the beginning and at the end Definition 3		FT in the beginning and PT at the end Definition 4	
	TG	CG	TG	CG	TG	CG	TG	CG
	375	3232	1015	2592	305	3302	640	2592
≤ 360	0.696	0.830	0.725	0.852	0.702	0.827	0.742	0.852
Other cutoff points								
≤ 30	0.179	0.378	0.105	0.456	0.203	0.372	0.063	0.456
≤ 40	0.235	0.469	0.157	0.558	0.256	0.462	0.111	0.558
≤ 50	0.285	0.536	0.214	0.626	0.308	0.529	0.172	0.626
≤ 60	0.347	0.591	0.279	0.678	0.374	0.584	0.239	0.678
≤ 70	0.381	0.628	0.341	0.705	0.410	0.620	0.317	0.705
≤ 80	0.419	0.660	0.383	0.733	0.446	0.652	0.363	0.733
≤ 90	0.461	0.685	0.431	0.752	0.485	0.678	0.413	0.752
≤ 120	0.539	0.730	0.527	0.782	0.561	0.724	0.520	0.782
≤ 180	0.627	0.778	0.635	0.811	0.639	0.773	0.641	0.811
≤ 240	0.667	0.810	0.689	0.836	0.669	0.806	0.702	0.836
≤ 300	0.691	0.821	0.708	0.846	0.695	0.818	0.719	0.846
≤ 330	0.693	0.827	0.721	0.849	0.698	0.823	0.738	0.849
≤ 390	0.699	0.831	0.727	0.853	0.705	0.828	0.744	0.853

Table A5 Mean values of instrument variables, by definition

	PT in the beginning Definition 1		PT in the beginning and/or the end Definition 2		PT in the beginning and at the end Definition 3		FT in the beginning and PT at the end Definition 4	
	TG	CG	TG	CG	TG	CG	TG	CG
	375	3232	1015	2592	305	3302	640	2592
Legislators, senior officials and managers	0.040	0.032	0.049	0.027	0.039	0.033	0.055	0.027
Professionals	0.237	0.118	0.197	0.105	0.233	0.121	0.173	0.105
Clerks	0.123	0.109	0.117	0.107	0.115	0.110	0.114	0.107
Service and shop sales workers	0.179	0.262	0.217	0.267	0.190	0.259	0.239	0.267
Craft and related trades workers	0.067	0.118	0.082	0.125	0.072	0.116	0.091	0.125
Plant/machine operators & assemblers	0.051	0.125	0.069	0.136	0.049	0.124	0.080	0.136
Other	0.296	0.227	0.262	0.223	0.298	0.228	0.242	0.223

#

Table A6 Parameters estimates of the selection equation, by definition

	PT in the beginning Definition 1		PT in the beginning and/or the end Definition 2		PT in the beginning and at the end Definition 3		FT in the beginning and PT at the end Definition 4	
Men	-0.538	***	-0.392	***	-0.442	***	-0.203	**
Swedish born	0.278	**	0.217	**	0.088		0.087	
Age/10	-0.935	***	-0.380	***	-0.961	***	-0.473	***
Age-squared/100	0.113	***	0.048	***	0.120	***	0.056	***
Stockholm's region	-0.180	*	-0.331	***	-0.291	**	-0.321	***
Sick leave previous year	0.342	***	0.224	***	0.287	***	0.070	
Married	-0.166	*	-0.056		-0.131		0.038	
Physician (CG: primary care)								
Company	0.331	**	0.524	***	0.317	**	0.553	***
Private	-0.023		-0.032		-0.020		-0.069	
Specialist	-0.257	**	-0.171	**	-0.374	***	-0.121	
Income# (in thousand SEK)	0.211	**	0.156	**	0.185	**	0.066	
Municipality sector	-0.075		-0.125		-0.043		-0.109	
Occupation (CG: Professionals)								
Legislators, senior officials	-0.342		-0.014		-0.314		0.149	
Clerks	-0.362	**	-0.387	***	-0.341	**	-0.318	**
Service and shop sales work	-0.721	***	-0.609	***	-0.626	***	-0.446	***
Craft and related trades	-0.601	***	-0.646	***	-0.548	***	-0.539	***
Plant/machine operators	-0.883	***	-0.876	***	-0.854	***	-0.720	***
Others	-0.286	**	-0.342	***	-0.258	**	-0.317	***
Factor loadings								
Full-time equation	-2.401	***	-2.885	***	-2.414	***	-4.839	***
Part-time equation	-1.212		-0.092		-4.873		-0.201	
n	3607		3607		3607		3232	
Log-likelihood	-2746.1		-3647.6		-2614.1		-2951.6	

Notes: CG stands for comparison group, and # the earned income the year before the spell started. The estimate is significant at the 10% level (*), at the 5% level (**), and at the 1% level (***). These notes hold for all tables of estimates.

Table A7 Estimates of outcome equations, by definition

	PT in the beginning Definition 1	PT in the beginning and/or the end Definition 2	PT in the beginning and at the end Definition 3	FT in the beginning and PT at the end Definition 4
Full-time equation				
Men	0.291	0.519 **	0.189	0.284
SGI	-0.033	0.192	0.012	0.872 **
Swedish born	0.364	0.383 *	0.413 *	1.214 **
AGE	1.463 ***	1.027 ***	1.498 ***	1.963 ***
AGESQ	-0.222 ***	-0.166 ***	-0.233 ***	-0.353 ***
Stockholm's region	0.398 **	0.640 **	0.481 **	0.960 *
	-0.159	-0.167	-0.066	-0.419
Sick leave previous year	-0.554 **	-0.488 **	-0.538 **	-0.388
Married	0.082	0.125	0.052	-0.036
Physician (CG: primary care)				
Company	-1.499 ***	-1.672 ***	-1.516 ***	-3.660 ***
Private	-0.325	-0.514 *	-0.279	-1.012 *
Specialist	0.333	0.072	0.358 *	0.321
Private employer	0.061	-0.337	0.043	-0.705 *
Occupation requires higher educ.	-0.314	-0.292	-0.261	-0.658
Part-time equation				
Men	0.033	0.002	0.186	0.100
SGI	0.173	-0.050	0.131	-0.225
Swedish born	0.251	0.164	1.555	0.152
AGE	1.385	0.589 **	3.590	0.749 *
AGESQ	-0.213	-0.097 ***	-0.485	-0.110 **
Stockholm's region	0.906	0.301 **	1.585 **	0.175
	0.207	0.065	0.832	-0.006
Sick leave previous year	-0.469	-0.119	-0.860	-0.006
Married	-0.034	-0.081	-0.308	-0.085
Physician (CG: primary care)				
Company	-0.058	-0.094	-0.002	-0.206
Private	-0.193	0.010	-0.258	0.082
Specialist	-0.235	0.093	-0.017	0.258 *
Private employer	-0.141	0.122	0.137	0.250 **
Occupation requires higher educ.	0.064	0.109	0.054	0.071