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Is part-time sick leave helping the unemployed?

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Abstract
Using a discrete choice one-factor model, we estimate mean treatment parameters and distributional treatment parameters to analyze the effects of degree of sick leave on the probability of full recovery of lost work capacity for employed and unemployed individuals, respectively. Our results indicate that one year after the sick leave spell started, the average potential impact of part-time sick listing on an individual randomly chosen from the population on sick leave was positive for both groups, but the average effect on those who actually were on part-time sick leave was positive only for the employed, and negative for the unemployed.

Key words: unemployed, part-time sick leave, selection, unobserved heterogeneity, treatment effects

JEL Classification: I12; J21; J28

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1 Introduction

In Sweden, part-time sick leave (PTSL) has been suggested as an assessment toward work orientation if employees combine it with some hours of work (Andrén and Palmer, 2004). In some countries (e.g., all of Scandinavia), it is possible to combine part-time work with part-time sick leave when people's work capacity with respect to their contracted job is reduced by at least 25%. The degree of compensation during a sick leave spell is determined accordingly to the person's work capacity. Ideally, people with partially-reduced work capacity should not leave the labor force but instead be supported to remain in, or find, appropriate jobs (OECD, 2003). Despite the recent focus among policy makers on this issue, very few studies (e.g., Andrén and Andrén, 2008, 2009; Andrén and Svensson, 2009; Andrén, 2010, Høgelund et al., 2010) have empirically analyzed if people with partially-reduced work capacity should not leave the labor force. All these studies tested the impact of PTSL on full recovery of lost work capacity of employees. Basically all employed workers are covered by the sickness insurance (SI), but other categories (e.g., unemployed and self-employed) are also eligible. To our knowledge, no study has analyzed the effect of PTSL on categories of insured individuals other than employed workers. As far as results, a few studies (e.g., Larsson 2004, 2006; Henningsen 2007; Hall and Hartman 2010) that have found empirical evidence that economic incentives are important for the use of sickness insurance among the unemployed.[1] We analyze the impact of PTSL on the probability of full recovery of lost work capacity among unemployed people. PTSL as being discussed mainly as a way of avoiding long-term absences from work (which in most cases ended by a permanent exit from the labor market), was always connected to employed workers with reduced work capacity who can combine part-time work with PTSL. Therefore, it is of policy interest to find out the impact of PTSL on full recovery when it is not combined with some hours of work. The fact that unemployed people have less opportunity to keep in contact with a work place motivates the present study, which aims to estimate the impact of PTSL on full recovery of lost work capacity among unemployed individuals. Using a discrete choice one-factor model, we estimate mean treatment parameters and distributional treatment parameters from a common set of structural parameters for 572 unemployed and 3,607 employed individuals selected from a representative sample of

[1] For example, Larsson (2006) focused on the interplay between unemployment insurance (UI) and SI in Sweden, and found that an increase in wages seems to have a different effect on the sick-report rate for unemployed people who can benefit from moving to SI, as compared to those who cannot. Henningsen (2008) examined the transition from unemployment with UI to SI in Norway, and found a pre-exhaustion spike in the SI hazard for most limits implied by the various policy regimes. He reported that his results call for further attention to the employability of persons registered as unemployed and to screening of applicants for benefits related to sickness and disability.

persons (aged 20-64 years) one year after they started a sickness spell. Given the limitations caused by the sample size of the "treatment" group of unemployed individuals, which includes only 52 persons, our estimates are only general "points of reference". Our estimates of the treatment on the treated (*TT*) parameter, which measures the effect of PTSL on those who were actually on PTSL, were positive for the employed, but negative for the unemployed.

The study is organized as follows. The next section presents the institutional settings of SI and unemployment insurance (UI) in Sweden, while Sections 3, 4, and 5 present the empirical specification, data, and the estimated results, respectively. The final section summarizes the paper and draws conclusions.

2 Institutional settings

The purpose of SI is to provide economic support when the worker is too sick to work and support himself/herself. Basically all employed workers are automatically covered by the SI. Students and unemployed workers are also eligible for the SI as long as certain requirements are met. An unemployed person must be registered at a local employment office as a job seeker.[2] The size of his SI benefits is not based on his/her UI benefits but on his/her wage before unemployment. Thus, unemployed persons without previous employment are not eligible for SI benefits.

Given the institutional framework, it is possible for a person who has not lost more than 75% of his/her work capacity to be on sick leave part-time and work part-time. The right to compensation of income loss 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 sick-listing, even in cases when the physician's own judgment speaks against sick-listing (Englund & Svärdsudd, 2000).

Following the physician's evaluation, it is the social insurance office that decides whether an individual is entitled to compensation, and if so what type (i.e., 25%, 50%, 75%, or 100%). In most cases, social insurance officers accept the recommendation of the physicians as final rather than use their own judgment (Hensing, Timpka, & Alexanderson, 1997). Although PTSL can fulfill the goal of keeping in

[2] For a detailed description of the UI settings and the economic incentives to choose a transition from unemployment to sick leave, see Larrson (2006) and Hatman and Hall (2008).

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.[3]

There is both a lower and an upper limit to these benefits. UI and SI benefits are based on the salary earned before the event of unemployment or sick leave, up to a ceiling above which the benefit is constant. The replacement ratio has been the same in both systems (80% of previous earnings), whereas the ceiling for SI benefits has been about 35-40% higher than for UI benefits. The UI ceiling was adjusted in 2001 and 2002. The combination of a slightly declining benefit ceiling and continuous nominal wage growth has led to a substantial fall in replacement rates for workers with above-average earnings. New regulations apply from July 1, 2003 reducing SI benefits for unemployed individuals who could receive higher benefits from SI than UI.

To overcome the possible exclusion of many people from the workforce due to long-term absence related to sickness or disability, the government proposed in 2003, among other measures, the use of partial sick leave (or PTSL) as "the starting point for sick leave" (Regeringens proposition 2002/03:89, Förändringar inom sjukförsäkringen för ökad hälsa i arbetslivet.).

3 Data

Due to numerous changes in the rules related to sick leave and data availability, we decided to use data from a period when PTSL was not specifically listed in the general guidelines for sicklisting. Thus, this study uses the 2002 sample of the RFV-LS database of the Swedish Social Insurance Agency of Sweden. The database includes exact dates of 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 (such as age, marital status, citizenship, etc.), the job (occupation, type of employer), the social insurance (local and regional office, the source of money, etc.), and the type of doctor who evaluated the health status of the person (generalist, specialist, private, company doctor, and “other”). The sample also contains information about the sickness history the year before (number of compensated cases and duration of the longest spell). The 2002 sample is representative for all residents of Sweden who were registered with the social insurance office. All

[3] In fact, the SI and the collective agreement replace 90% of the income lost due to sickness or disability. However, annual earnings that exceed 7.5 so-called base amounts (which equaled SEK 276,750 or about USD 29,132 in 2001, the year analyzed here) are not covered by the social insurance, but are covered by the collective agreement (usually up to a higher ceiling).

persons in the sample started a sickness spell 1-16 February 2001 and were 20-64 years old. Given the institutional settings of the SI and UI and the aim of this paper, we analyze only people who were employed or unemployed the day before starting the analyzed sickness spell, which gives us a sample of 3,607 employed, and 572 unemployed individuals.

One variable of main interest is the degree of sick leave, which is used to construct the group of part-time sicklisted individuals. As already pointed out by Andrén (2011), the definition of PTSL is important when reporting impacts of PTSL on recovery of lost work capacity. In order to draw conclusions about the effects of PTSL compared to full-time sick leave (FTSL) it is necessary to assume that the cases are otherwise equivalent (for example as regards the reduction in work and the severity of the disease, as well as all other factors that may influence sick-leave periods, e.g., workplace characteristics. However, due to the sample size limitation, we can only use one of the four definitions reported by Andrén (2011), i.e., the unemployed (or employed) person was on PTSL in the beginning and/or the end of the analyzed sick leave spell. We end up with a subsample of 52 persons, which is almost double compared with the other definitions (i.e., 25 unemployed started their sick leave spell on part-time; 20 unemployed were on PTSL both in the beginning and the end of the spell; and 27 unemployed started on full-time and ended on part-time). The sample size of the "treatment" group also limits the use of of many explanatory variables in the empirical analysis (as suggested by the theoretical and institutional frameworks). Table A1 in the Appendix presents descriptive statistics of the variables used in the empirical analysis, by degree of sick leave for both employees and the unemployed.

Another important variable for our analysis is outcome, which in this paper is defined as a discrete binary variable that takes the value one if the unemployed fully recovered his/her lost work capacity at the end of his/her spell of sick leave; and zero otherwise. Table A2 in the Appendix shows descriptive statistics for this variable at different cut-off points, while Table A3 also presents the percentage of people who finished their sick leave spell without full recovery of lost work capacity.

The choice of instrument in this study is based on the fact that the nature of certain work task makes it difficult for some employers to offer only some hours of work to employees with partially-reduced work capacity. During the period analyzed in this paper, the employer paid the first two weeks, and afterwards the compensation was paid by the social insurance, which implies that some employees with partially-reduced work capacity might end up in the combination PTSL/part-time unemployment

from the very beginning of the sick leave spell. The social insurance pays the compensation for unemployed people from the second day of sick leave. Some sicklisted people (both employed and unemployed) who recover enough to be able to work some hours have difficulties finding part-time jobs. All these characteristics suggest that the occupation (or the occupational groups) is expected to impact the selection into part-time or full-time sick leave, but not necessary the recovery of lost work capacity. Therefore, we use the occupational groups as instruments in our econometric model.

4 The model and the estimation strategy

The point of departure is an individual of working age with a diagnosed health condition and an accompanying reduced work capacity. Given the institutional settings of the sickness insurance, this implies a decision between part-time and full-time sick leave. The choice of the degree of sick leave is a complex dynamic decision made by several parties, which never all meet together. As regards, employed individuals, there is a dynamic interaction between the individual, the physician, and social insurance administrator, and the employer, while for unemployed individuals an employer is not involved: instead, an unemployment insurance administrator is involved. In both cases (i.e., employed and unemployed individuals), it has to be an agreement among the parties before a final decision can be made, meaning that the selection into PTSL or FTSL can be represented by just one indicator. Given that the "negotiation" parties are not the same for the employed and the unemployed , the selection into PTSL and FTSL is expected to be different. This implies that even though we can use the same econometric model for the two samples (of employed and unemployed people), the model specification for the selection is not the same.

The common objective of all parties involved in the decision on degree of sick leave is to choose the alternative (PTSL or FTSL) with the highest likelihood of full recovery of lost work capacity in the shortest amount of time. The relevant outcome is therefore a measure of the probability to fully recover 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 (Heckman, 1978; 1979). Aakvik et al. (1999, 2000, 2005) proposed and implemented a methodology that is sufficiently flexible to accommodate discrete, continuous, and mixed discrete continuous outcome variables and can be generalized to panel data settings, and applied the model to study the Norwegian Vocational Rehabilitation training program. Andrén and Andrén (2008, 2009) adapted Aakvik et al. (2005)'s model

to study PTSL in Sweden. We follow these previous papers and their models, and estimate a discrete choice one-factor model that evaluates the effect of PTSL for the unemployed. Given the institutional settings, the selection into PTSL or FTSL should be related to the individual's work capacity and their work tasks. Therefore, we use the same model and estimate the model separately for the employed and the unemployed.

5 Results

5.1 The estimates of the factor model

The outcome for an individual might depend on how the "treatment" is assigned to the person as well as on how the "treatment" is assigned across persons. We estimate the effect of the same policy (the use of PTSL), but due to sample size we pooled together assignments at different points of the analyzed spell. However, the reason for the decision is the same: a reduced work capacity which might allow people to work some hours, given their work tasks. The estimates of the factor model are reported in Table 1, which presents the estimates for the selection equation for the degree of sick-leave, and in Table 2, which presents the estimates for the outcome equations (i.e., the probability of full recovery of lost work capacity for people who sicklisted full time and part time, respectively).

All estimated coefficients of the selection equation are statistically different from zero for both model specifications for the employee sample. Several of the estimated coefficients of the selection equation (gender, age, region, and physician type) are statistically different from zero for both the employed and the unemployed, which indicates that individuals under "treatment" differ significantly from non-participants with respect to observable characteristics. The coefficients that are statistically significant (at the 5% level or better) differ in magnitude across the analyzed samples and/or specifications, but have the same sign for the employed and the unemployed. The estimated parameters for the occupational type (our instruments) are statistically different from zero only for the s employed.

Several of the estimated coefficients of the outcome equations are statistically different from zero for both model specifications for the employee sample, but, with the exception of the estimate of age-squared in the part-time equation, none of the estimated coefficients of the unemployed are. The estimated coefficients for the full-time equation for the employed suggest that males and those who are Swedish born are more likely to recover, and the recovery probability is increasing with age at a decreasing rate. The likelihood of full recovery is decreasing if the employees were on sick leave due to a

musculoskeletal diagnosis or a mental disorder. The statistically significant estimates for the part-time equation show the same direction of the impacts of age and diagnosis.

Table 1 The estimated parameters of the selection equation

	Unemployed			Employed (Unemployed specification)			Employed (Extended specification)		
	Estimate	Std. err.		Estimate	Std. err.		Estimate	Std. err.	
Man	-0.623	0.244	**	-0.470	0.075	***	-0.560	0.077	***
Age/10	-0.510	0.186	***	-0.335	0.054	***	-0.735	0.091	***
Age-squared/100	0.042	0.030		0.047	0.009	***	0.089	0.012	***
Stockholm's region	-0.739	0.360	**	-0.346	0.077	***	-0.327	0.082	***
Sick leave previous year	0.259	0.230		0.209	0.073	***	0.200	0.075	**
Physician (CG: other)									
Primary care	-0.659	0.260	**	-0.292	0.078	***	-0.220	0.080	***
Specialist	-0.737	0.331	**	-0.313	0.088	***	-0.263	0.090	***
Occupation (CG: other)									
Craft and related trades	0.042	0.268		-0.419	0.078	***	-0.314	0.080	***
Plant/machine operators	-0.079	0.400		-0.211	0.114	*	-0.251	0.108	**
Diagnosis									
Mental disorder	0.331	0.285		0.698	0.088	***	0.693	0.088	***
Musculoskeletal	0.438	0.281		0.279	0.075	***	0.315	0.074	***
Other variables	-			-			YES		
Factor loadings									
Full-time equation	0.800	1.320		1.158	0.525	**	-2.815	0.422	***
Part-time equation	-1.042	0.917		0.898	0.495	*	-2.001	0.717	***
LL	-511.1			-3669.5			-3626.2		
n	572			3607			3607		

Table 2 The estimated parameters of the outcome equations

	Unemployed			Employed (Unemployed specification)			Employed (Extended specification)		
	Estimate	Std. err.		Estimate	Std. err.		Estimate	Std. err.	
Full-time equation									
Man	-0.196	0.229		-0.082	0.110		0.567	0.217	***
SGI-income[#] (in thousand SEK)	0.099	0.131		0.107	0.104		-0.200	0.207	
Swedish born	0.020	0.178		0.350	0.152	**	0.512	0.235	**
Age	0.671	0.475		1.044	0.309	***	1.640	0.339	***
Age-squared/100	-0.113	0.076		-0.142	0.041	***	-0.233	0.043	***
Diagnosis									
Mental disorder	-0.669	0.421		-0.592	0.165	***	-1.942	0.377	***
Musculoskeletal	-0.474	0.302		-0.426	0.135	***	-1.227	0.312	***
Occupation's educational requirement (CG: higher education)									
None	0.127	0.288		-0.004	0.204		-0.185	0.314	
High school	0.161	0.287		-0.013	0.139		0.155	0.233	
Post high school	-0.050	0.330		-0.021	0.174		0.018	0.296	
Other variables							YES		
Part-time equation									
Man	0.408	0.771		-0.143	0.156		0.417	0.230	
SGI-income (in thousand SEK)	-0.086	0.791		-0.003	0.131		-0.243	0.210	
Swedish born	-1.373	1.252		0.174	0.181		0.256	0.266	
Age	2.211	1.502		0.413	0.183	**	2.209	0.631	***
Age-squared/100	-0.357	0.208	*	-0.083	0.022	***	-0.307	0.082	***
Diagnosis									
Mental disorder	0.831	1.040		0.008	0.175		-0.865	0.323	***
Musculoskeletal	0.010	0.864		-0.183	0.131		-0.594	0.212	***
Occupation's educational requirement (CG: higher education)									
None	0.632	0.934		-0.036	0.249		0.157	0.241	
Highschool	0.939	0.976		-0.127	0.158		-0.011	0.260	
Post high school	5.685	43.895		-0.087	0.166		0.053	0.180	
Other variables							YES		

Note: [#]The benefit amount is based on a theoretical income, *sjukpenninggrundande inkomst* (SGI), which is calculated based on current or prior 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.

5.2 The estimates of the treatment effects

Table 3 presents the average treatment effect (*ATE*) and of starting the sick leave part time compared to full time, and the effect of the treatment on the treated (*TT*).

Table 3 ATE and TT estimates, employed and unemployed

	Unemployed	Employed (Unemployed specification)	Employed (Extended specification)
ATE	0.254 ***	-0.368 ***	0.175 ***
	(0.065)	(0.080)	(0.012)
TT	-0.130 ***	-0.249	0.346 ***
	(0.210)	(0.022)	(0.021)

The *ATE* is estimated on the whole group of employees on sick leave and measures the average potential impact on an individual randomly chosen from the unemployed (or employed) population on sick leave. The *ATE* for the unemployed suggests that, on average, an unemployed individual on PTSL has a nearly 25% higher probability of full recovery of lost work capacity than if she/he would have been on FTSL during the entire spell. The results for employed persons differ very much between the two specifications, which suggests that if the workplace characteristics are ignored in the process of sick listing, an employee on PTSL has, on average, a nearly 37% lower probability of full recovery of lost work capacity than if she/he would have been on FTSL during the entire spell. When workplace characteristics are taken into consideration (the extended specification), an employed worker on PTSL has, on average, a nearly 18% higher probability of full recovery of lost work capacity than if she/he would have been on FTSL during the entire spell.

The *TT* parameter measures the effect of PTSL on those who actually were on PTSL. *TT* describes the difference between the actual state and the counterfactual state, in case the individual had been chosen or sorted into full-time sick leave. The estimated parameter was positive for the employed people, but negative for unemployed, which suggest that more analysis of using the PTSL for the unemployed should be done

Table 4 presents the estimated distributional effects (based on the parameters of interest), allowing us to investigate how many would gain or lose from PTSL or being indifferent to the degree of sick leave . The *ATE* estimates suggest that about 33% of the unemployed and 18% of the employees on sick leave fully recovered due to PTSL. Moreover, the majority of the employees (about 71%) and the unemployed (about 56%) who were on sick leave would have had the same outcome (recovery) in both

states. The *TT* estimates show that about 36% the employees on PTSL, and 9% of the unemployed on PTSL fully recovered following PTSL. Moreover, the majority of the unemployed (about 66%) and about 37% of the employed on sick leave would have had the same outcome (recovery) in both states. The good news is that only about 1% of the employed on PTSL did not recover following the part-time "intervention".

Table 4 Distributional treatment effects of PTSL

	Unemployed	Employed (Unemployed specification)	Employed (Extended specification)
ATE			
Positive	0.331	0.019	0.181
Indifferent positive	0.561	0.497	0.714
Indifferent negative	0.031	0.096	0.098
Negative	0.077	0.388	0.006
TT			
Positive	0.090	0.009	0.356
Indifferent positive	0.662	0.715	0.369
Indifferent negative	0.029	0.017	0.264
Negative	0.220	0.258	0.010

6 Summary and conclusions

PTSL is one of the “inventions” suggested by the Swedish government in 2002 expected to help people with reduced work capacity not lose contact with their work place, and in so doing combat earlier permanent exit from the labor market. This has turned out to work well for employed people with reduced work capacity. However, unemployed people who worked before becoming unemployed can also have reduced work capacity, and may therefore combine unemployment with PTSL. However, there was not, and there is not yet, a special "PTSL" policy explicitly aimed to this population. Moreover, it is more difficult to build expectations about the combination of sick leave and something other than paid work. Therefore, using data from the National Agency of Social Insurance we assessed the effect of PTSL on the probability of full recovery of lost work capacity for both unemployed and employed individuals by estimating a discrete choice one-factor model, which takes into account the selection into the degree of sickness (part-time and full-time). Given different institutional settings, it was not surprising to find that after one year, the *TT* parameter, which measures the effect of PTSL on those who actually were on PTSL, was positive for employed individuals, but negative for unemployed ones. However, the *ATE* parameter, which measures the average potential impact on an individual randomly chosen from the analyzed population (i.e., employed on sick leave and unemployed on sick leave), was positive for both

the employed and the unemployed. The results also suggest that it is important to take into consideration workplace characteristics when deciding on an employed individual's degree of sick leave. If workplace characteristics are ignored in the process of sicklisting, an employee on PTSL is expected to have on average about 37% lower probability of full recovery of lost work capacity than if she/he would have been on FTSL during the entire spell. When workplace characteristics are taken into consideration, an employed individual on PTSL has on average about 18% higher probability of full recovery of lost work capacity than if she/he would have been on FTSL during the entire spell.

The estimated distributional effects suggest that the majority of the employed (about 71%) and the unemployed (about 56%) who were on sick leave would have had the same outcome (recovery) in both states. About 36% of the employed individuals on PTSL and 9% of the unemployed on PTSL fully recovered following PTSL. Moreover, the majority of the unemployed (about 66%) on sick leave would have had the same outcome (recovery) in both states, and only about 1% of the employed on PTSL did not recovered due to the part-time "intervention".

References

Aakvik, A., Heckman, J. J., & Vytlacil, E. J. (2005). Estimating treatment effects for discrete outcomes when responses to treatment vary: an application to Norwegian vocational rehabilitation programs. Journal of Econometrics, 125 (1-2), 15-51.

Arrelöv Britt E., Lars Borgquist, and Kurt F. Svärdsudd (2005). Influence of local structural factors on physicians' sick-listing practice: a population-based study. Eur J Public Health 15(5): 470-474.

Andrén, Daniela (2010). Part-time sick leave as a treatment method for individuals with mental disorders? Working Papers 2010/17, Örebro University, Swedish Business School.

Andrén, Daniela (2011). "Half empty or half full": The importance of the definition of part-time sick leave when estimating its effects. Working Papers 2011/4, Örebro University, Swedish Business School.

Andrén, Daniela, and Thomas Andrén (2008). Part-Time Sick Leave as a Treatment Method?, Working Paper in Economics 320, Göteborg University, Department of Economics.

Andrén, Daniela & Andrén, Thomas (2009). Starting Sick Leave on Part-Time as a Treatment Method?. Working Papers 2009:10, Örebro University, Swedish Business School.

Andrén, D., & Palmer E. (2004). Deltidssjukskrivning (Part-time sick leave). unpublished document (in Swedish). Riksförsäkringsverket (Swedish National Social Insurance Board).

Andrén, Daniela & Svensson, Mikael (2009). Part-time sick leave as a treatment method for individuals with musculoskeletal disorders. Working Papers 2009:11, Örebro University, Swedish Business School.

Englund, L., & Svärdsudd, K. (2000). Sick-listing habits among general practitioners in a Swedish county. Scandinavian Journal of Primary Health Care, 18 (2), 81-86.

Henningsen M (2007) Benefit shifting: the case of sickness insurance for the unemployed. Labour Economics 15:1238–1269.

Hall, C & Hartman L (2010). Moral hazard among the sick and unemployed: evidence from a Swedish social insurance reform, Empirical Economics, Springer, vol. 39(1), pages 27-50, August.

Heckman, J. J. (1978). Dummy Endogenous Variables in a Simultaneous Equation System. Econometrica, 46 (4), 931-959.

Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. Econometrica, 47 (1), 153-161.

Heckman, J. (1981). The incidental parameters problem and the problem of initial conditions in estimating a discrete time–discrete data stochastic process. in C. Manski, D. & McFadden, Editors, Structural Analysis of Discrete Data with Econometric Applications. Cambridge, MA: MIT Press, 179-195.

Hensing, G., Timpka, T., & Alexanderson, K. (1997). Dilemmas in the daily work of social insurance officers. Scandinavian Journal of Social Welfare, 6, 301-309.

Høgelund, J., Holm, A. & McIntosh, J. (2010). Does graded return-to-work improve sick-listed workers' chance of returning to regular working hours? Journal of Health Economics, 29, 158-169.

Larsson L (2004) Harmonizing unemployment and sickness insurance: why (not)? Swedish Econ Policy Rev 11(1):151–188.

Larsson L (2006) Sick of being unemployed? Interactions between unemployment and sickness insurance in Sweden. Scand J Econ 108(1):97–113.

OECD (2003). Transforming Disability into Ability. Policies to promote work and income security for disabled people.

Regeringens proposition 2002/03:89, Förändringar inom sjukförsäkringen för ökad hälsa i arbetslivet.

RFV – Riksförsäkringsverket (2003), Regionala skillnader i sjukskrivning – hur ser de ut och vad beror de på? (Regional differences in sickness reporting – patterns and causes), RFV analyserar 2003:12, The National Social Insurance Board, Stockholm.

Ydreborg, B., Ekberg, K., & Nilsson, K. (2007). Swedish social insurance officers' experiences of difficulties in assessing applications for disability pensions - an interview study. BMC Public Health, 7 (1), 128.

Appendix

Table A1 Mean values by degree of sick leave

	Employees		Unemployed	
	PTSL	FTSL	PTSL	FTSL
Men	0.294	0.397	0.269	0.487
Women	0.706	0.603	0.731	0.513
SGI-income in 100 SEK [#]	2096.9	2002.8	1832	1733
Income from employment in 100 kr	2079.5	1988.9	1832	1679
Age	45.011	43.444	41.84	43.64
Married	0.490	0.485	0.288	0.487
Born in Sweden	0.905	0.855	0.885	0.790
NUTS regions				
Stockholm	0.189	0.230	0.096	0.162
East Central	0.177	0.155	0.212	0.177
Occupation with very low or no educational requirements	0.061	0.084	0.063	0.081
Employer				
Private	0.445	0.522	0.409	0.515
Municipality	0.307	0.296	0.297	0.295
Occupation				
Legislators, senior officials and managers	0.049	0.027	0.038	0.002
Professionals	0.197	0.105	0.077	0.058
Clerks	0.117	0.107	0.077	0.067
Service and shop sales workers	0.217	0.267	0.231	0.179
Craft and related trade workers	0.082	0.125	0.077	0.125
Plant/machine operators & assemblers	0.069	0.136	0.038	0.067
Other	0.262	0.223	0.462	0.481
Diagnosis				
Mental disorder	0.256	0.142	0.327	0.306
Circulatory organs	0.026	0.041	0.019	0.033
Musculoskeletal	0.342	0.318	0.442	0.342
Pregnancy and given birth complications	0.034	0.032	0.058	0.023
Injuries and poisoning	0.084	0.093	0.058	0.054
Physician				
Primary care	0.463	0.471	0.558	0.606
Company	0.157	0.080	0.058	0.017
Private	0.120	0.127	0.212	0.138
Specialist (at the hospital)	0.224	0.313	0.173	0.238
Percent of finished spells	0.821	0.909	0.846	0.773
Duration (censored March 1, 2002)	156.0	85.4	164.2	156.8
Outcome (full recovery after about one year)	0.725	0.855	0.769	0.627
Number of observations	1015	2592	52	520

Table A2 Full recovery of work capacity by degree of sick leave (in percent)

	Employees		Unemployed	
Cut-off points	PTSL	FTSL	PTSL	FTSL
≤ 30	10.5	45.6	11.5	27.9
≤ 60	27.9	67.8	34.6	42.1
≤ 90	43.1	75.2	38.5	49.4
≤ 120	52.7	78.2	44.2	52.9
≤ 150	60.8	80.2	48.1	55.0
≤ 180	63.5	81.1	53.8	56.2
≤ 210	66.5	82.9	65.4	58.5
≤ 240	68.9	83.6	67.3	59.2
≤ 270	70.1	84.4	69.2	60.2
≤ 300	70.8	84.6	71.2	61.2
≤ 330	72.1	84.9	73.1	61.3
≤ 360	72.5	85.2	75.0	61.3
Ongoing spells after one year	17.9	9.2	15.4	22.7
Number of observations	1015	2592	52	520

Table A3 Spells by recovery status and degree of sick leave (in percent)

	Employees				Unemployed			
Cut-off points	Recovered		Not recovered		Recovered		Not recovered	
	PTSL	FTSL	PTSL	FTSL	PTSL	FTSL	PTSL	FTSL
Duration								
≤ 30	14.2	53.3	6.9	8.8	15.0	44.5	3.6	8.3
≤ 60	37.6	79.3	13.7	17.4	45.0	67.2	10.3	16.7
≤ 90	58.0	87.9	14.9	19.8	50.0	78.8	14.4	16.7
≤ 120	71.0	91.4	16.4	21.7	57.5	84.4	17.0	16.7
≤ 150	81.9	93.7	17.2	24.1	62.5	87.7	18.6	16.7
≤ 180	85.7	94.8	18.7	25.4	70.0	89.6	19.6	25.0
≤ 210	89.6	96.9	19.5	27.0	85.0	93.3	20.6	25.0
≤ 240	92.8	97.7	19.8	27.3	87.5	94.5	21.1	25.0
≤ 270	94.6	98.6	24.8	30.5	90.0	96.0	30.4	33.3
≤ 300	95.5	98.9	28.2	31.8	92.5	97.5	33.5	33.3
≤ 330	97.2	99.2	29.0	32.9	95.0	97.9	35.6	41.7
≤ 360	97.7	99.6	30.5	35.8	97.5	97.9	38.7	41.7
Ongoing spells after one year	1.6	0.3	64.9	61.5	2.5	0.0	61.3	58.3
Number of observations	753	2218	262	374	40	326	194	12