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The Effect of Self-assessed Job Security on the Demand for Medical Rehab

#162

Imprint

Ruhr Economic Papers

Published by

Ruhr-Universität Bochum (RUB), Department of Economics
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Ruhr Economic Papers #162

Responsible Editor: Christoph M. Schmidt

ISSN 1864-4872 (online) – ISBN 978-3-86788-181-4

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Bibliografische Informationen der Deutschen Nationalbibliothek

Die Deutsche Bibliothek verzeichnet diese Publikation in der deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über: *http//dnb.ddb.de* abrufbar.

ISSN 1864-4872 (online)
ISBN 978-3-86788-181-4

Boris Augurzky, Arndt Reichert, and Harald Tauchmann[1]

The Effect of Self-assessed Job Security on the Demand for Medical Rehab

Abstract

The interdependence of labor market conditions and the demand for health care has been addressed by several theoretical and empirical analyses. We contribute to the debate by empirically examining the effect of a decrease in self-perceived job security on health care utilization. That is, employees at risk of losing their job might postpone or even try not to use non-acute rehab measures in order to reduce their individual risk of being laid off by avoiding absenteeism and signaling good health. We use individual-level data from the German Socioeconomic Panel for the years 2003, 2004, and 2006. The identification strategy rests on an instrumental variable approach where the county unemployment rate and its relative change compared to the previous year serve as instruments for the employees' self-assessed risk of losing their jobs. Contrary to the hypothesis, we have evidence for job insecurity increasing the demand for medical rehab. This finding is robust to various model variants.

JEL Classification: I11

Keywords: Rehab; unemployment; health care utilization; job worries; absenteeism; sick leave

January 2010

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1 All RWI. – The data used in this paper were extracted using the Add-On package PanelWhiz for Stata. PanelWhiz (http://www.PanelWhiz.eu) was written by Prof. Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2006) for details. The PanelWhiz generated DO file to retrieve the data used here is available from the authors upon request. Any data or computational errors in this paper are our own. – The authors are grateful to Thomas K. Bauer, Colin Green, Katja Görlitz, Alfredo Paloyo and Christoph M. Schmidt for valuable comments and Adam Pilny for research assistance. – All correspondence to Arndt Reichert, RWI, Hohenzollernstr. 1-3, 45128 Essen, Germany, e-mail: arndt.reichert@rwi-essen.de.

1 Introduction and Literature Review

The German health sector is on alert as the current financial and economic crisis is expected to affect the labor market in 2010. While social health insurance and health service providers are worried about fewer contributions and a slump in demand, respectively, health economists point out that increasing unemployment might change health-conscious individual behavior (e.g., Brenner 1975; Ruhm 2000; 2005). For instance, Ruhm (2005) shows that individuals adopt a healthier lifestyle when unemployment is rising. More specifically, a drop in the employment rate is negatively correlated with the prevalence of smoking and physical inactivity. At the same time, health care utilization decreases, particularly participation in preventive medical care (Ruhm 2000).

We contribute to the existing literature by focussing on a specific channel through which economic cycles may affect individual health care demand in Germany. We pick up the current public debate in Germany that stresses the argument that employees being afraid of losing their job avoid absence from work by, e.g., not taking sick leaves for non-acute health care services. It is thought that in doing, they aim at pleasing their employer and hence reducing their risk of being laid off. Specifically, we empirically test the hypothesis that employees' with a high self-perceived job insecurity participate less in rehab. Compared to other health care services such as hospital treatments, we assume that medical rehab measures are often used more flexibly with respect to their timing, the reason being that rehab measures address non-acute health problems such as exhaustion or overexertion. Moreover, it is an important sector in the German health care market.[1]

The question of whether the very fear of job loss — as opposed to actually losing the job — matters for health care demand, is at least of the same importance when analyzing the effects of rising unemployment because the number of employees being concerned about their job security is likely to exceed the number of those who are actually laid off. Until lately, security of employment had been addressed by economists merely in the field of labor economics. Several empirical analyses find that job insecurity is associated with lower absenteeism (Leigh 1985). Related literature that examines the relationship between sick leaves and dismissal protection finds similar results (Ichino and Riphahn 2005). Recently, economists have begun to highlight job insecurity in the interface between labor economics and allied disciplines. For instance,

[1] In 2006, total expenditure on rehab serives was €7.4 billion (Augurzky et al., 2009).

Fertig and Schmidt (2009) do not find any significant effect of fear of unemployment on negative attitudes towards immigrants representing potential competitors at the labor market. To our knowledge, we are the first who link the security of employment to the demand for health care.

Standard economic theory explains the utilization of health care services by deriving a demand function from the optimal production of health capital (Grossman 1972). Accordingly, temporary labor market downturns alter the demand for health care services mainly via declining opportunity costs of time, as long as there is full-cost coverage by health insurance. However, due to the fact that in Germany employees receive sick pay for the time of rehab participation, their health care demand should not be affected at all by changes in the opportunity cost of time. Thus, business cycles more likely affect the demand for health care through other channels, such as anxiety of layoff.

To analyze our research question empirically, we use individual-level data for the years 2003, 2004 and 2006 from the German Socioeconomic Panel (GSOEP). The data are well suited for our analysis, as they contain detailed information on rehab participation and self-assessed job insecurity along with numerous individual characteristics and the unemployment rate at the county level. First, we employ an instrumental variable probit approach tackling the potential endogeneity of self-assessed job insecurity. Second, we check for the robustness of our results by applying a fixed-effects logit model.

The remainder of the paper is organized as follows. Section 2 discusses the institutional setting of medical rehabilitation in Germany and introduces the data material, Section 3 discusses the econometric approach, Section 4 reports the empirical results, and Section 5 concludes.

2 Institutional Setting and Data

Medical rehab is the process of restoring a person's skills following an illness or an accident in order to regain self-sufficiency, allowing for a life as close to normality as possible. Rehab covers various health problems ranging from cancer, stroke etc. to non-acute ones such as drug addiction, musculoskeletal disorders or exhaustion. In the latter cases — as opposed to acute health problems following surgery or accidents — patients are largely free in timing rehab participation.

In Germany, the social pension fund incurs any expense if rehab focuses on the recovery

of the patient's ability to work.[2] If a particular case does not fall into the jurisdiction of the social pension fund or any other reimbursement authority, patients can claim the reimbursement against their health insurer.[3] In essence, this means that the vast majority of individuals in Germany has some insurance coverage for rehabilitation.

In any case, patients have to apply for rehab measures. Subsequently, the corresponding reimbursement authority has to decide on the application on purely medical grounds and — if rehab participation is approved — has to assign a rehab center or another medical facility within five weeks. It is important to note that employers have no right to object against any rehab participation of their personnel. Moreover, employees are entitled to continued pay during rehab participation while employers do not receive any compensation.[4] The duration of rehab is generally three weeks depending on medical aspects (DRV 2008a and 2008b). If there is any second medical opinion necessary, it may be expanded to a maximum length of seven weeks. However, continued payment of wages stops after the first six weeks.

Medical rehab can be pursued in- or outpatient. There are no substantial differences in the medical treatment between in- and outpatient rehab. In particular, the specific medical measure does not indicate whether individuals will be assigned to in- or outpatient rehab. Inpatients have to co-pay €10 per day up to a maximum of 42 days, given that they are in the economic position to do so.[5] For outpatient rehab, there is no co-payment schedule. Roughly, 85 percent of all rehab measures are inpatient (DRV 2008c).

The analysis is based on data from the German Socioeconomic Panel (GSOEP), a large longitudional household survey that started in 1983 (Haisken-DeNew and Frick 2005). The GSOEP includes a wide range of information at the individual and the household level such as working and living conditions, as well as variables on individual health status and health care utilization. The data we use cover more than 22,000 individuals over the 2002–2006 time period. We focus on the waves 2003, 2004, and 2006 since information on the outcome variable is available only for these years. The dependent variable is medical rehab participation, a binary variable that takes the value 1 if the respondent was at least once in rehab during a particular

[2]Depending on the case, there are also other authorities considered. The conditions vary from authority to authority.

[3]However, some individuals have a private health insurer where insurance coverage for rehab depends on their individual contract.

[4]Unemployed patients are entitled to so-called interim payment which they have to claim against the relevant reimbursement authority.

[5]Up to an income of €1,200 per month, participants face reduced co-payments with increasing exemption depending on gross income level.

year and 0 otherwise. For the years 2002 and 2005, there is no information on rehab participation available.[6]

Biennally, the interviewees were asked about the likelihood of losing their job within the next two years. We suppose that the corresponding variable (*afraid of losing job*), measured at the 0–100 interval, is a good proxy for the anxiety about job loss.[7] While *rehab* refers to the whole calendar year, *afraid of losing job* is linked to the current job security at the time of the interview which predominantly takes place between January and April. Aimed at explaining the probability of yearly rehab participation at the beginning of the year, this is only possible for the year 2003 because for all other waves, both variables refer to different periods of time. Thus, when using this variable, only cross-sectional data are available to examine the effect of the fear of unemployment on the demand for rehab in the econometric analysis in Section 4.1.

Most relevant to our analysis, the data contain the unemployment rate that corresponds to the county where the individual lives. This information is used to construct instrumental variables (see Section 3). Alternatively, there is a second proxy for the fear of unemployment. GSOEP asks whether the individuals are very, somewhat or not concerned at all about their job security, i.e., *job worries* is an ordinal variable. As the data for this variable are available for 2003, 2004, and 2006, we have a panel structure that allows us to exploit variation over individuals and time (see Section 4.2).

With respect to the controls, we use socio-economic characteristics such as sex, age, and education. We also control for the working environment in order to account for differences in dismissal protection. For instance, we use two dummy variables indicating whether individuals work for a company with more than five and more than 2,000 workers, respectively. While the reference category is exempted from stringer dismissal protection regulation, the latter one controls for very large companies which have lower dismissal rates (Bachmann and David, 2009). Other employed working environment variables closely related to individual job insecurity are firm tenure and a dummy indicating those employees with a temporary contract. For further details with respect to the variables used in the empirical analysis see table A1 (variable description) and table A2 (descriptive statistics) in the Appendix.

[6]The GSOEP provides rehab data in wave 2004, 2005 and 2007. The corresponding questionnaires contain the question whether an individual received any treatment towards medical rehabilitation during the last year. We recoded the data set in such a way that the individual's answer to this question is linked to the previous year.

[7]Controlling for whether individuals have temporary contracts, this variable is a good predictor for the likelihood of becoming unemployed next year, in two years or in three years. Regression results are available upon request.

Naturally, we only consider employed individuals in our analyses. We further exclude the conscripts, the self-employed, and the civil servants because these groups cannot be laid off and, thus, behave differently. The latter have a special status being protected against dismissal by law. Although public sector employees may eventually be concerned about losing their job, we also exclude them from the empirical analysis as, in general, they hardly do. In fact, having a look at the data reveals that they are much less concerned about their job security than private sector employees. This is most likely due to enhanced dismissal protection in the public sector, i.e. public sector employees with a certain employment duration almost aquire public servant status.

After these exclusions,[8] the total sample in 2003 consists of 7,078 individuals[9] of whom 296 were in rehab. In 2004, 220 individuals were in rehab and in 2006, the number of rehab participants amounts to 186. Regarding the explanatory variable *afraid of losing job*, we observe that in 2003, 40 percent of the individuals assessed a very low likelihood of losing their job within the next two years. The mean self-assessed likelihood of job loss was 25.6 percent in that year. The 90th percentile was at 60 percent. We observe a positive but weak correlation (0.025) with the binary outcome variable. This is an indication against the current public opinion that the fear of becoming redundant implies less absenteeism.

3 Estimation Strategy

In order to address our research question empirically, we set up a regression model explaining rehab participation R_i^* by the self-assessed likelihood of job-loss A_i and a vector of control variables X_i:

$$R_i^* = X_i\beta + A_i\gamma + \epsilon_i. \tag{1}$$

subscript i indicates the individual, ϵ_i represents a random error term while γ and β are coefficients subject to estimation. Because we observe rehab participation as a dichotomous indicator R_i, rather than a continuous variable R_i^*, such as time spent in rehab, we employ probit and

[8] Surprisingly, there are still elderly people in our sample (see table A2). This is due to some pensioners that are holding down a job in order to receive additional income.

[9] The sample size of the GSOEP varies over time due to births, temporary drop-outs, or persons and households which could not be successfully interviewed in a given year. For more details, see also Haisken-DeNew and Frick (2005).

logit models for estimating equation (1).

Evidently, the key explanatory variable *afraid of losing job* may suffer from unobserved heterogeneity, rendering the regression results biased. For instance, highly motivated individuals might assess the probability of losing their job more optimistically and, at the same time, might demand more rehab services in order to restore their ability to work quickly. Moreover, reversed causality is a potential issue as rehab participation might affect employment perspectives.

In order to tackle this potential endogeneity problem, we pursue an instrumental variable (IV) approach. In the presence of endogeneity, IV methods estimate the parameter of *afraid of losing job* consistently if valid instruments are at hand. We employ regional labor market conditions S_i as instruments for A_i. More precisely, we use two instrumental variables: (i) the current county unemployment rate and (ii) the relative change in county unemployment compared to the previous year.[10] The intuition behind the former instrument is that individuals may estimate their individual base-line risk of job loss on basis of regional unemployment rates. The reasoning behind the latter variable is that employees are likely to become more pessimistic about their individual job security as they experience layoffs among people from their social environment. As meso-level variables, regional labor market indicators are not significantly affected by individual behavior and individual perception and, hence, are exogenous in econometric terms. Moreover, it appears rather unlikely that regional unemployment exerts a direct effect on the individuals' demand for rehab that does not operate through the endogenous explanatory variable. However, the raw regional unemployment rate might indirectly suffer from endogeneity due to the place of residence representing a choice variable. For instance, 'motivated' individuals might be more likely to migrate to persistently more prosperous regions than inactive ones, rendering regional unemployment rates potentially correlated with unobserved individual characteristics. In contrast, this argument does not apply to short term changes in regional unemployment. Fortunately, with two instruments in hand, we can test whether one instrument is invalidated, for instance by endogenous migration.

Apparently, the impact of regional labor market conditions on self-assessed job insecurity is likely to be heterogeneous across individuals. For this, individual character traits as well as institutional and job-specific factors might play a role. We partly account for these factors by including job-related variables like company size, tenure, temporary employment and the type of work in the regression equation. Moreover, we exclude groups of individuals from the

[10] We exclude individuals that moved into another federal state in 2003 from the estimation sample.

econometric analysis, e.g., civil servants, who for legal reasons cannot be laid off regardless of how bad the economy is. However, our results have to be interpreted in terms of local average treatment effects (Angrist and Krueger, 2001).

To take account of the potential endogeneity of A_i within a probit framework, we apply conditional maximum-likelihood estimation. That is, we reformulate the joint normal distribution of the endogenous variables R_i^* and A_i in terms of the conditional distribution $f\left(R_i^*|A_i, X_i, S_i\right)$ and the marginal distribution $f\left(A_i|X_i, S_i\right)$, see Wooldridge (2002, 476). We prefer this approach to alternative two-step approaches, e.g., Newey (1987), because it is more efficient.

In order to check the robustness of the results obtained from IV estimation, we additionally apply fixed-effects (FE) logit estimation (Chamberlain 1980) as qualitatively equivalent results from FE estimation will give support to cross section IV results.[11] Pursuing a panel data approach for estimation requires an alternative measure for the anxiety about job loss that is available for several waves. As already mentioned, *job worries* is available in 2003, 2004, and 2006 (see Section 2). Based on this variable, we construct a binary variable (taking the value 1 if the individuals are concerned about their job security and 0 otherwise) that enters the FE logit model.

4 Results

In the econometric analysis we distinguish two model variants. Our benchmark model 1 contains only basic socio-economic characteristics and job-related variables; model 2 additionally includes health and income.[12] Neither in model 1 nor in model 2 we include a price variable because in Germany, almost everyone has health insurance coverage for rehab (see Section 2). Model 2 represents our preferred specification because ignoring potential income and health effects might result in omitted-variables bias.

As a reference, we first examine results from simple probit estimation that do not account for potential endogeneity of self-assessed job insecurity (see Table 1). For model 1, estimation results indicate that individuals who fear job loss demand more rather than less rehab services. However, as soon as we control for health and income (model 2), this relationship becomes

[11] We apply the sample exclusion criteria of section 4.1. Thus, we exclude individuals who moved into another federal state in 2003, 2004 or 2006 from the FE logit estimation.

[12] Indeed, income and health might be endogenous regressors. We treat this issue in section 4.2.

insignificant and almost completely vanishes. Moreover, few controls exert a significant influence on rehab participation.

Table 1: **Cross-Section simple Probit Estimates for Rehab Participation**

		Model 1		Model 2	
		Coef.	S.E.	Coef.	S.E.
afraid of losing job		0.003**	0.001	−0.000	0.001
single		0.034	0.085	0.047	0.095
education		−0.0001	0.013	0.001	0.016
age		0.012***	0.004	0.004	0.004
male		0.073	0.063	0.094	0.076
temporary contract		−0.026	0.186	0.014	0.202
blue collar		0.095	0.067	0.131*	0.078
tenure		0.002	0.004	0.000	0.004
company size:	*medium*	0.157	0.109	0.177	0.129
	large	0.090	0.073	0.123	0.081
self assessed health:	*poor*			−0.594***	0.180
	satisfactory			−1.187***	0.176
	good			−1.508***	0.179
	very good			−1.755***	0.227
sports:	*every month*			−0.033	0.094
	seldom			0.093	0.125
	never			0.224***	0.085
grade of occupational disability				0.007***	0.002
income				0.017	0.020
constant		−2.481***	0.246	−1.204***	0.329
# of observations		6,581		5,885	

Notes: *** significant at 1%; ** significant at 5%; * significant at 10%; unemployed, self-employed, conscripts, civil servants, and government employees excluded.

4.1 Instrumental Variable Estimation

We now turn to the preferred IV estimates, summarized in Table 2. Concerning the instrumental equation (second part of Table 2), for models 1 and 2, both instruments exhibit the expected positive sign and the joint test of instrument relevance turns out to be highly significant. The F statistic exceeds by far the threshold of 10, suggested by Staiger and Stock (1997).[13] Thus, we are not concerned about weak instruments. The test of over-identifying restrictions[14] is far from rejecting null hypothesis (p-value 0.251 for model 1, and p-value 0.501 for model 2). Hence we are confident about the validity of the suggested instruments. Moreover, we examine whether IV estimation is required or whether we could stick to more efficient simple probit estimation. Though for some tested model variants, the applied Wald test does not reject exogeneity at a

[13]The reported joint wald test on *county unemployment* and *change in county unemployment* is based on estimating the instrumental equation by OLS, yielding a F statistic of 126 for model 2. The corresponding χ^2-statistic for the nonlinear joint model is 174. Both statistics indicate the relevance of the instruments.

[14]We use the stata ado-file *rivtest* (see Finlay and Magnusson (2009) for a detailed discussion) for carrying out such a test for the endogenous probit model. The J-statistic proposed by Finlay and Magnusson (2009) is evaluated at the actual estimate for γ.

high level of significance, for several other it does. Thus, we cannot rule out endogeneity of *afraid of losing job*, making us focus on consistent IV results.

With respect to the control variables, *tenure* has the expected negative and *temporary contract* the expected positive sign. Both variables are highly significant. Tests for the set of dummy variables indicating the company size point at joint significance. Our results do not indicate fear of job loss monotonically decreasing with firm size. Rather unexpectedly, employees of very small establishments are least concerned, while those in medium size firms are most.

Turning to the equation of primary interest (first part of Table 2), the coefficient of the key explanatory variable *afraid of losing job* is greater than zero. Indeed, a one-sided t-test clearly rejects a negative relationship between fear of unemployment and rehab consumption for both model variants. This is evidence against the hypothesis that employees postpone or try not to use non-acute rehab measures in order to reduce their individual risk of layoff by avoiding absenteeism and signaling good health.

In contrast, we find a positive effect that is statistically significant for model 1 (at a marginal level) and model 2 (at the 5-percent level). There are two possible explanations for this finding: (i) individuals who know that they are going to lose their job in all likelihood have a rationale to participate in rehab when they are still employed rather than already laid off. These individuals may gain days off whithout losses of earnings; (ii) rather than capturing a genuine effect of self-assessed job insecurity, the coefficient might capture the impact of closely related but unobserved variables, i.e. the economic performance of the company. This, in turn, would mean that we estimate the effect of the workload at the job on the demand for rehab. Our results then imply that individuals who face less work at the job jump at the chance to utilize the medical rehab measure that has been overdue because of full order books. In doing so, they shift their consumption of rehab measures from economic upturns to downturns where the workload is relatively small. Moreover, the results might also reflect that employers intervene in the employees' timing of rehab measure by discouraging them to not go to rehab when they are needed at the job even though employers officially are not allowed to do so.

Examining the size of the estimated effect for our preferred model 2, the marginal effect at the means of the covariates is 0.015 (p-value 0.012). That is, on average, the probability of participating in rehab would rise by 0.015 percentage points if the self-assessed probability of job loss increased by 1 percentage point. Comparing this with the sample average of rehab

Table 2: **Cross-Section IV Probit Estimates for Rehab Participation**

		Model 1		Model 2	
		Coef.	S.E.	Coef.	S.E.
Structural equation: probability of rehab participation					
afraid of losing job		0.011^{*}	0.006	0.015^{**}	0.006
single		0.016	0.084	0.018	0.090
education		−0.013	0.013	−0.009	0.015
age		0.012^{***}	0.003	0.004	0.004
male		0.073	0.062	0.059	0.073
temporary contract		−0.106	0.191	−0.119	0.197
blue collar		0.077	0.068	0.107	0.074
tenure		0.004	0.004	0.005	0.004
company size:	*medium*	0.130	0.109	0.115	0.124
	large	0.109	0.073	0.147^{*}	0.076
self assessed health:	*poor*			-0.388^{*}	0.201
	satisfactory			-0.894^{***}	0.228
	good			-1.132^{***}	0.259
	very good			-1.260^{***}	0.329
sports:	*every month*			−0.096	0.091
	seldom			0.012	0.123
	never			0.156^{*}	0.086
grade of occupational disability				0.008^{***}	0.002
income				0.033^{*}	0.020
constant		-2.602^{***}	0.245	-1.621^{***}	0.335
Instrumental equation: *afraid of losing job*					
county unemployment rate		0.929^{***}	0.070	0.951^{***}	0.075
change in county unemployment		6.229	4.505	8.564^{*}	4.647
single		1.379	0.888	1.577^{*}	0.935
education		0.100	0.142	0.241	0.161
age		−0.049	0.039	−0.060	0.042
male		0.032	0.671	1.370^{*}	0.768
temporary contract		9.540^{***}	1.992	8.866^{***}	2.158
blue collar		0.947	0.739	0.540	0.794
tenure		-0.276^{***}	0.041	-0.291^{***}	0.044
company size:	*medium*	2.414^{**}	1.054	3.111^{***}	1.129
	large	-1.628^{**}	0.824	-1.715^{**}	0.861
self assessed health:	*poor*			-10.878^{***}	3.304
	satisfactory			-14.024^{***}	3.187
	good			-17.504^{***}	3.179
	very good			-24.321^{***}	3.314
sports:	*every month*			4.233^{***}	0.910
	seldom			4.785^{***}	1.227
	never			4.165^{***}	0.864
grade of occupational disability				-0.067^{**}	0.030
income				-0.666^{***}	0.221
constant		15.697^{***}	2.571	28.286^{***}	4.155
test of exogeneity (p-value)		0.169		0.021	
overidentification test (p-value)		0.251		0.501	
# of observations		6,578		5,883	

Notes: *** significant at 1%; ** significant at 5%; * significant at 10%; unemployed, self-employed, conscripts, civil servants, and government employees excluded.

participation reveals that the effect of the fear of unemployment on rehab participation is of considerable magnitude. Since just 4 percent of the employed individuals were in rehab in 2003, in relative terms, rehab participation would increase by 0.375 percent if the self-assessed likelihood of job loss was on average 1 percentage point higher.

Regarding the control variables, we affirm results of previous empirical analyses, e.g., Cameron and Trivedi (1974).

4.2 Robustness Checks

To gain some insight on whether the instrumental variable approach is properly addressing endogeneity, we first compare results from the simple probit model with IV probit estimates. While the coefficient of *afraid of losing job* turned insignificant and negative whenever we included potentially endogenous controls, such as *income* and the set of health proxies in the simple probit model (see Table 1), it is robust to different model variants when employing IV estimation.[15] This hints at our identification strategy being effective in tackling the endogeneity bias with respect to the effect of fear of unemployment on the demand for rehab.

Second, we present results for the FE logit model (see Table 3). As discussed in Section 2, *job worries* is an alternative proxy variable for fear of unemployment. This variable is available for the years 2003, 2004, and 2006, making FE logit estimation suitable. Since FE estimation does not allow for identifying the effects of time-invariant variables, *education*, *age*, *male*, and *tenure* are excluded from this variant of the model. We include time dummies to control for changes in policy and the economy, yielding a two-way fixed-effects model. FE estimates confirm the main qualitative result of the preferred model of our previous analysis[16] rejecting the hypothesis of a negative effect of fear of unemployment on the demand for rehab (p-value 0.031, one-sided z-test). Rather, the coefficient of *job worries* is positive and statistically significant at a marginal level (p-value 0.062), supporting previous results from IV estimation.

[15] Excluding the potentially endogenous regressors from the instrumental equation, but keeping them as controls in the structural one, exerts virtually no effect on the IV results and tests presented in table 2. Results are available upon request.

[16] As we employ two different proxy variables for the self-perceived job insecurity, coefficient estimates are not directly comparable in quantitive terms. Yet, using *job worries* in place of *afraid of losing job* in the original cross-section IV-specification (model 2) yields a positive and highly significant coefficient (p-value 0.001). The marginal effect at the means of the covariates is 0.131, however it is significant only at a marginal level (p-value 0.090). Results are available upon request.

Table 3: **Fixed-Effects Panel Logit Estimates for Rehab Participation**

		Coefficient	S.E.
job worries		0.285*	0.153
year 2004		−0.094	0.215
year 2006		0.044	0.250
single		1.292	6.444
temporary contract		0.050	0.416
blue collar		0.263	0.446
company size:	*medium*	0.675	0.746
	large	−0.397	0.379
self assessed health:	*poor*	−0.971**	0.465
	satisfactory	−1.912***	0.492
	good	−2.353***	0.520
	very good	−2.138***	0.662
sports:	*every month*	−0.240	0.281
	seldom	−0.343	0.358
	never	0.323	0.263
grade of occupational disability		−0.003	0.007
income		0.174	0.187
# of observations		1,084	

Notes: *** significant at 1%; ** significant at 5%; * significant at 10%; S.E. bootstrapped standard errors; unemployed, self-employed, conscripts, civil servants, and government employees excluded; years 2003, 2004, and 2006 considered.

5 Conclusions

Our analysis addresses the current public debate in Germany that argues that the fear of unemployment is associated with less absenteeism, which in turn implies a reduced demand for rehab participation. Our empirical results clearly reject this hypothesis. In contrast, we find evidence for a positive effect of self-assessed job insecurity on the utilization of rehab measures. That is, individuals do not postpone rehab measures when the economy is weak, rather they shift their consumption from economic upturns to economic downturns. This is an important finding as the number of individuals who fear unemployment during recession is likely to exceed by far the number of those who actually lose their job. Hence, analyses that focus only on actual layoffs may yield an incomplete picture.

We have two possible explanations for our result: (i) individuals who know that they are going to lose their job have an incentive to participate in rehab when they are still employed rather than already laid off; (ii) individuals take into account their dispensability at the job, which is relatively high in a recession. We regard the latter as the most likely explanation. Yet, it might capture three different aspects: (i) employees may indeed feel responsible for the economic performance of their company; (ii) employees may try to please their employers by

timing rehab participation such that they meet employers' interest; (iii) employers may exert pressure on their employees to schedule their rehab participation when losses in output and sales are minimal.

The estimated marginal effect is 0.015. That is, the probability for participating in rehab would rise by 0.015 percentage points if the self-assessed probability of job loss increased by 1 percentage point. Considering that the average rate of rehab utilization is just 4 percent, rehab participation would increase by 0.375 percent if the self-assessed likelihood of job loss was on average 1 percentage point higher. In addition, our results confirm earlier empirical results with respect to the employed control variables, e.g., Cameron and Trivedi (1974). We checked our results for robustness and find that two-way fixed-effects estimation yields results that are qualitatively equivalent to those of the original cross-section approach.

However, several relevant issues still have to be addressed by further research. The present analysis cannot disentangle what might be the reason for individuals who fear job loss demanding more rehab measures. Is it because they presume their dismissal or do they consider the economic performance of their company? Given that they shift their rehabilitation leave to meet employers' interests, we do not know whether they do it voluntarily because of just feeling responsible for the company or whether employers interfere with their decisions.

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Appendix

Table A1: **Description of Variables**

Variable	Questions in the GSOEP Questionaire/ Item Description
rehab	'Did you have medical rehab last year?' Yes = 1; no = 0.
afraid of losing job	'How likely is it that one or more of the following occupational changes will take place in your life within the next two years?' Item: 'Lose your job.' 0-100%.
job worries	'What is your attitude towards the following areas - are you concerned about them?' Item: 'Your job security.' Yes = 1; no = 0. See Section 2.
income	Gross income or pension last month in 1,000 €.
education	Years of education= schooling + occupational training. No degree = 7 years; lower school degree = 9 years, etc.
male	Binary indicator: Male = 1; female = 0.
age	Age in years, survey year minus year of birth.
government employee	Binary Indicator. Government Employee = 1; other = 0.
single	Marital status: Single = 1; other = 0.
temporary contract	Duration of work contract. Unlimited period= 1; limited period = 0.
blue-collar	Type of occupation: 'Blue-collar' = 1; other = 0.
tenure	Number of years working for the current employer.
company size:	'How many people does the company employ as a whole?'
medium	Binary indicator: More than 5 people = 1; other = 0.
large	Binary indicator: More than 2000 people = 1; other = 0.
self-assessed health:	'How would you describe your current health?
very good	Yes = 1; no = 0.
good	Yes = 1; no = 0.
satisfactory	Yes = 1; no = 0.
poor	Yes = 1; no = 0.
bad	Yes = 1; no = 0.
sports:	'How often do you take part in active sport?'
every month	Yes = 1; no = 0.
seldom	Yes = 1; no = 0.
never	Yes = 1; no = 0.
grade of occupational disability	'Are you legally classified as handicapped or capable of gainful employment only to a reduced extent due to medical reasons? What is the extent of this capability reduction or handicap according to the most recent diagnosis?' 0-100%.
county unemployment rate	See Section 3.
change in county unemployment	See Section 3.

Table A2: **Descriptive Statistics to IV Probit Regression**

Variable		Mean	Std. Dev.	Min	Max
rehab		0.038	0.192	0	1
afraid of losing job		25.837	26.118	0	100
single		0.262	0.440	0	1
education		12.104	2.505	7	18
age		40.674	11.148	17	82
male		0.567	0.496	0	1
temporary contract		0.024	0.152	0	1
blue collar		0.374	0.484	0	1
tenure		9.436	9.229	0	49.8
company size:	*medium*	0.200	0.400	0	1
	large	0.900	0.300	0	1
self-assessed health:	*poor*	0.086	0.281	0	1
	satisfactory	0.297	0.457	0	1
	good	0.498	0.50	0	1
	very good	0.107	0.309	0	1
sports:	*every month*	0.242	0.428	0	1
	seldom	0.099	0.298	0	1
	never	0.363	0.481	0	1
grade of occupational disability		2.366	11.190	0	100
income		2.402	1.941	0	36
county unemployment rate		10.662	4.938	4.2	27.3
change in county unemployment		0.094	0.076	-0.5	1.1

Notes: unemployed, self-employed, conscripts, and civil servants excluded; # of obs. 5,883; year 2003 considered.

Table A3: **Descriptive Statistics to Fixed Effects Logit Regression**

Variable		Mean	Std. Dev.	Min	Max
rehab		0.399	0.49	0	1
job worries		0.686	0.464	0	1
year 2004		0.359	0.48	0	1
year 2006		0.299	0.458	0	1
single		0.194	0.395	0	1
temporary contract		0.018	0.135	0	1
blue collar		0.426	0.495	0	1
company size:	*medium*	0.949	0.22	0	1
	large	0.233	0.423	0	1
self-assessed health:	*poor*	0.219	0.414	0	1
	satisfactory	0.373	0.484	0	1
	good	0.323	0.468	0	1
	very good	0.045	0.208	0	1
sports:	*every month*	0.074	0.262	0	1
	seldom	0.036	0.186	0	1
	never	0.126	0.332	0	1
grade of occupational disability		7.687	19.206	0	100
income		2.576	1.725	0.1	13.5

Notes: unemployed, self-employed, conscripts, civil servants, and government employees excluded; # of obs. 1,084; years 2003, 2004, and 2006 considered.