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## The role of job satisfaction and local labor market conditions for the dissolution of worker-job matches

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Lehrstuhl für VWL, insbes. Arbeitsmarkt- und Regionalpolitik  
Professor Dr. Claus Schnabel

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**The role of job satisfaction and local labor  
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TINA HINZ AND DANIEL S. J. LECHMANN

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# The role of job satisfaction and local labor market conditions for the dissolution of worker-job matches\*

Tina Hinz<sup>a</sup> and Daniel S. J. Lechmann

*Abstract:* This paper scrutinizes the effect of job satisfaction on labor turnover. We use German SOEP data to estimate a multinomial logit model with random effects for the probability of a worker-job separation. In line with the previous literature, we find a negative relationship between job satisfaction and separations. We show that this relationship is entirely driven by less satisfied individuals, as the separation probability of more satisfied workers does not vary with job satisfaction. We also find that even among the most dissatisfied individuals, most workers remain in their current jobs. Finally, we show that the effect of job satisfaction varies with both local labor market conditions and the kind of separation under consideration (job-to-job or job-to-non-employment).

*Zusammenfassung:* Der Artikel untersucht den Zusammenhang von Arbeitszufriedenheit und der Auflösung von Arbeitsverhältnissen. Wir verwenden Daten des Sozioökonomischen Panels (SOEP) für Deutschland und schätzen multinomiale Logitmodelle mit zufälligen Effekten, um die Wahrscheinlichkeit der Auflösung eines Arbeitsverhältnisses zu untersuchen. In Übereinstimmung mit der Literatur finden wir einen negativen Zusammenhang zwischen der Arbeitszufriedenheit und der Auflösung eines Arbeitsverhältnisses. Wir zeigen, dass dieser Zusammenhang vollständig durch weniger zufriedene Individuen verursacht wird, da die Auflösungswahrscheinlichkeit bei zufriedeneren Arbeitnehmern nicht mit deren Arbeitszufriedenheit variiert. Allerdings verharren selbst die meisten der sehr unzufriedenen Arbeitnehmer in deren aktuellen Arbeitsverhältnissen. Wir zeigen, dass der Effekt der Arbeitszufriedenheit auf die Auflösung des Arbeitsverhältnisses sowohl mit den regionalen Arbeitsmarktbedingungen als auch mit der Art der Auflösung (Wechsel in anderes Beschäftigungsverhältnis oder in Nichterwerbstätigkeit) zusammenhängt.

JEL classification: J28, J63, R23

Keywords: Germany, job satisfaction, labor market tightness, labor turnover, SOEP

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## 1. INTRODUCTION

Employee turnover, i.e., the dissolution of worker-job matches, is of crucial importance in the labor market. On the one hand, worker-job separations are associated with substantial costs for firms such as the costs of hiring and firing, training new employees, decreased production during the settling-in period of new employees, and lost production while vacancies are not immediately filled (as already noted by Douglas 1918). On the other hand, employee turnover is desirable to some extent for reasons of labor market efficiency. First, since the quality of worker-job matches is unknown *ex ante*, turnover is necessary so as to match workers with jobs that suit their abilities and preferences best (cf. Eberle 1919). Second, a low degree of worker mobility provides firms monopsonistic market power which results in lower wages, employment, and production (see Manning 2003). For these reasons, it is important for managers and policymakers alike to understand why and when worker-job separations occur.

Not surprisingly then, there is a large literature that studies the determinants of employee turnover. This literature shows that job satisfaction is a central determinant of quits (see, e.g., the survey by Hom et al. 2017 and the meta-analysis by Griffeth et al. 2000). However, not being satisfied with one's job is at most a necessary condition for quitting the job. For low job satisfaction actually causing a worker to quit, better alternatives need to be available and affordable (in terms of switching costs). Consequently, the *effect* of job satisfaction is expected to vary with the (local) availability of alternative jobs (cf., e.g., Muchinsky & Morrow 1980). At the same time, labor market conditions may affect the *level* of satisfaction as well (see, e.g., Clark et al. 2010), for instance, because workers may be less satisfied if they expect to lose their jobs due to bad labor market conditions. In other words, labor market conditions are both a moderator and a confounder of the relationship between job satisfaction and turnover. For these reasons, it appears crucial to account for (local) labor market conditions and their interaction with job satisfaction to identify the role of job satisfaction for employee turnover.

Previous studies mostly look separately at either the effect of job satisfaction (see, e.g., Green 2010, Cornelißen 2009, Lévy-Garboua et al. 2007, Clark et al. 1998) or the effect of labor market conditions (see, e.g., Bleakley & Lin 2012, Finney & Kohlhase 2008) on turnover. Two early meta-analyses that compare studies on the effect of job satisfaction for different years come to inconsistent conclusions about the correlation between the unemployment rate and the magnitude of the job satisfaction-job change relationship (see Carsten & Spector 1987, Shikiar & Freudenberg 1982). In a study using US data from 1980 to 1992, Trevor (2001) directly investigates the interaction

effect between job satisfaction and the availability of alternative jobs on turnover. Contrary to expectations, he does not find evidence that the negative effect of job satisfaction on voluntary quits is more pronounced if the local unemployment rate is low. Taken as a whole, up to now, the scarce empirical evidence on whether and to what extent (local) labor market conditions do moderate the effect of job satisfaction on quits seems still obscure.

There are some further limitations in the extant literature that we want to address. First, the literature most often treats job satisfaction like a cardinal variable although it is an ordinal variable measured, for instance, on an 11-point scale. Restricting a change in job satisfaction from 1 to 2 to signify the same change as from 8 to 9 misses that the effect of job satisfaction could be non-linear. Indeed, Green (2010), using just three categories of job satisfaction, finds that only individuals with low job satisfaction have statistically significantly higher quit rates than those with medium satisfaction, whereas there is no statistically significant difference between those with medium and high job satisfaction. Such knowledge is important because it shows for which workers measures that change job satisfaction are most effective (or effective at all).

Second, the literature mostly uses a dichotomous quitting variable where one category signifies (“voluntary”) quits and the other one may contain such different events as staying in the old job, “involuntary” job-to-job changes, and transitions to unemployment or non-employment. Although this approach may not be wrong per se, it does generate a quite blurry picture of employee turnover. At the same time, omitting certain events, for instance transitions to unemployment and non-employment, provides only an incomplete picture of employee turnover and may even result in sample selection bias.<sup>1</sup> A more instructive approach is using an outcome variable that distinguishes explicitly between different kinds of separations. In the only study we are aware of doing so, Sousa-Poza & Sousa-Poza (2007) distinguish between job-to-job transitions and job-to-non-employment transitions. Using Swiss data, they find that while job-to-job mobility depends on job satisfaction, job-to-non-employment transitions appear not to.

Against this background, we provide new up-to-date estimates of the effect of job satisfaction on worker-job separations for Germany using panel data from 2000 to 2015

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<sup>1</sup> Transitioning to non-employment is a potential outcome of low job satisfaction. Selecting the sample based on the outcome (by excluding transitions to non-employment) results in endogenous selection bias (see, e.g., Elwert & Winship 2014).

(for results up to 2003, see Cornelißen 2009 and Lévy-Garboua et al. 2007).<sup>2</sup> Our paper contributes to the literature mainly in the following ways. First, we scrutinize the interaction of job satisfaction, local labor market conditions, and separations. In particular, by using information on the labor market tightness in 141 labor market regions in Germany, we investigate whether and to what extent the effect of job satisfaction on separations varies with the availability of alternative jobs. Second, we check to what extent Green’s (2010) finding of a non-linear effect of job satisfaction on separations is robust to using a more flexible specification with 11 categories of job satisfaction, a different data set for another country, and the distinction of different kinds of separations. Third, we want to obtain a clearer and more encompassing picture of employee turnover. Therefore, like Sousa-Poza & Sousa-Poza (2007), we distinguish between job-to-job moves and moves out of employment. In doing so and at the same time taking account of local labor market conditions, we are able to ascertain whether low job satisfaction can also result in moves out of employment, especially when labor market conditions are unfavorable and, as a result, changing jobs may not be possible (or very costly at least).

## 2. THEORETICAL BACKGROUND AND ESTIMATION STRATEGY

The economic literature considers worker mobility as an investment decision (see, e.g., Ehrenberg & Smith 2006: 324). A worker quits a job if the present net value of doing so exceeds the costs of the move, i.e., if

$$\sum_{t=1}^T \frac{U_{a,t} - U_{s,t}}{(1+d)^t} > C$$

where  $U_{s,t}$  and  $U_{a,t}$  denote the utility of staying and choosing an alternative, respectively, in period  $t$ ,  $T$  the length of time until retirement,  $d$  the rate of discount, and  $C$  switching costs. Therefore, the probability of quitting in the next period  $P(\text{quit})_{t+1}$  is

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<sup>2</sup> Our interpretation of our results as “effects” is based on the identifying assumption that we condition by and large on all variables that simultaneously affect job satisfaction and separations. If we missed important determinants of both job satisfaction and separations, our findings still show how you can use job satisfaction to predict separations and identify unstable employment relationships under different labor market conditions, which may be interesting for firms on its own.

$$P(\text{quit})_{t+1} = f(U_{a,t} - U_{s,t}, T, d, C)$$

According to Lévy-Garboua & Montmarquette (2004), job satisfaction  $JS$  is a measure of relative utility, i.e., it reflects individuals' assessment of their current job compared to some alternative. For this reason, we can replace  $U_{a,t} - U_{s,t}$  by  $JS$ . The time until retirement  $T$  is basically a function of age. Switching costs  $C$  on the one hand depend on individual characteristics. In particular, the disutility from moving may be higher for married individuals, parents, and home owners. On the other hand, we expect switching costs to be higher when the labor market conditions  $LMC$  in the local labor market are unfavorable. For instance, workers may have to move farther afield to take on a new job when unemployment is high and vacancies are scarce. They also need to search harder to find an alternative job in the first place. We therefore write

$$P(\text{quit})_{t+1} = f(JS, \text{age}, d, \text{homeowner}, \text{married}, \text{kids}, LMC)$$

In principle, the effect of job satisfaction on quitting should be negative, i.e., more satisfied workers are less likely to quit. However, as stated above, this effect presumably very much depends on local labor market conditions. For instance, if the labor market conditions are very unfavorable so that there are hardly any alternative job opportunities, the probability of changing jobs should be low throughout regardless of the level of job satisfaction. On the other hand, the probability of moving out of employment should still vary with the level of job satisfaction and even more so, given that this kind of move would be the only possibility to escape an unbearable job situation. These considerations once again point to the importance of taking both labor market conditions and different kinds of quits into account when studying the effect of job satisfaction on quits.

We do so by estimating a multinomial logit model where the dependent variable  $Y$  takes on three different values for the respective changes in employment states (job-to-job, job-to-non-employment, no separation) and the independent variables include the interaction term of job satisfaction and local labor market conditions. Given the theoretical considerations above, the vector of control variables  $x$  includes the individual's age, marital and parental status, and homeowner status.

The considerations above apply to a worker's decision to quit. But separations may also take place for other reasons, in particular, employers may decide to terminate the employment relationship. Therefore, we additionally control for a set of variables that may influence the incentives and the possibility of employers to dismiss workers,

namely, tenure, firm size, and having a fixed-term or temporary employment contract. We also include standard socio-demographic variables such as sex and education. Finally, we include an individual-specific random effect which ought to take account of the unobserved individual rate of discount  $d$  and other unobserved preferences that may induce within-individual correlation.<sup>3</sup> Hence, we estimate the parameters in

$$P(Y_{it+1} = j) = \frac{\exp(\alpha_{1j}JS_{it} + \alpha_{2j}LMC_{it} + \alpha_{3j}(JS * LMC)_{it} + \beta_j^T \mathbf{x}_{it} + u_{ij})}{\sum_{k=1}^3 \exp(\alpha_{1k}JS_{it} + \alpha_{2k}LMC_{it} + \alpha_{3k}(JS * LMC)_{it} + \beta_k^T \mathbf{x}_{it} + u_{ik})}$$

### 3. DATA AND DESCRIPTIVE EVIDENCE

To study the consequences of job satisfaction and local labor market conditions for the change of employment state, we use data from the German Socio-Economic Panel (SOEP 2017). The SOEP is an annual panel data survey of private households in Germany with detailed information on individual characteristics, (un)employment status, job satisfaction, and other work-related characteristics (see Wagner et al. 2007). Our analysis period covers the years 2001-2015. The analysis sample includes individuals aged 18 to 65 who are blue- or white-collar workers, marginally employed workers, and non-employed individuals (who may either be registered unemployed or individuals out of the labor force), i.e., we exclude apprentices, civil servants and self-employed individuals. After dropping observations with missing information on key variables, we obtain 105,619 person-year observations for 22,416 individuals.

We consider three different kinds of separations: (i) job-to-job move, (ii) job-to-non-employment move, and (iii) no separation. We identify these different kinds of separations by comparing job tenure reported in the subsequent survey wave  $t+1$  with the time elapsed between the interviews of the subsequent and the current survey  $t$  in the following way. For all kinds of separations, the individual needs to be employed in  $t$ . We assign (i) a job-to-job move if an individual has a job tenure in  $t+1$  that is shorter than the time elapsed between the current and the subsequent interview. For instance, if job tenure amounts to three months in  $t+1$  and the time period between both interviews amounts to eleven months, the individual must have changed jobs between  $t$  and  $t+1$  at least once. If, on the other hand, job tenure exceeds the time elapsed between the interviews, the individual must have been employed at the same employer, so we assign (iii) no separation. If an individual is employed in  $t$  but not

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<sup>3</sup> We cannot use fixed effects estimation because of feedback effects. Changing jobs affects future job satisfaction (see, e.g., Chadi & Hetschko 2018), which violates the strict exogeneity assumption.



employed in  $t+1$ , this individual has (ii) a job-to-non-employment move between  $t$  and  $t+1$ .

We refrain from distinguishing between “voluntary” quits and “involuntary” separations. First, employers can, at least in principle, always produce “voluntary” quits by worsening the working conditions of employees (cf. Böckerman & Ilmakunnas 2009). Second, “labor turnover is always efficient or joint wealth maximizing [...] The firm and worker dissolve their employment match if and only if their total value when separated exceeds the combined value of the match” (McLaughlin 1991: 3). In other words, if it were possible to redistribute the value of the match to satisfy both, the worker and the employer, no separation would occur. Therefore, from a theoretical point of view, it does not seem particularly useful to distinguish empirically who initiated the separation.

Using this classification of separations, the data show that for the vast majority, namely, 88% of observations, no separation takes place from  $t-1$  to  $t$  (cf. Table 1). Where separations do take place, they divide about equally between job-to-job moves and job-to-non-employment moves with 6% of observations each.

The SOEP provides individuals’ job satisfaction on an 11-point scale from 0 (completely dissatisfied) to 10 (completely satisfied). Table 1 suggests that most workers are fairly satisfied with their jobs. The majority report a job satisfaction of 7 or higher, with 8 being the category most often reported (about 27.7% of observations). Only about 6.2% of individuals report a job satisfaction of 4 or less.

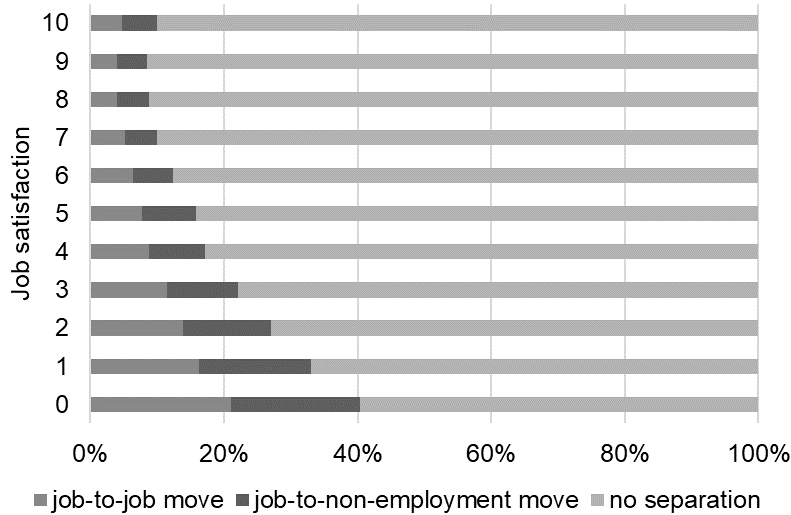
Figure 1 shows descriptively how job satisfaction in the current period  $t$  is related to the different kinds of separations in the period  $t+1$ . As expected, the share of movers, both to a new job or to non-employment, varies by individuals’ job satisfaction. More than 30% of those who are extremely dissatisfied (categories 0 or 1) either moved to another employer or are not employed in the subsequent period. At the other end of the distribution (categories 7 to 10), separation rates are only about 10%. These figures confirm the negative association between job satisfaction and turnover found in the literature. They also clearly illustrate that being dissatisfied is by no means a sufficient condition for quitting as the majority even of those who are extremely dissatisfied with their jobs are nevertheless still working in that job a period later. We suspect that local labor market conditions also play a role for the decision to quit.

**Table 1:** Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Change in labor market state				
Job to job	0.057	0.232	0	1
Job to non-employment	0.058	0.234	0	1
No separation	0.884	0.320	0	1
Job satisfaction				
0	0.005	0.069	0	1
1	0.007	0.081	0	1
2	0.018	0.131	0	1
3	0.033	0.179	0	1
4	0.040	0.196	0	1
5	0.103	0.304	0	1
6	0.106	0.308	0	1
7	0.197	0.398	0	1
8	0.277	0.448	0	1
9	0.142	0.349	0	1
10	0.073	0.259	0	1
Male (0/1)	0.516	0.500	0	1
Age	43.243	10.391	18	65
Married (0/1)	0.645	0.478	0	1
Kids younger than 18 (0/1)	0.426	0.494	0	1
Fixed term contract (0/1)	0.089	0.285	0	1
Temporary employment (0/1)	0.022	0.147	0	1
Education				
Less than intermediate general qualification	0.277	0.447	0	1
Intermediate or maturity qualification	0.462	0.499	0	1
Tertiary education	0.262	0.440	0	1
Homeowner (0/1)	0.538	0.499	0	1
Tenure	11.524	10.117	0	51.417
Firm Size				
<20	0.221	0.415	0	1
20 - 99	0.201	0.401	0	1
100-199	0.098	0.298	0	1
>200	0.480	0.500	0	1
Labor market tightness (LMT)	0.128	0.090	0.010	0.788
ln(LMT)	-2.335	0.723	-4.632	-0.349
Unemployment rate (in %)	8.208	3.765	2.010	22.762

Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed.  
Observations=105,619.

Data: SOEP v32.1 (2017), 2001-2015.



**Figure 1:** Kinds of separations in t+1 by job satisfaction of period t

Data: SOEP v32.1 (2017), 2001-2015.

To obtain the labor market conditions of each individuals' local labor market, we proceed as follows. First, based on the place of residence, we assign each individual to a local labor market. The classification of local labor markets follows Kosfeld & Werner (2012) who use commuter flows (rather than just administrative borders) to define 141 distinct local labor market regions in Germany. By that classification, individuals' place of residence and workplace are in the same region (with very few exceptions).<sup>4</sup>

Second, for every labor market region, we calculate the logarithm of the respective labor market tightness  $\ln(LMT)$ , where LMT is the ratio of the number of vacancies to unemployed. The number of vacancies (unemployed) is the yearly average of the registered vacancies (registered unemployed) at the Federal Employment Agency in each region (see BA Statistik 2014, 2015, 2016, 2017).<sup>5</sup> Figure A1.1 in the Appendix 1 displays the pooled average of the labor market tightness in the different regional labor markets in Germany.

<sup>4</sup> This classification is common in regional labor market studies with German data (see, e.g., Görlitz & Rzepka 2017, Rzepka & Tamm 2016, Hirsch et al. 2016).

<sup>5</sup> The data on registered vacancies is adjusted for structural breaks of the statistical recordings in 2010 by the BA Statistik (cf. Hartmann & Reimer 2010). Note that firms do not report all vacancies at the Federal Employment Agency.

#### 4. ECONOMETRIC ANALYSIS

We present the results of our econometric analysis in three steps. In a first step, Table 2 reports the estimates of the multinomial logit model with random effects discussed above. To investigate whether and to what extent the effect of job satisfaction on separations is non-linear and varies with labor market conditions, the model includes 11 dummies, one for each category of job satisfaction, and interaction terms of each of these dummies with  $\ln(LMT)$ . However, the coefficient estimates are hard to interpret in terms of effect sizes and, since this is a non-linear model, we cannot even interpret the signs and statistical significance of the interaction terms (see, e.g., Karaca-Mandic et al. 2012). Therefore, in a second step, we use the estimates of the multinomial logit model to predict separation probabilities by job satisfaction (presented in Figure 2). In a third step, we use these estimates to calculate the marginal effects of job satisfaction conditional on different values of LMT (presented in Figures 3a and 3b).<sup>6</sup>

**Table 2:** Estimates of multinomial logit model with random effects

Dependent variable: Separations in t+1 (ref.: no separation)	job to job		job to non-employment	
	Coef.	Std. Err.	Coef.	Std. Err.
Job satisfaction (ref.: 8)				
0	1.825 ***	(0.462)	1.134 **	(0.508)
1	2.379 ***	(0.414)	1.466 ***	(0.438)
2	1.815 ***	(0.275)	1.367 ***	(0.296)
3	2.142 ***	(0.226)	1.239 ***	(0.242)
4	1.355 ***	(0.227)	0.505 **	(0.242)
5	1.004 ***	(0.168)	0.603 ***	(0.172)
6	0.850 ***	(0.173)	0.303 *	(0.183)
7	0.391 **	(0.153)	-0.160	(0.162)
9	-0.420 **	(0.181)	-0.193	(0.180)
10	-0.237	(0.222)	-0.007	(0.225)
$\ln(LMT)$	0.124 ***	(0.044)	-0.189 ***	(0.042)
Job satisfaction * $\ln(LMT)$				
0 * $\ln(LMT)$	-0.203	(0.191)	-0.375 *	(0.204)
1 * $\ln(LMT)$	0.166	(0.174)	-0.113	(0.173)
2 * $\ln(LMT)$	0.075	(0.112)	-0.006	(0.116)
3 * $\ln(LMT)$	0.305 ***	(0.095)	0.059	(0.095)
4 * $\ln(LMT)$	0.118	(0.093)	-0.097	(0.093)
5 * $\ln(LMT)$	0.044	(0.069)	-0.010	(0.067)
6 * $\ln(LMT)$	0.089	(0.072)	-0.007	(0.072)
7 * $\ln(LMT)$	0.017	(0.064)	-0.077	(0.064)

<sup>6</sup> Table A1.1 in the Appendix 1 shows the marginal effects for the control variables.

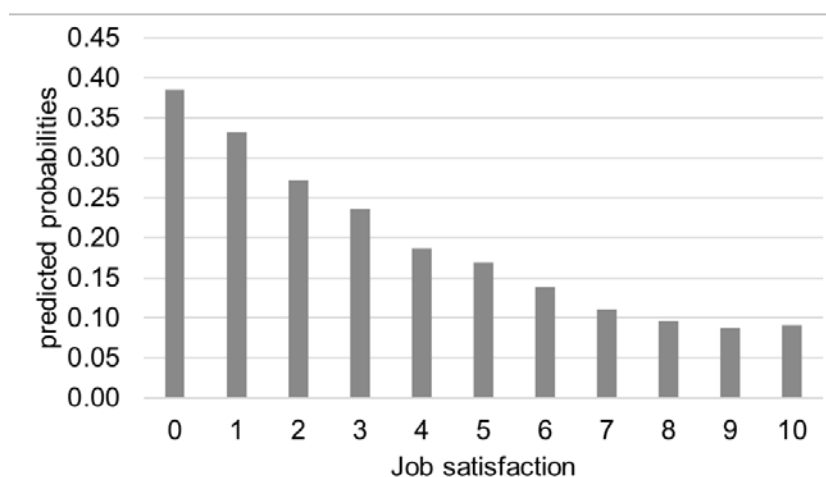
	9 * ln(LMT)	-0.119	(0.075)	-0.033	(0.072)
	10 * ln(LMT)	-0.097	(0.093)	0.047	(0.092)
Male (0/1)		0.140 ***	(0.034)	-0.554 ***	(0.039)
Age		-0.028 ***	(0.002)	0.000	(0.002)
Married (0/1)		-0.064 *	(0.037)	0.039	(0.039)
Kids younger than 18 (0/1)		0.031	(0.034)	-0.390 ***	(0.036)
Education (ref. intermediate or maturity qualification)					
Less than intermediate general qualif.		-0.126 ***	(0.039)	0.399 ***	(0.041)
Tertiary education		0.074 *	(0.039)	-0.260 ***	(0.047)
Homeowner (0/1)		-0.093 ***	(0.032)	-0.278 ***	(0.035)
Tenure		-0.089 ***	(0.003)	-0.024 ***	(0.002)
Fixed term contract (0/1)		0.967 ***	(0.039)	1.232 ***	(0.043)
Temporary employment (0/1)		0.728 ***	(0.066)	0.682 ***	(0.074)
Firm Size (ref. >200)					
	<20	0.613 ***	(0.039)	0.541 ***	(0.043)
	20 - 99	0.257 ***	(0.041)	0.272 ***	(0.044)
	100-200	0.130 **	(0.055)	0.143 ***	(0.056)
Industry (11 dummies)			yes		yes
Constant		-1.721 ***	(0.129)	-3.431 ***	(0.136)
<i>F-Test: Job sat. (ref.: 8) * ln(LMT)</i>					
chi <sup>2</sup> (10)		24.100 ***		7.580	
Random part					
var( $u_{ij}$ )		0.374	(0.042)	1.132	(0.079)
cov( $u_{i,job-to-job}$ , $u_{i,j-to-non-employment}$ )		0.272 ***	(0.045)		
Observations				105,619	
Persons				22,416	

Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed. Significance level: \* $<0.1$ , \*\* $<0.05$ , \*\*\* $<0.01$ .

Data: SOEP v32.1 (2017), 2001-2015.

Besides the coefficient estimates, Table 2 includes the estimated variance and covariance values for the random part of the model. The variance of the random effect for job-to-non-employment moves is somewhat larger than the variance for job-to-job moves, which implies that unobserved factors are more important for explaining the propensity to move to non-employment than to switch jobs. Also, there is a positive correlation between the random effects for job-to-job and job-to-non-employment moves, which suggests that those who are more likely to have a job-to-job move because of unobserved preferences are also more likely to have a job-to-non-employment move. For instance, having a low unobserved individual discount rate likely increases the probability of either separation (job-to-job and job-to-non-employment) over no separation.

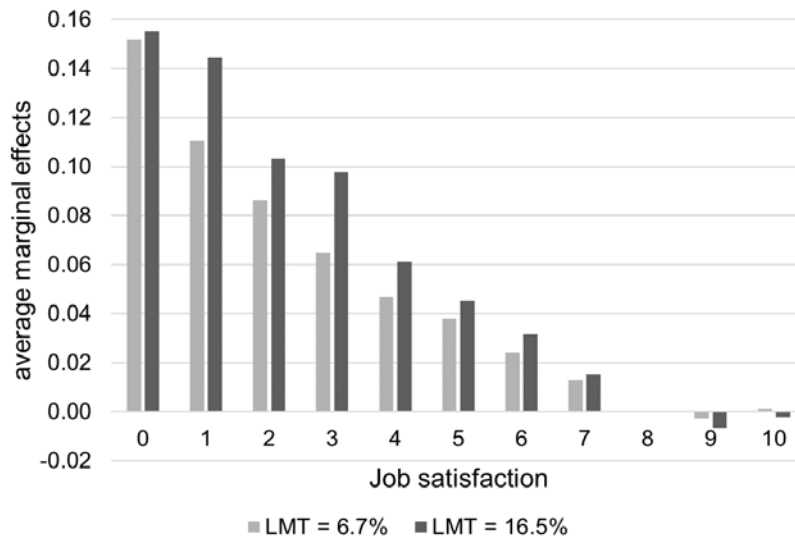
Figure 2 displays the predicted probability of separation by previous job satisfaction. As in the descriptive analysis in Figure 1, we see a negative relationship between job satisfaction and separations. The figure also clearly shows that the relationship between separations and job satisfaction is non-linear. For instance, the separation probability amounts to 38.5% for a job satisfaction of 0 and to 33.2% if job satisfaction is 1 – a difference of more than 5 percentage points. In contrast, there is effectively no difference in the separation probability between different categories of job satisfaction within the group of highly satisfied individuals (i.e., job satisfaction of 7 or higher). In other words, a change in job satisfaction by one category does not seem to matter for separations of satisfied workers but makes a big difference for dissatisfied workers. These results corroborate Green's (2010) findings, which are based on just three categories of job satisfaction and one kind of separation.



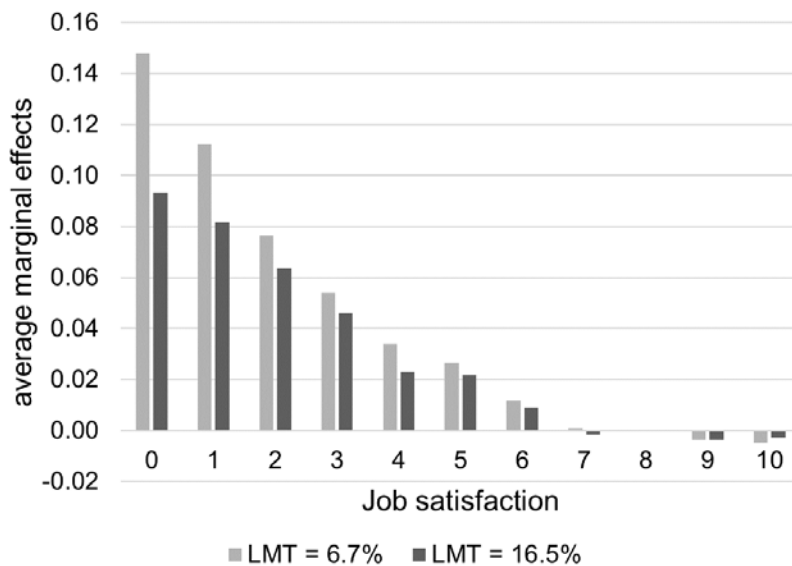
**Figure 2:** Predicted probabilities of separation by job satisfaction

Notes: based on estimates in Table 2.  
Data: SOEP v32.1 (2017), 2001-2015.

Figures 3a and 3b show the marginal effects of job satisfaction on both kinds of separations conditional on two different values of LMT, namely, 6.7% and 16.5%, corresponding to the 25% and 75% quartiles of the distribution of  $\ln(\text{LMT})$ . A LMT of 6.7% (16.5%) indicates that, arithmetically, there are vacancies for 6.7% (16.5%) of the unemployed in the respective region and year. Therefore, the former reflects relatively unfavorable labor market conditions, whereas the latter reflects a more favorable labor market situation.



**Figure 3a:** Average marginal effects of job satisfaction on job-to-job move by local labor market condition



**Figure 3b:** Average marginal effects of job satisfaction on job-to-non-employment move by local labor market condition

Notes: Reference category: job satisfaction = 8. Labor market tightness (LMT) is the regional ratio of vacancies to unemployed. Figures based on estimates reported in Table 2.

Data: SOEP v32.1 (2017), 2001-2015.

Figure 3a shows that the effect of job satisfaction on job-to-job moves tends to be more pronounced when labor market conditions are better. For instance, having a job satisfaction of 1 instead of 8 (reference category) increases the probability of changing jobs by roughly 14 percentage points when the regional labor market is in a good situation but only by about 11 percentage points in a worse labor market situation. If we look at job-to-non-employment moves instead (see Figure 3b), exactly the opposite

seems to be the case, i.e., the effect of job satisfaction tends to be more pronounced when labor market conditions are worse. Having a job satisfaction of 1 instead of 8 increases the separation probability to non-employment by about 8 percentage points when the regional labor market is in a good situation compared to about 11 percentage points in a unfavorable labor market situation. Jointly, these findings draw a reasonable and nuanced picture of the quitting behavior of dissatisfied workers. If there are plenty alternatives, some (but not nearly all) of these workers tend to change jobs, but if that is not feasible because of an unfavorable labor market situation, they rather switch to non-employment. Additionally, dissatisfied workers may also be the first to be dismissed in an economic downturn – after all, these workers may be the less productive ones (see, e.g., Böckerman & Ilmakunnas 2012).

This picture is in contrast to Sousa-Poza & Sousa-Poza (2007) who do not find an effect of job satisfaction on transitions to non-employment. Two differences between their study and ours that may (partly) explain the different findings are that they use Swiss data and that they do not include random effects.

Our findings do not change if we conduct the following robustness checks: Using the regional unemployment rate instead of the labor market tightness, excluding Eastern German regions, splitting the sample by sex, or excluding workers older than 50 years (as retirement considerations may influence their quitting behavior). Also, including year dummies, which eliminates a lot of variation in the labor market tightness, does not change our insights. Appendix 2 comprises the results of these robustness checks.

## 5. CONCLUSIONS

This paper investigates heterogeneities and non-linearities in the effect of job satisfaction on employee turnover. Using German SOEP data, we have found that the relationship between job satisfaction and separations is distinctly non-linear and depends on both the regional labor market conditions and the kind of separation under consideration. In particular, our results indicate that the negative relationship between job satisfaction and turnover found in the extant literature is entirely driven by less satisfied individuals as there is no variation in the separation probability over different levels of job satisfaction among more satisfied workers. This finding implies that it is ineffective to increase the job satisfaction of satisfied workers even more. Rather, firms interested in decreasing turnover need to identify dissatisfied workers and enhance their working conditions, resulting in better worker-job matches. As this insight rests



upon the non-linear treatment of job satisfaction, we think that future research would profit from no longer treating job satisfaction as a linear variable.<sup>7</sup>

We have also found that regional labor market conditions moderate the effect of job satisfaction on separations, but they do so in opposite directions depending on the kind of separation. While the effect of job satisfaction on job-to-job moves is more pronounced when the labor market is in a good state, the effect on job-to-non-employment moves is more pronounced when the labor market situation is unfavorable – a result well in line with theoretical considerations.

Finally, our results illustrate that being dissatisfied is not at all sufficient for quitting a job. Even among extremely dissatisfied workers, the majority still work in the same job in consecutive periods. This finding may indicate that some fairly inefficient worker-job matches persist in the German labor market. Therefore, lowering switching costs could be an advisable policy. For instance, the government (or the potential new employer) could subsidize the costs of relocating for job switchers. Since our results have shown that dissatisfaction can lead to non-employment when alternative jobs are hard to find, such policy could be especially useful when the economy is in a downturn.

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<sup>7</sup> Likewise, Schröder & Yitzhaki (2017) show that the cardinal treatment of job satisfaction can lead to misleading conclusions when job satisfaction is the dependent variable.

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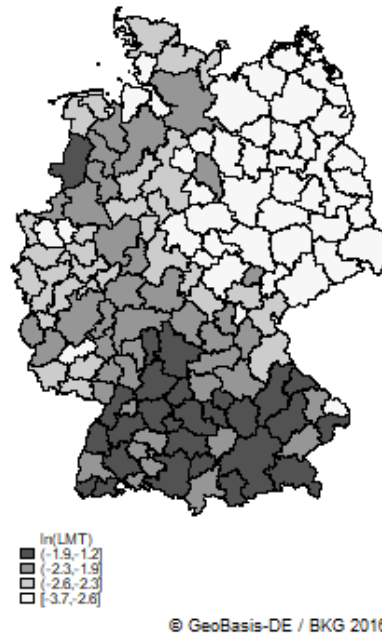
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## APPENDIX 1



**Figure A1.1:** Labor market tightness (ln(LMT)) in German regions.

Notes: Labor market tightness is the regional ratio of vacancies to unemployed and averaged over the analysis period.

Data: SOEP v32.1 (2017), 2001-2015.

**Table A1.1:** Average marginal effects of control variables

Dependent variable: Separations in t+1 (ref.: no separation)	job to job		job to non-employment	
	dy/dx	Std. Err.	dy/dx	Std. Err.
Male (0/1)	0.009 ***	(0.002)	-0.024 ***	(0.002)
Age	-0.001 ***	(0.000)	0.000	(0.000)
Married (0/1)	-0.003 *	(0.002)	0.002	(0.002)
Kids younger than 18 (0/1)	0.003 **	(0.002)	-0.017 ***	(0.002)
Education (ref. intermediate or maturity qualification)				
Less than intermediate general qualification	-0.007 ***	(0.002)	0.020 ***	(0.002)
Tertiary education	0.005 ***	(0.002)	-0.010 ***	(0.002)
Homeowner (0/1)	-0.003 **	(0.001)	-0.011 ***	(0.002)
Tenure	-0.004 ***	(0.000)	-0.001 ***	(0.000)
Fixed term contract (0/1)	0.039 ***	(0.002)	0.048 ***	(0.002)
Temporary employment (0/1)	0.031 ***	(0.003)	0.026 ***	(0.003)
Firm Size (ref. >200)				
<20	0.027 ***	(0.002)	0.021 ***	(0.002)
20 - 99	0.010 ***	(0.002)	0.010 ***	(0.002)
100-199	0.005 **	(0.002)	0.005 **	(0.002)

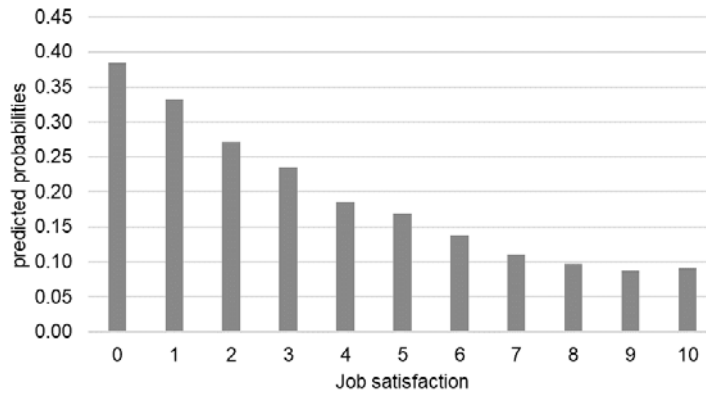
Notes: Marginal effects based on estimates of multinomial logit model with random effects (see Table 2). Significance level: \* < 0.1, \*\* < 0.05, \*\*\* < 0.01.

Data: SOEP v32.1 (2017), 2001-2015.

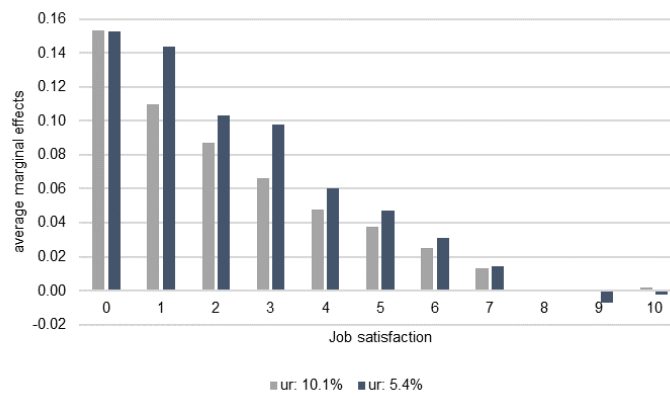
APPENDIX 2 ROBUSTNESS ANALYSES

**Figure A2.1** Using Unemployment rate as measure for LMC

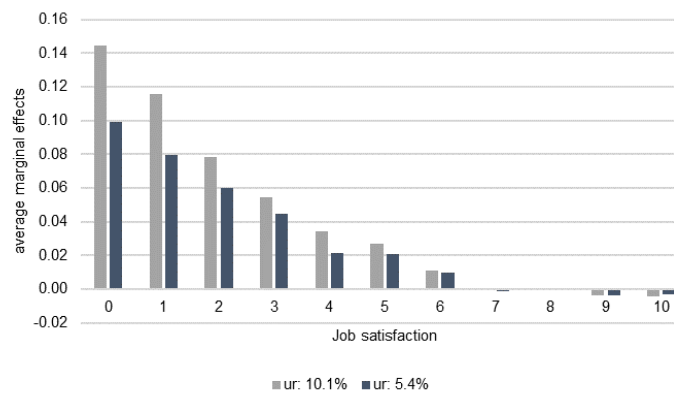
**Figure A2.1a** Predicted probabilities of separation by job satisfaction



**Figure A2.1b** Job-to-job move by job satisfaction and local labor market condition



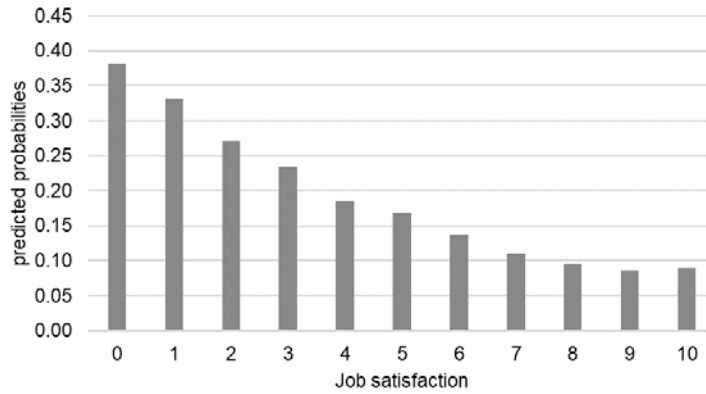
**Figure A2.1c** Job-to-non-employment move by job satisfaction and local labor market condition



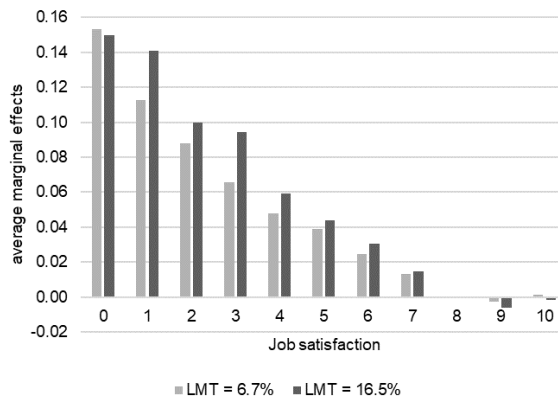
Notes: Unemployment rate (ur) is the regional share of unemployed. Observations: 105,619 Persons: 22,416  
 Data: SOEP v32.1 (2017), 2001-2015.

**Figure A2.2** Including year dummies in the regression

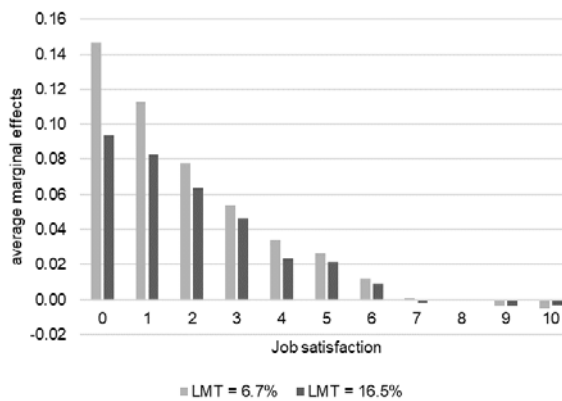
**Figure A2.2a** Predicted probabilities of separation by job satisfaction



**Figure A2.2b** Job-to-job move by job satisfaction and local labor market condition



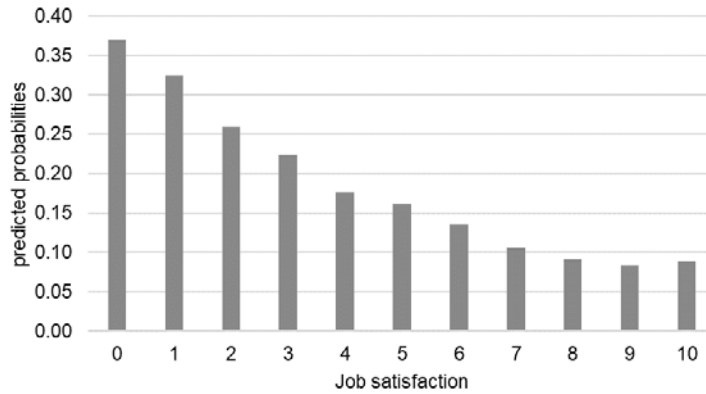
**Figure A2.3c** Job-to-non-employment move by job satisfaction and local labor market condition



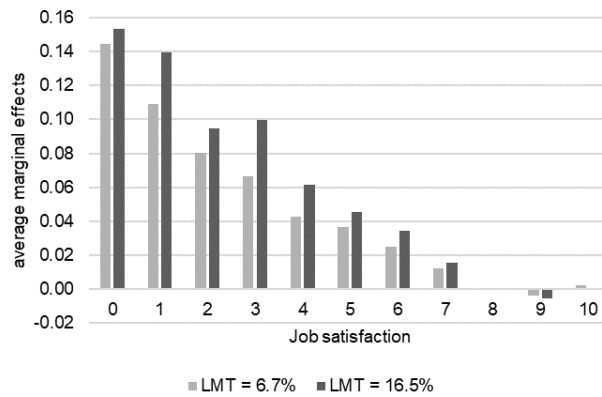
Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed.  
 Observations: 105,619 Persons: 22,416  
 Data: SOEP v32.1 (2017), 2001-2015.

**Figure A2.3** Years post 2004 only

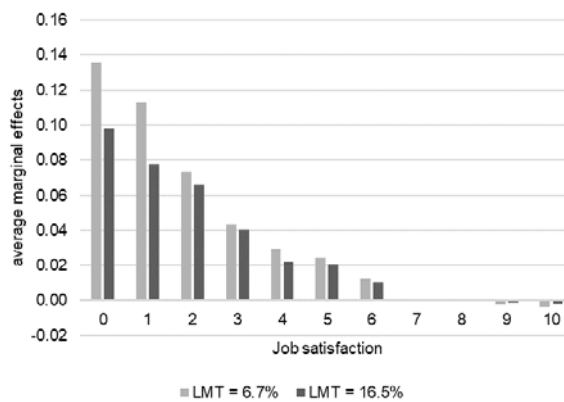
**Figure A2.3a** Predicted probabilities of separation by job satisfaction



**Figure A2.3b** Job-to-job move by job satisfaction and local labor market condition



**Figure A2.3c** Job-to-non-employment move by job satisfaction and local labor market condition

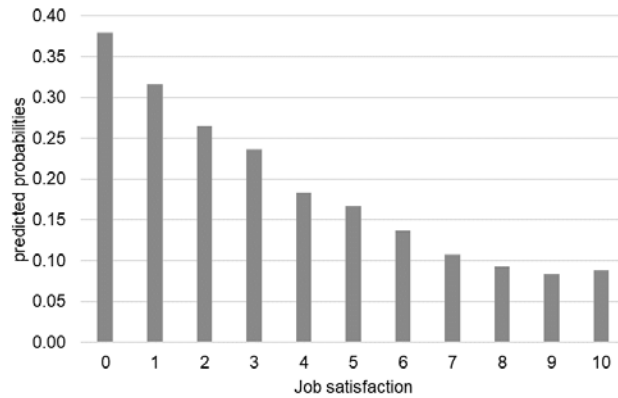


Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed.  
 Observations: 80,248 Persons: 19,635  
 Data: SOEP v32.1 (2017), 2001-2015.

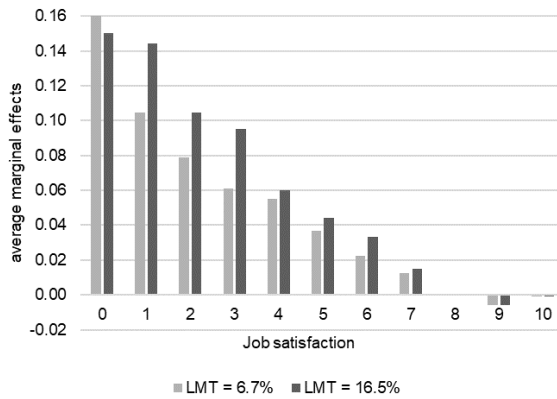


**Figure A2.4** Western Germany only

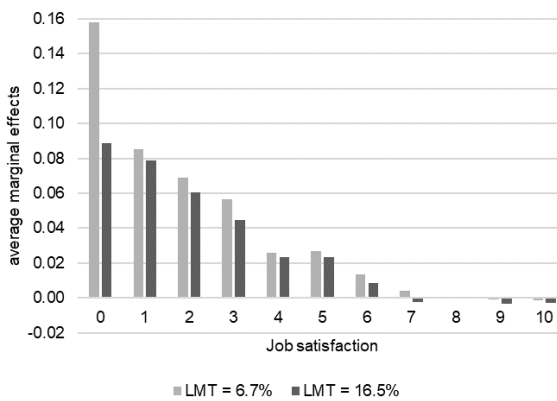
**Figure A2.4a** Predicted probabilities of separation by job satisfaction



**Figure A2.4b** Job-to-job move by job satisfaction and local labor market condition



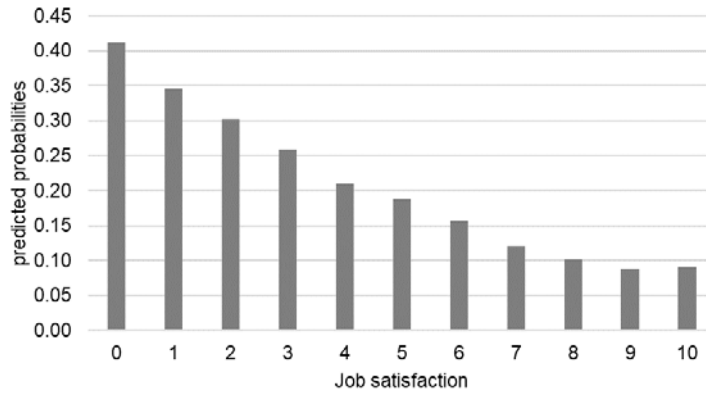
**Figure A2.4c** Job-to-non-employment move by job satisfaction and local labor market condition



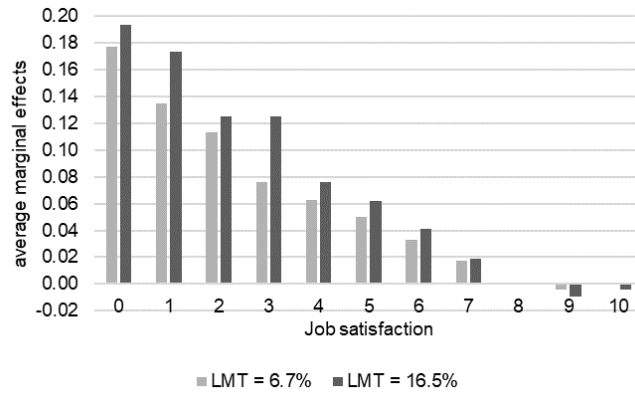
Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed. Observations: 80,629 Persons: 17,586 Data: SOEP v32.1 (2017), 2001-2015.

**Figure A2.5** Only until age 50

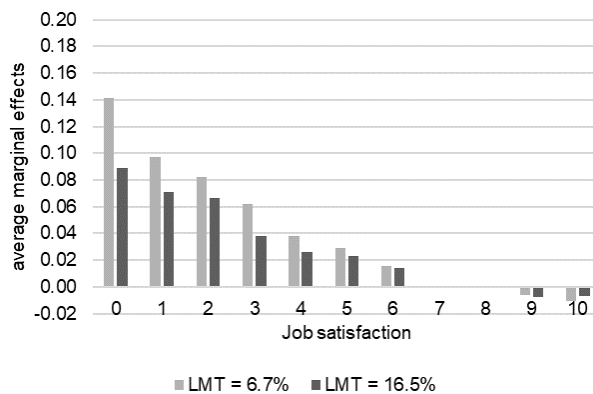
**Figure A2.5a** Predicted probabilities of separation by job satisfaction



**Figure A2.5b** Job-to-job move by job satisfaction and local labor market condition



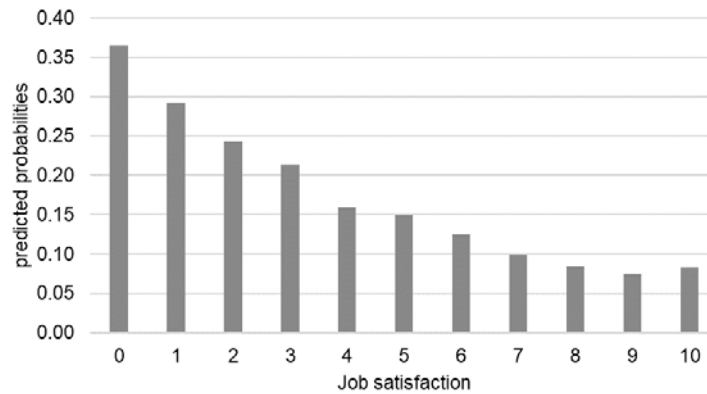
**Figure A2.5c** Job-to-non-employment move by job satisfaction and local labor market condition



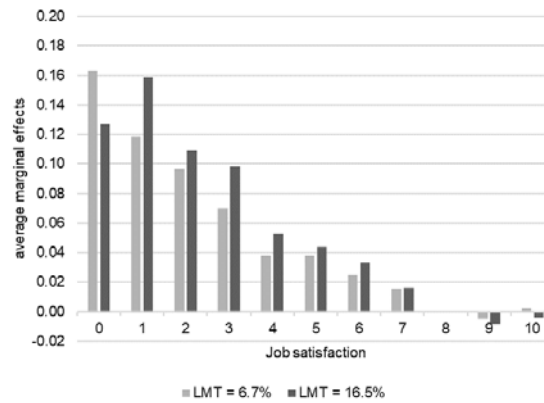
Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed.  
 Observations: 73,274 Persons: 17,478  
 Data: SOEP v32.1 (2017), 2001-2015.

**Figure A2.6** Men only

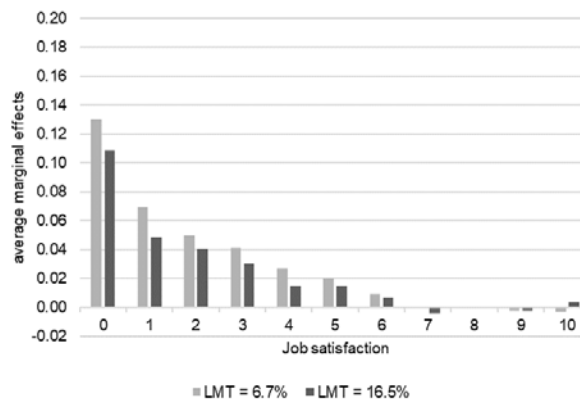
**Figure A2.6a** Predicted probabilities of separation by job satisfaction



**Figure A2.6b** Job-to-job move by job satisfaction and local labor market condition



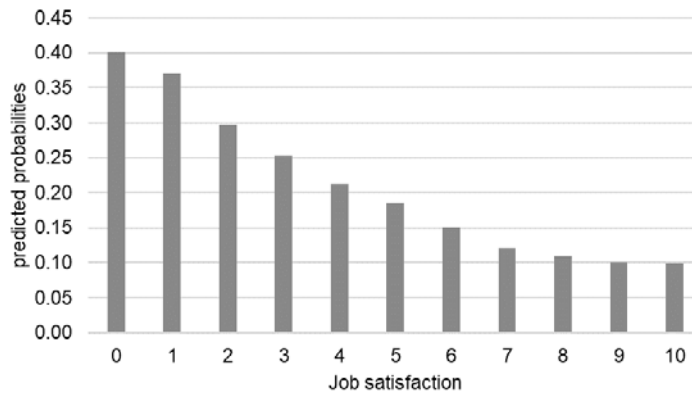
**Figure A2.6c** Job-to-non-employment move by job satisfaction and local labor market condition



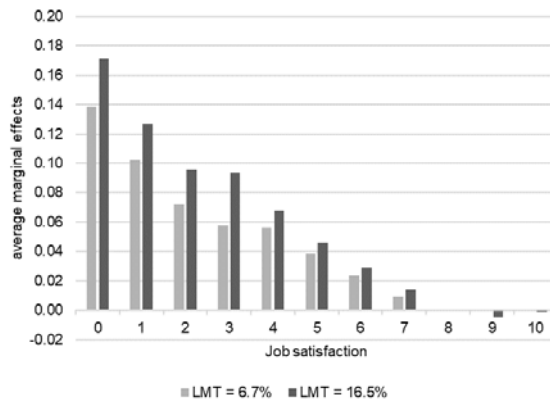
Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed.  
 Observations: 54,460 Persons: 11,166  
 Data: SOEP v32.1 (2017), 2001-2015.

**Figure A2.7** Women only

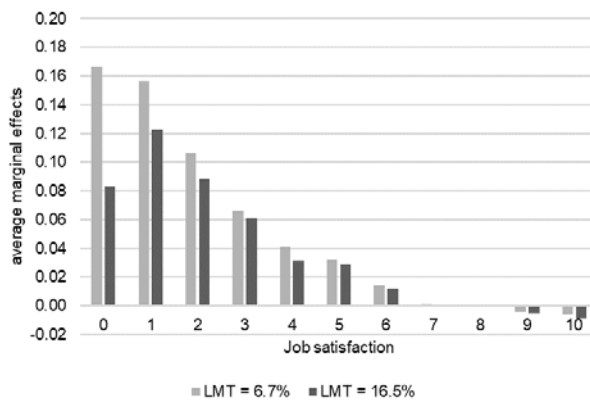
**Figure A2.7a** Predicted probabilities of separation by job satisfaction



**Figure A2.7b** Job-to-job move by job satisfaction and local labor market condition



**Figure A2.7c** Job-to-non-employment move by job satisfaction and local labor market condition



Notes: Labor market tightness (LMT) is the regional ratio of vacancies to unemployed.  
 Observations: 51,159 Persons: 11,251  
 Data: SOEP v32.1 (2017), 2001-2015.

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