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Michael Beckmann, Andrea Binz, Bernd Schauenberg

The Author(s):

Prof. Dr. Michael Beckmann

Center of Business and Economics (WWZ)
Department for Human Resources and Organization
Rosshofgasse 2
CH-4051 Basel, Switzerland
michael.beckmann@unibas.ch

Dr. Andrea Binz

University of Munich
Munich School of Management
Ludwigstrasse 28 RG
D-80539 Munich, Germany
binz@bwl.uni-muenchen.de

Prof. Dr. Bernd Schauenberg

University of Freiburg
Department of Personnel and Organizational Economics
Platz der Alten Synagoge
D-79085 Freiburg i.B., Germany
bernd.schauenberg@vwl.uni-freiburg.de

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Contact:

WWZ Forum | Petersgraben 51 | CH-4003 Basel | forum-wwz@unibas.ch | www.wwz.unibas.ch

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Michael Beckmann*, Andrea Binz and Bernd Schauenberg*****

* Prof. Dr. Michael Beckmann, University of Basel, Center for Economic Sciences (WWZ), Department for Human Resources and Organization, Rosshofgasse 2, CH-4051 Basel, Switzerland, Phone: +41-61-267-3224, Fax: +41-61-267-2758, E-mail: michael.beckmann@unibas.ch.

** Dr. Andrea Binz, University of Munich, Munich School of Management, Ludwigstrasse 28 RG, D-80539 Munich, Germany, Phone: +49-89-2180-6056, Fax: +49-89-2180-5652, E-mail: binz@bwl.uni-muenchen.de.

*** Prof. Dr. Bernd Schauenberg, University of Freiburg, Department of Personnel and Organizational Economics, Platz der Alten Synagoge, D-79085 Freiburg im Breisgau, Germany, Phone: +49-761-203-2390, Fax: +49-761-203-2394, E-mail: bernd.schauenberg@vwl.uni-freiburg.de.

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Abstract:

The present paper examines the relationship between fixed-term employment and job satisfaction using individual-level data from the German Socio Economic Panel (GSOEP). According to theoretical expectations, fixed-term employment should be associated with a relative low level of job satisfaction, and the majority of empirical investigations is actually in line with this prediction. However, none of these studies accounts for the fact that a worker's choice of whether or not to accept a temporary working contract might substantially be driven by individual characteristics and would then be endogenous. In contrast to prior studies, our preferred model specification explicitly accounts for a potential selectivity bias. The estimation results of our treatment effects model indicate a positive connection between fixed-term employment and job satisfaction. Hence, we conclude that job satisfaction on average is not negatively affected by the pure duration of an employment contract, but by individual characteristics, job-related factors, and working conditions. Nevertheless, we would not recommend firms to replace permanent by fixed-term workers as the latter are more satisfied with their jobs associated with higher motivation and productivity levels. Instead, firms are encouraged to improve working conditions, especially for better educated and more tenured workers.

Keywords: Fixed-term employment; job satisfaction; selectivity bias.

JEL classification: C21, C25, J28, M12

1 Introduction

The number of debates about the desirability and the drawbacks of flexible forms of employment has tremendously increased in recent years. Apart from part-time work, jobs offered by temporary help agencies, and non-social security system employment, fixed-term employment contracts represent an important instrument of flexible employment opportunities. From the viewpoint of firms, fixed-term contracts are beneficial, since they enable firms to adjust their workforce to demand fluctuations at a comparatively low expense. Particularly in countries with high levels of employment protection and high dismissal costs, e.g. Germany, France, Italy, and Spain, firms have increasingly been using temporary working contracts as an instrument of flexible adjustment. Nowadays, about 12 percent of the employees in the European Union are employed on the basis of temporary contracts. Young and first-time employees are particularly affected by temporary work arrangements, which indicates a second advantage associated with the use of fixed-term employment contracts. Usually, employers lack adequate information about the traits and abilities of the workers currently selected. Thus, they have an incentive to initially employ their workers on the basis of temporary contracts in order to screen them for permanent positions. As a consequence, fixed term contracts do not only possess the advantage of serving as an instrument of flexible adjustment but also as a screening device.

It is important to note that the use of fixed-term work arrangements contributes to generate a segmented intra-firm employment structure with core employees being permanently employed and fixed-term employees representing the flexibility reserve. Workers belonging to the flexibility reserve usually have less job security, lower earnings and fewer other job rewards compared to permanent core workers. Consequently, fixed-term workers are expected to report lower job satisfaction compared to individuals employed on the basis of permanent working contracts.

The objective of this paper is to examine whether fixed-term contracts are indeed associated with a deterioration of employees' job satisfaction. For this purpose, we use individual-level data from the German Socio-economic Panel (GSOEP). Although the discussion so far clearly supports the perspective that fixed-term employees should be less satisfied with their job than permanent workers, there are other arguments coming to a reverse conclusion. For example, fixed-term workers may even be more satisfied with their job than permanent workers, since

the temporary job enabled them to leave the unemployment status, and hence, having got a job at all is of greater value for them than for permanent workers. Another argument for the hypothesis that fixed-term workers may report higher job satisfaction levels is that they are strongly motivated to achieve a permanent job in the future.

Therefore, the theoretical discussion is not unambiguous. In contrast to the theoretical debate, the majority of empirical studies provides evidence for a negative impact of fixed-term employment on job satisfaction. Some other studies do not find a significant correlation between fixed-term employment contracts and job satisfaction at all. A major drawback of these investigations, however, is that none of them explicitly accounts for a potential selectivity bias. Since job satisfaction is usually measured at an ordinal scale, almost all studies apply the standard ordered probit model to estimate the effect of temporary employment on job satisfaction and thereby neglect a possible selectivity bias. However, the reported level of job satisfaction is unlikely to be independent from an individual's choice of whether or not to accept a fixed-term employment contract. Hence, not accounting for the individual's endogenous contract decision can be associated with inconsistent parameter estimates that are either biased upward or downward. In order to test for a potential selectivity bias, we estimate a treatment effects model in addition to the usual ordered probit model and binary choice models and compare the magnitude and the signs of the relevant coefficients.

The paper is organized as follows: In section 2, we present an overview of the theoretical discussion concerning the impact of fixed-term employment on job satisfaction. Section 3 provides a brief review of the previous empirical literature. In section 4, we present our econometric analysis on the relation between fixed-term contracts and job satisfaction using the GSOEP-data. Section 5 contains our management implications derived from the regression results. Finally, section 6 concludes.

2 Theoretical considerations

It is primarily the sociological and psychological literature which deals with the determinants and consequences of differences in individuals' reported job satisfaction. Since job satisfaction plays a crucial role with regard to overall subjective well-being of employees and subjective well-being can be considered as "the central economic variable driving individuals' decisions" (Sousa-Poza and Sousa-Poza, 2000: 518), it is not surprising that the economic and

management literature has increasingly drawn its attention on the causes and consequences of job satisfaction throughout the years. However, so far relatively little research has been done with respect to the relationship between temporary working contracts and employees' job satisfaction.

In principle, temporary employment contracts can either have a positive or negative effect on employees' job satisfaction. A negative relationship is more obvious and can be explained as follows: The first argument relates to job insecurity which is often associated with temporary working contracts. Job insecurity reflects the concern of employees to lose their current job. A secure job not only provides individuals with the essential monetary income, it also enables them to establish social contacts and influences individuals' scheduling and time management. As a consequence, the loss of a job implies a threat for important financial, social and societal resources (De Witte, 1999). Therefore, job insecurity is likely to deteriorate individuals' job satisfaction and well-being (Sverke et al., 2002). Since temporary contracts by definition have a limited duration and employment continuity is not guaranteed, job satisfaction for concerned employees can be expected to be relatively low.

Another explanation for the hypothesis that holding a temporary contract is likely to reduce an individual's level of job satisfaction can be derived from the psychological contract theory (Guest, 2000; Shore and Tetrick, 1994). According to this theory, contracts are typically characterized by an employee's perception of reciprocal obligations between employer and employee. The substance of these obligations refers to the worker's contributions to the organization, e.g., effort, competencies, and loyalty, in relation to the returns of the employer, e.g., payment, job security, and promotion opportunities (Isaksson et al., 2003). The psychological contract theory implies that productive working requires a balanced relation between the workers contributions and rewards. When employees perceive an unbalanced relation, the psychological contract is violated. As a consequence, job satisfaction will decline encouraging the employee to restore the disturbed balance. According to the psychological contract theory, temporary employees perceive an inequality between contributions and rewards, when they are very unlikely to get permanently employed, in spite of high effort, and when the employer mostly decides unilaterally regarding the usage of fixed-term workers and their assignments (De Witte and Näswall, 2003).

A further theoretical explanation for the expected negative relationship between temporary contracts and job satisfaction relates to the effects of social comparison processes. These processes implicate that an individual conducts a comparative evaluation of the own employment situation with that of a reference person. In the context of temporary work arrangements the evaluation of social comparison processes suggests that fixed-term workers may perceive themselves as disadvantaged compared to permanently employed workers. If fixed-term workers choose permanent workers as the reference group, they may subjectively feel deprivation and inequality at their expense (Pearce, 1998). For example, fixed-term workers may feel relative deprivation, if they compare their level of job security to that of permanent workers. In accordance with the theory of social comparison processes, the perception of being disadvantaged relative to others is related to a declining level of job satisfaction (Beard and Edwards, 1995; Kochan et al., 1994).

A complementary explanation for the anticipated negative effect of fixed-term employment contracts on an employee's job satisfaction can be derived from the theory of segmented labour markets, which has been introduced by Doeringer and Piore (1971). The simultaneous use of permanent and fixed-term work arrangements divides the intra-firm employment structure into two segments. One segment contains the permanently employed core workers. The other segment contains the fixed-term employees representing the flexibility reserve. The employment of workers with short-term contracts enables firms to adjust their workforce to demand fluctuations at a comparatively low expense and is therefore an instrument of flexible adjustment. Permanent core workers are thus much more likely to have secure jobs, higher earnings and better promotion opportunities than fixed-term workers. As a result, inequality-averse fixed-term workers are suggested to report a lower level of job satisfaction than individuals employed on the basis of permanent working contracts.

The discussion so far is consistent with the hypothesis that fixed-term employees are expected to be less satisfied with their jobs than permanent workers. However, there are also other arguments contradicting this view. For example, fixed-term workers can even be assumed to be more satisfied with their jobs than permanent workers, if the temporary job enabled them to leave the unemployment status. Hence, having got a job at all is more important to them than for workers who are employed on the basis of a permanent contract. Permanent workers face a relatively high job security and may therefore assess the pure employment status less valuable than temporarily employed workers, whose jobs are much more insecure. Hence, a

relatively high job satisfaction of fixed-term employees may stem from a higher assessment of the value of employment. Another argument is that fixed-term workers may have higher job satisfaction levels, because they are strongly motivated to achieve a permanent job in the future. This point is related to the tournament theory of Lazear and Rosen (1981). In this context, temporarily employed workers compete against each other to achieve a permanent job. The winner's prize is therefore a promotion from temporary to permanent employment. When firms use fixed-term contracts as a screening device and actually offer their temporarily employed workers the opportunity to be promoted on a permanent job, high effort levels, which are necessary to obtain the permanent job, and high job satisfaction levels may coincide.

3 Previous empirical research

As already mentioned in the previous section, the economists' interest in individuals' job satisfaction levels is quite new, while psychology and sociology have a much longer tradition in investigating the determinants and consequences of job satisfaction. The rarity of economic research on job satisfaction could at least partially be attributed to the fact that in contrast to wages and other labour market outcomes representing continuously measurable and thus objective indicators, job satisfaction is strongly subject to individual assessments, which implies that interpersonal comparisons are quite difficult to conduct (Freeman, 1978; Kaiser, 2002). Despite this restriction, an economic analysis of the determination of job satisfaction is of major importance, because job satisfaction is likely to have a positive influence on the motivation and productivity of employees. Some empirical studies have already confirmed this presumed effect (Mangione and Quinn, 1975; Clegg, 1983).

The previous empirical research provides a couple of studies, which either examine the relationship between temporary employment contracts and job insecurity (Isaksson et al., 2003) or the connection between job insecurity and job satisfaction (Schlese and Schramm, 1994; Ashford et al., 1989; Sverke et al., 2002). There are, however, only a few empirical studies on the impact of different durations of employment contracts on the employees' job satisfaction. Petrongolo (2004) conducts one of those studies. Using data from the European Community Household Panel Survey of the years 1994 to 1999, she differentiates between overall job satisfaction and different dimensions of job satisfaction, e.g., satisfaction with earnings, job security, type of job, and working hours. She estimates an ordered probit model,

controlling for the usual individual and job characteristics. The results imply that temporary employment contracts reduce overall job satisfaction as well as satisfaction with earnings, job security, and the type of job.

Kaiser (2002) also uses data from the European Community Household Panel and conducts his examination on the relationship between fixed-term contracts and the individuals' job satisfaction for a specific collection of countries: Denmark, Germany, the Netherlands, Portugal, and the United Kingdom. In contrast to Petrongolo (2004), he estimates an ordinary probit model distinguishing between overall job satisfaction, satisfaction with job security and satisfaction with working hours.¹ The estimation results imply that being employed on the basis of a temporary contract is associated with a deterioration of overall job satisfaction in all countries, except Denmark. Similarly, the examination of the relation between fixed-term contracts and satisfaction with job security does also show the expected negative effect.

Another study stems from D'Addio et al. (2003). Using data for Denmark from the European Community Household Panel the authors examine the impact of fixed-term employment contracts on overall job satisfaction and estimate fixed effects ordered logit and random effects ordered probit models. The estimation of models on the basis of panel data enables the authors to account for unobserved individual heterogeneity, which – similarly to selectivity – is another source of inconsistently estimated coefficients. The results show that being employed on a fixed-term contract has a significant negative effect on job satisfaction for male employees, while the effect for female employees is insignificant.

Booth et al. (2002) make use of data from the British Household Panel between 1991 and 1997. The authors estimate an ordered probit model and distinguish between overall job satisfaction and seven different components of job satisfaction. According to their results, there is no difference in overall job satisfaction between workers being employed on the basis of temporary contracts and workers in permanent jobs. Regarding the different components of job satisfaction, the results show, however, that temporary workers are less satisfied with job security and promotion prospects. Also using the British Household Panel and estimating an ordered probit model, Clark (1996) does not find significant differences in job satisfaction between temporarily and permanently employed individuals.

Kalleberg and Reynolds (2003) present an interesting study about the relation between non-standard work arrangements and employees' job satisfaction. The authors use a cross-national survey data set, the 1997 International Social Survey Program (ISSP) module on "work orientations". With the aid of this data set, the authors are able to examine the relationship between temporary work and job satisfaction in the United States, Japan, and a number of European countries. The results of their investigation show that temporary workers do not generally differ from permanent workers in terms of job satisfaction. However, this outcome does not hold for West Germany and Norway. In both countries the authors obtain a positive effect of temporary employment on employees' job satisfaction.

In their investigation of the relationship between fixed-term working contracts and employees' job satisfaction Ellingson et al. (1998) distinguish between workers, who are voluntarily or involuntarily employed on the basis of a fixed-term contract. The authors assume that some individuals prefer temporary contracts to permanent jobs, because of the flexibility and variation that goes along with fixed-term work arrangements. These individuals are identified as voluntary fixed-term employees. In contrast, there are also individuals who accept temporary jobs because they have no alternative job options. If these individuals were able to choose between permanent and temporary jobs, they would prefer a permanent job. These individuals are identified as involuntary fixed-term employees. The estimation results indicate that job satisfaction is negatively affected, when workers are involuntarily employed on the basis of a fixed-term contract, while the reverse is true for workers being voluntarily employed on the basis of a fixed-term contract.

Finally, using data from the Swiss Household Panel (SHP) between 1999 and 2001 Henneberger et al. (2004) investigate the impact of fixed-term employment on three dimensions of job satisfaction – overall job satisfaction, satisfaction with the wage, and satisfaction with the intra-firm atmosphere. First, the ordered probit estimates show that female workers who are employed on the basis of a fixed-term contract are more satisfied with their wages than permanently employed women, while there are no significant differences between male fixed-term and permanent workers. Second, the authors find an inverse relationship between fixed-term employment and the satisfaction with the intra-firm atmosphere. However, this result does only hold for male workers. Third and most importantly, fixed-term employment is found to be positively related to overall job satisfaction. According to the model estimates, fixed-term employees are less likely to be

generally dissatisfied with their jobs, while they are more likely to be very satisfied with their jobs than permanent workers.

To summarize, the vast majority of empirical studies either conclude that fixed-term workers are less satisfied with their jobs than permanent workers or they have found no significant differences between fixed-term and permanent workers. There are only a few exceptions so far finding indications for a positive effect of fixed-term working contracts on job satisfaction. At a first glance, a positive relationship may appear to be somewhat surprising. However, the discussion in section 2 has demonstrated that there may also be good reasons for temporarily employed workers to be more satisfied with their jobs than their permanently employed counterparts.

Finally, it should be mentioned that none of these studies explicitly account for a potential selectivity bias. However, selectivity represents an important econometric estimation problem to be accounted for in order to avoid inconsistent and biased parameter estimates. In the present context, an individual's choice of whether or not to accept a fixed-term job offer is very likely to be correlated with the level of job satisfaction. Therefore, the individual characteristics determining this decision have to be an integral part of the model specification to account for a possible selectivity bias sufficiently. As a consequence, our estimation strategy in the following section 4 is to specify a treatment effects model and compare the parameter estimates for fixed-term employment with the corresponding coefficients resulting from the more conventional ordered probit and binary choice model, respectively.

4 Econometric analysis: fixed-term contracts and job satisfaction

4.1 Data, variables and descriptive statistics

Our empirical analysis is based on data from the German Socio-economic Panel (GSOEP). The GSOEP is a longitudinal study of private households in Germany. It started in 1984 and from that time on the same households have been surveyed annually. The panel offers information on German citizens and immigrants living in the eastern or western part of Germany. The GSOEP questionnaires contain two thematic areas. First, GSOEP data cover a wide range of subjects, for example, personality traits, occupational and family biographies, employment and professional mobility, earnings, health, individual satisfaction, household

composition and living situation. Second, the GSOEP also covers subjects in recent elements in the survey. These elements contain topics such as education, training, family and social services, social security and environmental behaviour.

The GSOEP offers a very extensive database, which is characterized by a high level of constancy over time. For example, in 1984, the first year of the survey, 5,921 households with 12,290 individuals participated in West Germany. In 2004, 3,724 of these households with 6,811 individuals were still responding the questionnaire.

In order to examine the relationship between fixed-term contracts and employees' job satisfaction, we use the GSOEP wave of the year 2000. In our analysis individuals' job satisfaction is considered as the dependent variable. In the GSOEP questionnaire job satisfaction is covered as: "How satisfied are you with your work today?" The responses to job satisfaction are measured at an ordinal scale ranging from 0 (completely dissatisfied) to 10 (completely satisfied). Table 1 displays the distribution of the job satisfaction values achieved.

[Insert Table 1 about here]

The distribution of the variable job satisfaction shows that the respondents exhibit a remarkably high level of job satisfaction. The mean value is 7.14, the median is 8.

In our study, the explanatory variable of main interest measures, whether an individual is currently employed on the basis of a fixed-term or a permanent contract. Thereby, we focus only on full-time workers and exclude part-time workers from our analysis. Since we aim at examining whether or not temporary employment is associated with higher or lower levels of job satisfaction than permanent employment, we are forced to exclude certain employee groups from our sample in order to avoid an estimation bias. Additionally, we do not consider other forms of employment, which are also not relevant for our analysis, i.e., self-employment, employment of apprentices, and employment of public servants.

Table 2 presents the mean values of the dependent variable and some explanatory variables used in this study separated for contingent and permanent workers. Some of these variables describe socio-demographic characteristics of the individuals, i.e., age, sex, education, marital

status, nationality. Others, including the dependent variable job satisfaction, describe job characteristics, i.e., the log gross monthly wage, occupational status, firm size, the use of computers at the workplace, training opportunities, the amount of tenure, and the fact of working in the origin job, working hours, work at night or at weekend, and working in the public sector. This comparative analysis gives first insights on specific differences between contingent and permanent workers and allows to gain information on the determination of fixed-term employment. A more detailed description of the considered variables can be found in the appendix in Table A1.

[Insert Table 2 about here]

According to the calculated means there are only slight differences between fixed-term and permanent workers regarding the average level of job satisfaction. Furthermore, fixed-term workers do not seem to differ substantially from permanent workers in the years of education, nationality, working hours, and the need to work at night or at weekend. However, there are significant differences with respect to other characteristics. For example, contingent workers seem to earn much less than permanent workers. They are much younger and have much less tenure than permanent workers. Moreover, permanent workers are more likely to use a personal computer at work, participate in continuous training programmes, and work in their certified job. Finally, fixed-term workers are more often female, unmarried and working in the public sector.

4.2 Econometric modelling

In the GSOEP questionnaires the individuals are asked to provide information about the level of satisfaction with their current job using an ordinal scale that ranges from 0 (completely dissatisfied) to 10 (completely satisfied). Since job satisfaction is the dependent variable in our investigation, we apply an ordered probit model to estimate the determination of the individuals' job satisfaction. Our main interest is to evaluate, whether or not workers who are currently employed on the basis of a fixed-term contract have a different level of job satisfaction relative to permanent workers. In order to additionally account for individual characteristics, occupational status, job-related factors, working conditions, and other potential determinants we regress our ordinally scaled dependent variable job satisfaction on a

dummy variable measuring whether a worker is temporarily or permanently employed and the other covariates introduced in the previous subsection.

Referring to the analysis of the previous subsection, the econometric model of job satisfaction (JS) has the general form

$$JS^* = X\beta + \gamma FTE + \nu, \quad (1)$$

where JS^* is a latent variable indicating the unobservable level of job satisfaction of the employees. FTE is a dummy variable that separates fixed-term employees from permanent workers, X is a matrix containing individual socio-demographic characteristics, job-related factors, information on working conditions and the occupational status, and other control variables. Finally, β and γ represent the coefficients to be estimated and ν is a stochastic error term with the usual assumptions, i.e., normal distribution, zero mean, and finite variance. Since individual job satisfaction cannot precisely be observed, equation (1) cannot directly be estimated. Instead, the ordinally scaled variable $JOBSAT$ is estimated as a linear function of the explanatory variables and a set of cut points θ_i . In the ordered probit model, the probability of a given observation is

$$\begin{aligned} \Pr(JOBSAT = i) &= \Pr(\theta_{i-1} < X\beta + \gamma FTE + \nu \leq \theta_i) \\ &= \Phi(\theta_i - (X\beta + \gamma FTE)) - \Phi(\theta_{i-1} - (X\beta + \gamma FTE)), \end{aligned} \quad (2)$$

where $i = 0, \dots, 10$, and $\Phi(\cdot)$ is the standard cumulative distribution function.

The descriptive analysis in subsection 4.1 indicates that the average level of job satisfaction of temporarily employed workers is quite similar to the level of permanent workers. However, this does not necessarily mean that a multiple regression analysis cannot identify significant differences so that job satisfaction patterns may actually deviate substantially. In order to provide an alternative estimation approach to the ordered probit model we estimate binary choice models using the probit maximum likelihood (ML) approach. Our idea behind this estimation strategy is that even if average job satisfaction of temporary and permanent workers is quite similar, temporary workers might report more frequently higher or lower job satisfaction levels than permanent workers. The binary choice models then examine whether or not temporary workers are more likely to self-select themselves into lower or higher job satisfaction levels than permanent workers.

The dichotomous dependent variable of our binary choice model representing an employee's selection into lower levels of job satisfaction is defined as

$$JS_LOW = \begin{cases} 1, & \text{if } JOBSAT \leq 4 \\ 0, & \text{otherwise.} \end{cases} \quad (3)$$

Correspondingly, the dichotomous dependent variable representing an employee's selection into higher levels of job satisfaction is defined as

$$JS_HIGH = \begin{cases} 1, & \text{if } JOBSAT \geq 9 \\ 0, & \text{otherwise.} \end{cases} \quad (4)$$

If the latent variable JS^* in (1) is replaced by JS_LOW or JS_HIGH specified in (3) and (4), respectively, the probit ML estimation approach can be applied. The descriptive statistics of JS_LOW and JS_HIGH are summarized in Table 3.

[Insert Table 3 about here]

The results show that only 9 percent of the respondents indicated to be relatively dissatisfied with their work (job satisfaction levels 0 to 4). On the contrary, about 23 percent of the respondents reported to be highly satisfied with their work (job satisfaction levels 9 and 10).²

So far, the model specification does not explicitly account for a potential selectivity bias that may occur if an employee's decision process to accept or reject a fixed-term contract is not exogenous in the model. Not accounting for the employee's selection decision may lead to inconsistent parameter estimates, so that the effect of fixed-term employment on job satisfaction is either overestimated or underestimated. More precisely, the effect which has falsely been attributed to a temporary employment contract can truly be driven by individual characteristics encouraging an individual to accept or reject a temporary job offer and not by the duration of the working contact. An estimation model that explicitly accounts for a potential selectivity bias is the treatment effects model.

The treatment effects model estimates the effect of our endogenous binary treatment FTE on a continuous, fully observed variable job satisfaction (JS). The primary regression equation is

$$JS = X\beta + \gamma FTE + v. \quad (5)$$

In contrast to equation (1), the dummy variable FTE in equation (5) is considered as endogenous indicating whether or not the treatment is assigned. The binary decision to obtain the treatment FTE is modelled as the outcome of an unobserved latent variable FTE^* . This

variable is assumed to be a linear function of a set of exogenous covariates Z and an error term ε , i.e.,

$$FTE^* = Z\delta + \varepsilon. \quad (6)$$

The parameter vector δ represents the coefficients of the covariates in Z . It is important to note that the decision of an individual to accept or reject a fixed-term employment contract is observable:

$$FTE = \begin{cases} 1, & \text{if } FTE^* > 0 \\ 0, & \text{otherwise.} \end{cases} \quad (7)$$

The error terms ε and ν are bivariate normally distributed with mean zero and covariance matrix

$$Cov(\varepsilon, \nu) = \begin{bmatrix} \sigma & \rho \\ \rho & 1 \end{bmatrix}. \quad (8)$$

In the present case, the individual's decision to accept or reject a fixed-term job offer is assumed to depend on a set of individual characteristics, i.e., sex, marital status, age, nationality, and years of education.

The estimation of the treatment effects model requires a slight modification of the dependent variable $JOBSAT$, which is originally measured at an ordinal scale. However, the dependent variable of the treatment effects model JS in equation (5) has to be continuous. A continuously scaled variable JS can be generated by standardizing the ordinal variable $JOBSAT$ using an approach introduced by Bresnahan, Brynjofsson and Hitt (2002), i.e.,

$$JS = \frac{JOBSAT - \mu_{JS}}{\sigma_{JS}}, \quad (9)$$

where μ_{JS} is the mean and σ_{JS} is the standard deviation of $JOBSAT$. After this transformation the coefficient of interest γ is estimated consistently using the full maximum likelihood estimator (MLE).³

4.3 Empirical results

The results of our ordered probit model are summarized in Table 4. Apart from our major variable of interest fixed-term employment (FTE) the estimation model contains several individual socio-demographic explanatory variables (sex, marital status, years of education), job-related variables (gross monthly wages, tenure, the use of computers at the workplace,

previous participation at continuous training programmes, employment in the individual's original profession), variables on working conditions (weekly working time, the need to work at night or at weekend, employment in the public sector), dummy variables for occupational status (managerial and professional (high-skilled) occupations, white-collar and blue-collar occupations (skilled and unskilled)), and firm size dummies.

[Insert Table 4 about here]

Our most important result is that fixed-term employees do not differ substantially from permanent employees with respect to job satisfaction. The estimated coefficient for our fixed-term employment variable *FTE* is negative albeit insignificant. Furthermore, the ordered probit estimates for the other explanatory variables show, for example, that better educated individuals are less satisfied with their jobs. Obviously, there is a strong complementary relationship between an individual's aspiration level regarding job tasks and its educational level.

Almost all of the job-related factors are significant determinants of job satisfaction. Not surprisingly, wages have a strong positive impact on a worker's job satisfaction. This result is therefore in line with other empirical studies on job satisfaction (e.g. Grund and Sliwka, 2004). Furthermore, the results show a U-shaped relationship between tenure and job satisfaction. Hence, at first job satisfaction declines with tenure, reaches a minimum and turns to increase the closer the worker comes to retirement age. In other words, younger and senior workers tend to be more satisfied with their jobs, while prime-age workers appear to be more discontent with their jobs. Finally, computer users at work and employees who are still working in their original profession are significantly more satisfied with their jobs than their corresponding counterparts. Hence, computer jobs are obviously more challenging and convenient than non-computer jobs and individuals prefer working in the original profession instead of working in a foreign job.

Job satisfaction is also determined by working conditions. First, job satisfaction is negatively related to the number of weekly working hours. Second, working in the public sector is associated with higher levels of job satisfaction. These less surprising results are also in line with previous empirical investigations (e.g. Kaiser, 2002). The coefficients of the dummy variables controlling for occupational status (displayed in Table A3 in the appendix) are

always insignificant relative to the reference group unskilled blue collar workers. Finally, the coefficients of the firm size dummies (displayed in Table A3 in the appendix) indicate that job satisfaction declines with firm size.

Table 4 also contains the probit ML estimates for the determinants of the probability that employees are either dissatisfied with their jobs or highly satisfied. Interestingly, the coefficient of our explanatory variable of interest *FTE* in the *JS_LOW* equation is positive and significant at the 10 percent level. More precisely, a discrete change of *FTE* from 0 to 1 (from permanent employment to fixed-term employment) increases the probability that an employee is dissatisfied with his job about 2.8 percent. In contrast, the *FTE* coefficient in the *JS_HIGH* equation is insignificant. The coefficients of the remaining covariates confirm the results of the ordered probit model. To sum up, the current model estimates provide only little evidence for the hypothesis that workers who are employed on the basis of a temporary contract are less satisfied with their jobs than permanently employed workers. The results are therefore in line with the majority of previous studies, which either found an insignificant effect or a negative effect of fixed-term employment on job satisfaction.

In order to account for a possible selectivity bias in our model specification, we finally estimate a treatment effects model. Specifically, we suppose that the error terms in equations (5) and (6), ε and ν , are correlated. In this case, an OLS regression of equation (5) would involve an inconsistent estimate of the parameter γ . If ε and ν were positively correlated, the OLS estimate would be biased upward. On the other hand, if ε and ν were negatively correlated, the OLS estimate would be biased downward. Table 5 displays the results of our specified treatment effects model.

[Insert Table 5 about here]

First of all, the results of the selection model (6) and (7) indicate that an individual's decision of whether or not to accept a temporary employment contract significantly depends on age, sex, marital status, and private computer use. Specifically, the probability to accept a fixed-term employment contract declines with the individual's age. Hence, younger workers are much more likely to be temporarily employed than prime age or senior workers. Furthermore, female workers and unmarried workers are more likely to accept a fixed-term employment

contract. These outcomes are insistently in line with our a priori expectations. Finally, employees who use computers privately are less likely to be temporarily employed.

Most importantly, the parameter estimate for our endogenous treatment variable *FTE* is positive and significant at the 5 percent level. A first conclusion of this outcome is that the impact of a fixed-term employment contract on job satisfaction has previously been understated. This result is confirmed by the estimated correlation coefficient $\rho = -0.140$. The Wald test of independent residuals in the regression and treatment equation clearly rejects the null hypothesis $\rho = 0$. A negative ρ implies that the error terms ε and ν are negatively correlated, so any prior outcome indicating either insignificance or a negative connection between fixed-term employment and job satisfaction has to be treated cautiously. Our results from the treatment effects model indicate that those estimates, which do not explicitly account for a potential selectivity bias, may actually be biased downward. A second conclusion from our estimates is that any observed dissatisfaction with the job cannot be ascribed to the circumstance that the duration of an individual's employment contract is only temporary instead of being permanent. Job satisfaction rather seems to be negatively affected by a number of job characteristics and working conditions, for example, low wages, a certain amount of tenure, no computer use at work, inadequately employment, or the amount of effective working hours.

Finally, the estimates for the remaining covariates including the occupational status and firm size dummies (not displayed in the table) are very similar to the parameter estimates of the ordered probit model in terms of magnitude and significance.

5 Management implications

Before pointing out some management implications for the firms, the positive effect of fixed-term employment on job satisfaction deserves some attention. A positive relationship between temporary employment and job satisfaction appears to be somewhat surprising as it contradicts the conventional a priori expectations and the majority of previous studies, which rather found evidence for a negative impact of fixed-term contracts on job satisfaction. The standard explanation for a negative relationship is that fixed-term employees are more likely to be dissatisfied with their job than permanent workers, because they failed to get a permanent job and their employment status is relatively insecure. The firms may use the

instrument of fixed-term working contracts just for the reason to keep employment flexible, and thus, to save dismissal costs. Fixed-term workers may therefore feel discriminated relative to permanent workers in terms of promotion opportunities and other long-term human resource management strategies.

However, the empirical results of our investigation contradict to this interpretation. According to our results, fixed-term employees are more satisfied with their jobs than permanent workers. This outcome is the result of our estimation strategy as we – in contrast to other comparable studies – explicitly account for a potential selectivity bias in our econometric model. Since we explicitly consider the status of fixed-term employment as an endogenous binary treatment, we are able to account for the determination of fixed-term employment, while estimating the determinants of job satisfaction, and thus, avoid the selectivity bias. The results from our treatment effects model show that the probability of whether or not a worker accepts a fixed-term employment contract is largely determined by individual characteristics. Fixed-term employees significantly differ from permanent workers in terms of individual characteristics, e.g. age, sex, marital status, and the private effort to combine work and leisure using computers at home. These interpersonal differences between fixed-term and permanent workers are responsible for the empirical finding of a positive effect of fixed-term contracts on job satisfaction. There are two explanations for a positive relationship between fixed-term employment and job satisfaction. First, fixed-term workers may be more satisfied with their job than permanent workers, because they are glad that they have succeeded to leave the unemployment status and find a job at all. Second, fixed-term workers may have higher job satisfaction levels, because they are strongly motivated to achieve a permanent job in the future. The conclusion therefore is that job satisfaction on average is not negatively affected by a limited duration of an employment contract, but by certain individual characteristics, job-related factors, and working conditions.

Despite this outcome we would like to recommend the firms not to overshoot the use of fixed-term employment contracts. Our results do not imply to replace permanent by fixed-term workers, because the latter are found to be more satisfied with their jobs. If a firm employed too many workers on the basis of fixed-term contracts, one would rather expect a reduction of average job satisfaction as the concerned workers are less likely to be promoted on permanent jobs. Furthermore, low levels of job satisfaction may be associated with a lack of worker motivation and thus affect productivity negatively (Clark, 1996). Our management advice for

the firms therefore is to use fixed-term employment adequately in order to extend permanent employment and take care of the working conditions to keep the level of job satisfaction high. This advice includes developing strategies in terms of flexible working schedules as well as strategies to improve the working conditions for better educated and more tenured workers, who are according to our results especially prone to be dissatisfied with their jobs.

6 Conclusion

The present paper examines the relationship between fixed-term employment and job satisfaction using individual-level data from the German Socio Economic Panel (GSOEP). Recently, there is a lively theoretical debate on this topic, although most arguments emphasize that fixed-term employment should be associated with a relatively low level of job satisfaction, and the majority of empirical investigations is in line with this prediction. Fixed-term workers do usually belong to the flexibility reserve of a firm and thus have less job security, lower earnings and less promotion opportunities relative to the permanent core workers. However, there are also contrary arguments. For example, fixed-term workers may even be more satisfied with their job than permanent workers, if the temporary job enabled them to leave the unemployment status, and hence, having got a job at all is more important to them than for permanent workers. In this sense, fixed-term workers, whose jobs are quite insecure, may assess the pure employment status more valuable than permanent workers, who face a relatively high job security. Another argument is that fixed-term workers may report higher levels of job satisfaction, because they are strongly motivated to achieve a permanent job in the future.

A major drawback of the prior empirical investigations is that none of them explicitly accounts for a potential selectivity bias. However, since an individual's choice of whether or not to accept a fixed-term employment contract is very likely to be correlated with the level of reported job satisfaction, our methodological strategy is to estimate a treatment effects model in addition to the usual ordered probit and binary choice models in order to evaluate whether or not selectivity involving inconsistent parameter estimates plays a crucial role.

The empirical results of our regression analyses can be summarized as follows: First, our ordered probit and ordinary probit ML estimates are in line with comparable prior studies, i.e., fixed-term employment tends to have a weak negative impact on a worker's job satisfaction.

Second, after accounting for selectivity we obtain a significant positive effect of fixed-term employment on job satisfaction. Thus, not accounting for selectivity is associated with downward biased parameter estimates. According to our results, therefore, fixed-term employees are more satisfied with their jobs than permanent workers. This outcome is the result of our estimation strategy as we explicitly consider the status of fixed-term employment as an endogenous binary treatment. Furthermore, our treatment effects model estimates show that fixed-term workers significantly differ from permanent workers in terms of individual characteristics such as age, sex, marital status and the private effort to combine work and leisure using computers at home. These interpersonal differences between fixed-term and permanent workers are responsible for our finding of a positive connection between fixed-term contracts and job satisfaction. The conclusion therefore is that the limited duration of an employment contract is not responsible for a relatively low level of job satisfaction. Hence, job dissatisfaction cannot hastily be ascribed to fixed-term employment. In this context, it is important to recognize that fixed-term workers differ substantially from permanent workers in terms of individual characteristics. These individual characteristics as well as some job-related factors and working conditions are responsible for an employee's level of job satisfaction.

As a consequence, our estimation results do not imply to replace permanent by fixed-term workers as the latter are found to be more satisfied with their jobs. Although workers, who are satisfied with their jobs, are likely to be highly motivated and productive, firms are expected to suffer productivity losses from the replacement strategy, when they employ fixed-term workers excessively. Our management advice for the firms therefore is to use fixed-term employment as an extension to permanent employment and take care of the working conditions in order to keep the level of job satisfaction high. Firms are asked to develop strategies in terms of flexible working schedules and better working conditions. Particularly, firms should put effort on enriching the working conditions for better educated and more tenured workers, who are according to our results, especially prone to be dissatisfied with their jobs.

Notes

- 1 The author prefers the ordinary probit model to the ordered probit model, because estimating an ordinary probit model “allows to relate the analysis to a specific level of satisfaction by means of an appropriate endogenous variable” (Kaiser, 2002: 16).
- 2 Furthermore, the thresholds 4 or 9, respectively, have been chosen using the descriptive statistics of Table 1. According to the results of Table 1, a value of 8 represents the median level of job satisfaction. Hence, levels 9 and 10 indicate high job satisfaction levels. Due to the relatively small case numbers for the lower levels of job satisfaction, the categories 0 to 4 have been combined to represent job dissatisfaction. As a consequence, the remaining levels 5 to 8 describe the medium job satisfaction levels of the workers.
- 3 Since *JS* is the standardized form of *JOBSAT*, a regression of *JOBSAT* or *JS* on *X* and *FTE* would yield identical parameter estimates. Nevertheless, the treatment effects approach applied here is adequate, because the results obtained by the ordered probit model (requiring ordinally scaled observations) introduced in equation (2) and an alternative OLS regression (requiring continuously scaled observations) are very similar with respect to magnitude and significance of the estimated coefficients. The estimates of this reference OLS model are not displayed here but can, of course, be obtained from the authors upon request.

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Table 1: Distribution of job satisfaction

Job satisfaction	0	1	2	3	4	5	6	7	8	9	10
N	38	24	87	180	229	659	625	1,172	1,694	784	608
Percent	0.6	0.4	1.4	2.9	3.8	10.8	10.2	19.2	27.8	12.9	10.0
Cumulative	0.6	1.0	2.4	5.3	9.1	19.9	30.1	49.3	77.1	90.0	100

Note: The calculations are restricted to individuals who do not provide item non-responses for the subsequent regression analysis. N is the number of observations.

Source: GSOEP 2000, own calculations.

Table 2: Fixed-term vs. permanent employment: mean values of important variables

Variable	Mean for fixed-term employees	Mean for permanent employees
Job satisfaction	6.97	7.15
Log wage	8.07	8.36
Years of education	11.92	12.03
Worker's age	36.14	40.26
Tenure	2.61	10.56
PC	0.46	0.67
Continuous training	0.25	0.32
Adequate job	0.46	0.59
Unmarried	0.38	0.24
Female	0.44	0.34
Working hours	38.06	38.45
Work at night or at weekend	0.63	0.63
Nationality	0.87	0.88
Public sector	0.32	0.20

Note: The calculations are restricted to individuals who do not provide item non-responses for the subsequent regression analysis. The means of Job satisfaction have been calculated from ordinal observations. Tenure, PC, Continuous training, Adequate job, Unmarried, Female, Work at night or at weekend, Nationality, and Public sector are dummy variables. Thus, the means display the fraction of individuals belonging to that certain feature.

Source: GSOEP 2000, own calculations.

Table 3: Descriptive statistics of the binary dependent variables

Variable	Min-Max	Mean	Standard deviation
<i>JS_LOW</i>	0-1	0.091	0.288
<i>JS_HIGH</i>	0-1	0.228	0.419

Note: The calculations are restricted to individuals who do not provide item non-responses for the subsequent regression analysis.

Source: GSOEP 2000, own calculations.

Table 4: Determinants of job satisfaction

Dependent Variable Estimation method	<i>JOBSAT</i>		<i>JS_LOW</i>		<i>JS_HIGH</i>	
	Ordered probit		Probit ML		Probit ML	
Fixed-term Employment (<i>FTE</i>)	-0.048	(-0.80)	0.028*	(1.74)	-0.008	(-0.38)
Individual characteristics						
Female	-0.001	(-0.03)	0.001	(0.08)	0.009	(0.71)
Unmarried	0.016	(0.51)	-0.001	(-0.16)	0.011	(0.91)
Years of education	-0.033***	(-4.77)	-0.111***	(-4.99)	-0.012***	(-4.26)
Job-related factors						
Log wage	0.303***	(6.46)	-0.052***	(-4.75)	0.066***	(3.44)
Tenure	-0.016***	(-3.56)	0.003**	(2.54)	-0.005***	(-3.05)
Tenure ² (*100)	0.035***	(2.67)	-0.007**	(-2.01)	0.011**	(2.10)
PC	0.090***	(3.96)	-0.013**	(-2.13)	0.027***	(3.02)
Continuous training	-0.008	(-0.28)	-0.003	(-0.38)	-0.011	(-0.93)
Adequate job	0.074**	(2.30)	-0.023***	(-2.59)	0.006	(0.47)
Working conditions						
Working time	-0.008**	(-2.07)	0.001	(1.60)	-0.001	(-0.85)
Nightshift / weekend	-0.041	(-1.49)	0.005	(0.70)	-0.001	(-0.08)
Public sector	0.114***	(3.27)	-0.021**	(-2.35)	0.048***	(3.34)
Occupational status	yes		yes		yes	
Firm size dummies	yes		yes		yes	
Constant			0.568	(0.96)	-1.803***	(-3.31)
Wald χ^2 test	137.92***		59.16***		71.32***	
Pseudo R ²	0.0060		0.0158		0.0111	
N	6,100		6,100		6,100	

Note: * significant at the 10 % level, ** significant at the 5 % level, *** significant at the 1 % level; robust z-values in parentheses. The parameter estimates in the equations for *JS_LOW* and *JS_HIGH* are marginal effects. The model specification contains six dummy variables indicating occupational status and six firm size dummies. The Wald χ^2 test and Pseudo-R² provide information about the fit of the specified model. N is the number of observations.

Source: GSOEP 2000, own calculations.

Table 5: Treatment effects model estimates of job satisfaction

Dependent Variable Estimation method	<i>JS</i> MLE		<i>FTE</i> (Treatment equation) MLE	
Fixed-term Employment (<i>FTE</i>)	0.199**	(2.26)		
Individual characteristics				
Female	-0.012	(-0.42)	0.166***	(3.12)
Unmarried	0.000	(0.01)	0.125**	(1.99)
Age			-0.015***	(-4.80)
Nationality			-0.028	(-0.35)
Private PC use			-0.075**	(-2.06)
Years of education	-0.026***	(-4.24)	-0.005	(-0.45)
Job-related factors				
Log wage	0.270***	(6.69)		
Tenure	-0.014***	(-3.58)		
Tenure ² (*100)	0.030***	(2.70)		
PC	0.076***	(3.98)		
Continuous training	0.000	(0.00)		
Adequate job	0.079***	(2.84)		
Working conditions				
Working time	-0.007**	(-2.19)		
Nightshift / weekend	-0.039	(-1.62)		
Public sector	0.092***	(3.14)		
Occupational status	yes			
Firm size dummies	yes			
Constant	-1.499***	(-4.34)	-0.878***	(-4.69)
<hr/>				
ρ			-0.140	
Wald test ($\rho = 0$)			19.40***	
Wald χ^2 test			156.31***	
N			6,100	

Note: * significant at the 10 % level, ** significant at the 5 % level, *** significant at the 1 % level; robust z-values in parentheses. The model specification contains six dummy variables indicating occupational status and six firm size dummies. The Wald χ^2 test provides information about the fit of the specified model. N is the number of observations.

Source: GSOEP 2000, own calculations.

Appendix:

Table A1: Description of variables

Variable	Description
Fixed-term Employment (<i>FTE</i>)	Dummy variable indicating whether an individual is temporarily or permanently employed
Dependent variables	
<i>JOBSAT</i>	Ordinal variable measuring an individual's job satisfaction between 0 (completely dissatisfied) and 10 (completely satisfied)
<i>JS_LOW</i>	Dummy variable indicating whether or not an individual has a relative low level of job satisfaction (categories 0 to 4)
<i>JS_HIGH</i>	Dummy variable indicating whether or not an individual has a high level of job satisfaction (categories 9 and 10)
Individual characteristics	
Female	Dummy variable indicating whether or not an individual is female
Unmarried	Dummy variable indicating whether or not an individual is unmarried
Age	Age of the individual
Nationality	Dummy variable indicating whether or not an individual is a German citizen
Private PC use	Count variable between 0 and 2 (0 = individual uses neither computers nor the internet privately; 1 = individual uses either computers or the internet privately; 2 = individual uses both computers and the internet privately)
Years of education	Years of an individual's education
Job-related factors	
Log wage	Log of an individual's recent gross earnings
Tenure	Years of an individual's intra-firm job tenure
PC	Count variable between 0 and 2 (0 = individual uses neither computers nor the internet at work; 1 = individual uses either computers or the internet at work; 2 = individual uses both computers and the internet at work)
Continuous training	Dummy variable indicating whether or not an individual has recently participated in continuous training programmes
Adequate job	Dummy variable indicating whether or not an individual is working in its original job
Working conditions	
Working time	Number of effective working hours per week
Nightshift / weekend	Dummy variable indicating whether or not an individual is at least sometimes working at night or at weekends
Public sector	Dummy variable indicating whether or not an individual is employed in the public sector
Occupational status	Six dummy variables for managers, highly skilled white collar workers, skilled white collar workers, skilled blue collar workers, unskilled white collar workers, and unskilled blue collar workers
Firm size dummies	Six dummy variables indicating different firm size classes (< 5 employees, 5-19 employees, 20-99 employees, 100-199 employees, 200-1,999 employees, 2,000 and more employees)

Source: GSOEP 2000, own calculations.

Table A2: Descriptive statistics of the variables not presented in Table 2

Variable	Min-Max	Mean	Std. Dev.
Job satisfaction (<i>JOBSAT</i>)	0-10	7.146	1.95
Fixed-term Employment (<i>FTE</i>)	0-1	0.063	0.24
Female	0-1	0.346	0.47
Unmarried	0-1	0.255	0.43
Age	18-65	40.00	10.39
Nationality	0-1	0.885	0.31
Private PC use	0-2	0.614	0.78
Years of education	7-18	12.02	2.40
Log wage	4.60-10.30	8.349	0.43
Tenure	0-47.9	10.05	9.23
PC	0-2	0.665	0.78
Continuous training	0-1	0.315	0.46
Adequate job	0-1	0.584	0.49
Working time	8-77	38.43	3.47
Nightshift / weekend	0-1	0.633	0.48
Public sector	0-1	0.207	0.40
Manager	0-1	0.014	0.11
High skilled white collar workers	0-1	0.165	0.37
Skilled white collar workers	0-1	0.287	0.45
Skilled blue collar workers	0-1	0.259	0.43
Unskilled white collar workers	0-1	0.095	0.29
Unskilled blue collar workers	0-1	0.178	0.38

Note: The calculations are restricted to individuals who do not provide item non-responses for the subsequent regression analysis.

Source: GSOEP 2000, own calculations.

Table A3: Estimates for occupational status and firm size dummies from the ordered probit model (not displayed in Table 4)

Dependent Variable	<i>JOBSTAT</i>	
Estimation method	Ordered probit	
Occupational status		
Manager	0.036	(0.27)
High skilled white collar workers	0.019	(0.28)
Skilled white collar workers	0.020	(0.37)
Skilled blue collar workers	0.059	(1.20)
Unskilled white collar workers	-0.004	(-0.08)
Firm size		
5 to 19 employees	-0.141**	(-2.10)
20 to 99 employees	-0.144**	(-2.17)
100 to 199 employees	-0.141*	(-1.95)
200 to 1,999 employees	-0.153**	(-2.26)
2,000 and more employees	-0.173**	(-2.50)

Note: * significant at the 10 % level, ** significant at the 5 % level, *** significant at the 1 % level; robust z-values in parentheses. The reference group for occupational status is the group of unskilled blue collar workers. The reference group for the firm size dummies are small establishments employing less than 5 workers.

Source: GSOEP 2000, own calculations.