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# Fixed-term employment, work organization and job satisfaction: Evidence from German individual-level data

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## Abstract

The present paper examines the joint effect of fixed-term employment and work organization on job satisfaction using individual-level data from the German Socio-Economic Panel (GSOEP). Specifically, we analyze whether workers who are heterogeneous in terms of the type of working contract (fixed-term vs. permanent) do also differ with regard to job satisfaction, when they perform under comparable work organizational conditions. Such information would be quite valuable for employers, because they can learn about the responsiveness of heterogeneous workers to innovative work organizational practices. For this purpose, we at first estimate a linear fixed effects model, thereby controlling for unobserved time-constant characteristics. In a second step, we account for potential remaining endogeneity by combining the fixed effects approach with a two-stage estimation strategy. Our empirical results show that in terms of job satisfaction fixed-term workers and their permanent counterparts respond differently to a number of organizational practices including task diversity, employee involvement, social relations at work, general working conditions, and career prospects. The results may be used by employers to improve their concept of diversity management and specifically the job design of heterogeneous workers.



**Keywords**: Fixed-term employment, permanent employment, job satisfaction, work organization, selectivity bias, unobserved heterogeneity

**JEL classification**: J28, J81, M55

## 1. Introduction

Since about 15 to 20 years two remarkable changes in the human resource management of firms can be observed simultaneously. First, the number of flexible forms of employment has tremendously increased in recent years. Thereby, flexible employment forms include part-time work, temporary agency work, non-social security system employment, and fixed-term employment. For example, in the EU-27 countries the share of workers employed on the basis of a fixed-term contract has increased from 11.4 per cent in 1997 to 14.5 per cent in 2007 (European Commission, 2008, p. 218), where younger employees and entrants are particularly concerned by such work arrangements. Furthermore, the relative growth in fixed-term employment between 2000 and 2007 has been substantial, with an increase of 24.6 per cent, while the corresponding growth rate for permanent employment is only 5.4 per cent (European Commission, 2008, pp. 28-29).

The second noticeable development refers to a substantial change in the work organization of firms. Specifically, as a direct response to increased product diversification many firms have abandoned the traditional tayloristic system and instead adopted work organization systems that highly rely on practices such as reduced specialization, teamwork, job enrichment, quality management, and employee involvement (see e.g. Betcherman, 1997). In the recent past, such organizational practices are assumed to be the core elements of whole systems of work organization frequently called high performance work systems or something like that. By now, it is hard to overlook the number of studies examining the determinants or productivity effects of such high performance work systems.[1]

Both developments the new employment forms and the new work organization practices have mainly been adopted to meet the increasing requirements of firms with regard to flexibility. Firms are typically forced to adapt to these flexibility requirements in order to maintain competitiveness. On the other hand, not only firms but also employees are likely to be affected by changing employment and work organization patterns. Specifically, the concerned workers may be more or less satisfied with their jobs compared with their counterparts. Moreover, gaining information on the workers' job satisfaction is also important for employers as job satisfaction is likely to have a positive effect on labour productivity and firm performance (Cropanzano and Wright, 2001; Judge et al., 2001; Wright et al., 2002; Zelenski

[1] Representative for many others, we refer to the seminal studies of MacDuffie (1995), Ichniowski et al. (1997), Black and Lynch (2001), and Caroli and Van Reenen (2001).

et al., 2008). As a result, if employers had information about the sources of job satisfaction, they could adopt suitable management practices in order to stimulate the workers' job satisfaction and thus their productivity.

In our study, we consider new employment forms and work organization practices in detail and evaluate their impact on job satisfaction. Regarding the new employment forms we thereby exclusively focus on the role of fixed-term employment. In contrast to related studies[2], we are not solely interested in the question, whether fixed-term employment and innovative work practices are positively or negatively related to job satisfaction. In fact, since both types of management practices are unlikely to be adopted independently, we are especially interested in the joint effect of fixed-term employment and an innovative work organization on a worker's job satisfaction. Specifically, we assume that workers who are heterogeneous in terms of the type of working contract (fixed-term vs. permanent) are unlikely to report the same level of job satisfaction, when they perform under comparable work organizational conditions. For example, fixed-term workers performing multiple tasks may be more or less satisfied with their jobs than their permanently employed counterparts. Such information would be very valuable for employers, who aim at improving their concept of diversity management, especially if fixed-term workers and permanent workers were found to differ with regard to extrinsic and intrinsic motivation.

Methodologically, our focus on estimating the joint effect of fixed-term employment and innovative organizational practices on job satisfaction is associated with the estimation of interaction terms. This is a challenging undertaking insofar as both working contract status and organizational work practices, which represent our explanatory variables of interest, are unlikely to be exogenous factors. For example, individual workers vary in several observed and unobserved characteristics and are thus likely to select themselves into temporary or permanent positions. Analogously, workers are likely to assign themselves or be assigned to jobs with diverging practices of work organization. As a consequence, not accounting for the sources of endogeneity would probably be associated with biased and inconsistent parameter estimates of the effects of contracts status and work organization on job satisfaction. Of course, this does also apply to the joint effect of contracts status and work organization.

[2] First and foremost, see the recent work of Origo and Pagani (2008).

Interestingly, so far endogeneity issues have largely been neglected in empirical studies on the effects of fixed-term employment or innovative work practices on job satisfaction. The studies of Askenazy and Caroli (2006), Cornelissen (2006, 2009), de Graaf-Zijl (2005), Mohr and Zoghi (2006), and Origo and Pagani (2008, 2009) represent some of the rare exceptions, although it must be mentioned that apart from Mohr and Zoghi (2006) as well as Origo and Pagani (2009) these studies concentrate on accounting for either observed heterogeneity or unobserved time-constant characteristics and thus fail to control for unobserved time-varying factors. In contrast, our estimation strategy extensively addresses the endogeneity problem in two steps. In a first step, we use individual-level panel data and apply a linear fixed effects model, thereby controlling for unobserved time-constant characteristics. In a second step, we account for potential remaining endogeneity by combining the fixed effects approach with a two-stage estimation strategy. In this respect, we choose to apply a procedure suggested by Dubin and McFadden (1984), which has also been used recently in Origo and Pagani (2009). Precisely, we calculate a set of correction terms from a multinomial logit model of the determinants of the considered working contract-work organization combinations in the first stage and use these estimates as additional regressor variables to control for endogeneity when estimating the job satisfaction equation in the second stage.

To the best of our knowledge, the research question of our investigation is novel insofar, as previous empirical studies do not consider the joint effect of fixed-term contracts and work design on job satisfaction but concentrate instead on the single effect of either fixed-term contracts or organizational practices on job satisfaction. However, as argued above this interaction is worth considering, because it may provide useful insights in terms of potentially diverging levels of job satisfaction in situations, where fixed-term and permanent workers face comparable working conditions. Hence, the objective of this paper is to examine whether fixed-term contracts contribute either to deteriorate or increase job satisfaction, when the concerned employees work under similar organizational conditions as their permanent counterparts. If we, in fact, identified significant differences in the levels of job satisfaction between permanent and fixed-term workers, who both perform, for example, multiple tasks in their jobs, we could conclude that one of the two groups of workers is more responsive to innovative work organizational practices than the other group. As a consequence, diversifying jobs would constitute a useful management implication, because management practices enhancing job satisfaction are likely to increase productivity as well.

In our study, we use individual-level data from the German Socio-Economic Panel (GSOEP). The GSOEP is a longitudinal study of private households in Germany that started in 1984 and covers a wide range of socio-economic and other variables. For our research question we can use the waves 1985, 1987, 1995 and 2001 of the GSOEP.

The remainder of the paper is organized as follows. In Section 2, we present an overview of the theoretical discussion concerning the impact of fixed-term employment and work design on job satisfaction. Section 3 provides a brief review of the previous empirical literature. In Section 4, we present our econometric analysis on the joint impact of fixed-term employment and work design on job satisfaction using the GSOEP data. Finally, Section 5 concludes.

## 2. Theoretical considerations

### *2.1. Fixed-term employment and job satisfaction*

From the viewpoint of firms, fixed-term employment appears beneficial for at least two reasons: First, fixed-term employment can be used as an instrument of flexible adjustment. In this case, fixed-term workers serve as a buffer stock allowing firms to keep their labour demand flexible at low cost. Second, fixed term contracts may be used as a screening device, where fixed-term workers are tested for permanent positions.[3] However, the success of the adoption of fixed-term contracts does not only depend on the employers' objectives, but also on the acceptance or responsiveness of the concerned workers.

In principle, fixed-term contracts can either have a positive or negative effect on employees' job satisfaction. An explanation which supports the view of a negative relationship can be derived from the theory of segmented labour markets introduced by Doeringer and Piore (1971). The simultaneous use of permanent and fixed-term workers is associated with a separation of the workforce into two segments. One segment contains the permanently employed core workers, while the other segment contains the peripheral fixed-term employees. The essential point is that permanent and fixed-term workers face different and segment-specific working conditions. While the segment of the permanent core workers is characterised, for example, by employment protection (at least to a certain degree), appealing wages and existing training and promotion options, the fixed-term workers belonging to the

[3] For a more comprehensive discussion see e.g. Bentolila and Saint-Paul (1992), Booth et al. (2002) and Boockmann and Hagen (2008).

peripheral segment are much more likely to suffer from insecure jobs, wage penalties[4], unsatisfactory working hours, less employer-provided training opportunities, and limited career options (Wooden and Warren, 2003). Hence, the segmentation strategy may induce the fixed-term workers to feel like second-class members of the workforce. As a result, fixed-term workers are expected to report lower levels of job satisfaction than permanent workers.

Another explanation for the hypothesis that a fixed-term contract is likely to deteriorate workers' 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, ability, loyalty) in relation to the returns of the employer (e.g. payment, job security, promotion opportunities) (Isaksson et al., 2003). The psychological contract theory implies that productive working requires the worker's contributions and rewards to be balanced. When employees perceive inequality between contributions and rewards, they assess the psychological contract to be violated. As a consequence, job satisfaction will decline encouraging the employee to restore equality. For example, if fixed-term workers have more limited psychological contracts than permanent workers or if managers feel less compelled to keep their promises to fixed-term workers as opposed to permanent workers, job satisfaction of the former is likely to decline due to the perception of unfair treatment (Guest and Clinton, 2006). According to psychological contract theory, therefore, fixed-term workers may perceive an inequality between contributions and rewards, when they are unlikely to be promoted to the aspired permanent job or receive a low wage despite high effort.

A related theoretical explanation for the expected negative relationship between fixed-term contracts and job satisfaction can be derived from equity theory (Adams, 1965; Robbins and Judge, 2008). According to equity theory, workers are inequality averse and compare their reward-contribution ratio with the corresponding ratio of co-workers. If a worker identified inequality, i.e., the reward-contribution ratio of a reference worker exceeds that of his own, he would take actions to reduce the perceived inequality. In the present case, fixed-term workers may choose permanent workers as the reference group. If they identify equal effort levels but lower wages or less job security compared to permanent workers, fixed-term workers are likely to perceive relative deprivation and inequality at their expense (Pearce, 1998).

[4] According to the idea of fixed-term contracts as a sorting mechanism (see Boockmann and Hagen, 2008) fixed-term workers may initially suffer from wage penalties relative to permanent workers.

Consistent with equity theory, the perception of being disadvantaged relative to reference workers is associated with a declining level of job satisfaction (Beard and Edwards, 1995; Kochan et al., 1994).

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, according to the literature of changing employment prospects and job insecurity (see e.g. Cappelli, 1999; Burchell et al., 2002), it is nowadays no great advantage of having a permanent job compared to having a fixed-term contract. In times, where not only unsuccessful firms but also profitable establishments can be threatened by takeovers, a sudden change of employment prospects may concern the jobs of both permanent and fixed-term workers. As a consequence, permanent jobs need not necessarily be more secure than temporary jobs thus leading to the conclusion that permanent and fixed-term workers may exhibit similar levels of job satisfaction (Guest and Clinton, 2006).

Finally, fixed-term workers can even be assumed to be more satisfied with their jobs than permanent workers. This may yield, for example, if the temporary job is the only chance for a worker to leave unemployment. Hence, having got a job at all may be more important to fixed-term workers than for workers who are employed on the basis of a permanent contract. Put it another way, permanent workers who feel that their jobs are relatively secure may value the pure employment status less than temporarily employed workers, who are glad not to be unemployed anymore. Hence, a relatively high job satisfaction of fixed-term employees may result from a higher valuation of the employment status or from a lower aspiration level with respect to the job compared to permanent workers. In this sense, fixed term workers are likely to be more easily satisfied, because they have lower expectations about the employer's behaviour and duties (Van Dyne and Ang, 1998). Note that this view is consistent with expectancy theory (Vroom, 1964; Robbins and Judge, 2008).

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. Hence, the winner's prize is a promotion from fixed-term 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 to a permanent job, high effort levels, which are necessary to obtain the permanent job, and high job satisfaction levels may coincide.

A final reasoning emphasizes the deviating attitude of workers to work. More precisely, some workers may prefer the more limited commitments that are typically associated with non-permanent jobs (Guest and Clinton, 2006). These workers consciously search for temporary jobs opportunities and do not seek long-term jobs at all, because they value job mobility more than job security. More precisely, they aim at gaining experience and expertise with different tasks and jobs, thus following a concept of employment security rather than job security. Another reason for voluntarily accepting a fixed-term contract is that the wanted job only comes on a non-permanent basis. As a consequence, workers who have voluntarily chosen a fixed-term contract are likely to be satisfied with their job and perhaps even more satisfied than permanent workers.

*2.2. Work organization and job satisfaction*

Similar to the theoretical discussion with regard to the effects of fixed-term-employment on job satisfaction, which does not lead to clear-cut implications, the expected impact of work organization on job satisfaction cannot easily be predicted either. According to a first line of reasoning, turning away from tayloristic concepts of work organisation that build on highly specialized tasks, rigid command structures or centralized responsibilities and thus resigning the principles of scientific management can be assumed to increase the workers' job satisfaction. For example, according to the two-factor theory (see Herzberg et al., 1959; Robbins and Judge, 2008) or the job characteristics model of work motivation introduced by Hackman and Oldman (1976, 1980), job characteristics like task diversity, autonomy at work, employee involvement, self-managed team work, job rotation, working time flexibility, horizontal communication channels, and delegation of decision rights are likely to improve the working conditions within firms. In addition to these measures of job enlargement and job enrichment the social relations have been identified as an important attribute of a job that may contribute substantially to improve working conditions. More precisely, the quality of the workers' relationship with colleagues and supervisors are likely to determine internal working conditions. As a result, a work organization that contains superior social relations as well as

measures of job enlargement and job enrichment described above is expected to have a positive influence on the workers' job satisfaction.

In contrast, another stream of literature emphasizes that in many European countries work intensity has increased in recent years (see e.g. Green, 2004). At the same time, the proportion of employees with work-related health problems has also increased. Moreover, in recent years there is a renaissance of occupational injuries in certain European countries as well as an increase in the number of cumulative trauma disorders (Askenazy and Caroli, 2006). The idea is that this upward trend in work-related health problems and occupational risks can at least partially be attributed to the introduction of organizational practices like job enrichment, job enlargement, quality management or working time flexibility. For example, quality management programmes usually do not only aim at improving quality, but also at reducing costs, which in turn may imperil the workers' job security. Similarly, the decentralisation of decision-making may not only enhance the degree of worker autonomy, but also the mental strain and pressure exerted on particular workers. Moreover, job rotation or working time flexibility may also raise the pace and intensity of work, thereby disturbing people's work life balance. Finally, organizational practices such as quality management, team work and quality circles are typically associated with the introduction of peer monitoring or peer evaluations, which in turn may be at the expense of internal working atmosphere (Askenazy and Caroli, 2006, Mohr and Zoghi, 2006). From this point of view, new organizational practices are therefore likely to deteriorate the workers' job satisfaction.

## 3. Related literature

The relevant empirical work on the present research question can be divided into three areas. At first, there are various studies which have an exclusive focus on the impact of fixed-term employment (and other forms of flexible employment) on job satisfaction. These studies do not consider instruments of work organization as potential determinants of job satisfaction at all or only in a very crude way. Conversely, several studies exclusively focus on the impact of work organization on job satisfaction without additionally controlling for the role of the employees' type of working contract. Finally, there are some studies assuming that both fixed-term employment and work organization determine job satisfaction. Typically, however, even those studies have a focus on either fixed-term employment or work organization, while the respective other determinant merely works as a control variable. To

the best of our knowledge, so far there are no studies that focus on the interaction of work organization and fixed-term employment and thus consider the joint effect of both instruments on job satisfaction.

The studies of Clark (1996), Ellingson et al. (1998), Booth et al. (2002), Kaiser (2002), D'Addio et al. (2003), Kalleberg and Reynolds (2003), Wooden and Warren (2003), Henneberger et al. (2004), Petrongolo (2004), an de Graaf-Zijl (2005) can be assigned to the first of these categories. The results of these studies are quite mixed. While some studies report a negative impact of fixed-term employment (and other forms of temporary employment) on overall job satisfaction (Kaiser, 2002; D'Addio et al., 2003; Petrongolo, 2004), other studies do not find a significant difference with regard to the job satisfaction of temporarily employed and permanent workers (Clark, 1996; Booth et al., 2002; Kalleberg and Reynolds, 2003; de Graaf-Zijl, 2005). For example, a main result of de Graaf-Zijl (2005) is that temporary agency work is associated with the lowest job satisfaction, while on-call work and fixed-term employment do not differ significantly from regular work in terms of overall job satisfaction.

In turn, other studies even find that temporarily employed workers are more satisfied with their jobs than permanent workers. For example, according to Henneberger et al. (2004) fixed-term employment is found to be positively related to overall job satisfaction. Similarly, Wooden and Warren (2003) conclude that fixed-term workers are more satisfied with their jobs than permanent workers who are in turn more satisfied than casual workers.

Note that the studies supporting a negative relationship between fixed-term employment and job satisfaction are in line with the theory of segmented labour markets, the psychological contract theory, or the equity theory, respectively. On the contrary, the studies that cannot identify significant differences in the job satisfaction of fixed-term and permanent workers confirm the view described in the literature of changing employment prospects and job insecurity. Finally, positive effects of fixed-term employment on job satisfaction are consistent with the expectancy theory, the tournament theory, or the self-selection interpretation introduced in Section 2.

Another stream of empirical literature focuses on the impact of work organizational practices on job satisfaction. Despite the competing lines of reasoning with regard to the effects of a

work organization characterized by practices such as task diversity, job rotation, worker autonomy, team work and working time flexibility, the empirical evidence is quite clear-cut. The majority of empirical studies conclude that innovative organizational practices tend to improve the workers' job satisfaction (see e.g. Fahr and Mammel, 2007; Mohr and Zoghi, 2006; Cornelissen, 2006). The study of Petrescu and Simmons (2008) restricts this conclusion to non-union members, stating that job satisfaction of union members is not significantly affected by work organizational practices. All in all, however, these studies are in line with the two-factor theory or the job characteristics model of work motivation, respectively.

Empirical evidence in accordance with a negative impact of a modern work organization on job satisfaction is rather scarce and implicit. One example is the study of Askenazy and Caroli (2006). Using a data set of French workers for the year 1998, the authors examine the impact of new organizational practices and information and communication technologies on working conditions, where working conditions are measured by occupational risks and injuries as well as several indicators of mental strain. Such working conditions are likely to be associated with a low level of job satisfaction or well-being at work, respectively.[5] The authors find that the new organizational practices contribute to deteriorate working conditions (and thus well-being at work), which is consistent with the work intensification hypothesis derived by Mohr and Zoghi (2006).[6]

Finally, there are a few studies that consider both fixed-term employment and work organization as potential determinants of job satisfaction. However, almost all of these studies have a strong focus on the impact of work design and merely apply fixed-term employment as a control variable. For example, Bauer (2004) investigates the effects of high performance workplace practices such as increased autonomy, team work, job rotation or increased communication with co-workers on self-reported job satisfaction using cross-sectional data from the European Survey on Working Conditions (ESWC). The study provides evidence for a positive impact of high performance work systems on job satisfaction in 11 of 15 European countries. The estimated effect of fixed-term employment on job satisfaction is negative. Moreover, using the German Socio-Economic Panel (GSOEP) Cornelissen (2009) identifies

[5] In a previous version of this paper the authors use the term 'well-being at work' instead of working conditions, which is probably more related to job satisfaction.

[6] Another study that provides supporting evidence for the intensification hypothesis comes from Green (2004). In this study, work intensification is attributed to technological chance, innovative work practices (task flexibility, high involvement policies), high-commitment human resource policies, declining unionization and increasing job insecurity.

several work organizational practices such as task diversity, employee involvement, autonomy, and social relations at work to increase job satisfaction. In terms of fixed-term employment, the author cannot identify a significant effect on job satisfaction.

An empirical investigation, which regarding to the research question is quite closely related to our study, comes from Galup, Klein and Jiang (2008). The authors examine the impact of various organizational practices (job autonomy, task interdependence, job involvement, management support) on the job satisfaction of information systems workers. Thereby, the analyses are conducted separately for permanent and temporary workers. The data set used for the regression analysis is relatively small (sample size is $N = 169$) and restricted to employees in the public sector and non-profit organizations. Since the authors do not consider socio-economic variables as potential determinants of job satisfaction, their estimation model is quite crude. Furthermore, important econometric problems like unobserved heterogeneity and selectivity are also ignored. While management support is found to raise job satisfaction of both permanent and temporary workers, job involvement increases only the permanent workers'' job satisfaction and task interdependence mitigates only the temporary workers' job satisfaction. The authors therefore conclude that managers should assign less interdependent tasks to temporary workers.

Finally, Origo and Pagani (2008) address the problem how quantitative and qualitative (functional) workplace flexibility affect overall, intrinsic and extrinsic job satisfaction using individual data from the Eurobarometer survey at the cross-sectional level. Quantitative flexibility is measured by the use of temporary work, part-time work and flexible working hours, while qualitative flexibility contains practices like employee involvement, job rotation, work autonomy, teamwork and the use of multiple skills. The authors apply ordered probit estimations and control for endogeneity problems by adding variables on personality and psychological characteristics to the set of explanatory variables in order to proxy unobserved time-invariant factors. They ascertain a positive link between qualitative workplace flexibility and job satisfaction, while they find no or a negative effect of quantitative workplace flexibility. Moreover, the positive impact of qualitative workplace flexibility is found to be larger, when considering satisfaction for intrinsic aspects of the job.

The study of Origo and Pagani (2008) is also quite closely related to our investigation. However, in contrast to Origo and Pagani (2008) we explicitly focus on the interaction

between fixed-term employment and work organization and thus on the joint effect on job satisfaction. Moreover, our treatment of the endogeneity problem differs from the approach of Origo and Pagani (2008) in two ways. First, due to the fact that we have access to panel data, we are able to account for unobserved individual characteristics by applying fixed effects models which in either case is a promising and probably more appropriate approach than exploiting the richness of the data set in terms of additional explanatory variables. Second, our estimation strategy allows accounting for a potentially remaining selectivity or sorting bias using a procedure introduced by Dubin and McFadden (1984). Our estimation strategy is therefore similar to the proceeding applied in Origo and Pagani (2009). However, in this study the authors have no access to panel data and thus cannot estimate fixed effects models. Furthermore, Origo and Pagani (2009) do not consider the joint effect of fixed-term employment and work organization on job satisfaction, but the joint effect of fixed-term employment and job security.

To summarize, our study differs in content, data and methodological approach from existing empirical investigations. Note, for example, that the endogeneity problem, which is potentially inherent in both the fixed-term and the work organization variable, is completely ignored in some of the studies discussed above, while other studies just focus on either observed heterogeneity (e.g. Bauer, 2004; Askenazy and Caroli, 2006) or time-constant unobserved heterogeneity (e.g. D'Addio et al., 2003; de Graaf-Zijl, 2005; Cornelissen, 2006, 2009; Origo and Pagani, 2008). Only Mohr and Zoghi (2006) as well as Origo and Pagani (2009) additionally address the issue of unobserved time-varying heterogeneity, which is also our concern in the present study. Finally, apart from our study the German Socio-Economic Panel (GSOEP) has previously been used only in Fahr and Mammel (2007) and Cornelissen (2006, 2009).

## 4. Econometric analysis

### *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 concerned households have been surveyed annually.[7] The panel offers information on German citizens and immigrants living in the eastern or western part of Germany. The GSOEP questionnaires cover a wide range of subjects. For example, the GSOEP contain information about personality traits, occupational and family biographies, employment status and working conditions, professional mobility, earnings, health, individual satisfaction and well-being, household composition and living situation, education, training, social security, and environmental behaviour. Some of the items are surveyed annually, while others are captured in rather irregular time intervals. For example, the information about work organization belong to the latter category.

In order to examine the relationship between fixed-term contracts, work organization and the employees' job satisfaction, we use the waves 1985, 1987, 1995 and 2001 of the GSOEP. In these waves, employees have been asked a number of questions related to the organization of work, such as task diversity, autonomy at work, employee involvement, relations with colleagues and supervisors, promotion opportunities, environmental risks and others. Furthermore, the data set gives information on the employees' job satisfaction and the type of employment contract (fixed-term or permanent). Finally, it provides a rich set of socio-economic control variables.[8] Note that in addition to the information provided by the survey, we match the unemployment rates of the different German Federal States as published by the German Federal Statistical Office to the data set. We restrict the analysis to private and public sector employees excluding civil servants and apprentices. Workers in the sample are aged 17 to 64. At first, Figure 1 displays the distribution of job satisfaction in 1987 and 2001.[9] This figure provides first insights with regard to potential changes in the distribution of job satisfaction over time.

[Insert Figure 1 about here]

Two findings are worth mentioning. First, the distribution is in line with the results of related studies that report a relatively high degree of the employees' job satisfaction. Second, job satisfaction appears to decline slightly over time. Unfortunately, at this point we cannot

[7] 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.
[8] For more comprehensive information on the GSOEP see Wagner et al. (2007).
[9] 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).

identify whether or not flexible employment forms like fixed-term contracts or innovative organizational practices contribute to this development anyway.

Since we apply quite a lot of measures of work organization, clustering appears to be helpful. Hence, we assign the organizational variables to one of the following four categories: innovative work practices, general working conditions, social relations at work, and career prospects. The category 'innovative work practices' consists of variables measuring task diversity, employee involvement and work autonomy. 'General working conditions' is the generic term for the stress level, physically demanding work and environmental risks. Moreover, the category 'social relations at work' includes measures for the extent of performance monitoring as well as relations with peers and supervisors. Finally, measures for promotion and learning opportunities as well as a variable capturing whether or not a worker is paid above median wage are assigned to the category 'career prospects'.

Note that our understanding of the concept of work organization is rather broad. The measures we consider sometimes turn out to be integral parts of so-called high performance work systems. However, as we do not interact bundles composed of these measures with the contract status variable but focus on pairwise interactions, we abstain from using the term high performance work systems for the benefit of the term work organization.[10]

Table 1 presents an overview of the main variables considered in the analysis (job satisfaction and various work organization measures) separated for fixed-term and permanent workers.[11]

[Insert Table 1 about here]

At a first glance, fixed-term and permanent workers appear to differ in terms of some of these variables. More specifically, permanent workers, on average, appear to be more satisfied with their jobs than fixed-term workers. Moreover, permanent workers report more frequently to exercise jobs with task diversity. They also report more frequently to decide quite autonomously how to complete the delegated tasks. Furthermore, permanent workers are more likely to be involved in decisions such as determining whether or not employees should receive a higher wage or promotion. On the other hand, fixed-term workers seem to be more

[10] The term 'organizational practices' would probably shape up as an alternative to our concept of work organization.
[11] The complete list of variables is summarized and explained in Table A1 in the Appendix.

subject to strict performance monitoring. Interestingly, fixed-term workers are more likely to exhibit better learning opportunities than permanent workers. Finally, the previously mentioned wage penalty of fixed-term workers becomes visible. The differences with regard to the remaining variables are less striking. Although these descriptive statistics may provide some first insights on the specific differences between fixed-term and permanent workers, we should not put too much weight on them. Meaningful conclusions can only be drawn from a multiple regression analysis that additionally accounts for potential endogeneity biases, so that real causal effects can be estimated.

*4.2. Econometric modelling*

Similar to related empirical studies on the determination of job satisfaction our own analysis follows Clark and Oswald (1996), who assumed that an employee's $i$ utility from work $U_i$ depends on individual ($I_i$), establishment ($E_i$) and job characteristics ($J_i$). Since we are particularly interested in the joint effect of contract status (fixed-term vs. permanent) and work organization, utility of worker $i$ can be expressed as

$$U_i = U_i\left(A_i, I_i, E_i, J_i\right), \tag{1}$$

where $A_i$ is the working contract-work organization combination of worker $i$. For example, worker $i$ = 1 may be employed on the basis of a fixed-term contract and simultaneously performs a job with task diversity, while worker $i$ = 2 may be permanently employed and simultaneously performs a job with task specialization.[12]

Utility from work can empirically be approximated by self-reported job satisfaction. As mentioned above, in the GSOEP job satisfaction is measured at an ordinal scale ranging from 0 (completely dissatisfied) to 10 (completely satisfied). In this context, the determinants of job satisfaction are usually estimated using conventional ordered probit or logit models. However, these models exhibit some drawbacks when unobserved time-constant heterogeneity is important. Specifically, conventional ordered probit or logit models fail to account for unobserved characteristics and thus suffer from a heterogeneity bias. As a consequence, the estimated coefficients of the explanatory variables are likely to either overestimate or underestimate the respective true effect. On the other hand, accounting for fixed effects in qualitative response models (like an empirical model of job satisfaction) is not unproblematic

[12] The reasoning for the other characteristics of work organization displayed in Table 1 is analogous.

either. For example, the fixed effects probit model leads to inconsistent parameter estimates (see e.g. Baltagi, 2001, p. 206; Hsiao, 2003, p. 194), and the fixed effects logit model can only be estimated on the subsample of individuals that have longitudinal variation in the dependent variable, which leads to small sample sizes and selected samples. This reasoning does also apply for ordered models.

All in all, it is clear that we cannot abstain from accounting for fixed effects in empirical models of job satisfaction, because job satisfaction is likely to depend on various unobserved individual characteristics of the respective workers. If these unobserved personality traits and genetic predispositions that influence job satisfaction are related to observed characteristics, the estimates of the effect of these characteristics on job satisfaction will be biased. The problem is especially relevant when both the dependent and independent variables are subjective measures (Hamermesh, 2004), because both then include a person-specific effect and estimates are affected by this effect and do not reveal the true relationship of the underlying objective measures. In this case, including fixed effects can to some extent alleviate the problem of inter-personal non-comparability of subjective data (Cornelissen, 2009). It is therefore important to account for unobserved individual heterogeneity when estimating job satisfaction estimations.[13]

As a consequence of these considerations and in order to circumvent the problems mentioned above, we estimate a linear fixed-effects model. For this purpose, we at first rescale the ordinal dependent variable to make it more compatible with a linear model. This procedure of cardinalisation has been proposed by van Praag and Ferrer-i-Carbonel (2004), who call their approach probit-adapted OLS (POLS). In principle, we follow this approach of "roughly cardinalising" our job satisfaction variable. However, we slightly modify the POLS approach as suggested in Cornelissen (2006, 2009) and call the resulting procedure ordered logit-adapted OLS (OLOLS). The OLOLS estimation approach is explained in Appendix A.

The cardinalisation of the dependent variable allows us to specify a linear estimation model, which is equivalent to utility function (1):

$$JS_{it} = \alpha_{10} D_{10it,k} + \alpha_{01} D_{01it,k} + \alpha_{11} D_{11it,k} + \beta' X_{it} + \mu_i + \varepsilon_{it} \,. \qquad (2)$$

[13] Including individual fixed effects in the regression will hold time-invariant unobserved heterogeneity constant.

Here, $JS_{it}$ is job satisfaction of worker $i$ at time $t$. The dummy variables $D$ represent the effects of different combinations of the type of working contract and work organization. Thereby, the index $k$ indicates the respective measure of work organization also displayed in Table 1. For example, if $k$ indicates whether or not worker $i$ is autonomous in performing his or her job, $D_{10}$ represents a worker with a fixed-term contract and no or little autonomy. Furthermore, permanent workers who can perform their job quite autonomously are captured by $D_{01}$, while $D_{11}$ indicates autonomously performing fixed-term workers. Note that $D_{00}$ represents the reference group workers, i.e., permanent workers with no or little autonomy, and is therefore excluded form the estimation model. Finally, $X$ is a vector of observable individual, establishment and job characteristics, $\mu$ captures unobserved fixed (i.e., time-constant) effects and $\varepsilon$ is the remaining error term.[14] It is important to note that $X$ also contains the $l$ ($l \neq k$) remaining work organization variables. The parameters to be estimated are illustrated by $\alpha_{10}$, $\alpha_{01}$, $\alpha_{11}$ and $\beta$, where we are especially interested in the $\alpha$-parameters.

The estimation of the fixed effects model (2) is necessary in this context as both the type of working contract and work organization typically result from the choices of employers and employees. Hence, both explanatory variables of interest are likely to be endogenous and thus depend themselves on other factors, which may either be observable or unobservable. Not accounting for the sources of endogeneity in the estimation strategy would be associated with biased and inconsistent parameter estimates. Applying the fixed effects estimation strategy explicitly addresses the problem that unobserved time-invariant factors (e.g. individual motivation or talent) may be correlated with both the explanatory variables of interest and the dependent variable. Including fixed effects into the analysis alleviates the endogeneity problem to some extent, because it filters out the effects of time-constant unobserved characteristics.

However, if and to the extent to which unobserved factors are time-varying, accounting solely for fixed-effects cannot completely remedy the endogeneity problem. More specifically, both explanatory variables of interest may also depend on time-varying unobserved factors that may simultaneously affect job satisfaction. For example, workers and employers may execute some unmeasured (extra) effort to influence the assignment to a special kind of working contract or innovative work practice. Hence, both the type of working contract and work

[14] The notion 'remaining error term' implicates the existence of a composite error consisting of a time-constant and a time-varying component such as $u_{it} = \mu_i + \varepsilon_{it}$, where $\mu_i$ reflects the time-constant component and $\varepsilon_{it}$ the time-varying component.

organizational practices are unlikely to result solely from some external events uncontrollable by individual decisions of certain firm members. For example, multitasking jobs or jobs with a high degree of autonomy are not arbitrarily assigned to workers. Similarly, workers with a fixed-term contract are likely to be systematically different from the types of workers filling permanent positions. Hence, parameter estimates may substantially suffer from a selectivity bias, unless this source of endogeneity is adequately taken into account by the estimation strategy.

In addition to the fixed effects estimation we therefore implement a two-step endogeneity correction introduced by Dubin and McFadden (1984) and recently applied in Origo and Pagani (2009).[15] According to this procedure, a multinomial logit model of the following form is estimated in a first step:

$$W_{it} = \gamma' Z_{it} + \nu_{it} \ . \tag{3}$$

Here, $W$ is the multinomial dependent variable taking the values 1 for $D_{00} = 1$, 2 for $D_{10} = 1$, 3 for $D_{01} = 1$, and 4 for $D_{11} = 1$. Hence, there are four groups of workers who are assumed to differ systematically with respect to certain characteristics included in $Z$. Moreover, $Z$ is a vector of observable characteristics with $Z = [X \ y]$, where $X$ includes all exogenous variables used in equation (2)[16] and $y$ is a dummy variable indicating whether or not the father of a respective employee worked as a civil servant, when this employee was 15 years old. This dummy variable is additionally included in order not to rely merely on the functional form assumptions for identification. Hence, we assume that the father's occupation as a civil servant during the employee's adolescence shapes his or her choice of the type of contract and work organization, but has no direct effect on the employee's job satisfaction. Finally, $\gamma$ is the vector of coefficients and $\nu$ is the error term.

Note that so far the multinomial logit model (3) contains no fixed effects, which are, however, included in our primary job satisfaction equation (2) and thus needed at the second stage of the estimation procedure. Due to the problems in the context of a fixed effects estimation of qualitative (i.e., binary, ordered or multinomial) response models mentioned above, we abstain from estimating a fixed effects multinomial logit model in order to account for

[15] As mentioned above, Origo and Pagani (2009) do not use panel data and therefore do not include fixed effects. Instead, the authors attempt to capture the effect of unobserved time-constant factors by adding time-constant personality traits to the regressor variables.

[16] For example, the four types of workers may differ with respect to characteristics like age, tenure, education, job security, working hours, and pay.

unobserved heterogeneity at the first stage. Instead, we address the problem of unobserved characteristics applying the so-called Mundlak's approach (see Greene, 2008, p. 209f) as an alternative. According to Mundlak's approach, we include the person means of all time-varying explanatory variables as additional regressors in equation (3). This allows controlling for unobserved effects that may be correlated with the regressors, at least to some extent. Taking Mundlak's approach into account, equation (3) changes to

$$W_{it} = \gamma' Z_{it} + \delta' \overline{X_i^1} + \nu_{it} \,, \tag{4}$$

where $\overline{X^1}$ contains the person means of all time-varying explanatory variables $X^1$ in $X$ with $X = [X^1 X^2]$ and $X^2$ as the vector including all time-constant explanatory variables.

From the first-stage regression of equation (4) a set of correction terms can be calculated, which are then used as additional control variables in the second stage linear fixed effects regression model. According to Dubin and McFadden (1984), the correction terms can be calculated as

$$c_{it} = E(\varepsilon \mid W = i) = \sum_{i \neq j}^{m} \frac{\hat{P}_{jt} \ln \hat{P}_{jt}}{1 - \hat{P}_{jt}} + \ln \hat{P}_{it} \,, \tag{5}$$

where $m$ is the number of choices (here $m = 4$) and $\hat{P}_j$ is the predicted probability of the $j$-th choice from the first stage multinomial logit model described in equation (4). The linear fixed effects model at the second-stage[17] is then specified as

$$JS_{it} = \alpha_{10} D_{10it,k} + \alpha_{01} D_{01it,k} + \alpha_{11} D_{11it,k} + \beta' X_{it} + \lambda' c_{it} + \mu_i + \varepsilon_{it} \,. \tag{6}$$

Significant parameters in $\lambda$ would indicate that the endogeneity problem is not exclusively solved by accounting for fixed effects, so the correction according to Dubin and McFadden (1984) is essential to eliminate any remaining endogeneity bias. Hence, the two-stage estimation approach derived in equations (4) to (6) assures unbiased and consistent estimates of the parameters of interest, i.e., $\alpha_{10}$, $\alpha_{01}$ and $\alpha_{11}$, which can then be interpreted as causal effects. On the other hand, if the parameter estimates $\lambda$ turned out to be insignificant, the estimation of the linear fixed effects model in equation (2) would be sufficient to obtain unbiased an consistent estimates of $\alpha_{10}$, $\alpha_{01}$ and $\alpha_{11}$.

[17] At this point another benefit of cardinalising the ordinal job satisfaction variable appears. Namely, a two-stage estimation procedure requires the equation at the second stage (i.e., the job satisfaction equation in our case) to be linear (Wooldridge, 2001). Otherwise the parameter estimates obtained would be inconsistent.

*4.3. Empirical results*

The main results of our empirical investigations are summarized in Table 2 to Table 5. We prefer to display the estimation results in several tables because of the relatively high number of work organization variables that have to be interacted with the fixed-term contracts dummy. Another reason for this proceeding is the usefulness to cluster the work organization variables to certain categories. Thereby, the interaction effects of fixed-term employment and various measures of innovative work practices are displayed in Table 2. Table 3 contains the interaction effects of fixed-term employment and the considered measures of general working conditions, while Table 4 displays the corresponding estimates for fixed-term employment and the measures of social relations at work. Finally, Table 5 contains the interaction effects of fixed-term employment and the measures of the career prospects of workers.

Note that all these tables exhibit the same structure. Precisely, columns (1)-(3) display the results of a pooled OLOLS estimation approach that serves as a reference model in order to evaluate to which extent the estimates change, when fixed effects and other sources of endogeneity are taken into account. Columns (4)-(6) show the results of our linear fixed effects model specified in equation (2), where we control for unobserved time-invariant characteristics. Finally, columns (7)-(9) contain the endogeneity corrected fixed effects estimates of our two-stage estimation approach according to equations (4) to (6). Alongside with our estimation results, we also report on our endogeneity test, which is a test of joint significance of the correction terms.[18]

Table 2 displays the estimated coefficients for the dummy variables $D_{10}$, $D_{01}$, and $D_{11}$, where fixed-term employment is interacted with some innovative work practices, i.e., task diversity, employee involvement and autonomy at work.

[Insert Table 2 about here]

[18] The estimates of the control variables are displayed in Table A2 in the Appendix. The control variables are similar to those used in related studies and include, for example, the usual individual socio-demographic explanatory variables (e.g. sex, years of education), job-related variables (e.g. tenure, working time, employment in the public sector), dummy variables for occupational status, and firm size dummies. Note that Table A2 refers to the specification, where the fixed-term contracts dummy is interacted with a work organization dummy variable indicating whether or not a worker executes a job with task diversity. The estimates for the remaining specifications provide very similar results and are available from the authors upon request.

Referring to the results of the endogeneity corrected fixed effects estimation in columns (7)-(9)[19], fixed-term workers in multitasking jobs are not only found to be more satisfied with their jobs than the reference group, i.e., permanent workers with task specialisation. They are also found to be more satisfied than fixed-term workers with task specialisation (work organization (WO) effect) as well as permanent workers in multitasking jobs (fixed-term contract (FTC) effect). In contrast, the fixed effects specification displayed in columns (4)-(6) that only accounts for unobserved time-invariant heterogeneity provides evidence for the WO effect but not for the FTC effect. Here, both fixed-term workers and permanent workers prefer multitasking jobs relative to jobs with task specialisation.

Interestingly, employee involvement increases the level of job satisfaction only for permanent workers (WO effect), while fixed-term workers without employee participation are more satisfied with their jobs than their permanent counterparts (FTC effect). Similarly, fixed-term workers do not attach great importance to a high degree of autonomy at work. Specifically, fixed-term workers without autonomy are more satisfied with their jobs than their permanent counterparts.

The interaction terms between fixed-term employment and the considered measures for the general working conditions, i.e., the level of stress, environmental risks, and physically demanding work, are displayed in Table 3.

[Insert Table 3 about here]

After controlling for endogeneity solely the fixed-term workers reporting a low stress level are found to be more satisfied with their jobs than the reference group workers, whereas the pooled OLOLS and the linear fixed effects estimations generally link stress to lower level of job satisfaction. At this point the relevance of simultaneously accounting for unobserved time-constant and time-varying heterogeneity becomes apparent once again. Obviously, stress carries negative connotations only for fixed-term workers, but not for permanent workers.[20] The results with regard to environmental risks and physically demanding jobs are very similar. Both working conditions also carry negative connotations for fixed-term workers, but

[19] In the following, our interpretation generally refers to the endogeneity corrected fixed effects model. The reason for this is that according to our endogeneity test of joint significance of the correction terms the endogeneity corrected model is more appropriate than the pure fixed effects model.

[20] Note that the WD effect is highly significant for fixed-term employees but insignificant for permanent workers.

not for permanent workers.[21] Specifically, only the fixed-term workers job satisfaction increases, when environmental risks and physically demanding work can be avoided.

In Table 4 fixed-term employment is interacted with social relations at work, i.e., the level of performance monitoring and the workers' relations with peers and supervisors.

[Insert Table 4 about here]

Surprisingly, after controlling for time-constant and time-varying unobserved characteristics a high level of performance monitoring does not damage the job satisfaction of permanent and fixed-term workers. The significant coefficients obtained in the pooled OLOLS and in the fixed effects specification do not turn out to persist in the endogeneity corrected fixed effects model. In contrast, social relations with peers and supervisors appear to be valued differently by permanent and fixed-term workers. More precisely, fixed-term workers obviously prefer good relations with colleagues and supervisors relative to conflicts. Surprisingly, this does not hold for permanent workers. There are no significant differences in the level of job satisfaction between permanent workers facing good relations to peers and supervisors and those with problematic relations. In contrast, fixed-term workers facing good relations with peers and supervisors are found to be more satisfied with their jobs than both their permanent counterparts on the one hand (FTC effect) and fixed-term workers facing rather bad relations with peers and supervisors on the other hand (WO effect).

Finally, Table 5 displays the estimates for the dummy variables $D_{10}$, $D_{01}$, and $D_{11}$, where fixed-term employment is interacted with some career prospects measures, i.e., promotion and learning opportunities as well as wage level.

[Insert Table 5 about here]

First, promotion and learning opportunities generally contribute to increasing job satisfaction. This holds for both fixed-term workers and permanent workers. Hence, there is a strong WO effect for both measures of career prospects. Interestingly, there is also a strong FTC effect with respect to promotion opportunities. Specifically, fixed-term workers facing good opportunities to be promoted (to a permanent job) are significantly more satisfied with their

[21] Note again that similar to the findings for stress, the pooled OLOLS and the linear fixed effects estimations link both environmental risks and physically demanding work to lower level of job satisfaction.

job than their permanent counterparts. A final result comes from interacting the fixed-term contracts dummy with a dummy indicating whether a worker is paid above or below the median wage. Irrespective of whether fixed-term workers are paid above or below the median wage, their level of job satisfaction do not differ significantly from the level of permanent workers paid below median wage. On the other hand, however, permanent workers are more satisfied with their job, when they are paid above median wage. Although there we cannot identify a significant FTC effect, we conclude from this finding that the job satisfaction of permanent workers is more subject to the level of pay than the job satisfaction of fixed-term workers.

## 5. Conclusion

In our paper we examine the joint effect of fixed-term employment and work organization on job satisfaction using individual-level data from the German Socio-Economic Panel (GSOEP). Specifically, we are interested in the question whether workers who are heterogeneous in terms of the type of working contract (fixed-term vs. permanent) do also reveal differences with regard to job satisfaction, when they perform under comparable work organizational conditions. For this purpose, we at first estimate a linear fixed effects model, thereby controlling for unobserved time-constant characteristics. In a second step, we account for potential remaining endogeneity by combining the fixed effects approach with a two-stage estimation strategy.

Our empirical results show that regarding job satisfaction fixed-term workers and their permanent counterparts respond differently to a number of organizational practices. They can be summarized as follows. First, we observe differences between fixed-term workers and their permanent counterparts in terms of responsiveness to various innovative work practices. For example, task diversity at the job increases job satisfaction only for fixed-term workers but not for permanent workers. On the contrary, employee involvement appears to be beneficial only for permanent workers, while fixed-term workers obviously prefer jobs without employee participation. Moreover, fixed-term workers do not attach great importance to a high degree of autonomy at work either.

Second, we can also identify significant differences in job satisfaction for fixed-term and permanent workers who face similar working conditions. For example, fixed-term workers are

found to be more stress-avers than permanent workers. Similarly, environmental risks and physically demanding jobs do also carry negative connotations only for fixed-term workers but not for permanent workers. Third, our results provide evidence that fixed-term workers value social relations with peers and supervisors much more than permanent workers. Fourth, according to our results with respect to career prospects, good promotion opportunities are appreciated by both fixed-term workers and permanent workers, but job satisfaction of fixed-term workers is relatively more affected. Finally, our estimates indicate that the job satisfaction of permanent workers is more subject to the level of pay than the job satisfaction of fixed-term workers.

Our results provide some useful information for employers, because they can learn about the responsiveness of heterogeneous workers to work organizational practices. In general, if employers had information about the sources of job satisfaction, they could adopt suitable management practices in order to stimulate the workers' job satisfaction and thus their productivity. First, our results suggest that although fixed-term workers are obviously interested in jobs that allow performing diversified tasks, they do not necessarily look for job in which responsibility plays a major role. In the same way, fixed-term workers obviously dislike jobs associated with physical and mental strains. Furthermore, as fixed-term workers attach great importance to social relations at work, employers are strongly encouraged to avoid an internal segmentation of the workers in first-class employees (permanent workers) and second-class employees (fixed-term workers). Instead, fixed-term and permanent workers should consciously be integrated into heterogeneous teams. Finally, employers are requested to pay special attention to announcing long-term perspectives for fixed-term workers, so that these workers have a real chance to be promoted to a permanent position. All in all, the results also indicate that fixed-term workers are rather intrinsically than extrinsically motivated. In the end, our results may be used by employers to improve their concept of diversity management and specifically the job design of workers who are heterogeneous with respect to their working contracts.

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## Appendix A: Cardinalized job satisfaction variable

We rescaled the ordinal dependent variable before applying a linear regression model as proposed by van Praag and Ferrer-i-Carbonel (2004). The rescaling makes the coefficients of the linear model comparable with the coefficients of the ordered probit model. Van Praag and Ferrer-i-Carbonel (2004) call this probit adapted OLS (POLS). The rescaling consists of deriving those *Z*-values of a standard normal distribution that correspond to the cumulated frequencies of the different categories of the ordinal dependent variable. Suppose an ordinal variable $x$ coded from 1 to 4 has the following distribution: $p(x=1)=0.1$, $p(x=2)=0.3$, $p(x=3)=0.5$, and $p(x=4)=0.1$. The cumulated frequencies are then $P(x\leq 1)=0.1$, $P(x\leq 2)=0.4$, $P(x\leq 3)=0.9$, and $P(x\leq 4)=1$, and the corresponding *Z*-values of the standard normal distribution are: $Z_{0.1}=-1.28$, $Z_{0.4}=-0.25$, $Z_{0.9}=1.28$, and $Z_1=\infty$. For a given value of the original ordinal variable, the value of the "cardinalized" dependent variable is constructed by considering the expectation of a standard normally distributed variable under the condition that it is in the interval between those two *Z*-values that correspond to the class of the value of the original variable. In the above example, this means that the cardinalized variable $x_c$ takes on the values:

$$x_c = \begin{cases} E(Z \mid Z < -1.28) = -\phi(-1.28)/\Phi(-1.28) & \text{if} \quad x=1 \\ E(Z \mid -1.28 < Z < -0.25) = [\phi(-1.28) - \phi(-0.25)]/[\Phi(-0.25) - \Phi(-1.28)] & \text{if} \quad x=2 \\ E(Z \mid -0.25 < Z < 1.28) = [\phi(-0.25) - \phi(1.28)]/[\Phi(1.28) - \Phi(-0.25)] & \text{if} \quad x=3 \\ E(Z \mid 1.28 < Z) = \phi(1.28)/[1 - \Phi(1.28)] & \text{if} \quad x=4 \end{cases},$$

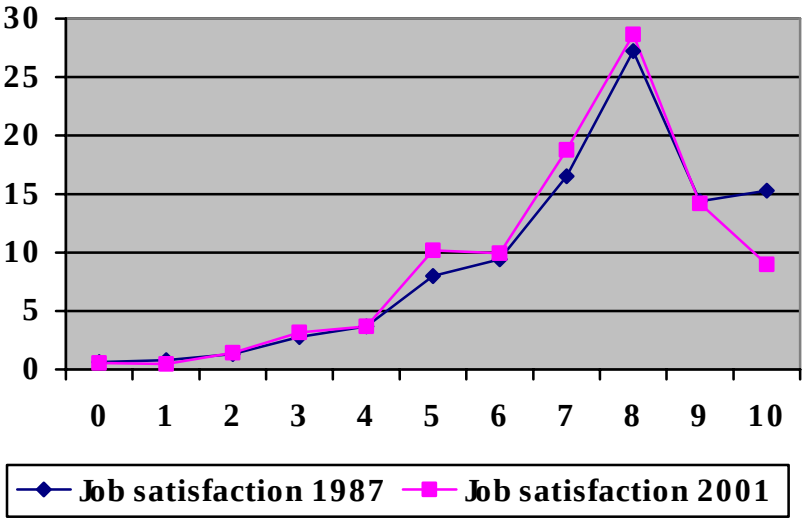
where $Z$ is a standard normal random variable, $\varphi$ being the standard normal probability density function, and $\Phi$ being the standard normal cumulative density function, which leads to:

$$x_c = \begin{cases} -1.75 & \text{if} \quad x=1 \\ -.70 & \text{if} \quad x=2 \\ .42 & \text{if} \quad x=3 \\ 1.75 & \text{if} \quad x=4 \end{cases}$$

In principle, we follow this approach but we replace the *Z*-values from the standard normal distribution by the cutoff points from the ordered probit regression. We prefer this approach because it uses the information of the whole model and not only the frequency distribution of the dependent variable for the rescaling.

**Figure 1**

Distribution of job satisfaction




Note: Job satisfaction is an ordinal variable ranging between 0 (totally unsatisfied) and 10 (totally satisfied).

Source: GSOEP 1987, 2001; own calculations.

**Table 1**

Fixed-term vs. permanent employment: mean values of the variables of interest

| | Variable | Mean for fixed-term employees | Mean for permanent employees |
|---|---|---|---|
| Dependent variable | Job satisfaction | 7.06 | 7.25 |
| Innovative work practices | Task diversity | 0.53 | 0.58 |
| | Employee involvement | 0.07 | 0.18 |
| | Autonomy at work | 0.31 | 0.36 |
| General working conditions | Stress level | 0.25 | 0.27 |
| | Environmental risks | 0.20 | 0.21 |
| | Physically demanding work | 0.20 | 0.17 |
| | Shift work | 0.25 | 0.22 |
| Social relations at work | Performance monitoring | 0.64 | 0.56 |
| | Conflicts with supervisor | 0.04 | 0.03 |
| | Good relations with colleagues | 0.78 | 0.80 |
| Career prospects | Good promotion opportunities | 0.15 | 0.15 |
| | Learning opportunities | 0.39 | 0.33 |
| | Logarithm of monthly net wage | 6.81 | 7.01 |
| *N* | | 1,136 | 18,266 |

Note: The means of Job satisfaction have been calculated from ordinal observations. The work design measures are dummy variables. Hence, the means display the fraction of individuals belonging to that certain feature. *N* is number of observations.

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.

**Table A1**

Description of variables

| Variable name | Variable definition | Permanent | | Fixed-term | |
|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD |
| Job satisfaction | How satisfied are you today with your job? Please answer using the following scale [ranging from 0 to 10]: 0 means totally unhappy, 10 means totally happy. | 7,25 | 1,98 | 7,06 | 2,15 |
| Task diversity | Is your job varied? Dummy=1 if completely true, =0 if partly true or not at all true | 0,58 | 0,49 | 0,53 | 0,50 |
| Employee involvement | Do you have an influence in determining whether employees receive more pay or promotion? Dummy=1 if completely true or partly true, =0 if not at all true | 0,18 | 0,38 | 0,07 | 0,25 |
| Autonomy at work | Do you decide yourself how to complete the tasks involved in your work? Dummy=1 if completely true, =0 if partly true or not at all true | 0,36 | 0,48 | 0,31 | 0,46 |
| Stress level | Does your work involve a high level of stress? Dummy=1 if completely true, =0 if partly true or not at all true | 0,27 | 0,45 | 0,25 | 0,43 |
| Environmental risks | Are you exposed to undesirable working conditions (cold, heat, wetness, chemicals, gases)? Dummy=1 if completely true, =0 if partly true or not at all true | 0,21 | 0,41 | 0,20 | 0,40 |
| Physically demanding work | Do you have to do hard manual labor at your job? Dummy=1 if completely true, =0 if partly true or not at all true | 0,17 | 0,38 | 0,20 | 0,40 |
| Shift work | Do you work the night shift or another type of special shift? Dummy=1 if completely true or partly true, =0 if not at all true | 0,22 | 0,41 | 0,25 | 0,43 |
| Performance monitoring | Is your work strictly monitored? Dummy=1 if completely true or partly true, =0 if not at all true | 0,56 | 0,50 | 0,64 | 0,48 |
| Conflicts with supervisor | Do you often have conflicts and difficulties with your boss? Dummy=1 if completely true, =0 if partly true or not at all true | 0,03 | 0,16 | 0,04 | 0,19 |
| Good relation with colleagues | Do you get along well with your colleagues? Dummy=1 if completely true, =0 if partly true or not at all true | 0,80 | 0,40 | 0,78 | 0,41 |
| Promotion opportunities | How likely is it that the following career change will take place in your life within the next two years: receive a promotion at your current place of employment? Dummy=1 if certainly or probably, =0 if probably not or certainly not [e)] | 0,15 | 0,35 | 0,15 | 0,36 |
| Learning opportunities | Do you often learn something new on the job, something which is relevant for your career? Dummy=1 if completely true, =0 if partly true or not at all true | 0,33 | 0,47 | 0,39 | 0,49 |
| Wage above median | Dummy indicating wage above median wage of given year | 0,50 | 0,50 | 0,28 | 0,45 |
| Strong worries about job security | What is your attitude towards your job security - are you concerned about it? - very concerned | 0,11 | 0,31 | 0,30 | 0,46 |
| Some worries about job security | What is your attitude towards your job security - are you concerned about it? - somewhat concerned | 0,37 | 0,48 | 0,41 | 0,49 |
| Fulltime | Dummy=1 if fulltime job, =0 if part-time job | 0,87 | 0,34 | 0,81 | 0,39 |
| Activity corresponds to job | Is your position the same as the profession for which you were educated or trained? Dummy=1 if yes, =0 if no. | 0,57 | 0,50 | 0,54 | 0,50 |
| Unemployment experience | Years of unemployment experience | 0,32 | 1,00 | 0,79 | 1,43 |
| Any unemployment experience | Dummy=1 if years of unemployment experience > 0, =0 otherwise | 0,27 | 0,44 | 0,49 | 0,50 |

**Table A1 (continued)**

Description of variables

| Variable name | Variable definition | Permanent | | Fixed-term | |
|---|---|---|---|---|---|
| | | Mean | SD | Mean | SDD |
| East Germany | Dummy=1 if East German Citizen, =0 if West German Citizen | 0,15 | 0,35 | 0,20 | 0,40 |
| Regional unemployment rate | Unemployment rate of the Region (German Federal State) | 9,78 | 4,02 | 10,61 | 4,50 |
| Deviation of actual from desired work time | Difference of actual weekly work hours and desired weekly work hours | 6,13 | 7,75 | 6,94 | 8,66 |
| Actual work time | Actual weekly work hours | 40,24 | 9,85 | 39,13 | 10,78 |
| Logarithm of net wage | Logarithm of monthly net wage | 7,01 | 0,50 | 6,81 | 0,50 |
| Growth of net wage | Annual difference of log monthly net wage, coded 0 if missing | 0,05 | 0,21 | 0,13 | 0,35 |
| Growth of net wage missing | Dummy=1 if net wage growth missing, =0 otherwise | 0,06 | 0,24 | 0,23 | 0,42 |
| Public sector | Dummy=1 if public sector, =0 if private sector | 0,21 | 0,41 | 0,31 | 0,46 |
| Years of education | Years of education | 11,60 | 2,31 | 12,18 | 2,95 |
| No professional degree [a)] | Dummy=1 if no professional degree, =0 otherwise | 0,14 | 0,34 | 0,16 | 0,37 |
| Professional degree [a)] | Dummy=1 if vocational degree, =0 otherwise | 0,72 | 0,45 | 0,60 | 0,49 |
| Sex: male | Dummy=1 if male, =0 if female | 0,61 | 0,49 | 0,50 | 0,50 |
| Age | Age in years | 39,82 | 10,52 | 34,48 | 10,93 |
| White collar worker [b)] | Dummy=1 if white collar worker, =0 otherwise | 0,41 | 0,49 | 0,37 | 0,48 |
| Manager [b)] | Dummy=1 if manager, =0 otherwise | 0,15 | 0,35 | 0,16 | 0,37 |
| Job tenure | Job tenure in years | 10,36 | 8,93 | 3,63 | 6,12 |
| Living with partner / spouse | Dummy=1 if living with partner or spouse, =0 otherwise | 0,82 | 0,38 | 0,71 | 0,45 |
| Foreign nationality | Dummy=1 if foreign nationality, =0 otherwise | 0,17 | 0,37 | 0,19 | 0,39 |
| Firm size 20-199 [c)] | Dummy=1 if firm size 20-199, =0 otherwise | 0,29 | 0,45 | 0,33 | 0,47 |
| Firm size 200-1999 [c)] | Dummy=1 if firm size 200-1999, =0 otherwise | 0,25 | 0,43 | 0,26 | 0,44 |
| Firm size > 1999 [c)] | Dummy=1 if firm size >1999, =0 otherwise | 0,25 | 0,43 | 0,20 | 0,40 |
| Year 1987 [d)] | Dummy=1 if year=1987, =0 otherwise | 0,15 | 0,36 | 0,16 | 0,37 |
| Year 1989 [d)] | Dummy=1 if year=1989, =0 otherwise | 0,15 | 0,36 | 0,16 | 0,37 |
| Year 1995 [d)] | Dummy=1 if year=1995, =0 otherwise | 0,19 | 0,40 | 0,13 | 0,34 |
| Year 2001 [d)] | Dummy=1 if year=2001, =0 otherwise | 0,35 | 0,48 | 0,42 | 0,49 |
| *N* | | 18,266 | | 1,136 | |

Note: a) reference group: university degree, b) reference group: blue collar worker, d) reference group: year 1985, e) In 1999 the coding of the subjective promotion probabilities in the GSOEP changed. We harmonize the reply options by recoding 0 % to 'certainly not', 10-50 % to 'probably not', 60-90 % to 'probably' and 100 % to 'certainly'. This recoding ensures that the years before and after the change of the reply options, similar fractions of respondents are in the four categories.

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.

**Table A2**

Regression results for the control variables

| | Pooled OLOLS | Fixed effects | Endogeneity corrected fixed effects |
|---|---|---|---|
| Activity corresponds to job | 0.033** | 0.005 | 0.015 |
| | (0.015) | (0.033) | (0.039) |
| Conflicts with supervisor | -0.744*** | -0.510*** | -0.545*** |
| | (0.052) | (0.066) | (0.077) |
| Good relations with colleagues | 0.325*** | 0.217*** | 0.218*** |
| | (0.017) | (0.026) | (0.036) |
| Autonomy at work | 0.132*** | 0.120*** | 0.171*** |
| | (0.016) | (0.024) | (0.047) |
| Employee involvement | 0.086*** | 0.114*** | 0.152*** |
| | (0.020) | (0.034) | (0.050) |
| Performance monitoring | -0.099*** | -0.106*** | -0.159*** |
| | (0.015) | (0.023) | (0.029) |
| Environmental risks | -0.109*** | -0.088*** | -0.092** |
| | (0.021) | (0.034) | (0.043) |
| Physically demanding work | -0.181*** | -0.143*** | -0.104** |
| | (0.022) | (0.037) | (0.047) |
| High stress level | -0.222*** | -0.151*** | -0.122*** |
| | (0.017) | (0.028) | (0.047) |
| Shift work | 0.055*** | -0.025 | -0.139** |
| | (0.018) | (0.038) | (0.055) |
| Learning opportunities | 0.225*** | 0.143*** | 0.194*** |
| | (0.016) | (0.024) | (0.074) |
| Promotion opportunities | 0.100*** | 0.054* | 0.095*** |
| | (0.020) | (0.030) | (0.036) |
| Deviation of actual from desired work time | -0.009*** | -0.005*** | -0.007*** |
| | (0.001) | (0.001) | (0.002) |
| Actual work time | -0.003** | -0.003* | -0.002 |
| | (0.001) | (0.002) | (0.002) |
| Fulltime job | -0.019 | -0.033 | 0.011 |
| | (0.032) | (0.068) | (0.077) |
| Logarithm of net wage | 0.205*** | 0.268*** | 0.306*** |
| | (0.026) | (0.064) | (0.074) |
| Growth of net wage | 0.092*** | 0.078 | 0.053 |
| | (0.033) | (0.057) | (0.067) |
| Growth of net wage missing | 0.055* | -0.066 | -0.086 |
| | (0.029) | (0.046) | (0.056) |
| Public sector | 0.078*** | 0.005 | -0.073 |
| | (0.018) | (0.057) | (0.066) |
| Years of education | -0.036*** | -0.000 | 0.014 |
| | (0.004) | (0.017) | (0.019) |
| Sex: male | -0.060*** | - | - |
| | (0.019) | - | - |
| Age | -0.007 | -0.028** | -0.002 |
| | (0.006) | (0.012) | (0.015) |
| Age squared / 100 | 0.007 | -0.006 | -0.031* |
| | (0.007) | (0.014) | (0.017) |
| White collar worker | -0.068*** | 0.095* | 0.086 |
| | (0.020) | (0.051) | (0.058) |
| Manager | -0.048 | 0.134** | 0.090 |
| | (0.029) | (0.066) | (0.079) |

**Table A2 (continued)**

Regression results for the control variables

| | Pooled OLOLS | Fixed effects | Endogeneity corrected fixed effects |
|---|---|---|---|
| Job tenure | -0.006** | -0.019*** | -0.020*** |
| | (0.003) | (0.005) | (0.007) |
| Job tenure squared / 100 | 0.009 | 0.033** | 0.019 |
| | (0.008) | (0.016) | (0.019) |
| Living with partner or spouse | 0.033* | -0.018 | -0.048 |
| | (0.020) | (0.043) | (0.048) |
| Non-German nationality | 0.161*** | -0.076 | -0.227 |
| | (0.021) | (0.172) | (0.273) |
| Unemployment experience | -0.001 | 0.062 | 0.030 |
| | (0.009) | (0.046) | (0.050) |
| Any unemployment experience (Dummy) | -0.037* | -0.038 | -0.084 |
| | (0.020) | (0.075) | (0.080) |
| East German Citizen | -0.009 | 0.097 | 0.156 |
| | (0.032) | (0.156) | (0.185) |
| Regional unemployment rate | 0.006** | -0.007 | -0.012 |
| | (0.003) | (0.008) | (0.009) |
| Strong worries about job security | -0.438*** | -0.326*** | -0.409*** |
| | (0.026) | (0.043) | (0.058) |
| Some worries about job security | -0.243*** | -0.166*** | -0.208*** |
| | (0.015) | (0.023) | (0.029) |
| Firm size 20-199 | -0.070*** | 0.044 | 0.040 |
| | (0.020) | (0.046) | (0.055) |
| Firm size 200-1999 | -0.044** | 0.083 | 0.087 |
| | (0.022) | (0.052) | (0.066) |
| Firm size >1999 | -0.085*** | 0.110** | 0.106 |
| | (0.023) | (0.055) | (0.073) |
| Year 1987 | -0.098*** | -0.057** | -0.066** |
| | (0.027) | (0.023) | (0.028) |
| Year 1989 | -0.219*** | -0.161*** | -0.173*** |
| | (0.026) | (0.025) | (0.031) |
| Year 1995 | -0.305*** | -0.130*** | -0.122*** |
| | (0.027) | (0.022) | (0.025) |
| Year 2001 | -0.263*** | - | - |
| | (0.026) | - | - |
| Correction term 1 | - | - | -0.011 |
| | - | - | (0.265) |
| Correction term 2 | - | - | -0.180 |
| | - | - | (0.224) |
| Correction term 3 | - | - | 0.645** |
| | - | - | (0.254) |
| Correction term 4 | - | - | -0.269 |
| | - | - | (0.240) |
| Constant | -0.009 | 0.186 | -0.488 |
| | (0.168) | (0.407) | (0.503) |
| R-squared | 0.174 | 0.117 | 0.130 |

Note: The estimates refer to the specification, where fixed-term employment is interacted with task diversity. Stars indicate significance levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; robust standard errors in parentheses.

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.

**Table 2**

Job satisfaction estimates, fixed-term employment interacted by pairs with measures for innovative work practices

| | Pooled OLOLS | | | Fixed effects | | | Endogeneity corrected fixed effects | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect |
| No task diversity | Ref. | 0.043 | 0.043 | Ref. | 0.012 | 0.012 | Ref. | -0.045 | -0.045 |
| | | (0.047) | (0.047) | | (-0.085) | (-0.085) | | (-0.106) | (-0.106) |
| Task diversity | 0.29*** | 0.34*** | 0.05 | 0.211*** | 0.288*** | 0.077 | 0.097 | 0.377*** | 0.28*** |
| | (0.016) | (0.045) | (0.043) | (0.025) | (0.077) | (-0.075) | (0.087) | (0.102) | (0.097) |
| WO effect | 0.29*** | 0.297*** | 0.007 | 0.211*** | 0.276*** | 0.065 | 0.097 | 0.422*** | 0.325** |
| | (0.016) | (0.061) | (0.06) | (0.025) | (0.107) | (0.1075) | (0.087) | (0.123) | (0.138) |
| No involvement | Ref. | 0.047 | 0.047 | Ref. | 0.058 | 0.058 | Ref. | 0.155* | 0.155* |
| | | (0.034) | (0.034) | | (0.062) | (0.062) | | (0.081) | (0.081) |
| Involvement | 0.086*** | 0.131 | 0.045 | 0.118*** | -0.032 | -0.15 | 0.253*** | 0.075 | -0.178 |
| | (0.020) | (0.122) | (0.12) | (0.033) | (0.195) | (0.196) | (0.062) | (0.256) | (0.256) |
| WO effect | 0.086*** | 0.084 | -0.002 | 0.118*** | -0.09 | -0.208 | 0.253*** | -0.08 | 0.333 |
| | (0.020) | (0.130) | (0.13) | (0.033) | (0.204) | (0.201) | (0.062) | (0.260) | (0 0.263) |
| No autonomy | Ref. | 0.067* | 0.067* | Ref. | 0.047 | 0.047 | Ref. | 0.178* | 0.178* |
| | | (0.039) | (0.039) | | (-0.074) | (-0.074) | | (0.097) | (0.097) |
| Autonomy | 0.136*** | 0.139** | 0.003 | 0.118*** | 0.156 | 0.038 | 0.112 | 0.2 | 0.088 |
| | (0.016) | (0.058) | (0.06) | (0.024) | (-0.098) | (-0.098) | (0.122) | (0.140) | (0.135) |
| WO effect | 0.136*** | 0.072 | -0.064 | 0.118*** | 0.109 | -0.009 | 0.112 | 0.022 | -0.09 |
| | (0.016) | (0.067) | (0.069) | (0.024) | (0.121) | (0.121) | (0.122) | (0.149) | (0.171) |
| *N* | | 19,402 | | | 19,402 | | | 14,767 | |

Note: Stars indicate significance levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; robust standard errors in parentheses. The dependent variable is job satisfaction, which has been cardinalised as described in Appendix A. Each panel of the table corresponds to a separate regression. An endogeneity test (test of joint significance of the correction terms) for the endogeneity corrected fixed effects model rejects the null hypothesis of exogeneity in all panels concerned with $p < 0.01$.

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.

**Table 3**

Job satisfaction estimates, fixed-term employment interacted by pairs with measures for general working conditions

| | Pooled OLOLS | | | Fixed effects | | | Endogeneity corrected fixed effects | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect |
| Low stress level | Ref. | 0.043 | 0.043 | Ref. | 0.112* | 0.112* | Ref. | 0.264*** | 0.264*** |
| | | (0.037) | (0.037) | | (0,068) | (0,068) | | (0,093) | (0,093) |
| High stress level | -0.222*** | -0.165** | 0.057 | -0.140*** | -0.300** | -0,159 | -0,018 | -0,161 | -0,143 |
| | (0.018) | (0.065) | (0.06) | (0.028) | (0,119) | (0,118) | (0.1) | (0,154) | (0.156) |
| WO effect | -0.222*** | -0.208*** | 0,014 | -0.140*** | -0.412*** | -0.271** | -0,018 | -0.425*** | -0.407** |
| | (0.018) | (0,072) | (0.073) | (0.028) | (0,130) | (0.133) | (0.1) | (0,162) | (0.19) |
| No environmental risks | Ref. | 0.055 | 0.055 | Ref. | 0.121* | 0.121* | Ref. | 0.267*** | 0.267*** |
| | | (0.036) | (0.036) | | (0.069) | (0.069) | | (0.092) | (0.092) |
| Environmental risks | -0.107*** | -0.092 | 0.015 | -0.074** | -0.321** | -.247** | 0.004 | -0.207 | -0.211 |
| | (0.021) | (0.074) | (0,075) | (0.034) | (0.126) | (0,125) | (0.083) | (0.165) | (0,155) |
| WO effect | -0.107*** | -0.147* | -0.040 | -0.074** | -0.442*** | -0.368*** | 0.004 | -0.474*** | -0.478*** |
| | (0.021) | (0,080) | (0,082) | (0.034) | (0,141) | (0,142) | (0.083) | (0,167) | (0,175) |
| No physically demanding work | Ref. | 0.037 | 0.037 | Ref. | 0.103 | 0.103 | Ref. | 0.331*** | 0.331*** |
| | | (0.036) | (0.036) | | (0.068) | (0.068) | | (0.101) | (0.101) |
| Physically demanding work | -0.184*** | -0.099 | .085 | -0.129*** | -0.332*** | -.203* | 0.179* | -0.099 | -0.278** |
| | (0.022) | (0.075) | (0,076) | (0.037) | (0.114) | (0,114) | (0.102) | (0.164) | (0,145) |
| WO effect | -0.184*** | -0.136* | 0.048 | -0.129*** | -0.435*** | -0.306** | 0.179* | -0.43*** | -0.609*** |
| | (0.022) | (0,081) | (0,083) | (0.037) | (0,127) | (0,128) | (0.102) | (0,152) | (0,167) |
| *N* | | 19,402 | | | 19,402 | | | 14,767 | |

Note: Stars indicate significance levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; robust standard errors in parentheses. The dependent variable is job satisfaction, which has been cardinalised as described in Appendix A. Each panel of the table corresponds to a separate regression. An endogeneity test (test of joint significance of the correction terms) for the endogeneity corrected fixed effects model rejects the null hypothesis of exogeneity in all panels concerned with $p < 0.01$.

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.

**Table 4**

Job satisfaction estimates, fixed-term employment interacted by pairs with measures for social relations at work

| | Pooled OLOLS | | | Fixed effects | | | Endogeneity corrected fixed effects | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect |
| No strong control | Ref. | 0.086* | 0.086* | Ref. | 0,089 | 0,089 | Ref. | 0,128 | 0,128 |
| | | (0.052) | (0.052) | | (0,080) | (0,080) | | (0,128) | (0,128) |
| Strong control | -0.096*** | -0.071* | 0.025 | -0.102*** | -0,083 | 0,019 | -0,001 | 0,076 | 0,077 |
| | (0.015) | (0.042) | (0.041) | (0,023) | (0,078) | (0,076) | (0,154) | (0,132) | (0.11) |
| WO effect | -0.096*** | -0.157** | -0.061 | -0.102*** | -0.172* | -0.07 | -0,001 | -0.052 | -0.051 |
| | (0.015) | (0,063) | (0.064) | (0,023) | (0,101) | (0.101) | (0,154) | (0,128) | (0.183) |
| No conflict with supervisors | Ref. | 0.050 | 0.050 | Ref. | 0,047 | 0,047 | Ref. | 0.435*** | 0.435*** |
| | | (0.033) | (0.033) | | (-0,061) | (-0,061) | | (0,139) | (0,139) |
| Conflict with supervisors | -0.736*** | -0.779*** | -0.043 | -0.506*** | -0.524*** | -0,018 | -0,151 | -0,11 | 0,041 |
| | (0.054) | (0.188) | (0.19) | (0,069) | (0,187) | (0,200) | (0,199) | (0,302) | (0.28) |
| WO effect | -0.736*** | -0.829*** | -0.093 | -0.506*** | -0.571*** | -0.065 | -0,151 | -0.545** | -0.394 |
| | (0.054) | (0,190) | (0 .197) | (0,069) | (0,189) | (0,204) | (0,199) | (0,263) | (0.314) |
| Bad relations with colleagues | Ref. | -0.042 | -0.042 | Ref. | -0,135 | -0,135 | Ref. | -0,141 | -0,141 |
| | | (0.063) | (0.063) | | (0,114) | (0,114) | | (0,168) | (0,168) |
| Good relations with colleagues | 0.318*** | 0.389*** | 0.071* | 0.205*** | 0.298*** | 0,093 | 0,108 | 0.365*** | 0.257* |
| | (0.018) | (0.040) | (0.037) | (0,026) | (0,068) | (0,066) | (0,226) | (0,142) | (0.149) |
| WO effect | 0.318*** | 0.431*** | 0.113 | 0.205*** | 0.433*** | 0.228* | 0,108 | 0.506*** | 0.398 |
| | (0.018) | (0,070) | (0.072) | (0,026) | (0,122) | (0.123) | (0,226) | (0,155) | (0.257) |
| *N* | | 19,402 | | | 19,402 | | | 14,767 | |

Note: Stars indicate significance levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; robust standard errors in parentheses. The dependent variable is job satisfaction, which has been cardinalised as described in Appendix A. Each panel of the table corresponds to a separate regression. An endogeneity test (test of joint significance of the correction terms) for the endogeneity corrected fixed effects model rejects the null hypothesis of exogeneity with $p < 0.01$ ($p < 0.05$) for the conflict with supervisors-specification (the remaining specifications).

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.

**Table 5**

Job satisfaction estimates, fixed-term employment interacted by pairs with measures for career prospects

| | Pooled OLOLS | | | Fixed effects | | | Endogeneity corrected fixed effects | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect | Permanent | Fixed-term | FTC effect |
| Bad promotion opportunities | Ref. | 0.025 | 0.025 | Ref. | 0,029 | 0,029 | Ref. | 0,139 | 0,139 |
| | | (0.035) | (0.035) | | (0,066) | (0,066) | | (0,092) | (0,092) |
| Good promotion opportunities | 0.091*** | 0.259*** | 0.168** | 0.050* | 0,159 | 0,108 | 0.144** | 0.437*** | 0.293** |
| | (0.021) | (0.081) | (0.082) | (0,030) | (0,129) | (0,130) | (0,065) | (0,152) | (0.142) |
| WO effect | 0.091*** | 0.234*** | 0.143* | 0.050* | 0.13 | 0,079 | 0.144** | 0 .298** | 0.154 |
| | (0.021) | (0,086) | (0.088) | (0,030) | (0,142) | (0.14) | (0,065) | (0,150) | (0.161) |
| Bad learning opportunities | Ref. | 0.026 | 0.026 | Ref. | 0.033 | 0.033 | Ref. | 0.148 | 0.148 |
| | | (0.042) | (0.042) | | (0.074) | (0.074) | | (0.095) | (0.095) |
| Good Learning opportunities | 0.222*** | 0.303*** | .081 | 0.142*** | 0.208** | 0.066 | 0.252*** | 0.356*** | 0.104 |
| | (0.016) | (0.051) | (0,050) | (0.024) | (0.095) | (0,095) | (0.094) | (0.120) | (0,113) |
| WO effect | 0.222*** | 0 .277*** | 0.055 | 0.142*** | 0.175 | 0.033 | 0.252*** | 0.208* | 0.044 |
| | (0.016) | (0,063) | (0,064) | (0.024) | (0,113) | (0,113) | (0.094) | (0,127) | (0,144) |
| Wage below median | Ref. | 0.052 | 0.052 | Ref. | 0.108 | 0.108 | Ref. | 0.137 | 0.137 |
| | | (0.040) | (0.040) | | (0.079) | (0.079) | | (0.089) | (0.089) |
| Wage above median | -0.026 | 0.005 | 0.031 | 0.103*** | 0.012 | -0.091 | 0.098** | 0.058 | -0.04 |
| | (0.021) | (0.056) | (0.055) | (0.035) | (0.094) | (0.089) | (0.047) | (0.120) | (0.117) |
| WO effect | -0.026 | -0.047 | -0.021 | 0.103*** | -0.096 | -0.199* | 0.098** | -0.079 | -0.177 |
| | (0.021) | (0,067) | (0.066) | (0.035) | (0,115) | (0.114) | (0.047) | (0,135) | (0.135) |
| *N* | | 19,402 | | | 19,402 | | | 14,767 | |

Note: Stars indicate significance levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; robust standard errors in parentheses. The dependent variable is job satisfaction, which has been cardinalised as described in Appendix A. Each panel of the table corresponds to a separate regression. An endogeneity test (test of joint significance of the correction terms) for the endogeneity corrected fixed effects model rejects the null hypothesis of exogeneity in all panels concerned with $p < 0.01$.

Source: GSOEP 1985, 1987, 1989, 1995, 2001; own calculations.