

Work organization, fixed-term employment and job satisfaction: Evidence from German individual-level data

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Abstract

The present paper examines heterogeneous effects of work organization on job satisfaction by type of work contract (fixed-term versus permanent). Using individual-level data from the German Socio-Economic Panel (GSOEP), we analyze whether workers employed under these two different types of contract respond differently in terms of job satisfaction to varying work organizational conditions. Such information is valuable for employers, because they can learn about optimal combinations of work organization and type of contract. We account for potential endogeneity by combining a fixed effects approach with a two-stage selection correction strategy. Our empirical results show that fixed-term workers and their permanent counterparts respond differently in terms of job satisfaction 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 increased markedly 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. 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. By now, it is hard to overlook the number of studies examining the determinants or productivity effects of such high performance work systems.¹

Firms have adopted both practices, the new employment forms and the new work organization, mainly to gain flexibility in order to maintain competitiveness. However, not only firms but also employees are likely to be affected by changing employment and work organization patterns, because these changes most likely have an impact on employees' job satisfaction. Gaining information on how these practices affect the workers' job satisfaction is important for employers, as job satisfaction has been shown to have a positive effect on labour productivity and firm performance (Cropanzano and Wright, 2001; Judge et al., 2001; Wright et al., 2002; Zelenski et al., 2008). Hence, information about the sources of job satisfaction helps employers to adopt suitable management practices that stimulate workers' job satisfaction and thus productivity.

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).

In our study, we consider new employment forms and a detailed set of work organization practices and evaluate their impact on job satisfaction. Regarding the new employment forms we focus exclusively on the role of fixed-term employment. Both types of management practices are unlikely to be adopted independently. Therefore, in contrast to related studies², we do not analyse the effects of fixed-term employment and innovative work practices in isolations, but we are interested in the heterogeneous effects of an innovative work organization on a worker's job satisfaction depending on the type of working contract (fixed-term vs. permanent). For example, performing multiple tasks (as opposed to performing monotone tasks) may increase job satisfaction of fixed-term workers more strongly than that of permanently employed workers. Such information would be very valuable for employers to chose optimal combinations of type of contract and work organization. Such knowledge helps employers to improve their concept of diversity management, especially if fixed-term workers and permanent workers were found to differ with regard to extrinsic and intrinsic motivation.

We base our analysis on a representative household survey from Germany (GSOEP) providing individual-level panel data over a long period. The data cover a rich set of covariates. In particular, the GSOEP provides information on the type of work contract and the organization of work alongside with a wide range of socio-economic and other variables. Methodologically, our focus on estimating heterogeneous effects of innovative organizational practices by contract type involves 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 to be assigned to jobs with diverging practices of work organization. As a consequence, not accounting for the sources of endogeneity would be associated with inconsistent parameter estimates of the effects of interest.

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,

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

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 by combining a fixed effects approach with a two-stage selection correction strategy. This procedure was suggested by Dubin and McFadden (1984) and recently used in Origo and Pagani (2009). The method involves the calculation of a set of correction terms from a first-stage multinomial choice model of the work contract - work organization combination. The correction terms then enter the second-stage job satisfaction equation as additional regressors to control for endogeneity.

To the best of our knowledge, the research question of our investigation is novel, as previous empirical studies do not consider the joint effect of fixed-term contracts and work design on job satisfaction but concentrate on the isolated effect of either fixed-term contracts or organizational practices on job satisfaction.

We find that measures of work organization that emphasize workers' responsibility for the job and extrinsic motivation, i.e. high pay, involvement in decisions and autonomy, seem to work better (in terms of workers' job satisfaction) when combined with permanent contracts. On the other hand, measures emphasizing intrinsic motivation, i.e. measures not focussing on pay and responsibility for the job, but rather task diversity, absence of mental or physical strains and good relations at work, seem to work better when combined with fixed-term contracts.

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 peripheral segment are much more likely to suffer from insecure jobs, wage penalties⁴, 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 psychological contract theory and equity theory. Both theories maintain that individuals evaluate the outcomes of human interactions, such as workplace relations, subjectively by assessing the rewards and costs they get out of the interaction. Psychological contract theory deals with the direct interaction between employee and employer, characterizing it as a contract with reciprocal obligations of both sides (Guest, 2000; Shore and Tetrick, 1994). The psychological contract theory implies that productive

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

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.

working requires the worker's perceived contributions (e.g. effort, ability, loyalty) and rewards (e.g. payment, job security, promotion opportunities) to be balanced (Isaksson et al., 2003). Equity theory, on the contrary, involves no direct comparison between an employers' and employees' obligations, but it deals with perceived equity between employees. According to equity theory, workers are inequality averse and compare their reward-contribution ratio with the corresponding ratio of co-workers (Adams, 1965; Robbins and Judge, 2008). A similarity of both theories is that imbalances in the ratios of contributions and rewards (breach of the psychological contract or experience of inequity) are assumed to lead to cognitive consequences, for example a decline in job satisfaction, or even behavioural consequences aimed at restoring the balance. For example, while permanently employed workers may be likely to see their psychological contract in balance, fixed-term workers may perceive low chances of promotion to the aspired permanent job, or they may feel that they receive a low wage despite a high effort. Fixed-term workers would then be more likely to feel a breach of the psychological contract or an unfair treatment and would consequently report lower job satisfaction than permanently employed workers (Guest and Clinton, 2006). Similarly, in equity theory, if fixed-term workers choose permanent workers as a comparative reference group and identify equal effort levels but lower wages or less job security compared to permanent workers, they would perceive inequity at their expense which would be associated with lower job satisfaction (Pearce, 1998; 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 be the case, 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). It is also consistent with the concept of relative deprivation (Runciman 1966, Tyler and Smith 1998). According to this concept, individual satisfaction is a result of a comparison process of the own situation with the situation of a comparative reference group. If different individuals choose different reference groups, this can lead to a paradoxical result, in which individuals who are objectively worse off in objective terms are more satisfied than those who are better off.

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. The high levels of job satisfaction would be due to the prospect to be promoted to a permanent job.

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 job 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. Some fixed-term jobs are created in order to carry out a specific project running over a limited period of time. If an employee is recruited specifically for this project, then the match between the worker's qualification and the requirements of the task to be accomplished can be expected to be particularly good, which may yield higher job satisfaction.

From this, it becomes clear that the theoretical literature is not arguing that the contractual clause of a permanent or fixed-term contract *per se* influences job satisfaction. It rather argues that differences in job satisfaction between workers in both types of contracts come from their different working conditions, different preferences or different cognitive processes. As fixed-term contracts make it easier and less costly than permanent contracts to make employees redundant after a certain time, one may suspect job security to be the most important difference in terms of working conditions⁵. However, as argued above, fixed-term and permanent jobs may also differ along other dimensions, such as wages, training and promotion opportunities, work content and others. Furthermore, fixed-term workers and permanent workers may use different cognitive processes when evaluating their satisfaction. In particular, they may choose different comparative reference groups with whom to compare their own situation. If we define the causal effect of a fixed-term contract as the effect of switching the contractual clause but holding everything else constant, where 'everything else' includes job security, working conditions, choice of comparative reference group and worker preferences, then we would expect no such effect of a fixed-term contract on job satisfaction at all. Therefore, it makes little sense to interpret effects of fixed-term contracts from a model that includes a large set of working conditions, fixed effects and endogeneity correction terms. Our interpretations of our model will therefore focus on the heterogeneous work organisation effects by contract type, not on the effect of the contract type *per se*.

2.2. *Work organization and job satisfaction*

⁵ As fixed-term contracts can be renewed or switched to permanent contracts, it is a priori not clear whether fixed-term workers really face a higher job loss hazard. However, at least subjectively this seems to be the case. Own computations based on GSOEP data suggest that 65% of fixed-term workers have some or strong worries about their job security, while this percentage is only 52% for permanently employed workers.

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 renouncing from the principles of scientific management can be assumed to increase 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 is 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), and de Graaf-Zijl (2005) can be assigned to the first of these categories. The results of these studies are clearly 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 expectancy theory, the theory of relative deprivation with varying reference groups, 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.⁶ The authors find that the new organizational practices contribute to deteriorate working conditions (and thus well-being

⁶ 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.

at work), which is consistent with the work intensification hypothesis derived by Mohr and Zoghi (2006).⁷

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 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 with a research question 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.

⁷ Another study that provides supporting evidence for the intensification hypothesis comes from Green (2004). In this study, work intensification is attributed to technological change, innovative work practices (task flexibility, high involvement policies), high-commitment human resource policies, declining unionization and increasing job insecurity.

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 of work organization with fixed-term employment. 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 work organization and fixed-term employment on job satisfaction, but the joint effect of job security and fixed-term employment.

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.⁸ 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 contains 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 work organization, fixed-term contracts 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.⁹ 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

⁸ 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.

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

sector employees excluding civil servants and apprentices. Workers in the sample are aged 17 to 64.

To provide first descriptive evidence on the relation of job satisfaction, work organization and type of contract, Figure 1 displays the distribution of job satisfaction by contract type and work organization for the year 2001.¹⁰

[Insert Figure 1 about here]

Several findings are worth mentioning. First, many employees report high levels of job satisfaction, which is in line with the results of related studies. Second, at the descriptive level the job satisfaction distribution does not vary much with the type of contract (panel A of figure 1). It varies much stronger with the measures of work organization, especially with task diversity, conflict with supervisor, relations with colleagues and promotion and learning opportunities. This provides a motivation to focus the analysis on the effects of work organisation on job satisfaction (which we will do by contract type) rather than on direct effects of fixed-term employment on job satisfaction. Interestingly, the job satisfaction distribution varies also less with the wage level than with some of the non-wage job characteristics.

Since we consider quite a number of different measures of work organization, it is helpful to divide them into the following four groups: 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

¹⁰ 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).

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.¹¹

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.¹²

[Insert Table 1 about here]

Permanent workers, on average, appear to be slightly more satisfied with their jobs than fixed-term workers. Some measures of work organisation seem to be quite independent of the type of contract, but others are clearly related to the type of contract. More specifically, permanent workers report more frequently to exercise jobs with task diversity. They also report more frequently to decide 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 a promotion. On the other hand, fixed-term workers seem to be more subject to strict performance monitoring. Interestingly, fixed-term workers are more likely to exhibit better learning opportunities than permanent workers. Finally, the fraction of high-wage earners is much lower among fixed-term workers than among permanently employed workers. Hence, work organization differs to some extent between permanent and fixed-term workers. In the following, we will focus on the question whether the effects of work organization on job satisfaction also differs between the two groups of workers.

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 utility from work U_i depends on individual (I_i), establishment (E_i) and job characteristics (J_i) of employee 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

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

¹¹ The term ‘organizational practices’ would probably shape up as an alternative to our concept of work organization.

¹² The complete list of variables is summarized and explained in Table A1 in the Appendix.

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.¹³

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 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 reduced sample sizes and potentially selected samples. This reasoning in principle also applies to 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. It is therefore

¹³ The reasoning for the other characteristics of work organization displayed in Table 1 is analogous.

important to account for unobserved individual heterogeneity when estimating job satisfaction estimations.¹⁴

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). We follow this approach of “roughly cardinalising” our job satisfaction variable and describe the procedure in Appendix A.

The cardinalisation of the dependent variable allows us to specify a linear equation as empirical model of the utility function (1):

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

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 from the estimation model. Finally, X is a vector of observable individual, establishment and job characteristics, μ_i captures unobserved fixed (i.e., time-constant) effects and ε_{it} is the remaining error term.¹⁵ It is important to note that X also contains the l ($l \neq k$) remaining work organization variables. The parameters to be estimated are α_{10} , α_{01} , α_{11} and β , where we are especially interested in the α -parameters. In order to assess, for example, whether the effect of autonomous work organization on job satisfaction depends on the type of contract, we would then compute the effect of autonomy for fixed-term workers ($\alpha_{11}-\alpha_{10}$) and compare it to the effect of autonomy for permanent workers (α_{01}).

¹⁴ Including individual fixed effects in the regression will hold time-invariant unobserved heterogeneity constant.

¹⁵ 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 μ_i reflects the time-constant component and ε_{it} the time-varying component.

In estimating the parameters, we have to address the problem of endogeneity. Both, organization of work and type of contract typically result from choices of employers and employees. These variables are therefore likely to depend on worker and firm characteristics that are partly unobserved, and that may influence job satisfaction as well. Not accounting for such sources of endogeneity in the estimation strategy would be associated with biased and inconsistent parameter estimates. 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. Chances are that workers making different choices also differ in unobserved characteristics that influence their levels of job satisfaction. One way to alleviate this endogeneity problem is to assume that the unobserved factors are time-invariant, and to include worker fixed effects into the analysis to filter out the effects of time-constant unobserved worker characteristics. This is what we do in the fixed effects model of equation (2).

The assumption that relevant unobserved factors are time-invariant may well be reasonable for some characteristics, for example if we think of character traits such as individual motivation or talent. However, it is easy to think of situations where the assignment of workers to types of contract and measures of work organisation depends on time-varying unobserved characteristics. The propensity of workers and employers to assign workers to a special kind of working contract or innovative work practice may well vary over time. This may be due, for example, to shifting preferences of workers over their life-cycle, or to varying firm policies in response to the business cycle or to management trends. Most importantly, time-constant employer and job characteristics are in fact time-varying from the point of view of employees who change jobs or firms, and hence worker fixed-effects do not control for job or employer characteristics. Complementing the fixed effects estimation with a selection correction procedure as described below therefore has the potential to also deal with unobserved job and employer characteristics.

Consequently, we implement a two-step endogeneity correction introduced by Dubin and McFadden (1984) and recently applied in Origo and Pagani (2009).¹⁶ According to this procedure, a multinomial logit model of the following form is estimated in a first step:

¹⁶ 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.

$$W_{it} = \gamma' Z_{it} + v_{it} . \quad (3)$$

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)¹⁷ 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, γ is the vector of coefficients and v 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 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 alternative¹⁸. 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

$$W_{it} = \gamma' Z_{it} + \delta' \overline{X}_i^1 + v_{it} , \quad (4)$$

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.

¹⁷ For example, the four types of workers may differ with respect to characteristics like age, tenure, education, job security, working hours, and pay.

¹⁸ Note that in Mundlak's approach the inclusion of the person means of the time-varying regressors is usually combined with a random effects estimation. The virtue of random effects estimation is higher efficiency of the parameter estimates. However, in the first stage of our two-stage procedure efficiency does not matter. The only purpose is to predict the choice probabilities by exogenous variables. Therefore we do not use a random effects model here.

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

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

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-stage¹⁹ is then specified as

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

Conditional on the validity of the instrument included in the first stage, we can use a usual tests of statistical significance of the parameters λ to perform an endogeneity test. Significant parameters in λ 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 endogeneity bias. Hence, the two-stage estimation approach derived in equations (4) to (6) assures consistent estimates of the parameters of interest, i.e., α_{10} , α_{01} and α_{11} , which can then be interpreted as causal effects. On the other hand, if the parameter estimates λ turned out to be insignificant, the estimation of the linear fixed effects model in equation (2) would be sufficient to obtain consistent estimates of α_{10} , α_{01} and α_{11} .

4.4. Empirical results

The main results of our empirical investigations are summarized in Table 2 to Table 5, which all exhibit the same structure. Columns (1)-(2) display the results of a pooled 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 (3)-(4) show the results of our linear fixed effects model specified in equation (2), where we control for unobserved time-invariant characteristics. Finally, columns (5)-(6) 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

¹⁹ 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.

endogeneity test, which is a test of joint significance of the correction terms. This test rejects the null hypothesis of exogeneity for all of the estimates.²⁰

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]

Referring to the results of the endogeneity corrected fixed effects estimation in columns (5)-(6)²¹, fixed-term workers in multitasking jobs are found to be more satisfied with their jobs than fixed-term workers with task specialisation, while the same effect is not present for permanent workers. In contrast, in the fixed effects results displayed in columns (3)-(4), that only account for unobserved time-invariant heterogeneity, 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, and this result holds in all three model specifications. Similarly, fixed-term workers seem to attach less importance to a high degree of autonomy at work than permanent workers, although in the endogeneity corrected estimation the effect of autonomy is not significant for both groups.

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]

²⁰ 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.

²¹ 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.

The endogeneity-corrected estimates imply that stress carries negative connotations only for fixed-term workers, but not for permanent workers. The results with regard to environmental risks and physically demanding jobs are very similar. They also carry negative connotations for fixed-term workers, but not for permanent workers. Note that the pooled and the linear fixed effects estimations link stress, environmental risks and physically demanding work to lower level of job satisfaction for workers of both contract types.

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 neither damages the job satisfaction of permanent workers nor that of fixed-term workers. The significant coefficients obtained in the pooled 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. Fixed-term workers seem to prefer good relations with colleagues and no conflicts with supervisors. Surprisingly, this does not hold for permanent workers, as 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 after correcting for endogeneity.

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]

Promotion and learning opportunities generally contribute to increasing job satisfaction. This holds for both fixed-term workers and permanent workers. 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. Permanent workers are more satisfied with their job,

when they earn higher wages. 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 this paper we examine the question whether the effects of different measures of work organization on job satisfaction depend on the type of working contract (fixed-term vs. permanent). We base the analysis on individual-level data from the German Socio-Economic Panel (GSOEP), and combine a fixed effects approach with a two-stage selection correction strategy to account for endogeneity.

First, we observe differences between fixed-term workers and their permanent counterparts in their responsiveness in terms of job satisfaction to various innovative work practices. Fixed-term workers are more responsive than permanently employed workers to task diversity at the job, while permanently employed workers are more responsive to employee involvement a higher degree of autonomy at work. Second, we identify differences in the response of fixed-term and permanent workers to different working conditions. Fixed-term workers are found to be more stress-averse than permanent workers. Similarly, environmental risks and physically demanding jobs do also carry negative connotations 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. This helps to adopt suitable management practices in order to stimulate the workers' job satisfaction and thus their productivity. The results follow a certain pattern that would suggest that permanent contracts work best when combined with measures of work organization that emphasize workers' responsibility for the job and extrinsic motivation, i.e. high pay, involvement in decisions and autonomy. On the other hand, fixed-term contracts work best when combined with measures that emphasize intrinsic motivation, i.e. measures not focussing on pay and responsibility for the job, but rather task diversity, absence of mental or physical strains and

good relations at work. This aspect of good relations at work suggests that employers should 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, the finding that fixed-term workers do respond strongly to promotion opportunities suggests that employers should pay special attention to announcing long-term perspectives for fixed-term workers, ensuring real chances of promotion to permanent positions. 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.

References

- Adams, JS, 1965. Inequity in social exchanges. In: Berkowitz, L (Ed.), *Advances in Experimental Social Psychology*. New York: Academic Press, 267-300.
- Askenazy, P, Caroli, E, 2006. Innovative work practices, information technologies and working conditions: evidence for France. *EconomiX Document de Travail Working Paper 2006-02*, University Paris.
- Baltagi, BH, 2001. *Econometric Analysis of Panel Data*, 2nd ed. John Wiley & Sons, New York.
- Bauer, T, 2004. High performance workplace practices and job satisfaction: evidence from Europe. *IZA Discussion Paper No. 1265*.
- Beard, K, Edwards, J, 1995. Employees at risk: contingent work and the psychological experience of contingent workers. In: Cooper, C, Rousseau, D (Eds.), *Trends in Organizational Behavior*, Vol. 2, London: Wiley & Sons Ltd., 109-26.
- Bentolila, S, Saint-Paul, G, 1992. The macroeconomic impact of flexible labour contracts with an application to Spain. *European Economic Review* 36, 1013-1053.
- Betcherman, G, 1997. *Changing Workplace Strategies: Achieving Better Outcomes for Enterprises, Workers and Society*. Government of Canada and OECD, Ottawa.
- Black, SE, Lynch, LM, 2001. How to compete: the impact of workplace practices and information technology on productivity. *Review of Economics and Statistics* 83, 434-445.
- Boockmann, B, Hagen, T, 2008. Fixed-term contracts as sorting mechanisms: evidence from job durations in West Germany. *Labour Economics* 15, 984-1005.
- Booth, A, Francesconi, M, Frank, J, 2002. Temporary jobs: stepping stones or dead ends?, *Economic Journal* 112, F189-F213.
- Burchell, B, Laido, D, Wilkinson, F, 2002. *Job Insecurity and Work Intensification*. London: Routledge.
- Cappelli, P, 1999. *The New Deal at Work: Managing the Market-Driven Workforce*. Boston, MA, Harvard Business School Press.
- Caroli, E, Van Reenen, J, 2001. Skill biased organizational change? Evidence from a panel of British and French establishments. *Quarterly Journal of Economics* 116, 1449-1492.

- Clark, AE, 1996. Job satisfaction in Britain. *British Journal of Industrial Relations* 34, 189-217.
- Clark, AE, Oswald, AJ, 1996. Satisfaction and comparison income. *Journal of Public Economics* 61, 359-381.
- Cornelissen, T, 2006. Job characteristics as determinants of job satisfaction and labour mobility. Discussion Paper No. 334, University of Hannover, Germany.
- Cornelissen, T, 2009. The interaction of job satisfaction, job search, and job changes: an empirical investigation with German panel data. *Journal of Happiness Studies* 10, 367-384.
- Cropanzano, R, Wright, TA, 2001. When a “happy” worker is really a “productive” worker: a review and further refinement of the happy-productive worker thesis. *Consulting Psychology Journal: Practice & Research* 53, 182-199.
- D’Addio, A, Eriksson, T, Frijters, P, 2003. An analysis of the determinants of job satisfaction when individuals baseline satisfaction levels may differ. CAM (Centre for Applied Microeconometrics) Working Paper No. 2003-16.
- De Graaf-Zijl, M, 2005. The anatomy of job satisfaction and the role of contingent employment contracts. Tinbergen Institute Discussion Paper 2005-119/3.
- Doeringer, PB, Piore, MJ, 1971. *Internal Labor Markets and Manpower Analysis*. Lexington: DC Heath.
- Dubin, J, McFadden, D, 1984. An econometric analysis of residential electric appliance holdings and consumptions. *Econometrica* 52, 345-362.
- Ellingson, J, Gruys, M, Sackett, P, 1998. Factors related to the satisfaction and performance of temporary employees. *Journal of Applied Psychology* 83, 913-21.
- European Commission, 2008. *Employment in Europe 2007*. Brussels.
- Fahr, R, Mammel, P, 2007. *Arbeitsorganisation und Arbeitszufriedenheit – Empirische Evidenz für Deutschland auf Grundlage des Sozio-ökonomischen Panels*. Mimeo.
- Galup, SD, Klein, G, Jiang, JJ, 2008. The impacts of job characteristics on IS employee satisfaction: a comparison between permanent and temporary employees. *Journal of Computer Information Systems* 49, 58-68.
- Green, F, 2004. Why has work effort become more intense?. *Industrial Relations* 43, 709-741.

- Greene, W, 2008. *Econometric Analysis*, Sixth Edition. Pearson, New Jersey.
- Guest, D, 2000. Management and the insecure workforce: the search for a new psychological contract. In: Heery, E, Salmon, J (Eds.), *The Insecure Workforce*. London: Taylor & Francis Books Ltd., 140-154.
- Guest, D, Clinton, M, 2006. Temporary employment contracts, workers' well-being and behaviour: evidence from the UK. Department of Management Working Paper No. 38, King's College, London.
- Hackman, JR, Oldham, GR, 1976. Motivation through the design of work: test of a theory. *Organizational Behaviour and Human Performance* 16, 250-286
- Hackman, JR, Oldham, GR, 1980. *Work redesign*. Reading, MA.
- Hamermesh, 2004. Subjective outcomes in economics. NBER Working Paper 10361. National Bureau of Economic Research. Cambridge, MA.
- Henneberger, F, Sousa-Poza, A, Ziegler, A, 2004. Befristete Beschäftigung in der Schweiz: Ausmass, Determinanten und ökonomische Bewertung im internationalen Vergleich, *Zeitschrift für ArbeitsmarktForschung* 37, 239-267.
- Herzberg, F, Mausner, B, Snyderman, B, 1959. *The motivation to work*. New York.
- Hsiao, C, 2003. *Analysis of Panel Data*. Cambridge University Press, Cambridge.
- Ichniowski, C, Shaw, K, Prennushi, G, 1997. The effects of human resource management practices on productivity: a study of steel finishing lines. *American Economic Review* 87, 291-313.
- Isaksson, K, Bernhard, C, Claes, R, De Witte, H, Guest, D, Krausz, M, Mohr, G, Peiro, J, Schalk, R, 2003. *Employment contracts and psychological contracts in Europe*. SALTSA Report 2003 (1).
- Judge, TA, Bono, JE, Thoresen, CJ, Patton, GK, 2001. The job satisfaction-job performance relationship: a qualitative and quantitative review. *Psychological Bulletin* 127, 376-407.
- Kaiser, L, 2002. Job satisfaction: a comparison of standard, non-standard, and self-employment patterns across Europe with a special note to the gender/job satisfaction paradox. EPAG Working Paper 27, Colchester, University of Essex.
- Kalleberg, A, Reynolds, J, 2003. Work attitudes and nonstandard work arrangements in the United States, Japan, and Europe. In: Houseman, S, Osawa, M (Eds.), *Nonstandard*

- Work in Developed Economies: Causes and Consequences. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 423-479.
- Kochan, T, Smith, M, Wells, J, Rebitzer, J, 1994. Human resource strategies and contingent workers: the case of safety and health in the petrochemical industry. *Human Resource Management* 33, 55-77.
- Lazear, EP, Rosen, S, 1981. Rank-order tournaments as optimum labor contracts. *Journal of Political Economy* 89, 841-864.
- MacDuffie, JP, 1995. Human resource bundles and manufacturing performance: organizational logic and flexible production systems in the world auto industry. *Industrial and Labor Relations Review* 48, 197-221.
- Mohr, RD, Zoghi, C, 2006. Is job enrichment really enriching?. BLS Working Paper 389.U.S. Bureau of Labor Statistics.
- Origo, F, Pagani, L, 2008. Workplace flexibility and job satisfaction: some evidence from Europe. *International Journal of Manpower* 29, 539-566.
- Origo, F, Pagani, L, 2009. Flexicurity and job satisfaction in Europe: the importance of perceived and actual job stability for well-being at work. *Labour Economics*, doi:10.1016/j.labeco.2009.02.003
- Pearce, J, 1998. Job insecurity is important, but not for the reason you might think: the example of contingent workers. In: Cooper, C, Rousseau, D (Eds.), *Trends in Organizational Behavior*, Vol. 5. London: Wiley & Sons Ltd., 31-46.
- Petrescu, AI, Simmons, R, 2008. Human resource management practices and workers' job satisfaction. *International Journal of Manpower* 29, 651-667.
- Petrongolo, B, 2004. Gender segregation in employment contracts. CEP Discussion Paper No 637.
- Robbins, S, Judge, T, 2008. *Organizational Behavior*, 13th edition. Upper Saddle River, NJ.
- Runciman, W. G., 1966. *Relative deprivation and social justice: A study of attitudes to social inequality in twentieth century England*. Berkeley, University of California Press.
- Shore, L, Tetrick, L, 1994. The psychological contracts as an explanatory framework in the employment relationship. In: Cooper, C, Rousseau, D (Eds.), *Trends in Organizational Behavior*, Vol. 1. London: Wiley & Sons Ltd., 91-109.

- Tyler, TR, Smith, HJ, 1998. Social justice and social movements, in: Gilbert, D., Fiske, S.T. & Lindzey, G. (eds.), 1998. *The handbook of social psychology*, Vol. 2, McGraw-Hill.
- Van Dyne, L, Ang, S, 1998. Organizational citizenship behaviour of contingent workers in Singapore. *Academy of Management Journal* 41, 692-703.
- Van Praag, BMS, Ferrer-i-Carbonel, A, 2004. *Happiness Quantified: A Satisfaction Calculus Approach*. Oxford: Oxford University Press.
- Vroom, VH, 1964. *Work and Motivation*. New York: Wiley.
- Wagner, GG, Frick, JR, Schupp, J, 2007. The German socio-economic panel study (SOEP) – scope, evolution and enhancements. *Schmollers Jahrbuch* 127, 139-169.
- Wooden, M, Warren, D, 2003. The characteristics of casual and fixed-term employment: evidence from the HILDA survey. Melbourne Institute Working Paper No. 15/03, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.
- Wooldridge, J, 2001. *Econometric Analysis of Cross-Section and Panel Data*. MIT Press: Cambridge, MA.
- Wright, TA, Cropanzano, R, Denney, PJ, Moline, GL, 2002. When a happy worker is a productive worker: a preliminary examination of three models. *Canadian Journal of Behavioural Science* 34, 146-150.
- Zelenski, JM, Murphy, SA, Jenkins, DA, 2008. The happy-productive worker thesis revisited. *Journal of Happiness Studies* 9, 521-537.

Appendix A: Cardinalized job satisfaction variable

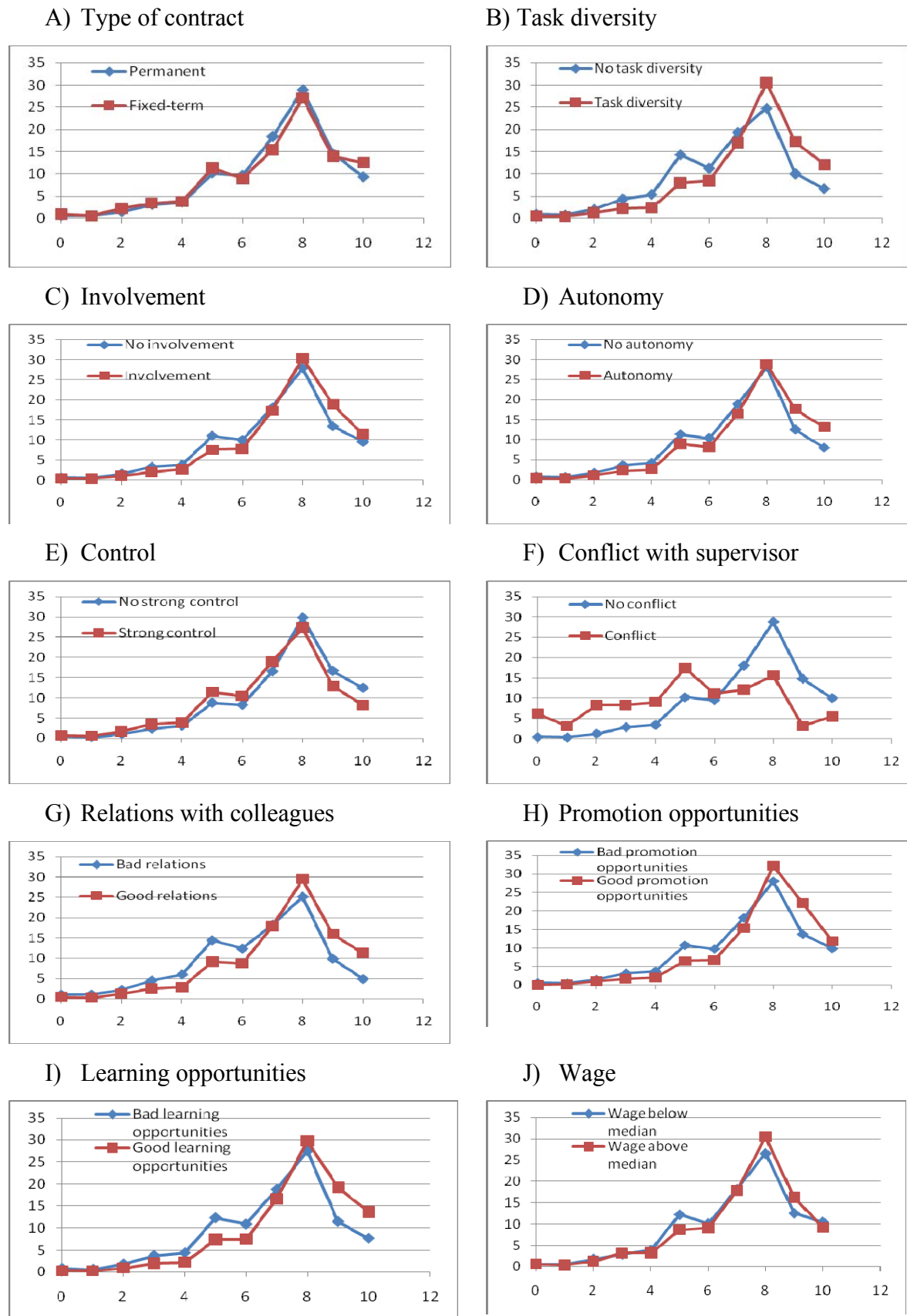
We rescaled the ordinal dependent variable before applying a linear regression model as proposed by van Praag and Ferrer-i-Carbonel (2004). The rescaling makes the coefficients of the linear model comparable with the coefficients of the ordered probit model. Van Praag and Ferrer-i-Carbonel (2004) call 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:

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

where Z is a standard normal random variable, ϕ being the standard normal probability density function, and Φ being the standard normal cumulative density function, which leads to:

$$x_c = \begin{cases} -1.75 & \text{if } x=1 \\ -0.70 & \text{if } x=2 \\ 0.42 & \text{if } x=3 \\ 1.75 & \text{if } x=4 \end{cases}$$

Figure 1 Distribution of job satisfaction by type of contract and work organization



Note: Job satisfaction is an ordinal variable ranging between 0 (totally unsatisfied) and 10 (totally satisfied). Y-axis labelled in percent. Source: GSOEP 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
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
	Wage above annual median	0.28	0.50
<i>N</i>		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
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 ^{b)}	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
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
Job tenure	Job tenure in years	10,36	8,93	3,63	6,12
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
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
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

Table A1 (continued)

Description of variables

Variable name	Variable definition	Permanent		Fixed-term	
		Mean	SD	Mean	SDD
Fulltime	Dummy=1 if fulltime job, =0 if part-time job	0,87	0,34	0,81	0,39
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
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
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
White collar worker ^{c)}	Dummy=1 if white collar worker, =0 otherwise	0,41	0,49	0,37	0,48
Manager ^{c)}	Dummy=1 if manager, =0 otherwise	0,15	0,35	0,16	0,37
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
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 ^{d)}	Dummy=1 if firm size 20-199, =0 otherwise	0,29	0,45	0,33	0,47
Firm size 200-1999 ^{d)}	Dummy=1 if firm size 200-1999, =0 otherwise	0,25	0,43	0,26	0,44
Firm size >1999 ^{d)}	Dummy=1 if firm size >1999, =0 otherwise	0,25	0,43	0,20	0,40
Year 1987 ^{e)}	Dummy=1 if year=1987, =0 otherwise	0,15	0,36	0,16	0,37
Year 1989 ^{e)}	Dummy=1 if year=1989, =0 otherwise	0,15	0,36	0,16	0,37
Year 1995 ^{e)}	Dummy=1 if year=1995, =0 otherwise	0,19	0,40	0,13	0,34
Year 2001 ^{e)}	Dummy=1 if year=2001, =0 otherwise	0,35	0,48	0,42	0,49
<i>N</i>		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	Fixed effects	Endogeneity corrected fixed effects
Employee involvement	0.086*** (0.020)	0.114*** (0.034)	0.152*** (0.050)
Autonomy at work	0.132*** (0.016)	0.120*** (0.024)	0.171*** (0.047)
Stress level	-0.222*** (0.017)	-0.151*** (0.028)	-0.122*** (0.047)
Environmental risks	-0.109*** (0.021)	-0.088*** (0.034)	-0.092** (0.043)
Physically demanding work	-0.181*** (0.022)	-0.143*** (0.037)	-0.104** (0.047)
Performance monitoring	-0.099*** (0.015)	-0.106*** (0.023)	-0.159*** (0.029)
Conflicts with supervisor	-0.744*** (0.052)	-0.510*** (0.066)	-0.545*** (0.077)
Good relation with colleagues	0.325*** (0.017)	0.217*** (0.026)	0.218*** (0.036)
Promotion opportunities	0.100*** (0.020)	0.054* (0.030)	0.095*** (0.036)
Learning opportunities	0.225*** (0.016)	0.143*** (0.024)	0.194*** (0.074)
Logarithm of net wage	0.205*** (0.026)	0.268*** (0.064)	0.306*** (0.074)
Sex: male	-0.060*** (0.019)	-	-
Age	-0.007 (0.006)	-0.028** (0.012)	-0.002 (0.015)
Age squared / 100	0.007 (0.007)	-0.006 (0.014)	-0.031* (0.017)
Job tenure	-0.006** (0.003)	-0.019*** (0.005)	-0.020*** (0.007)
Job tenure squared / 100	0.009 (0.008)	0.033** (0.016)	0.019 (0.019)
East Germany	-0.009 (0.032)	0.097 (0.156)	0.156 (0.185)
Regional unemployment rate	0.006** (0.003)	-0.007 (0.008)	-0.012 (0.009)
Unemployment experience	-0.001 (0.009)	0.062 (0.046)	0.030 (0.050)
Any unemployment experience (Dummy)	-0.037* (0.020)	-0.038 (0.075)	-0.084 (0.080)
Strong worries about job security	-0.438*** (0.026)	-0.326*** (0.043)	-0.409*** (0.058)
Some worries about job security	-0.243*** (0.015)	-0.166*** (0.023)	-0.208*** (0.029)
Fulltime	-0.019 (0.032)	-0.033 (0.068)	0.011 (0.077)
Deviation of actual from desired work time	-0.009*** (0.001)	-0.005*** (0.001)	-0.007*** (0.002)
Actual work time	-0.003** (0.001)	-0.003* (0.002)	-0.002 (0.002)

Table A2 (continued)

Regression results for the control variables

	Pooled	Fixed effects	Endogeneity corrected fixed effects
Shift work	0.055*** (0.018)	-0.025 (0.038)	-0.139** (0.055)
Growth of net wage	0.092*** (0.033)	0.078 (0.057)	0.053 (0.067)
Growth of net wage missing	0.055* (0.029)	-0.066 (0.046)	-0.086 (0.056)
Public sector	0.078*** (0.018)	0.005 (0.057)	-0.073 (0.066)
Years of education	-0.036*** (0.004)	-0.000 (0.017)	0.014 (0.019)
White collar worker	-0.068*** (0.020)	0.095* (0.051)	0.086 (0.058)
Manager	-0.048 (0.029)	0.134** (0.066)	0.090 (0.079)
Activity corresponds to job	0.033** (0.015)	0.005 (0.033)	0.015 (0.039)
Living with partner or spouse	0.033* (0.020)	-0.018 (0.043)	-0.048 (0.048)
Foreign nationality	0.161*** (0.021)	-0.076 (0.172)	-0.227 (0.273)
Firm size 20-199	-0.070*** (0.020)	0.044 (0.046)	0.040 (0.055)
Firm size 200-1999	-0.044** (0.022)	0.083 (0.052)	0.087 (0.066)
Firm size >1999	-0.085*** (0.023)	0.110** (0.055)	0.106 (0.073)
Year 1987	-0.098*** (0.027)	-0.057** (0.023)	-0.066** (0.028)
Year 1989	-0.219*** (0.026)	-0.161*** (0.025)	-0.173*** (0.031)
Year 1995	-0.305*** (0.027)	-0.130*** (0.022)	-0.122*** (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 (0.168)	0.186 (0.407)	-0.488 (0.503)
R-squared	0.174	0.117	0.130

Note: The dependent variable is job satisfaction cardinalized as described in appendix A. 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 OLS		Fixed effects		Endogeneity corrected fixed effects	
	(1) Permanent	(2) Fixed	(3) Permanent	(4) Fixed	(5) Permanent	(6) Fixed
No task diversity	Ref.	0.043 (0.047)	Ref.	0.012 (-0.085)	Ref.	-0.045 (-0.106)
Task diversity	0.29*** (0.016)	0.34*** (0.045)	0.211*** (0.025)	0.288*** (0.077)	0.097 (0.087)	0.377*** (0.102)
WO effect	0.29*** (0.016)	0.297*** (0.061)	0.211*** (0.025)	0.276*** (0.107)	0.097 (0.087)	0.422*** (0.123)
No involvement	Ref.	0.047 (0.034)	Ref.	0.058 (0.062)	Ref.	0.155* (0.081)
Involvement	0.086*** (0.020)	0.131 (0.122)	0.118*** (0.033)	-0.032 (0.195)	0.253*** (0.062)	0.075 (0.256)
WO effect	0.086*** (0.020)	0.084 (0.130)	0.118*** (0.033)	-0.09 (0.204)	0.253*** (0.062)	-0.08 (0.260)
No autonomy	Ref.	0.067* (0.039)	Ref.	0.047 (-0.074)	Ref.	0.178* (0.097)
Autonomy	0.136*** (0.016)	0.139** (0.058)	0.118*** (0.024)	0.156 (-0.098)	0.112 (0.122)	0.2 (0.140)
WO effect	0.136*** (0.016)	0.072 (0.067)	0.118*** (0.024)	0.109 (0.121)	0.112 (0.122)	0.022 (0.149)
N	19,402		19,402		14,767	

Note: The dependent variable is job satisfaction cardinalized as described in appendix A. 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 OLS		Fixed effects		Endogeneity corrected fixed effects	
	(1) Permanent	(2) Fixed	(3) Permanent	(4) Fixed	(5) Permanent	(6) Fixed
Low stress level	Ref.	0.043 (0.037)	Ref.	0.112* (0.068)	Ref.	0.264*** (0.093)
High stress level	-0.222*** (0.018)	-0.165** (0.065)	-0.140*** (0.028)	-0.300** (0.119)	-0.018 (0.1)	-0.161 (0.154)
WO effect	-0.222*** (0.018)	-0.208*** (0.072)	-0.140*** (0.028)	-0.412*** (0.130)	-0.018 (0.1)	-0.425*** (0.162)
No environmental risks	Ref.	0.055 (0.036)	Ref.	0.121* (0.069)	Ref.	0.267*** (0.092)
Environmental risks	-0.107*** (0.021)	-0.092 (0.074)	-0.074** (0.034)	-0.321** (0.126)	0.004 (0.083)	-0.207 (0.165)
WO effect	-0.107*** (0.021)	-0.147* (0.080)	-0.074** (0.034)	-0.442*** (0.141)	0.004 (0.083)	-0.474*** (0.167)
No physically demanding work	Ref.	0.037 (0.036)	Ref.	0.103 (0.068)	Ref.	0.331*** (0.101)
Physically demanding work	-0.184*** (0.022)	-0.099 (0.075)	-0.129*** (0.037)	-0.332*** (0.114)	0.179* (0.102)	-0.099 (0.164)
WO effect	-0.184*** (0.022)	-0.136* (0.081)	-0.129*** (0.037)	-0.435*** (0.127)	0.179* (0.102)	-0.43*** (0.152)
N	19,402		19,402		14,767	

Note: The dependent variable is job satisfaction cardinalized as described in appendix A. 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 OLS		Fixed effects		Endogeneity corrected fixed effects	
	(1) Permanent	(2) Fixed	(3) Permanent	(4) Fixed	(5) Permanent	(6) Fixed
No strong control	Ref.	0.086* (0.052)	Ref.	0.089 (0.080)	Ref.	0.128 (0.128)
Strong control	-0.096*** (0.015)	-0.071* (0.042)	-0.102*** (0.023)	-0.083 (0.078)	-0.001 (0.154)	0.076 (0.132)
WO effect	-0.096*** (0.015)	-0.157** (0.063)	-0.102*** (0.023)	-0.172* (0.101)	-0.001 (0.154)	-0.052 (0.128)
No conflict with supervisors	Ref.	0.050 (0.033)	Ref.	0.047 (-0.061)	Ref.	0.435*** (0.139)
Conflict with supervisors	-0.736*** (0.054)	-0.779*** (0.188)	-0.506*** (0.069)	-0.524*** (0.187)	-0.151 (0.199)	-0.11 (0.302)
WO effect	-0.736*** (0.054)	-0.829*** (0.190)	-0.506*** (0.069)	-0.571*** (0.189)	-0.151 (0.199)	-0.545** (0.263)
Bad relations with colleagues	Ref.	-0.042 (0.063)	Ref.	-0.135 (0.114)	Ref.	-0.141 (0.168)
Good relations with colleagues	0.318*** (0.018)	0.389*** (0.040)	0.205*** (0.026)	0.298*** (0.068)	0.108 (0.226)	0.365*** (0.142)
WO effect	0.318*** (0.018)	0.431*** (0.070)	0.205*** (0.026)	0.433*** (0.122)	0.108 (0.226)	0.506*** (0.155)
N	19,402		19,402		14,767	

Note: The dependent variable is job satisfaction cardinalized as described in appendix A. 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 OLS		Fixed effects		Endogeneity corrected fixed effects	
	(1) Permanent	(2) Fixed	(3) Permanent	(4) Fixed	(5) Permanent	(6) Fixed
Bad promotion opportunities	Ref.	0.025 (0.035)	Ref.	0.029 (0.066)	Ref.	0.139 (0.092)
Good promotion opportunities	0.091*** (0.021)	0.259*** (0.081)	0.050* (0.030)	0.159 (0.129)	0.144** (0.065)	0.437*** (0.152)
WO effect	0.091*** (0.021)	0.234*** (0.086)	0.050* (0.030)	0.13 (0.142)	0.144** (0.065)	0.298** (0.150)
Bad learning opportunities	Ref.	0.026 (0.042)	Ref.	0.033 (0.074)	Ref.	0.148 (0.095)
Good Learning opportunities	0.222*** (0.016)	0.303*** (0.051)	0.142*** (0.024)	0.208** (0.095)	0.252*** (0.094)	0.356*** (0.120)
WO effect	0.222*** (0.016)	0.277*** (0.063)	0.142*** (0.024)	0.175 (0.113)	0.252*** (0.094)	0.208* (0.127)
Wage below median	Ref.	0.052 (0.040)	Ref.	0.108 (0.079)	Ref.	0.137 (0.089)
Wage above median	-0.026 (0.021)	0.005 (0.056)	0.103*** (0.035)	0.012 (0.094)	0.098** (0.047)	0.058 (0.120)
WO effect	-0.026 (0.021)	-0.047 (0.067)	0.103*** (0.035)	-0.096 (0.115)	0.098** (0.047)	-0.079 (0.135)
N	19,402		19,402		14,767	

Note: The dependent variable is job satisfaction cardinalized as described in appendix A. 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.