

DISCUSSION PAPER SERIES

IZA DP No. 11871

**Works Councils, Training and Employee  
Satisfaction**

Lutz Bellmann  
Olaf Hübler  
Ute Leber

OCTOBER 2018

## DISCUSSION PAPER SERIES

IZA DP No. 11871

# Works Councils, Training and Employee Satisfaction

**Lutz Bellmann**

*IAB, University of Erlangen-Nuremberg and IZA*

**Olaf Hübler**

*IAB, IZA and Leibniz University Hannover*

**Ute Leber**

*IAB*

OCTOBER 2018

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

## ABSTRACT

---

# Works Councils, Training and Employee Satisfaction

This paper investigates the role of works councils in job satisfaction. Using the recently developed Linked Personnel Panel, we consider both the direct and indirect impact via further training. Basic estimates on an individual level do not reveal clearly direct effects, but on an establishment level, the existence of a works council increases the average job satisfaction in a company. In more extended approaches, we also find a positive, weakly significant link on an individual level accompanied by positive training with regard to job satisfaction if we control for personal characteristics, working conditions, firm size, collegiality variables and industry dummies. Firms with industry-wide bargaining agreements drive this result. The effects are stronger if the firm carries the training costs and if the share of trained workers within the firm measures training. The direct impact of works councils remains positive but becomes insignificant if Lewbel's instrumental variables estimator is applied.

**JEL Classification:** J24, J28, J53

**Keywords:** job satisfaction, training, works councils

**Corresponding author:**

Olaf Hübler  
Institut für Empirische Wirtschaftsforschung  
Leibniz Universität Hannover  
Königsworther Platz 1  
D-30167 Hannover  
E-mail: [huebler@ewifo.uni-hannover.de](mailto:huebler@ewifo.uni-hannover.de)

## **1 Introduction**

Although job satisfaction has become a variable in which an increasing number of researchers from many disciplines have been interested during the last 50 years (Borjas, 1997; Clark, 1996, 1997; Clark et al., 2008; Freeman, 1978; Locke, 1969), the complex relationship between employee representation and job satisfaction has not yet been thoroughly investigated. A works council is a specific German institution that is an important supplement to unions in the field of workplace worker representation. There exist many theoretical and empirical studies that investigate which determinants explain the incidence of works councils in establishments and the effect of works councils on relevant economic indicators. Works councils are involved in workplace issues such as working hours, dismissals, occupational safety and initial and further training; thus, their influence may be somewhat indirect. Since the topic of further training is of the utmost relevance, in the following, we are also going to focus on the works council's involvement in further training (henceforth, training). According to the Works Constitution Act, works councils have co-determination rights concerning, e.g., the organization, content and selection of participants in training measures.

Contributions that analyze the importance of works councils with regard to job satisfaction are relatively scarce. As works councils are elected by employees, we have to assume that the latter do so only if job satisfaction increases due to the installation of a works council. If we find that this is not the case, then we have to ask what is responsible for this fact. To date, we do not know much about what empirics tell us.

The intention of our paper is to extend previous analyses in several respects. First, we present more up-to-date information, where three data sources are considered. Second, the analysis is based on both the employee and establishment levels, where we also use information on whether employees are members of a works council. Third, we investigate not only the direct effects of works councils on job satisfaction but also the indirect effects via training. Fourth, we distinguish between different types of wage bargaining. Fifth, we consider personal characteristics such as the Big 5 attributes. Sixth, we take into account the endogeneity of works councils and training.

## **2 Theoretical arguments and previous empirical research**

### ***Theoretical arguments***

There are numerous arguments why works councils, as a highly developed mechanism for establishment-level participation (Hübler and Jirjahn, 2003), affect job satisfaction. However, from a

theoretical point of view, the relationship between works councils and job satisfaction is not straightforward.

First, as many working conditions can be regarded as workplace public goods (Freeman and Medoff, 1984), works councils may play the role of a collective voice, communicating worker preferences to management (FitzRoy and Kraft, 1987), e.g., employees are interested in flexible working time arrangements provided by working time accounts (Bellmann and Hübler, 2015). Thus, they seek to diminish the differences between desired and actual working conditions and work-life balance, with the consequence of higher satisfaction.

Second, works councils provide employees with better information about optional fringe benefits such as healthcare measures and further training, which potentially increase workers' job satisfaction.

Third, works councils reduce employees' fear of revealing information about potential productivity-enhancing process innovations (Hübler and Jirjahn, 2003), thereby increasing the joint surplus, which can be divided among the employer and employees, with the potential to improve employee remuneration. This aspect should also go along with higher job satisfaction.

Fourth, although wage negotiations between councils and management are not authorized by the Works Constitution Act, councils can use their co-determination rights regarding social and personnel matters to obtain employer concessions on issues where they have no legal power (Müller-Jentsch, 1995). Thus, co-determination may strengthen employees' bargaining power (Freeman and Lazear, 1995), tend to raise wages (Jirjahn and Klodt, 1999) and decrease the wage differential between skilled and unskilled employees within the establishment (Hübler and Meyer, 2001). A higher wage level has a positive impact on employee satisfaction – at least temporarily, as long as the members of the reference groups are paid less. In contrast, a larger wage differential tends to increase the job satisfaction of highly remunerated employees, whereas low-wage earners should become less satisfied.

Fifth, the literature on procedural and organizational justice suggests that not only decisions on the establishment level but also the perception of these decisions and how the decisions are reached are important to employees because of their positive or negative impacts (Frey et al., 2004). In conjunction with these decisions, the creation of employee commitment by means of employees' participation in the decision-making process via their representation in works councils can influence employee satisfaction. Different forms of commitment are distinguished (Robinson, 2003): Affiliative commitment means that an organization's interest and values are compatible with those of its employees. Associative commitment increases employees' self-esteem and status. Moral commitment relates to the mutual

responsibility of the organization and employees, whereas affective commitment or engagement means that employees derive satisfaction from their work and their colleagues, and their work environment is supportive of that satisfaction.

Sixth, related to our first and third arguments, the collective voice mechanism produced by employees' representation in conjunction with the higher wage in establishments in which works councils exist may lead to a lock-in effect of employees who are less satisfied with their workplace conditions (Freeman, 1980) if employees attach a higher value to their remuneration than to their well-being. In this case, works councils should go along with a lower job satisfaction of employees.

Additionally, the association between job satisfaction and the existence of works councils can be affected by the selection and recruitment processes of employees and employers: Employees with strong preferences for individual job security and amenities regulated in collective agreements such as working time regulations might self-select into workplaces in certain industries such as the automotive industry where works councils are widely spread. These employees might also enjoy a higher level of job satisfaction, not because of the successful activities of their representatives at the establishment level but because of their individual characteristics, which are the same as the characteristics of employees who are more satisfied than others such as better paid and older employees. Thus, there might be a spurious correlation between job satisfaction and the existence of a works council. Similarly, employers seek to recruit young and highly qualified employees who are not interested in works council activities because such workers are actually the type of worker who is not satisfied with the works council (Jirjahn and Tsertsvadze, 2006). Again, a spurious correlation might occur, because the existence of works councils may lead to a situation where unsatisfied employees use their voice option and their representatives are forced to negotiate with the management in order to improve working conditions.

Furthermore, works councils may influence workers' job satisfaction not only directly but also indirectly via further training. According to the German Works Constitution Act (Betriebsverfassungsgesetz), works councils have co-determination rights regarding certain further training issues. Among others, employers have to investigate the training demand and discuss training issues upon the request of works councils. Furthermore, works councils can co-determine further training activities with respect to their duration, timing and content as well as the selection of training participants. To the extent that works councils are engaged in further training issues and, as a possible consequence, increase firms' training activities, this phenomenon might also have an effect on workers' job satisfaction. Again, this effect can be positive or negative.

According to human capital theory (Becker, 1964), training leads to an increase in productivity and wages. Training activities will be undertaken only if the wage returns exceed the training costs. As long as such wage returns occur, training participation can increase job satisfaction. Works councils might even augment these wage returns of training, as they decrease the likelihood of dismissals and increase the promotion chances of insiders, at least insofar as the human capital acquired through training is specific. However, participation in further training might lead not only to monetary wage returns but also to non-monetary returns. For example, people might enjoy learning, as it enables them to discover something new, to broaden their minds or to get in touch with other training participants. Furthermore, training – especially if it occurs within the firm – can improve the working atmosphere and the group cohesion within a company. These aspects can have a positive impact on employee satisfaction – even though there was no impact of training on wages (Burgard and Görlitz, 2014).

While the aspects mentioned above point to a positive effect of training on job satisfaction, one might also think about the reasons for a negative relationship. This can especially be the case if training measures are not the result of a free decision of the training participants but are more or less compulsory. For example, in some occupations such as the healthcare professions in Germany, training participation is required by law and does not necessarily lead to better income and promotion prospects or higher job satisfaction. Furthermore, training measures can be required by the company. Even when the monetary costs of these training activities are borne by the employer, employees have to bear the non-monetary training costs such as stress, fear of failure or fear of learning, which can decrease their job satisfaction (Burgard and Görlitz, 2014). In addition, job satisfaction may be negatively affected by training if colleagues in the same workplace receive more training than the individual does. Following the literature on job satisfaction and pay, Jones et al. (2008) assume that employees are concerned not only with the absolute amount of training that they receive but also with the distribution of training within the firm: The higher in the training distribution within a company the individuals are, the more satisfied with their training opportunities they should be. However, this aspect might be mitigated by the existence of a works council to the extent that works councils pay attention to a more equal distribution of training by considering the special needs of certain groups of employees who are usually underrepresented in further training measures.

### ***Previous empirical research***

The determinants as well as the effects of job satisfaction have been investigated in several disciplines such as psychology, sociology or economics. Early (economic) studies showed that job satisfaction is a

predictor of consequences such as quitting, absenteeism or productivity (Freeman, 1978; Borjas, 1979). Not least against the backdrop of these positive effects of job satisfaction, a number of studies have aimed at analyzing the factors that influence job satisfaction. Many of these studies focus on individual aspects such as gender, age, qualifications or personality traits such as the Big 5 (e.g., Clark, 1996, 1997; Clark et al., 1996; Bender and Heywood, 2006; Fietze, 2011) In addition to such individual characteristics, job-related aspects such as the work environment, wages, career opportunities, job stability or working time are taken into account (e.g., Giesselmann et al., 2017; Hammermann and Stettes, 2017).

One aspect that is of high relevance in this context is the impact of unions. A number of contributions mainly for the U.S. but also for the UK examine the effects of unions on job satisfaction (e.g., Borjas, 1979; Freeman, 1978; Bender and Sloane, 1998; Bryson et al., 2004; Doucouliagos et al., 2017).

); most of them report a negative impact. As unions in the abovementioned countries often act at the firm level in a way similar to how works councils act in Germany, these findings are of particular importance for our study. However, we are aware of only a few contributions investigating the specific relationship between works councils and job satisfaction. While some of these studies suggest a negative relation between works councils and job satisfaction, others indicate a positive relation. In their study based on data from the German Socio-Economic Panel (SOEP), Jirjahn and Tsertsvadze (2006) find that, on average, job satisfaction is negatively associated with the existence of a works council. However, the authors show that there are differences between several types of workers. For instance, they find that the presence of a works council goes along with higher job satisfaction for full-time employed blue-collar workers while it is associated with lower job satisfaction for non-full-time workers and managers. In contrast to this study, a paper by Grund and Schmitt (2013) – also based on SOEP data – finds a positive effect of works councils on job satisfaction. However, this effect is mainly driven by workers who move to a firm with a works council, whereas the authors do not find a particular effect of an introduction of a works council for employees who stay at their firm.

Regarding our second variable of interest, training, we can also find only a small number of studies investigating the effect on job satisfaction. Kriechel et al. (2014) investigate the impact of works councils on apprenticeship training. They find that firms with works councils make a higher net investment in training than firms without such an institution. Furthermore, the authors show that the fraction of former trainees still employed within the same firm five years after training is significantly higher in the presence of works councils and that this outcome is more pronounced for firms covered by collective bargaining.

The relationship between further training and job satisfaction is investigated by Siebern-Thomas (2005), who finds in his study based on the European Community Household Panel a positive correlation between the skills that have been acquired through training and job satisfaction. A positive effect of training on several dimensions of job satisfaction (e.g., satisfaction with influence over job, satisfaction with sense of achievement) is also reported by Gazioglu and Tansel (2006), who use data from the Workplace Employee Relations Survey (WERS) in order to analyze the impact of individual and job-related factors on job satisfaction in Great Britain. By using the same data set, Jones et al. (2008) also find clear evidence that training is positively associated with job satisfaction. Their analysis also reveals that training has a greater impact on the job satisfaction of men than that of women. Furthermore, the authors show that the job satisfaction of employees decreases if the share of other workers receiving more training than the individual rises. In contrast to these two studies, Georgellis and Lange (2007) find a negative relationship between training participation in general and job satisfaction. By using data from the SOEP, the authors show that only firm-sponsored training has a positive impact on the job satisfaction of men whereas this is not the case for women. Based on their analysis, the duration of training does not affect job satisfaction. Gender differences in the relation between training and job satisfaction are also reported by Burgard and Görlitz (2014). Based on data from the SOEP, this study shows that attending training measures is positively correlated with job satisfaction for men but not for women. The same holds for certain characteristics of training courses such as financing or duration: While these characteristics are correlated with job satisfaction for males, they do not affect job satisfaction for females.

Our review should be completed by contributions that use establishment data in order to analyze the effects of works councils on further training. An early study by Backes-Gellner et al. (1997) found no significant differences in the training behavior of companies with and without a works council. The authors explain this result with the fact that further training issues are usually a field that is more or less free of conflicts. Works councils are supposed to limit their interventions only to cases of obvious disagreement. In contrast to this study, several studies based on the IAB Establishment Panel have found a positive relationship between the existence of works councils and firms' training activities. While some studies report significant effects on training incidence but not on training intensity (Zwick, 2004, 2005), others also find a positive effect on the share of training participants (e.g., Bellmann and Ellguth, 2006; Stegmaier, 2012). Similarly, studies for the UK arrive at mixed results when analyzing the effects of workplace unions on training. While some studies based on establishment data report higher training activities in union workplaces (Green et al. 2009), studies based on individual data find not only positive

but also negative effects of union membership on the individual's training probability (e.g., Booth et al., 2003; Green, 1993).

To the best of our knowledge, we are not aware of any study that investigates the interaction between works councils, further training and job satisfaction – thus, our study can help close this gap.

### **3 Methods, data, and descriptive results**

#### **3.1 Empirical methodology**

Our major interest is the estimation of job satisfaction with respect to works councils and training. As job satisfaction is measured by a scale variable of 0,...,10, we use ordered probit estimates. Our investigations are focused on different data sources and different specifications (Tables 3 and 4). Further robustness checks are conducted by subgroup estimates decomposed by types of bargaining agreement (Table 5). To obtain a clearer picture and to avoid multicollinearity due to the large number of control variables, we prefix a principal component analysis. From a methodological point of view, we examine whether job satisfaction, the existence of a works council and further training are interdependent. Instrumental variable estimates are based on Lewbel's approach (Lewbel, 2012) (see Table 8).

Lewbel's technique enables the identification of structural parameters in fully simultaneous linear models under the assumptions that the regressors and the error terms are uncorrelated and that the error terms are heteroskedastic. No information outside of the specified model is required. Identification comes from a heteroskedastic covariance restriction and is achieved by having regressors that are uncorrelated with the product of heteroskedastic errors. The greater the degree of scale heteroskedasticity in the error process is, the higher will be the correlation of the generated instrumental variables with the included endogenous variable, which is the regressand in the first-stage regression.

#### **3.2 Data**

In our investigations, we use three data sets. The major source is the Linked Personnel Panel (LPP – Broszeit and Wolter, 2015; Broszeit et al., 2016). As supplements, some data are consulted from the IAB Establishment Panel (Fischer et al., 2009). Finally, a few estimates are based on the German Socio-Economic Panel (SOEP - Wagner et al., 2007). The LPP is a new data set that has the advantage of providing information on two levels, namely, on the employee level and the establishment level. The survey was started in 2012/2013. Information from the second wave, 2014/2015, is also currently

available. Not all information is provided in both waves. Therefore, our analysis is focused on the second wave, 2014/2015. The employee level of the LPP considers demographic and job characteristics. Among others, job satisfaction is recorded.

One of our central variables, the works council information, is missing in the LPP. By a link with the IAB Establishment Panel via an establishment identification number, we obtain this information. We have done the same with the information on whether the firm has provided training in the last year, the share of trained workers, working time, firm size, industries and the type of bargaining.

It would also be possible to use the SOEP to estimate the relationship between works councils and job satisfaction, as Jirjahn and Tsertsvadze (2006) have done, where the works council information entered from 2001. In five-year intervals, this information was again provided by the SOEP (2006, 2011 and 2016). We do not replicate these estimates with the SOEP data, except for 2011. However, in 2015, individuals were asked for the first time whether they are a member of a works council. This information allows us to investigate whether such membership has effects on individual job satisfaction other than the pure existence of a works council in the establishment.

### 3.3 Descriptive results and simple correlations

First, empirical evidence of the development of our central variables, namely, job satisfaction, works councils and firm training activities, is presented in Figure 1. We find an obvious decrease in the share of establishments with a works council, while no clear tendency for job satisfaction and the share of firms with training activities can be observed. These are only average developments that cannot be used for a detailed analysis based on the individual and establishment levels because in Figure 1, different data sources that cannot be merged are used. A further hint regarding the differences in job satisfaction between workers with and without training in a specific period is shown by the histograms in Figure 2. At first glance, the two representations look similar, with a peak at the job satisfaction level 8 within the range (0, ..., 10) and very few values in the lower part of the histogram. However, around the part with the most observations (7-9), the proportion of workers with training is higher than that for others. Thus, we can suppose that there is a link between training and job satisfaction. A graph analogous to Figure 2, where we distinguish between employees who work in a firm with and without a works council (not presented in the paper), shows a nearly identical distribution of job satisfaction for the two worker groups. At this stage, we can speculate that the existence of a works council has no influence on individual job satisfaction. A final graphical representation is given in Figure 3, which provides insights into the strong dependence of the spread of works councils on firm size. This finding is due to the legal

requirements based on the Works Constitution Act. A works council can be elected in firms with 5 or more workers entitled to vote. The election procedure and the number of works council members also depend on the firm size. We should emphasize that a non-selection carries no sanctions.

In Table 1, we have presented the descriptive statistics (number of observations, mean and standard deviation) for individual and firm characteristics that might be relevant for our analysis of the relationship between job satisfaction, works councils and training. In the first column, the total sample is used, and in columns 2 to 3, we have split the sample by firms with and without works council. The strongest differences between the latter are revealed for the types of bargaining and the firm size, confirming Figure 3.

An impression of the relationship between our main variables of interest is provided in Table 2, with the help of Bravais-Pearson correlation coefficients ( $r$ ). Many of these determinants are measured by ordinal or categorical data. Therefore, it would be better to present measures of nominal or ordinal association such as Kendall's tau or the Kruskal-Wallis statistics (see Agresti, 1990). Nevertheless,  $r$  demonstrates which variables are more strongly linked than others. With respect to the purpose of our investigation, we can argue that on one hand, there is a positive and significant relationship between job satisfaction and training. On the other hand, no clear correlation with a works council can be detected. Furthermore, this step of the investigation gives hints as to which influences should be taken into account for the multivariate analysis of job satisfaction. Personal characteristics, oriented toward Big 5 theory and measurement, collegiality, commitment, working conditions, work-life balance and qualifications are important for explaining the differences in job satisfaction. This finding is in line with the results of the previous studies described in section 2. The assignment to industries does not seem to be relevant in this context. A wide spectrum of influences shows the correlation with training. The pattern is similar to that for job satisfaction. This finding means that we have to pay attention to possible interdependencies. Unobserved influences such as institutional requirements might be essential. Only a very small number of determinants that clarify why some firms have elected a works council and others have not could be found.

Finally, we should mention that the correlation with disaggregated individual and aggregated establishment variables based on the establishment level is not the same. The influence of an individual determinant on another on the same level is usually stronger than that of an analogous aggregated determinant. This concept seems plausible but should be considered when interpreting the determined effects. For example, a firm that offers training on the aggregated level has a less positive impact on

individual job satisfaction than a specific training participation of the observed workers. In both cases, we find a significant correlation (not in the tables). Why the effect of an aggregated variable on micro units can also be significant may be explained by Moulton (1990). Grouped variables such as regressors underestimate the standard errors if this variable strongly varies between groups but weakly varies within groups if no weighting is implemented.

## **4 Econometric estimates**

### **4.1 Basic estimates of job satisfaction**

Our econometric analysis starts with simple ordered probit estimates where only the two most important covariates are incorporated: works councils and training. In accordance with the descriptive results (Tables 1 and 2), we find that training increases job satisfaction. The works council coefficient is also positive but insignificant (not in the tables). In the next step, the approach is extended in four dimensions (Table 3). First, the list of control variables is enlarged by five further determinants: monthly gross wages, the willingness to take risks, health problems, age and gender. These are cardinal or categorical data that in most cases are significant. Second, the results of a further survey in addition to the LPP, namely, that from the SOEP, are presented. Third, the year of collection is varied (2011 to 2015). Fourth, we distinguish between employees and establishments as carriers of characteristics.

The signs of most coefficients and the significance of the control variables match over different periods and surveys. We find that our training variable has a positive effect on job satisfaction – regardless of which survey and which time period we use. Furthermore, we find that training affects not only individual job satisfaction but also the average job satisfaction of the entire staff of an establishment. Regarding the effect of the works council, in contrast, we do not find a significant effect on individual job satisfaction. However, it is an important finding that on the establishment level, works councils have a positive and weakly significant influence on the average job satisfaction of the staff (see column (4) of Table 3).

While the SOEP data of 2011 provide information on the presence of a works council in the establishment where an employee works, we determine from the SOEP data of 2015 whether an employee is a member of a works council. Doing so allows us to discriminate between the installation of and the individual membership in a works council, which can go along with fundamental differences. On one hand, in itself, a works council might help increase individual job satisfaction, as the workers' rights are improved and stabilized. In Table 3, this assumption is only partially confirmed. On the other hand,

the members of a works council have to solve conflicts, which can be combined with frustration and with less satisfaction if the employer successfully resists the objectives of the works council or if the employees are unhappy with the co-determination. As our results show, this assumption is confirmed. The effect of the relevant variable in column (5) is negative and significant.

#### 4.2 Extended approaches

The LPP in combination with the IAB Establishment Panel provides a wide spectrum of information. It makes sense to extend the specification in Table 3 with control variables. On one hand, we base this action on theoretical reflections as well as on the selection of variables used by previous studies (see section 2). On the other hand, we select variables that show a significant correlation with job satisfaction (see Table 2). As we know from several studies (e.g., Bender and Heywood, 2006; Fietze, 2011 or Giesselmann et al., 2017), schooling and qualifications as well as personal traits and the characteristics of working life determine job satisfaction. Jirjahn and Tsertsvadze (2006) show on the basis of SOEP data that these variables are also important in regard to explaining the works council effect on job satisfaction. Incorporating working conditions in their estimates, they find positively significant works council effects on job satisfaction for full-time employees, in contrast to estimates that disregard these influences. We try to replicate this result with LPP data, using modified working conditions and incorporating additional influences. In particular, personal traits that can be assigned to the Big 5 classification – openness, extraversion, conscientiousness, agreeableness and neuroticism (McCrae and Costa, 1997) – are included. Mainly psychological studies but also contributions from other disciplines show that there is a strong relationship between job satisfaction and these personality characteristics (e.g., Fietze, 2011). Moreover, we examine whether the degree of work-life balance, having a home office and the digitization of the workplace determine job satisfaction. The LPP provides all this information.

Table 4 presents the estimates of the extended approach in column (1). Working conditions and collegiality are still suppressed. We can observe that the training effects are still positively significant but larger than those in Table 3. Remarkably, the works council effect on individual job satisfaction is now also positively significant, though working conditions are not incorporated. This effect is driven by the Big 5 personal characteristics. Slightly modified specifications in columns (2) and (3) confirm this outcome. In column (2), some insignificant determinants of column (1) are removed, but the working conditions and collegiality variables are added. Since the number of control variables is large, insignificant estimates can follow due to multicollinearity. To avoid this effect, in the first step, we conduct a principal component

analysis, where six components are extracted. The Big 5 attributes, working conditions, collegiality influences and industry dummies are taken into account. The score variables of the six principal components are saved, and in the second step, they are incorporated as control variables (PC01-PC06). For the interpretations of the principal components, we focus on scoring coefficients larger than 0.3 and consider the assignment of personal characteristic to the Big 5 traits. Factors 1, 2 and 5 are driven by the Big 5. Factor 1 combines openness and extraversion. Factor 2 is mainly determined by conscientiousness and agreeableness, and the interpretation of factor 5 follows neuroticism. In factors 3 and 4, the high loading of the working conditions variables is particularly remarkable, whereas factor 6 is driven by collegiality. In the estimates of job satisfaction (see Table 4, column (3)), the score variables 2 and 4-6 (PC02, PC04-PC06) are significant.

Analogously to column (3), Table 4, in Table 5, we present separate estimates for the different schemes of bargaining agreement, namely, for industry-wide agreements (IA), for company agreements (CA), acting upon industry agreements (AIA) and no collective bargaining (NCB). Here, we can observe that the positively significant effects of works councils on job satisfaction are mainly driven by IA and AIA, while under CA and NCB, we do not find a significant influence. No differences between the four bargaining systems with respect to training effects on job satisfaction can be observed. To a certain extent, this result is surprising, as there are some industry-wide bargaining agreements in Germany that contain regulations concerning employee participation in further training.

The estimates of column (4) in Table 4 show a surprising result. When the information of no commitment is added, the works council effect is again completely insignificant, while the no-commitment effect on job satisfaction is negative and significant. This result means that works councils can contribute to increasing job satisfaction. However, if employees have no binding to their establishment, then this outcome is overcompensated. Whether commitment supports the election of a works council and the works council then strengthens the positive effect on job satisfaction or whether the installation of a works council is the most important factor for employees to have a strong binding to the company is an open question. The works council estimates (see Table 6, columns (1) and (2)) show that employees with no commitment have no significant effects on works councils. This result speaks more in favor of the second hypothesis. However, when we use aggregated commitment values (the percentage of employees within an establishment with no commitment) in columns (3) and (4), low commitment is negatively and significantly correlated with a works council, and we have to favor the first hypothesis. The implication is that poor commitment within an establishment hinders the election of a works council while a single worker with commitment or no commitment cannot affect the election of a works council.

### 4.3 Endogeneity and instrumental variables estimates

Hitherto, we have implicitly assumed for the econometric estimates that there are no interdependencies between job satisfaction, works councils and further training. However, the simple bivariate correlations hint at possible interrelations (see Table 2). The modeling of works- council-training functions is helpful in finding instrumental variables. The works council estimates in Table 6 again show that it is important to distinguish between the individual and establishment levels. The natural base for works councils is the establishment level. Regressors may be measured as individual or as grouped variables. Differences are revealed for commitment, schooling and partially for having a home office. These are individual characteristics, while firm size and collective bargaining are firm characteristics. The larger a firm is, the higher the probability that a works council is installed due to legal regulations. Collective bargaining supports this tendency (Hübler and Jirjahn, 2003). Grouped but not individual commitment is a determinant for an election of a works council. For schooling, we have the opposite result. The fact that a staff has a high level of qualifications is not responsible for the fact that a firm has a works council. In truth, people with a good education decide to work in an establishment with a works council. Following this outcome, we can use column (4) in Table 6 as the first-stage estimation of an interdependent job satisfaction-works council model. Column (3) is less preferred because the Big 5 properties as well as the industry assignment and having a home office have no influence.

Moreover, job satisfaction and training may also be interrelated. Therefore, we need a training function. Earlier studies on the determinants of further training show that training participation is affected by not only individual characteristics such as qualifications, age or gender but also by company-specific factors such as firm size and technical state (e.g., Leber and Möller, 2008; Zwick, 2004). The results of our estimates are presented in Table 7. We do not find a convincing model with many significant covariates independent of whether training is measured by a dummy on the individual or establishment levels or by the share of trained workers. Overall, our estimates can confirm only some of the findings that were reported in other studies. Among others, our results show that individual training participation decreases with age and increases with firm size. Unskilled workers are less likely to participate in training than are their more qualified counterparts. Except in the first of the three specifications, the influence of the works council is positively significant. This result is in line with earlier studies based on establishment data that reported a positive effect of the presence of a works council on firms' further training activities (e.g., Stegmaier, 2012; Bellmann and Ellguth, 2006).

Overall, our described first-stage 2SLS estimates are not completely convincing. Therefore, we choose as an alternative Lewbel's approach (see section 3.1). The results can be found in Table 8. The most striking result is that although the estimated coefficients have the expected sign, the influence of the instrumented regressor is not significant, neither in column (1) nor in (2), while the other relevant determinant (works councils or training) is significant and has the expected sign. Tests of exogeneity reject the null hypothesis in column (1) at  $\alpha < 0.1$ . Therefore, we should prefer this estimation compared with that in Table 4, column (3).

## **5 Conclusions**

Using the newly created German Linked Personnel Panel data set, we analyze the relationship between employee representation and job satisfaction. We consider both the direct impact of works councils and the indirect effect via training. Our estimates demonstrate the relevance of both channels. To the best of our knowledge, this study marks the first time in which such an indirect effect has been revealed. This result corroborates our theoretical conjectures about the co-determination of works councils concerning training matters according to the German Works Constitution Act. However, not only are issues of procedural and organizational justice positively affected; works councils also contribute to fewer job changes and, as a possible consequence, to higher actual and expected training returns.

As works councils seem to have a positive and significant influence only on the satisfaction of the staff as a whole but not on the individual satisfaction level, we conclude that works councils focus their activities more collectively on the workforce and that they are less fighting in the corner of each and every employee.

Since our results are driven by firms with industry-wide bargaining agreements, we suggest further investigating the specific role of collective agreements in conjunction with training and job satisfaction. There are some cases of industry-wide bargaining agreements in Germany with specific regulations concerning employee participation in training. Furthermore, because our effects are strengthened if the training costs are carried by the firm, the kind of cooperation between employers and employee representatives is of the utmost importance for future research.

## References

- Agresti, A. (1990): *Categorical data analysis*, John Wiley & Sons, New York.
- Backes-Gellner, U., Frick, B. and Sadowski, D. (1997): 'Codetermination and personnel policies of German firms: the influence of works councils on turnover and further training', *International Journal of Human Resource Management* 8, 328–47.
- Becker, G.S. (1964): *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, University of Chicago Press, Chicago.
- Bellmann, L. and Ellguth, P. (2006): 'Verbreitung von Betriebsräten und ihr Einfluss auf die betriebliche Weiterbildung', *Jahrbücher für Nationalökonomie und Statistik* 226, 487–504.
- Bellmann, L. and Hübler, O. (2015): 'Working time accounts and firm performance in Germany', *IZA Journal of European Labor Studies* 4, Art. 24.
- Bender, K.A. and Heywood, J.S. (2006): 'Job Satisfaction of the Highly Educated: The Role of Gender, Academic Tenure and Comparison Income', *Scottish Journal of Political Economy* 53, 253-279.
- Booth, A. L., Francesconi, M. and Zoega, G. (2003): 'Unions, Work-Related Training, and Wages: Evidence for British Men', IZA Discussion Paper 737.
- Borjas, G.J. (1979): 'Job satisfaction, wages and unions', *The Journal of Human Resources* 14(1), 21-40.
- Broszeit, S., Grunau, P. and Wolter, S. (2016): 'LPP – Linked Personnel Panel 1415', FDZ-Datenreport 06/2016, Nürnberg.
- Broszeit, S. and Wolter, S. (2015): 'LPP – Linked Personnel Panel – Arbeitsqualität und wirtschaftlicher Erfolg: Längsschnittstudie in deutschen Betrieben (Datendokumentation der ersten Welle)', FDZ-Datenreport 01/2015, Nürnberg.
- Bryson, A., Cappellari, L. and Lucifora, C. (2004): 'Does Union Membership Really Reduce Job Satisfaction?', *British Journal of Industrial Relations* 42(3), 439-459.
- Burgard, C. and Görlitz, K. (2014): 'Continuous Training, Job Satisfaction and Gender. An Empirical Analysis Using German Panel Data', *Evidence-based HRM: a global forum for empirical scholarship* 2(2), 126-144.
- Clark, A.E. (1996): 'Job satisfaction in Britain', *British Journal of Industrial Relations* 34(2), 189-217.
- Clark, A.E. (1997): 'Job satisfaction and gender: Why are women so happy at work?', *Labour Economics* 4(4), 341-372.
- Clark, A.E., Frijters, P. and Schields, M. (2008): 'Relative income, happiness and utility: An explanation for the Easterlin paradox and other puzzles', *Journal of Economic Literature* 46(1), 95-144.

Clark, A.E., Oswald, A. and Warr, P. (1996): 'Is job-satisfaction U-shaped in age?', *Journal of Occupational and Organizational Psychology* 69, 57-81.

Doucouliaqos, H., Freeman, R.B. and Laroche, P. (2017): *The Economics of Trade Unions – A Study of a Field and Its Findings*, Routledge, London and New York.

Fietze, S. (2011): 'Arbeitszufriedenheit und Persönlichkeit: „Wer schaffen will, muss fröhlich sein!“, SOEPpaper 388, Berlin.

Fischer, G., Janik, F., Müller, D. and Schmucker, A. (2009): 'The IAB Establishment Panel - things users should know', *Journal of Applied Social Science Studies* 129, 133-148.

FitzRoy, F.R. and Kraft, K. (1990): 'Innovation, rent-sharing and the organisation of labour in the Federal Republic of Germany', *Small Business Economics* 2, 95-103.

Freeman, R.B. (1978), 'Job satisfaction as an economic variable', *American Economic Review* 68(2), 135-141.

Freeman, R.B. (1980): 'The exit-voice tradeoff in the labor market: unionism, job tenure, quits, and separations', *Quarterly Journal of Economics* 94, 643-674.

Freeman, R.B. and Lazear, E.P. (1995): 'An economic analysis of works councils', in: Rogers J. and Streeck, W. (Eds.), *Works Councils – Consultation, Representation and Cooperation in Industrial Relations*, University of Chicago Press, Chicago, 27-52.

Freeman, R.B. and Medoff, J.L. (1984): *What Do Unions Do?*, Basic Books, New York.

Frey, B., Benz, M., and Stutzer, A. (2004): 'Introducing procedural utility: not only what, but also how matters', *Journal of Institutional and Theoretical Economics* 160, 377-401.

Gazioglu, S. and Tansel, A. (2006): 'Job satisfaction in Britain: Individual and job related Factors', *Applied Economics* 38(10), 1163–1171.

Georgellis, Y. and Lange, T.W. (2007): 'Participation in Continuous, On-the-Job Training and the Impact on Job Satisfaction: Longitudinal Evidence from the German Labour Market', *International Journal of Human Resource Management* 18(6), 969–985.

Giesselmann, M., Staneva, M., Schupp, J. and Richter, D. (2017): Arbeitsmarktposition und Arbeitszufriedenheit: quer- und längsschnittliche Befunde auf Basis des Sozio-oekonomischen Panels (SOEP). *SOEPpaper* 929, Berlin.

Green, F. (1993): 'The impact of trade union membership on training in Britain', *Applied Economics*, 25, 1033–43.

Grund, C. and Schmitt, A. (2013): 'Works councils, wages and job satisfaction', *Applied Economics* 45(3), 299-310.

Hammermann, A. and Stettes, O. (2017): 'Quality of Work in Europe – An Empirical Analysis on the Basis of the EWCS 2015', *IW Report* 24/2017.

Hübler, O. and Jirjahn, U. (2003): 'Works councils and collective bargaining in Germany: the impact on productivity and wages', *Scottish Journal of Political Economy* 50 (4), 471-491.

Hübler, O. and Meyer, W. (2001): 'Industrial relations and the wage differentials between skilled and unskilled blue-collar workers within establishments: an empirical analysis with data of manufacturing firms', *Journal of Applied Social Science Studies* 121, 285-312.

Jirjahn, U. and Klodt, T. (1999): 'Lohnhöhe, industrielle Beziehungen und Produktmärkte', in: Bellmann, L., Kohaut, S., and Lahner, M. (Eds.), *Zur Entwicklung von Lohn und Beschäftigung auf der Basis von Betriebs- und Unternehmensdaten*. BeitrAB 220, Nürnberg, 27-54.

Jirjahn, U. and Tsertsvadze, G. (2006): 'Betriebsräte und Arbeitszufriedenheit', *Jahrbücher für Nationalökonomie und Statistik* 226(5), 537-561.

Jones, M. K., Jones, R.J., Latreille, P.L. and Sloane, P.J. (2008): Training, Job Satisfaction and Workplace Performance in Britain: Evidence from WERS 2004. *IZA Discussion Papers* 3677.

Kriechel, B., Muehlemann, S., Pfeifer H. and Schütte, M. (2014): 'Works councils, collective bargaining, and apprenticeship training', *Industrial Relations* 53(2), 199-222.

Leber, U. and Möller, I. (2008): 'Weiterbildungsbeteiligung ausgewählter Personengruppen', *Schmollers Jahrbuch*, 128(3), 405-429.

Lewbel, A. (2012): 'Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models', *Journal of Business and Economic Statistics* 30(1), 67-80.

Locke, E.A. (1969): 'What is job satisfaction?', *Organizational Behavior and Human Performance* 4(4), 309-336.

McCrae, R. R. and Costa, P.T. (1997): 'Personality trait structure as a human universal', *American Psychologist* 52, 509-516.

Moulton, B. R. (1990): 'An illustration of a pitfall in estimating the effects of aggregate variables on micro units', *Review of Economic Studies* 72, 334-338.

Müller-Jentsch, W. (1995): 'Germany. From collective voice to co-management', in: Rogers, J. and Streeck, W. (Eds.), *Works Councils – Consultation, Representation and Cooperation in Industrial Relations*, University of Chicago Press, Chicago, 53-78.

Robinson, D. (2003): Defining and creating employee commitment: a review of current research. HR Network Paper MP 21, Institute for Employment Studies, Brighton.

Siebern-Thomas, F. (2005): 'Job quality in European labour markets', in: Bazen, S., Lucifora, C. and Salverda, W. (Eds.), *Job Quality and Employer Behaviour*, Palgrave Macmillan, Basingstoke, 31-65.

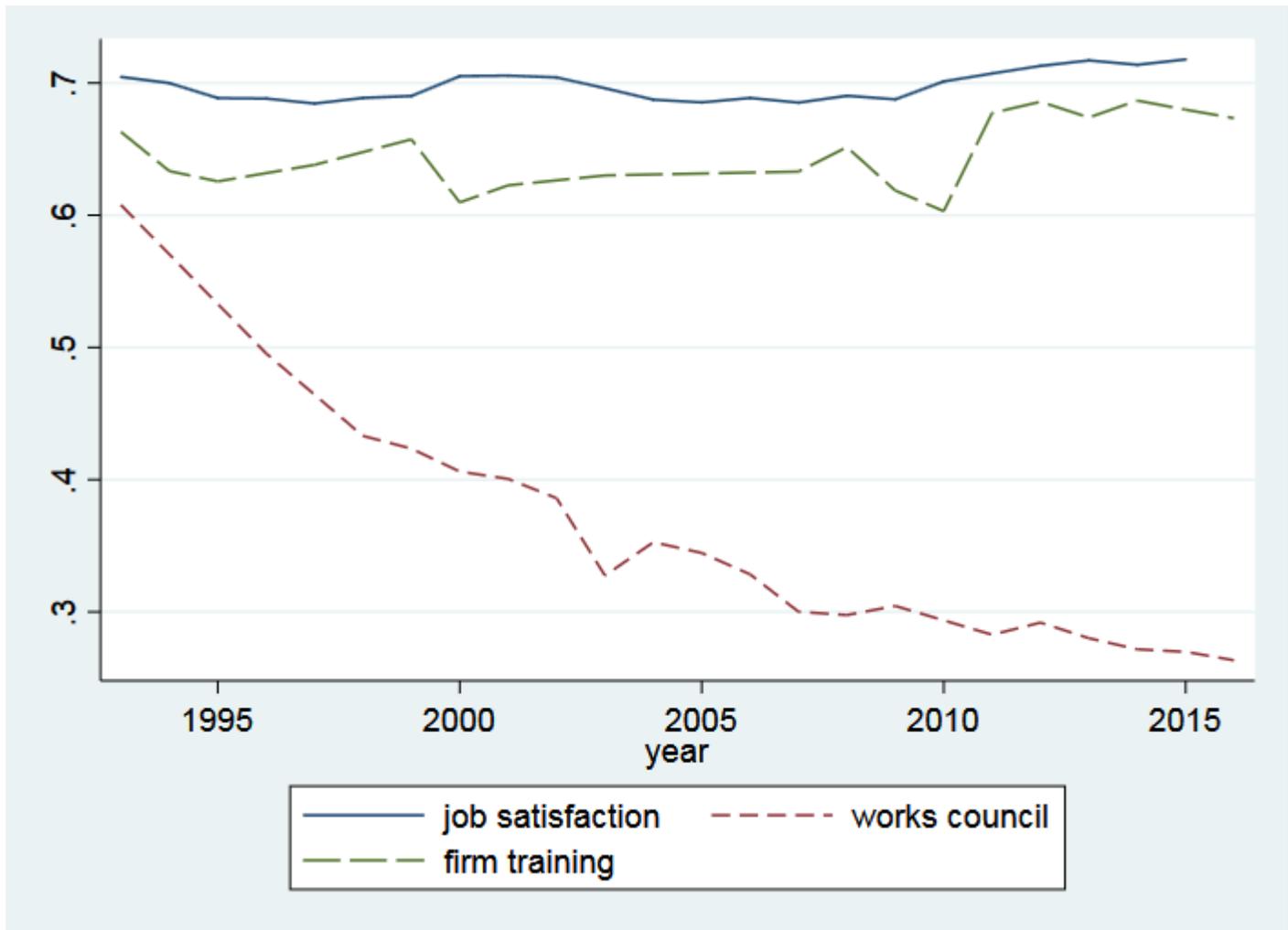
Stegmaier, J. (2012): 'Effects of works councils on firm-provided further training in Germany', *British Journal of Industrial Relations* 50(4), 667-689.

Wagner, G., Frick, J. and Schupp, J. (2007): 'The German Socio-Economic Panel Study – Scope, Evaluation, and Enhancements', *Schmollers Jahrbuch* 127, 139-169.

Zwick, T. (2004): 'Weiterbildungsintensität und betriebliche Produktivität', *Zeitschrift für Betriebswirtschaft* 74, 651–68.

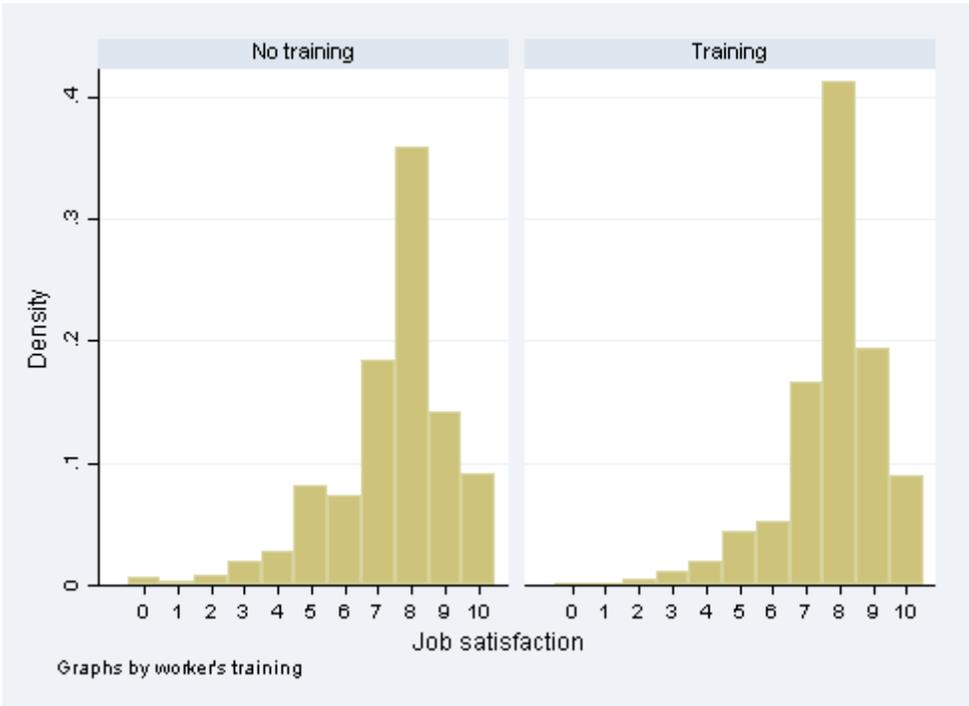
Zwick, T. (2005): 'Continuing vocational training forms and establishment productivity in Germany', *German Economic Review* 6, 155–84.

**Figure 1:** Development of average job satisfaction, the share of firms with training and the share of firms with a works council



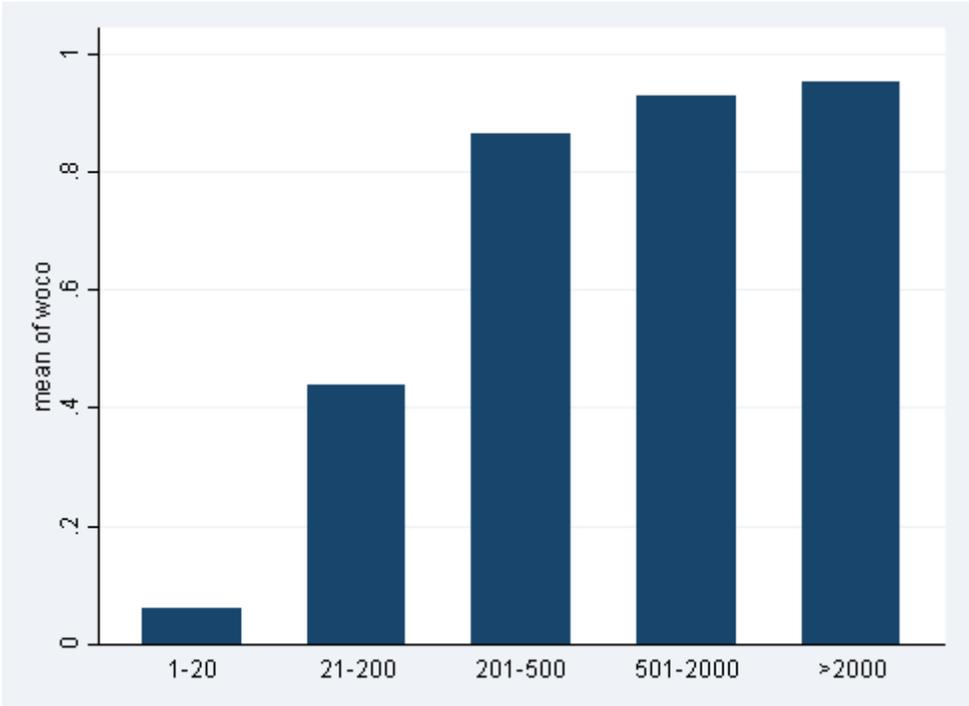
Notes: The job satisfaction variable from the German Socio Economic Panel, measured by the scale 0, ... 10, is divided by 10; source of firm training and works council is the IAB Establishment Panel.

**Figure 2:** Histogram of job satisfaction broken down by workers with and without training



Source: German Linked Personnel Panel (LPP) 2014/2015.

**Figure 3:** Share of firms with a works council broken down by firm size classes.



Source: IAB-Establishment Panel 2015.

**Table 1:** Summary statistics

	(1)			(2)			(3)		
Sample→	All			WOCO=1			WOCO=0		
Variables	N	Mean	sd.	N	Mean	sd.	N	Mean	sd.
↓									
JS	14,608	7.536	1.716	4,690	7.547	1.703	9,901	7.530	1.723
WOCO	14,773	0.321	0.467	4,749	1	0	10,024	0	0
TRAIN_W	14,608	0.374	0.483	4,686	0.379	0.485	9,905	0.372	0.483
TRAIN_E	14,784	0.724	0.446	4,746	0.947	0.222	10,021	0.619	0.486
WAGE	12,248	3,553	5,933	3,923	3,576	8,410	8,311	3,544	4,301
AGE	14,790	46.069	10.590	4,749	46.160	10.640	10,024	46.020	10.565
MALE	14,790	0.716	0.450	4,749	0.718	0.449	10,024	0.715	0.451
HEALTH	14,611	2.357	0.961	4,691	2.355	0.944	9,903	2.358	0.954
S	11,480	10.206	1.727	3,716	10.2454	1.743	7,751	10.187	1.719
UNSKILLED	14,763	0.035	0.184	4,741	0.035	0.185	10,005	0.034	0.183
SKILLED	14,763	0.201	0.400	4,741	0.1972	0.398	10,005	0.202	0.402
FIRM SIZE	14,790	164.35	1,146	4,749	439.10	1,985	10,024	34.279	143.14
PART TIME	14,778	0.127	0.333	4,746	0.129	0.335	10,015	0.126	0.332
IA	14,763	0.397	0.489	4,739	0.650	0.476	10,008	0.277	0.448
CA	14,463	0.069	0.254	4,739	0.158	0.365	10,008	0.028	0.165
AIA	14,763	0.273	0.445	4,739	0.114	0.318	10,008	0.349	0.477
NCB	14,763	0.532	0.498	4,739	0.191	0.393	10,008	0.695	0.461

Notes: JS – job satisfaction, WOCO-works council dummy, TRAIN\_W-training worker dummy, TRAIN\_E-training establishment dummy, WAGE-monthly gross wage, S-schooling in years, UNSKILLED-unskilled worker dummy, SKILLED-skilled worker dummy, PART TIME-part-time worker dummy, IA-industry-wide agreement dummy, CA-company agreement dummy, AIA-acting upon industry agreement dummy, NCB-no collective bargaining dummy.

**Table 2:** Correlation coefficients between job satisfaction, works council, training, wages and other determinants

	(1)	(2)	(3)	(4)
(1)Job satisfaction	1.0000			
(2)Works council	0.0058	1.0000		
(3)Training	0.1339*	0.0061	1.0000	
(4)Monthly gross wage	0.0398*	0.0099	0.0490*	1.0000
Age	0.0282*	0.0130	-0.0684*	0.0399
Male	0.0066	-0.0079	0.0170	0.0996*
Health problems	-0.2135*	0.0049	-0.1042*	-0.0402*
Firm size	0.0089	0.1593*	0.0109	0.0004
Working time	-0.0034	-0.0149	0.1267*	0.1261*
Performance	-0.0006	0.0009	-0.0188	-0.0276*
Digitization	0.0596*	0.0106	0.2420*	0.0954*
Willing to take risks	0.0564*	-0.0134	0.0598*	0.0891*
Schooling	-0.0581*	0.0365*	0.1541*	0.1858*
Unskilled workers	-0.0338*	-0.0045	-0.1119*	-0.0434*
Foreman/master	-0.0372*	-0.0117	-0.1052*	-0.0494
Work-life balance	0.2781*	0.0106	-0.0465*	-0.0140
Household size	0.0386*	-0.0057	0.0432*	0.0322*
Partner	0.0478*	0.0013	0.0354*	0.0437*
No collective bargaining	0.0028	-0.4675*	0.0047	-0.0086
Part-time work	-0.0167	0.0147	-0.0366*	-0.0946

Notes: \*  $p < 0.05$ . The correlation between job satisfaction and Big5 variables, working conditions, collegiality and commitment variables is significant in most cases, while no significant correlation with industry dummies can be found. A similar pattern is revealed for training. The existence of a works council varies with respect to industries.

Source: German Linked Personnel Panel (LPP) 2014/2015 and IAB Establishment Panel 2015.

**Table 3:** Ordered probit estimates of job satisfaction for different samples

	(1)	(2)	(3)	(4)	(5)
Year	2011	2012	2014	2014	2015
Sample→	SOEP	LPP	LPP	LPP	SOEP
Control variables	Coef.	Coef.	Coef.	Coef.	Coef.
↓					
Works council	-.013	-.029	.062	.183*	
Works council member					-.225**
Training		.122***	.205***	1.159***	.127***
Log (monthly gross wage)	.079***	.117***	.160***	.376**	-.053**
Willing to take risks		.060***	-.030**	-.0089	.025***
Health problems	-.361***	-.260***	-.193***	-.324**	-.334***
Age	.0003	.009***	.011***	.010	.003**
Male	-.092***	-.096***	-.036	.317	-.022
N	8,739	5,078	2,453	387	3,070
Pseudo R <sup>2</sup>	.023	.023	.018	.027	.021
Wald chi <sup>2</sup>	806.06***	356.43***	167.74***	82.05***	224.13***

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01; robust standard errors. In SOEP 2011 no information is available on training and risk attitude.

Sources: German Linked Personnel Panel (LPP), IAB Establishment Panel and German Socio Economic Panel (SOEP).

**Table 4:** Extended ordered probit estimates of job satisfaction with respect to works council and training

	(1)	(2)	(3)	(4)
Control variables	Coef.	Coef.	Coef.	Coef.
↓				
Works council	.134*	.148*	.143*	.071
Training	.314***	.280***	.266***	.234***
Log(monthly gross wage)	.433***	.394***	.385***	.373***
Willing to take risks	.006	.008	.008	0.010
Health problems	-.123***	-.096**	-.090**	-.066
Age	-0.029	-.013	-.022	-.010
Age <sup>2</sup>	.0004	.0002	.0003	.0002
Male	-.259**	-.185	-.187	-.197
Work-life balance	.209***	.146***	.162***	.149***
Schooling	-.082***	-.076***	-.076***	-.061**
Unskilled worker	.152*	.176**	.147*	.087
Forman/master	.182*	.027	.046	.024
Firm size/10000	-.189***	-.150***	-.219***	-.155***
Part-time worker	.227*	.245*	.233*	.055
No commitment				-.315***
German citizen	.049			
Eastern Germany	-.026			
Partner	-.127			
Household size	.008			
Home office	-.400			
Digitization	.097			
PC01			-.039	-.050**
PC02			-.076***	-.051**
PC03			.028	.023
PC04			.134***	.131***
PC05			.118***	.100***
PC06			-.188***	-.136***
Big5 properties	Yes	Yes	No	No
Industry dummies	Yes	Yes	No	No
Working conditions	No	Yes	No	No
Collegiality	No	Yes	No	No
N	959	950	950	948
Pseudo R <sup>2</sup>	.066	.098	.083	.108
Wald chi <sup>2</sup>	279.27***	371.52***	249.81***	332.24***

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01; PC01-PC06 are scores for components of a principal component analysis (PCA) after orthogonal varimax rotation. The PCA takes into account 16 personality traits (big5), 9 working conditions, 3 collegiality characteristics and 14 industries.

Source: German Linked Personnel Panel (LPP) 2014/2015.

**Table 5:** Ordered probit estimates of job satisfaction with respect to bargaining agreement

	(1)	(2)	(3)	(4)
Type of bargaining→	IA	CA	AIA	NCB
Control variables	Coef.	Coef.	Coef.	Coef.
↓				
Works council	.139*	.126	.133*	.119
Training	.266***	.263***	.267***	.267***
Bargaining agreement	.008	.107	-.037	-.047
Log(monthly gross wage)	.385***	.381***	-.384***	.384***
Willing to take risks	.008	.009	.009	.009
Health problems	-.090**	-.091**	-.091**	-.092**
Age	-.022	-.022	-.022	-.022
Age <sup>2</sup> /1000	.328	.326	.328	.326
Male	-.187	-.187	-.187	-.189
Work-life balance	.163***	-.163***	.163***	.164***
Schooling	-.076***	-.076***	-.076***	.076***
Unskilled worker	.147*	.145*	.148*	.148*
Foreman/master	.046	.044	.046	.048
Firm size/10000	-.219***	-.230***	-.221***	-.222***
Part-time worker	.234*	.230*	.231*	.232*
PC01	-.039	-.039	-.039	-.040*
PC02	-.076***	-.076***	-.075***	-.075***
PC03	.028	.027	.027	.027
PC04	.134***	.134***	.134***	.134***
PC05	.118***	.119***	-.117***	.118***
PC06	-.188***	-.188***	-.187***	-.188***
N	950	950	950	950
Pseudo R <sup>2</sup>	.083	.084	.084	.084
Wald chi <sup>2</sup>	250.70***	251.53***	249.84***	252.62***

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01; robust standard errors are reported. PC01 - PC06 are scores for components of a principal component analysis (PCA).

Source: German Linked Personnel Panel (LPP) 2014/2015.

**Table 6:** Probit estimates of works councils

	(1)	(2)	(3)	(4)
	Individual level	Individual level	Establishment level	Establishment level
Control variables	Coef.	Coef.	Coef.	Coef.
↓				
No commitment	.036	.030	-.055***	-.0525***
Schooling	.113***	.110***	.108	.116*
Firm size/100	.476***	.475***	.480***	.482***
Home office	.430		-.055	
No collective bargaining	-1.212***	-1.234***	-1.237***	-1.225***
Big5 properties	yes	no	yes	No
14 industries	yes	no	yes	No
Constant	-1.245***	-1.280***	-.076	-.196
N	1,053	1,053	1,060	1,060
Pseudo R <sup>2</sup>	.422	.416	.429	.422
Wald chi <sup>2</sup>	204.95***	182.32***	238.98***	196.25***

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

Source: German Linked Personnel Panel (LPP) 2014/2015.

**Table 7:** Probit and tobit estimates of training with respect to works council

	(1)Individual training dummy	(2)Establishment training dummy	(3)Share of trained workers
Control variables	Coef.	Coef.	Coef.
↓			
Works council	-.111	.520**	.130***
Age	-.013**	-.009	-.001
Male	.439**	-.054	.003
Health problems	-.042	.021	.011
Working time	.010	.005	.004
Apprenticeship	.045	.044	-.006
German citizen	.100	-.049	.045
Monthly gross wage/1000	.166***	.025	.006
Establishment return	.003	-.104*	-.029
Part-time work	.006	.083	.077
Firm size/1000	.049*	9.955***	.007**
Performance	.042	.054	.029
Digitization	.207*	-.305**	-.045
Unskilled worker	-0.448***	.114	.053
Foreman/master	-.148	.184	.044
Eastern Germany	.213	.244*	.034
N	704	704	704
Pseudo R <sup>2</sup>	.186	.248	.322
Wald chi <sup>2</sup> (F)	171.44***	146.21***	(3.77***)

Notes: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01; further control variables: 6 characteristics of commitment, 3 collegiality characteristics, 16 personal characteristics, 9 working conditions, 14 industries.

Source: German Linked Personnel Panel (LPP) 2014/2015.

**Table 8:** Lewbel's instrumental variables estimates of job satisfaction with generated instruments

	(1)		(2)	
Instrumented variable →	Works council		Training	
Control variables	Coef.	Std. Err.	Coef.	Std. Err.
↓				
Works council	0.3351	0.3902	0.1744*	0.0968
Training	0.3622***	0.1036	0.2739	0.2088
Log(monthly gross wage)	0.4290***	0.1393	0.4426***	0.1417
Willing to take risks	0.0229	0.0242	0.0225	0.0242
Health problems	-0.1239**	0.0509	-0.1243**	0.0509
Age	-0.0321	0.0321	-0.0316	0.0320
Age <sup>2</sup> /1000	0.3919	0.3686	0.3848	0.3667
Male	-0.2688**	0.1474	-0.2942**	0.1463
Work-life balance	0.2658***	0.0378	0.2640***	0.0377
Schooling	-0.1172***	0.0348	-0.1117***	0.0331
Unskilled worker	0.1067	0.1081	0.0994	0.1072
Foreman/Master	0.0766	0.1422	0.0812	0.1420
Firm size/10000	-0.3260	0.2800	-0.2649	0.2488
Part-time worker	0.1883	0.1955	0.1877	0.1952
PC01	-0.0288	0.0310	-0.0298	0.0310
PC02	-0.0718**	0.0317	-0.0738**	0.0310
PC03	0.0220	0.0350	0.0163	0.0349
PC04	0.1929***	0.0415	0.1997***	0.0410
PC05	0.1630***	0.0329	0.1648***	0.0332
PC06	-0.2671***	0.0336	-0.2646***	0.0329
N	1,231		1,231	
Centered R <sup>2</sup>	0.2370		0.2382	
Test for exogeneity	2.7450		0.2474	
Prob value	0.0976		0.6192	

Notes: \* p<0.05, \*\* p<0.01, \*\*\* p<0.001; robust standard errors. PC01-PC06 are scores for components of a principal component analysis (PCA) after orthogonal varimax rotation. The PCA takes into account 16 personality traits (big5), 9 working conditions, 3 collegiality characteristics and 14 industries.

Source: German Linked Personnel Panel (LPP) 2014/2015.