



Works councils as gatekeepers: Codetermination, management practices, and job satisfaction

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ABSTRACT

This paper analyzes the role of works councils as gatekeepers safeguarding employee's interests in the adoption of management practices to monitor employee performance and provide feedback. We first introduce a formal model predicting that (i) the introduction of such management practices leads to a stronger increase (or weaker decrease) in job satisfaction when a works council is in place, (ii) that this effect should be larger the lower the prior level of employee participation and (iii) that works councils increase the likelihood of the implementation of these practices at the level of individual employees. We provide evidence in line with these hypotheses, using linked-employer-employee panel data from Germany. We indeed find that the adoption of formal performance appraisals and feedback interviews is associated with a significantly larger increase in job satisfaction when there is a works council. This pattern is driven by establishments without collective bargaining agreements. The evidence also suggests that works councils indeed facilitate the implementation of such management practices, as codetermined firms have a higher likelihood that a practice implemented on the firm level is actually applied by middle management.

1. Introduction

Many industrialized countries, in particular in continental Europe, have adopted laws that give worker representatives specific codetermination rights. An important form are shop-floor or establishment level codetermination rights often implemented through elected bodies of worker representation such as works councils (Schnabel, 2020; Jäger et al., 2022b). These bodies often have quite substantial codetermination rights, in particular concerning the implementation of specific management practices used to monitor employee performance and provide feedback. This paper studies this role of works councils as gatekeepers safeguarding the interests of workers in the adoption of such management practices.

We first illustrate this function in a simple formal model where a firm decides on the implementation of a specific management practice that affects both, firm performance and worker job satisfaction. We show that conditionally on being adopted, a practice should naturally have a stronger effect on employee job satisfaction when there is a works

council. The mechanism is simple: when there is codetermination, works councils can filter out practices that have larger negative externalities on workers' job satisfaction or favour the implementation of practices that may reduce profits but increase job satisfaction. The model furthermore predicts that this effect is the larger the lower the prior level of employee participation, e.g. firms which are covered by collective bargaining agreements, as there are decreasing returns to participation.

We test implications of this gatekeeper approach to codetermination using matched employer-employee data from Germany. As it is notoriously difficult to use within-establishment variation in works council adoption,¹ our approach is a different one. We consider within-person variation in the use of specific management practices over time and study differences in the association between the use of such practices and employee job satisfaction between workers in establishments with and without works councils. We study this question focusing on two key practices: formal performance evaluations and feedback interviews. Whereas the former are concerned with practices to assess employee performance through a formal procedure (such as providing

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¹ Works councils are typically established in particular in times of crisis as here employees have strong interests in establishing a body with substantial legal rights to safeguard their interests. Hence, within workplace variation in works council incidence will most likely be correlated with worker job satisfaction beyond the direct impact of codetermination rights on the latter.

performance ratings on a scale²), the latter are simple meetings between supervisor and subordinate to provide feedback.

The gatekeeper model predicts that the implementation of a practice should be associated with a stronger increase (or smaller decrease) in job satisfaction when there is a works council. In other words, as works councils shift the distribution of adopted practices towards practices that have lower negative or larger positive externalities on workers' job satisfaction, we should observe a stronger increase in job satisfaction at the time of practice implementation when the establishment has a works council.

We indeed find patterns consistent with the gatekeeper model for both practices: While there is no detectable association between practice implementation and job satisfaction in establishments without works councils, there is a sizeable positive association in firms where a works council is in place. Moreover, in line with the idea of decreasing returns to worker representation, this pattern is driven by establishments that are *not* covered by collective bargaining agreements.

The gatekeeper model has a further implication that is concerned with the actual implementation of practices by middle managers. In particular with respect to monitoring and feedback practices, a firm itself typically can only devise a blueprint for a practice, but the practice must be applied by middle managers throughout the organisation. That is, while the firm can propose a format for a performance appraisal or a feedback interview, it is the managers who have to make the appraisal or conduct the interview, and they may not necessarily do so as implementation will consume time and effort or generate resistance by subordinates. But if works councils through their gatekeeping role favour the adoption of practices (on the firm or establishment level) that are associated with higher levels of employee satisfaction, this should also lower the costs or increase the benefits for middle managers of actually applying the practice.³ As shown in the simple formal framework, establishments with works councils should have a larger likelihood that a practice implemented on the firm level is actually applied by a middle manager. To test this hypothesis, we make use of a linked establishment survey, which includes survey items on whether the firm uses performance appraisals and feedback interviews and in a second step asks whether these practices are used for all employees (rather than subsets of the workforce). We then consider only those firms who state to apply the practice for all employees and use the employee level to measure the likelihood that the practice is indeed implemented by an employee's supervisor. We find that in particular for performance appraisals the likelihood of implementation of a practice that is supposed to be used for all employees is indeed substantially larger in firms with works councils.

The literature has put forward different theoretical arguments how and why codetermination should affect employee and firm outcomes. Most importantly, it has been claimed that works councils can provide "collective voice" (Hirschman, 1970), facilitate credible communication between employers and employees (Freeman and Lazear, 1995) and increase employees' bargaining power thus redistributing rents (Jensen and Meckling, 1979; Fitzroy and Kraft, 1987) or overcoming inefficiencies due to incomplete contracting or imbalances of power (Smith, 1991; Hogan, 2001; Frege and Godard, 2014).

There is a rich empirical literature on the effects of workplace-codetermination on firm performance and wages (see Addison (2009); Mohrenweiser (2022); Jirjahn and Smith, 2018; or Jäger, Noy and Schoefer (2022a) for recent surveys). Recently, Jirjahn et al. (2023) analysed the moderating role of works councils in the effectiveness of management practices and find that the incidence of a works council

strengthens the productivity effect of the practices. Fewer studies have investigated the association between shop-level codetermination and job satisfaction and have shown mixed results detecting rather moderate positive associations driven by specific subgroups of employees (Jirjahn and Tsertsvadze, 2006; Grund and Schmitt, 2013; Bellmann, Hübler and Leber, 2019; Harju et al., 2021; Mohrenweiser and Pfeifer, 2023).

Concerning the role of monitoring and feedback practices, several empirical studies have found substantial positive associations between practices such as performance appraisals and feedback interviews and outcomes such as productivity, or absenteeism, and employee retention (Cappelli and Neumark, 2001; Kuvaas, 2006; Bloom and Van Reenen, 2007; Peretz and Fried, 2012; Frederiksen et al., 2017; Cappelli and Conyon, 2018). Fewer studies have explored the association between such practices and job satisfaction. Kampkötter (2017), for instance, finds a significantly positive relation between the use of formal performance appraisals and job satisfaction using data of the German Socio-Economic Panel (SOEP).⁴ Studies focusing on performance related pay, for which arguably the use of performance appraisals is a precondition, also tend to find a positive link to job satisfaction (e.g. Heywood and Wei, 2006; Green and Heywood, 2008; Cornelissen et al., 2011; Bryson et al., 2012; Pagan and Malo, 2021).

The role of codetermination institutions in general and works councils in particular for the relation between monitoring and feedback practices and job satisfaction has to the best of our knowledge not been explored so far. Dow (1987) argued that worker representatives serve as a mechanism for supervising individuals towards authority, ensuring that practices do not diminish the well-being of workers. Smith (2006) illustrates the difference between intended and implemented practices by the concept of managerial opportunism: Managers prioritize their own career goals over productivity or the well-being of employees. According to Smith (2006) works councils serve as a tool to reduce this kind of managerial opportunism. Moreover, Doellgast (2010) conducted a case study and concluded that works councils use their codetermination rights to ensure that monitoring practices are applied for purposes of feedback and development rather than for punishment of employees. Our results thus shed light on a specific channel through which codetermination institutions can affect employee job satisfaction. As we argue, works councils – while potentially having weak direct effects on job satisfaction when they are established – may have substantial indirect effects through shifting the adoption of management practices. But as the effect of this gatekeeping role most likely needs time to unfold, it makes it harder to identify direct effects of works councils on job satisfaction and may help to understand the moderate association between works council adoption and job satisfaction typically found in the literature.

Finally, our paper also relates to the literature on potential discrepancies between intended and implemented HR practices (see e.g. Piening et al., 2014; Makhecha et al., 2018; Trullen et al., 2020) as we formally model the endogenous implementation of practices by middle managers and illustrate the role of codetermination in this process to foster consistency between intended and implemented practices.

2. Institutional setting and a formal model

2.1. Institutional setting

Workplace-level codetermination rights are particularly pronounced in the German model of industrial relations (Schnabel 2020; Jäger et al., 2022b). By the Works Constitution Act ("Betriebsverfassungsgesetz")

² A typical procedure is that supervisors have to rate their employees' performance on a scale from 1 to 5.

³ For instance, the supervisor may then face lower employee resistance or, when exhibiting social preferences towards the employee, will have lower intrinsic costs (or higher intrinsic benefits) when applying the practice in the interaction with the employee.

⁴ Several authors have stressed heterogeneity in the link between the general use of monitoring practices and job satisfaction, in particular with respect to perceived fairness of the specific design and implementations (e.g. Nathan, Mohrman and Milliman 1991; Pettijohn, Pettijohn and d'Amico 2001; Lau, Wong and Eggleton 2008; Brown, Hyatt and Benson 2010; Cheng 2014).

workers in Germany have the right to set up and elect works councils when at least five employees support their adoption.

Works councils have substantial codetermination rights in particular with respect to the implementation of employee monitoring and feedback practices. When a firm, for instance, wants to change or implement practices or devices to monitor the behavior or performance of the employees it needs the consent of the works council (§87 (1) of the Works Constitution Act).⁵ In case of a disagreement the implementation is decided by conciliation committee chaired by a neutral arbiter.

Hence works councils hold substantial power on the implementation of practices such as formal performance appraisals or feedback interviews. In the following we formalize this role and derive hypotheses that we will then test.

2.2. A simple model

We here develop a simple model of this gatekeeping role of works councils when a firm wants to implement or change a management practice. Consider a firm F deciding on the introduction of a new employee management practice $\tau_F \in \{0, 1\}$. The practice may affect both, the firm's productivity and the workers' utility from work, i.e. their job satisfaction. Let Π denote the firm's profits and U_i be the job satisfaction of the workers $i = 1, \dots, n$ with prior levels Π_0 and U_{0i} . Before a decision on the implementation is made, the firm (and its works council if there is one) learns the utility consequences of the implementation.

When the practice is implemented, Posterior levels of profits and job satisfaction are given by $\Pi_1 = \Pi_0 + \tau_F \pi$ and $U_{1i} = U_{0i} + \tau_F u_i$ such that u_i and π are the causal effects of the practice on profits and the job satisfaction of worker i respectively. Assume that the worker specific effect $u_i = u + \varepsilon_i$ where $\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$ and that u and π are drawn from a normal distribution

$$\begin{pmatrix} u \\ \pi \end{pmatrix} \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_u^2 & \rho_{u\pi}\sigma_u\sigma_\pi \\ \rho_{u\pi}\sigma_u\sigma_\pi & \sigma_\pi^2 \end{pmatrix}\right).$$

Workers' short-term wages are exogenously determined so that the implementation of the practice is independent from short-term wage setting.⁶ However, the framework allows that the implementation of a practice can affect later wages and careers as captured in its effects on posterior profits Π_1 and worker utilities U_{1i} .

The firm has either a works council or not, where $c \in \{0, 1\}$ is a dummy variable indicating the presence of a works council. We assume that the firm will implement the practice if

$$\pi + (\kappa_0 + c\kappa_\Delta)u \geq 0$$

where κ_0 is the prior strength of employee representation for instance due to other labor market institutions such as collective wage agreements or other forms of employee involvement practices and κ_Δ determines the additional effect of having a works council. Works councils thus increase the weight of employee job satisfaction in the firm's

considerations.

2.3. Works councils, management practices, and worker job satisfaction

We now analyze the effect of the introduction of the practice on worker job satisfaction as a function of the level of codetermination. Note that the average marginal effect of the introduction of the practice on job satisfaction is

$$\Delta U(c) = E[U_1 | \tau_F = 1, c] - E[U_1 | \tau_F = 0, c] = E[u | \pi + (\kappa_0 + c\kappa_\Delta)u \geq 0].$$

We can now show:

Proposition 1. *The introduction of a new management practice is associated with a stronger increase in job satisfaction when the firm has a works council, that is $\Delta U(c) = E[U_1 | \tau_F = 1, c] - E[U_1 | \tau_F = 0, c]$ is higher when $c = 1$.*

Proof: See Appendix.

Works councils thus act as gatekeepers, as they affect whether a certain practice with features (π, u) is adopted by the firm or not. As more weight is put in decision making on employee job satisfaction u when a works council is in place the likelihood that practices are adopted which are profitable for the firm but detrimental to employee job satisfaction is reduced. In turn, the model predicts that once a practice is adopted by a firm with a works council it will be associated with a stronger increase (or weaker decrease) in satisfaction than a related practice adopted in a firm without works council.

But the size of this effect will also depend on the baseline level of employee representation κ_0 as the following result shows.

Proposition 2. *The gain in job satisfaction $\Delta U(1) - \Delta U(0)$ from implementing the practice in a firm with a works council is the higher, the lower the prior level of employee representation κ_0 .*

Proof: See Appendix.

The intuition is simple: There are decreasing returns to employee representation. When a priori the firm has put a weak emphasis on employees' well-being when deciding about which practices to adopt, then the introduction of a works council has a strong effect. When, however, other forms of employee representation (such as through collective bargaining agreements) already gave some weight to employee well-being in the decision-making process, the additional effect of having a works council is weaker.

In cases of weak prior employee representation in a firm, taking the employees' perspective into account has a particular effect on job satisfaction. But the stronger the prior level of employee participation the weaker is the additional effect of giving employees more voice.

A direct testable implication of this result is that the moderating role of a works council in the association between the use of monitoring and feedback practices and job satisfaction is weaker in firms covered by collective bargaining agreements.

2.4. Works councils and the implementation of management practices

But the adoption of a management practice on the level of the firm may not necessarily mean that the practice is implemented by middle managers within the firm if they have a key role in applying the practice in their interaction with individual employees (as it is the case for feedback interviews and performance appraisals).

To study the role of middle managers, assume that once a practice is rolled out at the firm level, supervisors within the firm must implement it and have some leeway whether to do this. Each supervisor j can decide whether to implement the practice choosing $\tau_j \in \{0, 1\}$. Each supervisor has personal implementation costs $a_j \sim N(m_c, \sigma_c^2)$ and that a supervisor's benefits from implementation are the higher, the higher the expected benefits for her subordinates. This could be either because the supervisor internalizes her subordinate's job satisfaction to some extent due to

⁵ For an English translation of the law, compare section 87 in https://www.setze-im-internet.de/englisch_betrvg/englisch_betrvg.html. Manthei and Sliwka (2019) for instance document the case of a retail bank in Germany that conducted a field experiment in order to convince its works council to agree that supervisors had access to objective performance measures in the performance appraisal process.

⁶ Negotiations between works councils and firms are typically not concerned with wage setting such that wages are in practice rarely altered to compensate workers for potential non-monetary consequences of implementation choices. Moreover, in the German setting the law (§87 and §77(3) BetrVG) explicitly stipulates that topics that are determined by collective wage agreements cannot be part of an agreement between the firm and its works council (a principle called "Tarifvorrang", i.e. the priority of collective wage agreements over codetermination concerning wage determination).

social preferences or because she faces less resistance. Assume thus that the implementation of the practice changes supervisor j 's utility by $\eta E[u|\pi + \kappa u \geq 0] - a_j$. Hence, the likelihood that a practice is implemented by supervisor j is

$$Pr(a_j < \eta E[u|\pi + \kappa u \geq 0]) = \Phi\left(\frac{\eta E[u|\pi + \kappa u \geq 0] - m_c}{\sigma_c^2}\right)$$

(where $\Phi(x)$ is the cdf of a standard normal distribution) which is strictly increasing in κ . We have thus shown:

Proposition 3. *When the firm has a works council the likelihood is higher that a practice rolled out by a firm is actually applied by middle managers.*

The model thus implies the following hypotheses:

H1: The introduction of a management practice is associated with a stronger increase in job satisfaction when a firm has a works council.

H2: This effect is weaker in firms covered by a collective bargaining agreement.

H3: The likelihood that a practice rolled out on the firm level is implemented by middle managers is larger when there is a works council.

3. Empirical analysis

3.1. Data

The analysis is based on the Linked Personnel Panel (LPP), which is a longitudinally linked employer-employee data set of establishments and several of their employees in Germany (Bellmann et al., 2015; Kampkötter et al., 2016). The survey is conducted on behalf of the German Federal Ministry of Labor and the Institute of Employment Research (IAB) of the Federal Employment Agency. Establishment information stems from a survey among managing directors and HR managers. On the establishment level, the LPP is representative of German establishments with 50 and more employees outside of the public sector. The LPP includes information on job, firm, and personnel characteristics as well as employee attitudes towards the organization. Moreover, the LPP can be linked to the IAB establishment panel, which includes additional establishment information and the information of the existence of works councils. We use the second, third and fourth wave (2014, 2016 and 2018) of the linked employer-employee version of the LPP for our analysis, since information on individual performance appraisals is not available in the first wave.⁷

We restrict our sample to employees who are between 18 and 65 years old and receive a monthly gross wage between €450 and €100,000. Moreover, in the main analysis we consider only establishments where works council status is stable over the survey waves. The reason is that variation in works council status is typically associated with the respective firms' economic situation (e.g. Kraft and Lang, 2008; Jirjahn, 2009) and, in turn most likely connected with variations in employees' job satisfaction.⁸ That is, we consider only employees who work in firms with or without works councils between 2014 and 2018 and drop those employees working in firms with a change in the works councils' status. The unbalanced panel we use includes 9857 observations on 7387 individuals in 1053 firms.⁹ It is thus important to acknowledge that most employees are only observed once. We observe 2063 employees in at least two years for which we can track within-employee changes in management practices and job satisfaction.

⁷ Wave five of the LPP took place during the Covid pandemic and hence we did not include it in the analysis.

⁸ As explained already in footnote 1, works councils are, for instance, often initiated in times of economic distress in a firm. We also replicated our analysis including establishments which changed works council status and the results are robust to including such firms.

⁹ Our sample restrictions reduce the raw sample in the amount of $n = 3,108$.

Table 1
Descriptive statistics.

Variables	Whole sample ($n = 9857$)			
	Mean/ Share	SD	Min	Max
Job satisfaction	7.3950	1.7735	0	10
Job satisfaction (standardized)	0	1	-4.1698	1.4688
Performance appraisal (PA)	0.5044		0	1
Feedback interview	0.5682		0	1
Works council	0.8542		0	1
Plant PA	0.7428		0	1
Plant feedback interview	0.8144		0	1
Age	47.360	10.264	18	65
In relationship	0.8484		0	1
Children < 14	0.2466		0	1
Full-time	0.8698		0	1
Temporary contract	0.0318		0	1
Employment status				
Blue-collar worker	0.3472			
White-collar worker	0.4392			
Manager	0.2137		1	3
Monthly gross wage (in €)	4125.7	3868.5	450	100,000
Overtime	0.6745		0	1
Concerns about job security (3 = very concerned)	1.3865	0.5862	1	3
Firm size			1	4
50–99 employees	0.1013			
100–249 employees	0.2293			
250–499 employees	0.2186			
500 and > employees	0.4507			
Region of Germany			1	4
North	0.1920			
East	0.2414			
South	0.2962			
West	0.2704			
Industry			1	5
Manufacturing	0.2929			
Metal, electrical industry	0.4312			
Commerce, traffic	0.0956			
(Financial) services	0.1090			
IT, communication	0.0714			

3.2. Variables

Our dependent variable *Job satisfaction* is measured by the item “How satisfied are you currently with your job” on a 11-point Likert scale from 0 (=totally unhappy) to 10 (=totally happy). Employees' average job satisfaction is 7.4. Table 1 shows the descriptive statistics of the relevant variables of our sample.

The existence of a *Works council* is measured on the firm level as a binary variable indicating whether the firm states that it has a works council (1=yes).¹⁰ About 85 % of the employees in the sample work in firms with works councils.

In order to test the implications of our model we consider two management practices that are concerned with monitoring the behavior or performance of employees, an area where – as we laid out in the above – codetermination rights are substantial in the German setting we consider: first, we use the binary variable *Performance appraisal* (PA). This is elicited through the survey item: “Is your own performance regularly assessed by a supervisor as part of a predefined procedure?” (1=yes). About 50 % of the employees states to be subject to such a performance appraisal. About a quarter of employees change their performance appraisal status between two consecutive waves, which tends to be independent from the works council status in the firm (see Table A1 in the appendix). The second binary variable is the use of a *Feedback interview* (1=yes). The exact question to employees is: “Did you

¹⁰ This variable is measured through the IAB establishment panel to which the LPP is linked.

have a feedback interview with your supervisor last year?”. About 57 % of the employees had a feedback interview with their supervisor. In the case of feedback interviews, 18 % of the employees change their feedback interview status, again irrespective of the works council status (see Table A2 in the appendix).¹¹ Additionally, we consider PA and interview information measured on the firm level in an own subsection below. The variable *Plant PA* is a dummy variable (1=yes) indicating whether the firm states that it uses performance evaluations (74 % state that they do). More precisely, the HR director or managing director is asked, whether a review of the performance of the employees is carried out by the respective supervisor in their establishment at least once a year. The dummy variable *Plant feedback interview* (1=yes) indicates whether the firm conducts structured feedback interviews at least once a year (81 % state that they do).

Furthermore, we control for socio-demographic as well as individual job-related variables and further firm characteristics which have been identified as relevant for employees' job satisfaction in previous studies (e.g. Kampkötter 2017) and vary about time. Socio demographic variables are *age* (in years, mean = 47.36), *in relationship* (1 = yes; share = 0.85) and *children under 14* in household (1 = yes; share = 0.25). Job-related variables include information on *full-time* (1 = yes; share = 0.87), *temporary contract* (1 = yes; share = 0.03), *employment status* (3 categories: blue-collar worker (share = 0.35), white-collar worker (share = 0.44) and manager (share = 0.21)), *monthly gross wage* (mean = €4125), incidence of *overtime hours* (1 = yes; share = 0.67) and *concerns about job security* (3 categories). Furthermore, we control for *firm size* (4 dummies).

4. Results

4.1. Management practices, works councils and job satisfaction

In order to analyse the relation between job satisfaction, both practices and works councils, we provide OLS estimates of the following fixed effects panel model:

$$\text{Job satisfaction}_{it} = \beta_0 + \beta_1 \cdot \text{Practice}_{it} + \beta_2 \cdot \text{Practice}_{it} \times \text{Works council}_{it} + \gamma \cdot \text{Controls}_{it} + \alpha_i + \lambda_t + \varepsilon_{it}$$

where *Job satisfaction* is the job satisfaction of employee *i* in wave *t*. We rescale our dependent variable job satisfaction to a z-standardized variable in order to interpret our results in percentages of a standard deviation. To account for within-firm interdependencies, we cluster standard errors at the level of the firm. Note that works council status is relatively stable over time and as a change in works council status is typically associated with specific events we have restricted the data set to firms where the works council status does not change in the time frame.

The regression results are shown in Table 2. Columns (1) and (3) investigate the general association between changes in performance appraisal use and changes in job satisfaction. Columns (2) and (4) include an interaction term *Performance appraisal* × *Works Council* thus testing the first key hypothesis implied by the formal model. Column (3) and (4) additionally include time-varying control variables such as socio-demographic variables, individual job-related information, and firm characteristics. As already stated in the above, we observe 2063

employees in at least two years. Hence, the within employee effects we report are estimated from this sample of 4533 observations (1656 individuals in two (consecutive) waves and 407 individuals in all three waves).

We note that we do not claim to estimate causal effects of the management practices on employee satisfaction as there may be unobserved factors that at the same time affect changes in management practices and changes in employee satisfaction. We rather test whether patterns in the conditional expectation of changes in job satisfaction given changes in practice use indeed depend on works council incidence as our model predicts.

As columns (1) and (3) show, across the sample of all firms irrespective of the works council status we find that performance appraisals are significantly positively related to job satisfaction of employees. The adoption of performance appraisals is associated with an increase in job satisfaction of about 9 % of a standard deviation. We thus replicate a result by Kampkötter (2017) who studied data from the German Socio-Economic Panel and also found a positive association.

As columns (2) and (4), however, show works council incidence indeed significantly strengthens the relationship between performance appraisals and job satisfaction (by about 18 percent of a standard deviation) which confirms our hypothesis 1. Separate estimations of employees working in firms with works councils (column 5) and without (column 6) indeed show that this association only holds for establishments with a works council.¹² In establishments without a works council there is no evidence for an association between the use of performance appraisals and job satisfaction and the respective point estimate is rather close to zero.¹³

We replicate the analysis with *Feedback interviews* as a further management practice. The respective regression results are reported in Table 3. We again find a similar pattern: Works councils significantly strengthen the positive association between changes in the use of feedback interviews and changes in job satisfaction. While there is a positive association in establishments with works councils, there is no such relationship in those without. We caution that the coefficient is estimated based on a somewhat limited number of 72 persons (PA) and 55 persons (feedback interview), who report a change in the use of the respective management practice, though.

As firms using performance appraisals are also more likely to have feedback interviews, it appears important to study whether the interaction effects are also robust when we include works councils interaction with both practices in the same regression. As the results reported in Table 4 show, we again find that changes in the use of each of the two practices controlling for the use of the respective other practice is associated with higher job satisfaction in firms with works councils (column (2)) but no such association exists in firms without works councils (column (3)).¹⁴

We note that due to potential measurement error in the worker's

¹¹ Given the reported percentages of observations with variations in management practices, our analyses rely on about 500 persons with a status change in the use of performance appraisals and 375 persons with a status change in feedback interviews. Since the majority of employees in the sample are employed in firms with a works council, the absolute number of persons with status changes are more limited for those being employed in firms without a works council (performance appraisal: 72 and feedback interview: 55, respectively).

¹² At first glance, our findings may appear contrary to the literature regarding the paradox of unions and job satisfaction which discusses the sorting effect as one explanation that unionized workers have a lower job satisfaction despite higher pay and benefits (see Artz and Heywood 2021). The sorting effect means that workers in union jobs are more likely dissatisfied since they expect better working conditions compared to workers in nonunion jobs. However, for our results the sorting effect plays no role as we consider within-person variation by including employee fixed effects.

¹³ Note that the formal model indeed predicts that there is no such association when the effects of the practice on profits π and worker job satisfaction u are uncorrelated, i.e. when $\rho_{u\pi} = 0$ and the prior strength of employee representation $\kappa_0 = 0$ as then $E[u|\pi \geq 0] = 0$.

¹⁴ We also check for possible complementarities between both practices. However, as the results reported in Table A3 in the appendix show we find no evidence for a complementarity. We caution that this may be due to a lack of sufficient variation in both practices that limits the potential to estimate this triple interaction.

Table 2
Performance appraisal and works councils.

	Full sample				Works council	No Works council
	(1)	(2)	(3)	(4)	(5)	(6)
Performance appraisal (PA)	0.0954** (0.0406)	−0.0525 (0.0635)	0.0867** (0.0390)	−0.0645 (0.0702)	0.1146*** (0.0438)	−0.0553 (0.0717)
PA × Works council		0.1718** (0.0783)		0.1758** (0.0830)		
Controls	no	no	yes	yes	yes	yes
Employee fixed effects	yes	yes	yes	yes	yes	yes
Within R ²	0.0027	0.0037	0.0603	0.0613	0.0667	0.1007
# Observations in sample	9857	9857	9857	9857	8420	1437
# Observations of persons with repeated survey participation	4533	4533	4533	4533	3894	639
# Persons with repeated survey participation	2063	2063	2063	2063	1766	297
# Persons with variation in PA	496	496	496	496	424	72

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are *Age*, *Children* (1=yes), *In relationship* (1=yes), *Full-time* (1=yes), *Temporary contract* (1=yes), *Monthly gross wage*, *Employment status*, *Concerns about job security*, *Overtime* (1=yes), *Firm size* and *Year*.

Table 3
Feedback interview and works councils.

	Full sample				Works council	No Works council
	(1)	(2)	(3)	(4)	(5)	(6)
Feedback interview	0.0762 (0.0484)	−0.1591 (0.1290)	0.0829* (0.0462)	−0.1609 (0.1310)	0.1241** (0.0493)	−0.1578 (0.1415)
Feedback interview × Works council		0.2724** (0.1389)		0.2823** (0.1408)		
Controls	no	no	yes	yes	yes	yes
Employee fixed effects	yes	yes	yes	yes	yes	yes
Within R ²	0.0013	0.0032	0.0614	0.0636	0.0664	0.1053
# Observations in sample	9857	9857	9857	9857	8420	1437
# Observations of persons with repeated survey participation	4533	4533	4533	4533	3894	639
# Persons with repeated survey participation	2063	2063	2063	2063	1766	297
# Persons with variation in FI	375	375	375	375	320	55

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are *Age*, *Children* (1=yes), *In relationship* (1=yes), *Full-time* (1=yes), *Temporary contract* (1=yes), *Monthly gross wage*, *Employment status*, *Concerns about job security*, *Overtime* (1=yes), *Firm size* and *Year*.

Table 4
Performance appraisal, feedback interview and works councils.

	(1) Whole sample	(2) Firms with works councils	(3) Firms without works councils	(4) Whole sample
Performance appraisal	0.0810** (0.0386)	0.1067** (0.0488)	−0.0407 (0.0735)	−0.0490 (0.0720)
Feedback interview	0.0751 (0.0458)	0.1146** (0.0488)	−0.1526 (0.1428)	−0.1549 (0.1329)
PA × Works council				0.1527* (0.0844)
Feedback interview × Works council				0.2672* (0.1425)
Employee fixed effects	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Within R ²	0.0633	0.0698	0.1058	0.0664
# Observations	9857	8420	1437	9857
# Observations of persons with repeated survey participation	4533	3894	639	4533

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are *Age*, *Children* (1=yes), *In relationship* (1=yes), *Full-time* (1=yes), *Temporary contract* (1=yes), *Monthly gross wage*, *Employment status*, *Concerns of job security*, *Overtime* (1=yes), *Firm size* and *Year*.

survey responses there is likely some attenuation bias in our estimates of the coefficients of the management practices and the respective interaction term. From this perspective, these estimates should yield lower bounds to the associations in the population.

In a next step we investigate two potential confounds. First, employees working in firms with works councils may be less concerned with their job security due to stronger employment protection. In turn, for employees receiving poor performance evaluations this may lead to a weaker loss in job satisfaction when there is codetermination – which could yield an alternative explanation for the above findings. Second, as it is conceivable that performance appraisals are more effective in larger firms (for instance when appraisals or feedback interviews are implemented in a more professional manner) and as larger firms are more likely to have works councils, firm size may be another potential alternative driver of the interaction effect. As robustness checks we, therefore, additionally interact both practices with employees' *Concerns about job security* as well as with *Firm size* categories. The respective regression results are reported in [Tables A4 and A5](#) in the Appendix. For *Performance appraisals* we find that the inclusion of the additional interaction terms even strengthens the magnitude of the hypothesized interaction effect. For *Feedback interviews* the magnitude of the interaction effect is essentially unchanged when adding interaction terms with job security concerns, but is weakened (and, while still being sizeable becomes statistically insignificant) when adding firm size interactions. Hence, for feedback interviews a part of the interaction effect appears indeed to be driven by firm size effects but this is not the case for performance appraisals.

Table 5

Performance appraisals (upper panel)/Feedback interviews (lower panel) and works councils: separated by firms with and without collective agreements.

	(1) Firms with collective agreement	(2) Firms without collective agreement
Performance appraisal	0.2092* (0.1103)	−0.1747* (0.0915)
PA × Works council	−0.0944 (0.1210)	0.2307* (0.1345)
Employee fixed effects	yes	yes
Controls	yes	yes
Within R ²	0.0695	0.0932
Feedback interview	0.2274 (0.2060)	−0.2666* (0.1456)
Feedback interview × Works council	−0.1071 (0.2142)	0.3843* (0.2040)
Employee fixed effects	yes	yes
Controls	yes	yes
Within R ²	0.0687	0.0980
# Observations	7569	2266
# Observations of persons with repeated survey participation	3417	999

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are Age, Children (1=yes), In relationship (1=yes), Full-time (1=yes), Temporary contract (1=yes), Monthly gross wage, Employment status, Concerns of job security, Overtime (1=yes), Firm size and Year.

4.2. Decreasing returns to codetermination?

In a next step we test hypothesis 2, which states that the positive interaction between monitoring and feedback practices and codetermination is weaker in firms exposed to other forms of employee representation. To this end, we split our sample into firms either covered by collective bargaining agreements or not and re-estimate our primary model.¹⁵ The results are reported in Table 5, the upper panel of which reports results for *Performance appraisals* and the lower panel for *Feedback interviews*. Column (1) shows the estimates for firms covered by collective agreements and column (2) for those which are not covered.

Indeed, collective agreement coverage matters in line with hypothesis 2: While works council incidence strengthens the association between both practices and job satisfaction in firms not covered by collective bargaining agreements (column (2)), this is no longer the case in firms covered by such agreements (column (1)).¹⁶

These results thus suggest that unions and works councils are indeed substitutes in being gatekeepers to safeguard employees' interests in the implementation of management practices. In practical terms unions can fulfil this function informally by giving employees bargaining power. But in the German system of industrial relations they also can have a more formal role in the design of management practices. Collective bargaining agreements may in fact include clauses in that restrict

employers in how to design their performance assessment practices. Several so-called framework collective agreements ("Rahmentarifverträge") negotiated between employer federations and unions specify default rules for performance assessments. The framework agreement for the metal and electronics industry in Baden-Württemberg, for instance, explicitly specifies in §17.2.3 that "If the parties on the level of the establishment do not agree on their own appraisal system, the appraisal shall be carried out on the basis of the system recommended in the collective agreement".¹⁷ This "default" system is then described in detail in an Appendix to the framework agreement.

Interestingly, the previous literature on the interplay between collective bargaining coverage and works councils has sometimes stressed that both institutions can be complements in affecting productivity.¹⁸ Our results shows that they may well be substitutes when it comes to safeguarding employees' interests.

4.3. The use of implemented practices by managers

In order to test whether works councils are associated with a higher likelihood that a practice implemented on the firm level is applied by a middle manager (hypothesis 3) we make use of the establishment level survey on the use of *Performance Appraisals* and *Feedback interviews*. The establishment survey first asks responding firms whether they use the specific practice, and in a second step whether the practice is applied for all or only a subset of the employees. A share of 41 % of the employees work in firms that state to have performance appraisals for all employees and 51 % of the employees work in firms with feedback interviews for all.

We proceed in two steps. First, we estimate binary probit models of the following form:

$$\text{Individual practice}_{i,t} = \beta_0 + \beta_1 \cdot \text{Works council}_{i,t} + \beta_2 \cdot \text{Plant practice}_{i,t} + \gamma \cdot \text{Controls}_{i,t} + \varepsilon_{i,t}$$

for each of the two practices, where *Individual practice_{i,t}* are the respective dummy variables indicating whether an employee stated to receive the practice and *Plant practice_{i,t}* measures whether the firm has stated to use the respective practice in the establishment survey.

Table 6 shows the respective regression results in columns (1) and (2). First, we find that conditional of the claim to use the practice on the level of the establishment, each of the two practices is significantly more often implemented on the employee level when the establishment has a works council.

However, it may well be the case that firms intentionally use the practices only for a subset of the employees and works councils affect this intention rather than the actual implementation decision by middle managers. In addition, even in the absence of a performance appraisal system on the firm level, we find cases in the sample where supervisors conduct performance appraisals on the individual level. To provide a more precise test of hypothesis 3 which states that the likelihood that middle managers adopt a practice that the firm intends to implement, we in a second step therefore restrict our sample only to employees working in firms who state to have implemented the particular practice *for all employees*. Here, the fact that an employee is not subject to the practice shows a clear non-compliance by the respective manager with

¹⁵ The number of observations is slightly lower due to some missing values of the variable collective agreement. About 0.77 of the employees work in firms with collective agreement coverage. The sample includes employees in firms with changes of the collective agreement status.

¹⁶ In order to explore the role of unions by oneself, we complement our analysis by estimating our primary model again using collective agreements instead of works councils (Table A6 in the appendix). We, indeed, find only a significantly positive relation of individual PA and job satisfaction for employees working in firms with collective agreements. The corresponding coefficient for employees in firms without collective agreements is even negative, but not significant. The interaction effect of individual PA and collective agreement for employees' job satisfaction shows a positive but not significant result (model 3).

¹⁷ See, e.g. <https://www.bw.igm.de/tarife/tarifvertrag.html?id=696>. Page 44 defines the specific appraisal form that supervisors then have to use.

¹⁸ Pfeifer (2011), for instance, finds in firms with works councils and collective bargaining agreements lower quit rates compared to firms with works councils but without collective bargaining agreements. Hübler and Jirjahn (2003) find that works council firms with collective bargaining coverage are associated with higher productivity than works council firms without collective bargaining coverage and argue that this the case as distributional conflicts are removed from the establishment level.

Table 6
HR practices and works councils (binary probit model, marginal effects).

	(1) Whole Sample	(2) Whole Sample	(3) Only PA for all	(4) Only interview for all
	Performance Appraisal (Individual level)	Feedback Interview (Individual level)	Performance Appraisal (Individual level)	Feedback Interview (Individual level)
Works council	0.1079*** (0.0221)	0.0671*** (0.0227)	0.1582*** (0.0331)	0.0579* (0.0323)
Performance appraisal (Plant level)	0.2389*** (0.0208)		–	
Feedback interview (Plant level)		0.2829*** (0.0179)		–
Controls	yes	yes	yes	yes
Pseudo R ²	0.0708	0.1264	0.0671	0.1042
# Observations	9857	9857	4069	5067
# Observations of persons with repeated survey participation	4533	4533	1502	1752

Notes: Clustered-robust standard errors at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls include information on *Female* (1=yes), *Age*, *In relationship* (1=yes), *Children < 14* (1=yes), *Years of education*, *Full-time* (1=yes), *Temporary contract* (1=yes), *Occupational status*, *Concerns about job security*, *Firm size*, *Region of Germany*, *Industry*.

the intentions of the firm.

Columns (3) and (4) of Table 6 show the respective results which are most important for our hypothesis 3. We indeed find that works councils are associated with a higher likelihood that practices intended to be implemented on the firm level are in fact applied by middle managers which confirms our hypothesis 3. In the restricted sample of model 3 this likelihood is by 16 percentage points higher when a works council is in place compared to employees in firms without works councils.¹⁹ In firms without works councils only 41 % of the employees receive a performance appraisal although a PA system is supposed to be implemented for the whole workforce. Given this baseline likelihood, codetermination is thus associated with a 39 % increase in compliance. We observe a qualitatively similar albeit weaker pattern for feedback interviews (column (4)). Hence, when works councils are in place there is indeed a stronger consistency between the intentions to set up practices on the firm level and the likelihood that these practices are actually implemented on the level of individual employees.

5. Conclusion

We studied the role of works councils for the association between the use of management practices and employee job satisfaction. We have shown in a formal model that works councils should naturally act as gatekeepers safeguarding workers' interests in the implementation of management practices. As the model suggests, the use of a practice

should be associated with a higher increase (or lower decrease) in job satisfaction when a works council is in place. The reason is that works councils use their bargaining power to favour the adoption of practices that impose weaker negative or stronger positive externalities on employees' job satisfaction.

In order to test the propositions of our model, we use linked employer-employee panel data to study two key management practices: individual performance appraisals and feedback interviews. Indeed, we found that works councils are associated with a substantially stronger positive relation between the adoption of each of these practices and job satisfaction. Moreover, in line with the formal model, we found evidence for decreasing returns to employee participation in this respect as this effect is essentially driven by firms not covered by collective bargaining agreements.

Furthermore, the gatekeeper model implies that works councils should also affect the likelihood that a practice that the firm intends to implement is actually applied by middle managers. When works councils push towards the implementation of more employee friendly practices, managers should naturally have a stronger willingness to apply these practices. And indeed, we found that in firms intending to implement a practice for all employees, the likelihood that it is actually used in the individual supervisor-employee relationship is substantially higher when works councils are in place.

Our results also may help to shed light on the question why previous studies have found quite mixed and typically moderate effects of works councils on job satisfaction (Jirjahn and Tsertsvadze, 2006; Grund and Schmitt, 2013; Bellmann et al., 2019; Harju et al., 2021): Only when a firm wants to adopt or change a practice, a works council can use its bargaining power to achieve a more employee friendly implementation which then can affect job satisfaction. In turn, when works councils are established they will most likely not immediately raise job satisfaction as the gatekeeper role needs time to unfold.²⁰

In other words, it appears unlikely that there is a sharp increase in job satisfaction around the point in time when a works council is set up.²¹ Instead, we should see a more continuous shift in the design of the implemented practices and policies gradually leading to higher employee job satisfaction.

CRedit authorship contribution statement

Christian Grund: Writing – review & editing, Writing – original draft, Supervision, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Dirk Sliwka:** Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Krystina Titz:** Writing – review & editing, Writing – original draft, Visualization, Formal analysis, Data curation.

Data availability

Data is provided by the German Institute of Employment Research (IAB, Nuremberg)

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¹⁹ This result concerning works councils and performance appraisal use has already been found in Heywood and Jirjahn (2014) and Heywood et al. (2017). In addition to this finding, Grund, Sliwka and Titz (2020) find also a positive transfer function of works council regarding the actual use of performance appraisals. Whereas this earlier work argued that this pattern may be due to a stronger formalization of practices enforced by works council, we here provide a different explanation based on the idea that works councils lead to the adoption of practices that are associated with higher employee job satisfaction and thus lead to a higher willingness to apply these practices.

²⁰ Accordingly, Jirjahn et al. (2011) find that right after the implementation the influence of works councils on management policies is rather limited, but their involvement increases over time, which also comes along with decreasing employee quit rates with works councils' age.

²¹ In order to check this claim, we also ran regressions on a sample including individuals in firms with a change of works council incidence and add works council incidence as a further control. We find an insignificant and even slightly negative association between works council incidence and job satisfaction.

2) is gratefully acknowledged.

Appendix

Proofs

Proof of [Proposition 1](#):

To facilitate notation let $\kappa = \kappa_0 + \kappa_\Delta$. To determine $E[u|\pi + \kappa u \geq 0]$ we use the result (see for instance, p. 528) that for two jointly normal random variables. X and Z

$$E[X|Z \geq 0] = m_X + \frac{\sigma_{XZ}}{\sigma_Z} \frac{\phi\left(\frac{m_Z}{\sigma_Z}\right)}{\Phi\left(\frac{m_Z}{\sigma_Z}\right)}.$$

As

$$\begin{aligned} E[\pi + \kappa u] &= 0 \\ \text{Cov}[u, \pi + \kappa u] &= \sigma_{u\pi} + \kappa \sigma_u^2 \text{ and} \\ V[\pi + \kappa u] &= \sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \sigma_{u\pi} \end{aligned}$$

we have that

$$\begin{aligned} E[u|\pi + \kappa u \geq 0] &= \frac{\text{Cov}[u, \pi + \kappa u]}{\sqrt{V[\pi + \kappa u]}} \frac{\phi(0)}{\Phi(0)} \\ &= \sqrt{\frac{2}{\pi}} \frac{\rho_{u\pi} \sigma_u \sigma_\pi + \kappa \sigma_u^2}{\sqrt{\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi}} \end{aligned}$$

Now note that

$$\begin{aligned} \frac{\partial E[u|\pi + \kappa u \geq 0]}{\partial \kappa} &= \sqrt{\frac{2}{\pi}} \frac{\sigma_u^2 \sqrt{\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi} - (\rho_{u\pi} \sigma_u \sigma_\pi + \kappa \sigma_u^2) \frac{2\kappa \sigma_u^2 + 2\rho_{u\pi} \sigma_u \sigma_\pi}{2\sqrt{\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi}}}{\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi} \\ &= \sqrt{\frac{2}{\pi}} \frac{\sigma_u^2 (\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi) - (\rho_{u\pi} \sigma_u \sigma_\pi + \kappa \sigma_u^2) (\kappa \sigma_u^2 + \rho_{u\pi} \sigma_u \sigma_\pi)}{(\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi) \sqrt{\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi}} \\ &= \sqrt{\frac{2}{\pi}} \frac{\sigma_\pi^2 \sigma_u^2 (1 - \rho_{u\pi}^2)}{(\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi)^{\frac{3}{2}}} > 0. \end{aligned}$$

and thus

$$\Delta U(c) = E[u|\pi + (\kappa_0 + \kappa_\Delta)u \geq 0] - E[u|\pi + \kappa_0 u \geq 0] > 0.$$

which completes the proof.

Proof of [Proposition 2](#):

Note that

$$\frac{\partial E[u|\pi + \kappa u \geq 0]}{\partial \kappa} = \sqrt{\frac{2}{\pi}} \frac{\sigma_\pi^2 \sigma_u^2 (1 - \rho_{u\pi}^2)}{(\sigma_\pi^2 + \kappa^2 \sigma_u^2 + 2\kappa \rho_{u\pi} \sigma_u \sigma_\pi)^{\frac{3}{2}}}$$

implies that

$$\frac{\partial^2 E[u|\pi + \kappa u \geq 0]}{\partial \kappa^2} < 0.$$

As $E[u|\pi + \kappa u \geq 0]$ is thus concave in κ we must have that

$$\Delta U(c) = E[u|\pi + (\kappa_0 + \kappa_\Delta)u \geq 0] - E[u|\pi + \kappa_0 u \geq 0]$$

is decreasing in κ_0 .

Further Tables

Table A1

Variation of performance appraisal and works council status.

Performance appraisal (PA)	Works council		Total (2063 persons)
	No (297 persons)	Yes (1766 persons)	
Cancellation	0.12	0.14	0.14
No PA	0.59	0.35	0.39
PA	0.17	0.41	0.37
Introduction	0.12	0.10	0.10
Total	1	1	1

Table A2

Variation of feedback interview and works council status.

Feedback Interview (FI)	Works council		Total (2063 persons)
	No (297 persons)	Yes (1766 persons)	
Cancellation	0.09	0.08	0.08
No FI	0.56	0.31	0.34
FI	0.26	0.51	0.48
Introduction	0.09	0.10	0.10
Total	1	1	1

Table A3

Performance appraisal and feedback interview and works councils.

	(1) Whole sample
Performance appraisal	−0.0624 (0.1017)
Feedback interview	−0.1657 (0.1629)
PA × Feedback interview	0.0298 (0.1523)
PA × Works council	0.1373 (0.1213)
Feedback interview × Works council	0.2584 (0.1753)
PA × Feedback interview × Works council	0.0146 (0.1731)
Employee fixed effects	yes
Controls	yes
Within R ²	0.0666
# Observations	9857
# observations of persons with repeated survey participation	4533

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are *Age*, *Children* (1=yes), *In relationship* (1=yes), *Full-time* (1=yes), *Temporary contract* (1=yes), *Monthly gross wage*, *Employment status*, *Concerns of job security*, *Overtime* (1=yes), *Firm size* and *Year*.

Table A4

Performance appraisal and works councils: The role of firm size and job security concerns.

	(1)	(2)	(3)
Performance appraisal	−0.0493 (0.0733)	0.0039 (0.1200)	0.0096 (0.1209)
PA × Works council	0.1562* (0.0835)	0.2459** (0.1162)	0.2123* (0.1131)
Firm size (Reference: 50–99 employees)			

(continued on next page)

Table A4 (continued)

	(1)	(2)	(3)
100–249 employees		0.0930 (0.1705)	0.0934 (0.1699)
250–499 employees		0.2139 (0.2141)	0.2014 (0.2129)
500 and more employees		0.1447 (0.2217)	0.1111 (0.2220)
Concerns about job security (Reference: not concerned at all)			
somewhat concerned	–0.1579*** (0.0615)		–0.1577** (0.0616)
very concerned	–0.9598*** (0.1436)		–0.9539*** (0.1432)
PA × 100–249 employees		–0.0930 (0.1679)	–0.0822 (0.1637)
PA × 250–499 employees		–0.1799 (0.1728)	–0.1483 (0.1681)
PA × 500 and more employees		–0.1552 (0.1729)	–0.1266 (0.1673)
PA × somewhat concerned	–0.1156 (0.0712)		–0.1147 (0.0708)
PA × very concerned	0.5936*** (0.1789)		0.5861*** (0.1773)
Employee fixed effects	yes	yes	yes
Controls	yes	yes	yes
Within R ²	0.0728	0.0639	0.0733
# Observations	9857	9857	9857
# observations of persons with repeated survey participation	4533	4533	4533

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are Age, Children (1=yes), In relationship (1=yes), Full-time (1=yes), Temporary contract (1=yes), Monthly gross wage, Employment status, Overtime (1=yes), Firm size and Year.

Table A5

Feedback interviews and works councils: The role of firm size and job security concerns.

	(1)	(2)	(3)
Feedback interview	–0.1305 (0.1348)	–0.3389 (0.2064)	–0.3136 (0.2082)
Feedback interview × Works council	0.2706* (0.1404)	0.1379 (0.1667)	0.1347 (0.1652)
Firm size (Reference: 50–99 employees)			
100–249 employees		0.0245 (0.1665)	0.0147 (0.1651)
250–499 employees		0.0667 (0.2232)	0.0653 (0.2225)
500 and more employees		–0.0450 (0.2331)	–0.0461 (0.2333)
Concerns about job security (Reference: not concerned at all)			
somewhat concerned	–0.1583*** (0.0601)		–0.1583** (0.0605)
very concerned	–0.6968*** (0.1435)		–0.6966*** (0.1434)
Feedback interview × 100–249 employees		0.2717 (0.2393)	0.2696 (0.2393)
Feedback interview × 250–499 employees		0.3013 (0.2374)	0.2929 (0.2382)
Feedback interview × 500 and more employees		0.4030* (0.2317)	0.4008* (0.2329)
Feedback interview × somewhat concerned	–0.0988 (0.0764)		–0.0981 (0.0777)
Feedback interview × very concerned	0.1395 (0.2132)		0.1395 (0.2094)
Employee fixed effects	yes	yes	yes
Controls	yes	yes	yes
Within R ²	0.0613	0.0625	0.0638
# Observations	9857	9857	9857
# observations of persons with repeated survey participation	4533	4533	4533

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are Age, Children (1=yes), In relationship (1=yes), Full-time (1=yes), Temporary contract (1=yes), Monthly gross wage, Employment status, Overtime (1=yes), Firm size and Year.

Table A6
Performance appraisal and collective agreements.

	(1) Firms with collective agreement	(2) Firms without collective agreement	(3) Whole sample
Performance appraisal	0.1204*** (0.0460)	−0.0491 (0.0710)	−0.0002 (0.0689)
Collective agreement			0.0116 (0.0992)
PA × Collective agreement			0.1086 (0.0810)
Employee fixed effects	yes	yes	yes
Controls	yes	yes	yes
Within R ²	0.0694	0.0899	0.0632
# Observations	7569	2266	9835
# observations of persons with repeated survey participation	3417	999	4416

Notes: Table shows individual linear fixed effects panel estimations. Dependent variable is job satisfaction. Robust standard errors clustered at the firm level in parentheses. *significant at 10 %, **significant at 5 %, ***significant at 1 %. Controls are Age, Children (1=yes), In relationship (1=yes), Full-time (1=yes), Temporary contract (1=yes), Monthly gross wage, Employment status, Concerns of job security, Overtime (1=yes), Firm size and Year.

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