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Personnel adjustments during the Covid-19 pandemic: Did co-determination make a difference?*

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Abstract: Using a unique dataset of establishments in Germany surveyed during the Covid-19 pandemic, this study investigates whether personnel adjustments during the crisis differed between establishments with and without a works council. Our regression analyses show that the hiring and dismissal rate as well as the churning rate were lower in establishments with a works council. In contrast, the net employment growth rate over the pandemic and the implementation of short-time work did not differ significantly between establishments with and without a works council. We conclude that worker co-determination did indeed make a difference in terms of higher employment stability for the incumbent workforce during the pandemic.

Zusammenfassung: Anhand einer Befragung von Betrieben in Deutschland während der Covid-19-Pandemie untersucht diese Studie, ob sich die Personalanpassungen während der Krise zwischen Betrieben mit und ohne Betriebsrat unterschieden. Unsere Regressionsanalysen zeigen, dass die Einstellungs- und Entlassungsraten wie auch die Churning-Rate in Betrieben mit Betriebsrat geringer ausfielen. Dagegen unterschieden sich die Netto-Wachstumsrate der Beschäftigung und die Inanspruchnahme von Kurzarbeit nicht signifikant zwischen Betrieben mit und ohne Betriebsrat. Wir schlussfolgern, dass in der Pandemie Arbeitnehmermitbestimmung tatsächlich einen Unterschied für die Beschäftigungsstabilität der vorhandenen Mitarbeiter/-innen machte.

JEL-Classification: J53, J63, M51

Key words: works councils, co-determination, personnel adjustments, Covid-19 pandemic

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1. INTRODUCTION

It is almost a stylized fact in Germany that establishments with a works council record lower personnel turnover than comparable establishments without worker co-determination (see the reviews by Jirjahn and Smith 2018 and Schnabel 2020). There are two main explanations of this finding (e.g., Hirsch et al. 2010): First, works councils act as workers' "collective voice" (Freeman 1980) at the workplace and inform management about workers' preferences, so that unsatisfied workers have the chance to anonymously express their dissatisfaction rather than exiting the plant. If management takes workers' complaints and suggestions seriously, it can improve personnel policy. The collective-voice effect, the resulting better working conditions and the higher wages typically paid in plants with works councils all can be expected to reduce workers' (voluntary) quits in co-determined plants. Second, works councils may use their substantial rights of consultation and co-determination to prevent dismissals and to reduce firms' dismissal and hiring rates. Although various empirical studies point to lower personnel turnover in co-determined plants (e.g., Addison et al. 2001, Pfeifer 2011, Grund et al. 2016), it is an open question whether this relationship only holds in normal times or also shows up in times of severe economic crisis.

This study focuses on the Covid-19 pandemic which severely affected the German economy from March 2020 onwards. It resulted in a reduction in real GDP of more than 11 percent in the second quarter of 2020 and 4.6 percent over the year 2020, with total employment falling by 1.1 percent in 2020 and the average number of employees in short-time work rising from 145,000 in 2019 to 2.94 million in 2020. This abrupt downswing in economic activity can be regarded as a litmus test for the performance of the cooperative system of industrial relations in Germany, whose main pillars are encompassing collective bargaining agreements and worker co-determination at the workplace. In the pandemic, various ways of personnel adjustments were possible in German firms. As in normal times, firms could dismiss workers or reduce hirings, and employees could change their quitting behaviour. In addition, firms could make use of short-time work, an established furlough system that the government made more generous during the pandemic (for details, see Herzog-Stein et al. 2021).[2] Our research question is whether co-determination did make a difference in plants' personnel adjustment to the massive exogenous shock induced by the Covid-19 pandemic. In other words, did plants that had a works council use different ways of

[2] In the first wave of the pandemic in spring 2020, many establishments reported that they used short-time work, and some stopped hiring, but very few plants made use of layoffs (see Struck et al. 2021).

adjustment, did they reduce employment less than comparable plants without co-determination, and was personnel turnover lower in these plants?

Using a unique dataset of about 2,000 establishments in Germany surveyed during the pandemic, our study contributes to the literature on the effects of co-determination as well as to the literature on the consequences of the Covid-19 pandemic in three ways. First, we provide first evidence that in the pandemic the hiring and dismissal rate as well as the churning rate were lower in establishments with a works council. We thus can confirm that the lower personnel turnover in co-determined plants found in previous studies which were conducted in normal times also holds in times of severe economic crisis. Second, we do not find substantial and statistically significant differences in the implementation of short-time work during the pandemic by co-determined and other establishments – an aspect that has not been investigated before. Third, although the consequences of the pandemic were less severe for workers in co-determined plants, this does not mean that co-determination also moderated the overall employment effects of the pandemic since net employment growth is not found to differ between establishments with and without works councils. Nevertheless, our paper demonstrates that co-determination did indeed make a difference in terms of higher employment stability for the incumbent workforce during the pandemic.

2. INSTITUTIONAL BACKGROUND, PRIOR LITERATURE AND RESEARCH QUESTIONS

The two most important pillars of the German model of industrial relations identified in the literature are encompassing collective bargaining agreements and separate worker co-determination at the workplace via works councils.[3] In Germany, employers (or employers' associations) and unions have the right to regulate wages and working conditions without state interference. They may conclude collective bargaining agreements either as multi-employer agreements at sectoral (i.e. industry) level or as single-employer agreements at firm level. These agreements are legally binding on all members of the unions and employers' associations involved, but usually they are extended to all employees working for the employers involved (no matter whether they are union members or not). Collective agreements determine wages as well as working

[3] For more detailed descriptions of these two pillars and how they evolved over time, see Addison et al. (2017) and Oberfichtner and Schnabel (2019). In 2020, about 26 percent of plants and 51 percent of employees were covered by a collective agreement, and about 8 percent of establishments with five or more employees did have a works council, while approximately 40 percent of employees worked in a plant with a works council (see Ellguth and Kohaut 2021).

time and working conditions, and they may also contain regulations concerning dismissals and employment protection (although these are of minor importance). The concrete implementation and monitoring of sectoral-level collective agreements is typically relegated to works councils and management at the plant level.

Turning to the second pillar, works councils are mandatory in Germany in all establishments with five or more permanent employees, but they are not automatic in that they must be elected by the plant's entire workforce, and workers are free not to set up a works council. The size of the works council is determined by law and increases with the number of workers in a plant. The German Works Constitution Act gives works councils extensive rights of information (on all matters related to the discharge of their statutory functions), consultation, and even co-determination. Important for our study, consultation rights cover all decisions related to manpower planning and individual dismissals. For instance, a dismissal is rendered null and void if the employer fails to consult the works council. In plants with more than 20 employees, the employer has to consult the works council when hiring a new employee, and the hiring can only take place if the works council agrees. If the employer and the works council cannot reach consent concerning a dismissal or a hiring, the case typically ends up in labour court. In addition, German works councils have co-determination rights prescribed by law on "social matters" such as remuneration arrangements, health and safety measures, and the regulation of working time. They may also negotiate so-called social plans that provide compensation in case of plant closings or partial closings.

Unlike unions, works councils are not allowed to call a strike, and according to the Works Constitution Act they shall work together with the employer in a spirit of mutual trust. However, their substantive information, consultation and co-determination rights on many issues imply that works councils have a strong influence and considerable bargaining power that can be applied to all kinds of questions, including personnel adjustments and other reactions of plants to an economic crisis. Therefore, while collective bargaining played a minor role in the pandemic (such as freezing wages in the economic downturn), works councils can be regarded as the key players at the plant level concerning personnel adjustments during the crisis.

The empirical literature for Germany typically finds that personnel fluctuation is lower in plants that have a works council than in plants without worker co-determination at the workplace. Fewer separations, fewer voluntary quits by employees and/or fewer employer-initiated dismissals in co-determined plants are found in a number of cross-sectional studies like Backes-Gellner et al. (1997), Addison et al. (2001), Dilger (2002), Pfeifer (2011) and Grund (2016). Likewise, Hirsch et al. (2010) report lower separation

rates to employment and nonemployment in such plants. According to Frick and Möller (2003), Pfeifer (2011) and Adam (2019), the reduction in personnel fluctuation associated with works councils is more pronounced in plants that are covered by collective agreements. Using a difference-in-differences approach, Adam (2019) finds that the increase in works council authority fostered by the 2001 reform of the Works Constitution Act substantially reduced worker quits. Also applying a difference-in-differences approach, Gralla and Kraft (2018) show that after the introduction of a works council in a plant, hiring rates decline whereas dismissal rates remain constant. The reduction in hiring rates has been found before (e.g., Addison et al. 2001) and may reflect works councils' promotion of insider interests, but the insignificant effect on dismissals is somewhat surprising. Looking at the overall effect of works councils on employment, the empirical evidence is mixed. While some studies find a positive relationship between the existence of a works council and net employment growth (e.g., Jirjahn 2010), others point to a negative relation (e.g., Addison and Teixeira 2006, Gralla and Kraft 2018). Empirical studies on the nexus between a works council and the implementation of short-time work in a plant are lacking so far.

The extensive legal rights and the bargaining power of works councils, the theoretical background (e.g. collective voice theory), and the extant empirical literature suggest focusing on the following personnel adjustment possibilities and research questions:

1) *Hirings*: Did plants with works councils carry out fewer hirings than other plants in the pandemic?
2) *Dismissals*: Did plants with works councils lay off fewer workers in the pandemic?
3) *Voluntary quits*: Did plants with works councils record fewer employee quits than other plants?
4) *Labour fluctuation*: Did the extent of labour turnover (or churning) differ between co-determined and other plants during the pandemic?
5) *Employment growth*: Did net employment growth during the pandemic differ between plants with and without works councils?
6) *Short-time work*: Did plants with co-determination implement short-time work more often or less often than other plants?

3. DATA AND DESCRIPTIVE EVIDENCE

For our analyses we use data from the survey "Establishments in the Covid-19 Crisis", a high-frequency rotating panel survey that has been conducted on behalf of the

Institute for Employment Research (IAB) since August 2020 in order to monitor how establishments get along with the crisis and the containment measures (see Backhaus et al. 2021 for more detailed information). The survey includes approximately 2,000 private-sector establishments with at least one employee subject to social security notifications. We use data from the 15th wave that were collected in July 2021. This wave includes comprehensive information on industrial relations, most importantly about the existence of a works council (as well as its recent introduction or abolishment), and about the presence of collective bargaining agreements at the sectoral or firm level. The 15th wave further includes information about employment developments and personnel fluctuation (number of employees, hirings, and dismissals) since the beginning of the crisis in March 2020 as well as information on a large number of potential control variables such as establishment size, industry affiliation, location, firm and management structure, firm profits, exports, business volume, and government support.

As dependent variables for the investigation of establishments' personnel adjustments and labour fluctuation during the pandemic, we use hirings, dismissals, and quits**,** the latter including workers' voluntary separations, retirement, expirations of fixed-term contracts, or restricted takeover of former apprentices.[4] As a measure for the amount of labour fluctuation going beyond net employment adjustments we use churning (or excess worker flows), defined as the sum of accessions and separations minus the absolute value of the net employment change between two reference dates (see, e.g., Davis and Haltiwanger 1999, 2717). We also consider net employment changes between February 2020 and July 2021 and a dummy variable indicating whether at least one of an establishment's employees was in short-time work for at least one month between March 2020 and June 2021 (unfortunately we do not know the average or maximum number of employees in short-time work over this period).[5] We express all worker flow measures (hirings, dismissals, quits, and churning) and employment

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[4] Because we do not have direct information on quits, we calculate them using the available information on employment changes, hirings, and dismissals. More specifically, since $employment_t = employment_{t-1} + hirings - dismissals - quits$, quits are given by $quits = employment_{t-1} - employment_t + hirings - dismissals$. As usual in surveys, our data may suffer from recall bias and measurement error, which can result in negative values for quits. This applies to 343 establishments. In those cases, we dropped all establishments that had larger negative deviations than -2 (162 establishments). For the remaining establishments with negative values (up to -2), quits were set to zero. For larger establishments, this procedure permits only deviations that are very small in percentage terms. We therefore experimented with less restrictive margins, allowing, e.g., deviations of up to five or ten percent, which did not alter any of our insights. Even when we use all original values for quits (including all negative values) our insights are not affected.

[5] We only have information on the current share of workers in short-time work (as of July 2021). Alternatively using this variable does not alter our insights.

growth as rates by dividing each measure by average employment in February 2020 and July 2021 (for this procedure, see also Davis and Haltiwanger 1999, 2718 f.).

We exclude all establishments with less than five employees because they are not entitled to introduce a works council. As a robustness test, we will narrow our analyses to establishments with more than 20 employees because in those establishments, employers have to consult the works council when hiring employees or when planning a substantial reorganization of the plant. We further focus on establishments with established industrial relations, i.e., we exclude establishments having introduced a works council since March 2020 and those having abolished their works council within the last two years. This applies to seven and five establishments, respectively.

(Table 1 about here)

Table 1 shows the means of the dependent variables for establishments with and without works council in our sample. It is obvious that in terms of personnel adjustments during the pandemic, there are substantial differences between both groups of establishments. For instance, the average hiring rate in establishments with works councils is about 5.3 percent, whereas it amounts to almost 9.5 percent in establishments without worker co-determination. Similarly, the rates of dismissals and quits as well as the churning rate are lower in establishments with works councils. The same applies to the prevalence of short-time work. Having said this, establishments with and without a works council do not differ substantially in their average net employment growth during the pandemic. Although the descriptive evidence points to certain differences concerning personnel adjustment, we must also take into account that establishments with and without a works council differ in many other characteristics such as establishment size, bargaining coverage or workforce composition (see Appendix Table 1), for which we must control in our analyses. More specifically, we are able to control for collective bargaining coverage (at sectoral and firm level), establishment size, industry affiliation, firm and management structure (owner-managed, single-plant firm, headquarter, foreign ownership), the firm's profit situation before the crisis (i.e. in 2019), exports, and location (Eastern vs. Western Germany). In addition, we have information on the development of the business volume in 2020 compared to 2019 and on government financial support, which ensures that we compare establishments that were affected by the crisis in a similar way.

To take account of the establishments' employment structure before the pandemic, an important determinant of personnel adjustment costs, as well as establishment age, we use information from the Establishment History Panel (BHP). The BHP is an administrative dataset based on social security notifications. It contains all establishments with at least one employee subject to social security notifications and

refers to June 30th of each year (see Ganzer et al. 2020 for more information). We use data for the year 2019 to depict the employment situation before the pandemic. Merging data from the BHP is only possible for establishments that explicitly agreed on that, which is the case for more than 95 percent of establishments in our sample. Regarding the employment structure, we use information on the shares of women, of workers with different skill levels (according to the occupational classification by Blossfeld 1987), of part-time and marginal part-time employees, apprentices, employees with fixed-term contracts, and workers with foreign nationality.

4. Empirical results

The results of our empirical estimations based on OLS regressions are presented in Table 2. Starting with the hiring rate and first looking at the control variables, we see that these usually have the expected sign (e.g., hiring rates are higher in young establishments and lower when the business volume decreased), but not all estimated coefficients are statistically significant. Focusing on our main variable of interest, we find that the existence of a works council is associated with a 4.3 percentage points lower hiring rate compared to similar establishments without a works council. This difference is substantial, both in terms of statistical significance and economic magnitude. This finding is in accordance with the descriptive evidence above and answers our first research question in the affirmative.

(Table 2 about here)

Turning to our next indicators, we find that the dismissal rate is statistically significantly lower in establishments with a works council, ceteris paribus. As expected in research question 2, co-determined plants laid off fewer workers in the pandemic. Likewise, there is a negative association between workers' quit rate and the existence of a works council, albeit the estimated coefficient is not statistically significant at conventional levels. This statistical insignificance may reflect that our quit variable is quite heterogeneous, ranging from workers' voluntary separations over retirement to expirations of fixed-term contracts or restricted takeover of former apprentices.

Since we find negative coefficients for hirings, dismissals and quits, it is not surprising that the churning rate (which is composed of these various adjustment channels) is also substantially and statistically significantly lower in establishments with worker co-determination. Even if personnel fluctuation and its components are lower in establishments with works councils, this does not necessarily imply that overall

employment change is also lower. Indeed, as Table 2 shows, the net employment growth rate over the pandemic does not differ significantly between establishments with and without a works council, ceteris paribus.

Finally, we look at short-time work as an additional adjustment channel available in the pandemic to avoid dismissals. The last column in Table 2 shows that the probability of implementing short-time work does not differ significantly between establishments with and without a works council. Unfortunately, we do not have data on the volume of short-time work over the pandemic. Nevertheless, this result suggests that the lower dismissal rate in establishments with works councils does not seem to be due to a higher prevalence of short-time work.

Our empirical findings are in accordance with extant literature for Germany that did not focus on the pandemic or other times of crisis. We can confirm that personnel fluctuation is lower in plants that have a works council than in plants without worker co-determination at the workplace (see, e.g., Addison et al. 2001, Dilger 2002, Pfeifer 2011 and Grund 2016). Going beyond previous studies, our results indicate that works councils are able to stabilize employment even in times of severe economic crisis.[6]

Some previous studies have pointed to the dual nature of worker representation in Germany and have argued that the reduction in personnel fluctuation associated with works councils is more pronounced in plants that are covered by collective bargaining agreements (see Frick and Möller 2003, Pfeifer 2011 and Adam 2019). In order to test this assertation, we now add two interaction terms to our estimation equation.

(Table 3 about here)

Table 3 reports the estimated coefficients of our dummy variables for the existence of a works council and of a collective agreement at sectoral or firm level as well as two interaction terms of the works council and the collective agreements dummies (control variables are as in Table 2, results available on request). Looking at the hiring rate, the first interaction term indicates that the reduction in hirings is substantially and significantly larger in establishments with a works council and a collective agreement at sectoral level. In contrast, there is no such interaction effect for firm level agreements. At the same time, the coefficient of the works council dummy itself (without collective bargaining coverage) becomes smaller and statistically insignificant, suggesting that the negative impact of works councils on the hiring rate is mainly

[6] To check whether co-determination affects the survivability of firms, we also investigated whether establishments with works councils are more likely to report immediate existential threats (as of July 2021). We do not find any difference between establishments with and without works councils, which is not surprising given that previous studies on the effects of works councils on firm survival do not show a clear picture (e.g., Addison et al. 2004, Jirjahn 2011).

prevalent in establishments with a collective bargaining agreement at the sectoral level. We also find negative interaction effects of works council existence and sectoral collective agreements in our regressions for the dismissal, quit, and churning rates, although these interaction effects differ in magnitude and statistical significance. In contrast, neither the existence of a works council nor its interactions with collective agreements have any statistically significant effects on the net employment growth rate and the use of short-time work.

All in all, our estimations in Table 3 show that the reduction in personnel fluctuation associated with works councils is more pronounced in establishments that are covered by collective bargaining agreements at sectoral level. This finding confirms that works councils are more effective in reducing personnel fluctuation if they are backed up by a (sectoral) collective agreement which they monitor (Pfeifer 2011). Support by the sectoral union (e.g. by providing legal expertise and training to works councilors) may allow works councils to more effectively participate in decision making at the establishment level and to influence personnel turnover (Jirjahn and Smith 2018). No such interaction effect is found for firm level agreements, which could partly be due to the small share of establishments that make use of such agreements. It may also reflect that in practice the works councillors in an establishment are usually (inofficially) involved when unions conclude a firm-specific contract, so that we do not see an additional interaction effect with works councils in our estimations.

Although works councils have wide-reaching influence in plants of all sizes, they have additional powers concerning personnel adjustment in plants with more than 20 employees. In those plants, employers must consult the works council when hiring employees or when planning a substantial reorganization (including a partial closing) of the plant, and works councils may demand to set up a “social plan” in case of mass layoffs. As a robustness check, we therefore restricted our sample to establishments with more than 20 employees, which did not alter our insights (results are available on request).

5. Conclusions

Using a unique dataset of establishments in Germany surveyed during the Covid-19 pandemic, this study has analysed whether personnel adjustments during the crisis differed between establishments with and without a works council. We find this to be the case since the hiring and dismissal rate as well as the churning rate were lower in establishments with a works council. The reduction in personnel fluctuation associated

with works councils is found to be more pronounced in establishments that are covered by sectoral collective bargaining agreements. By reducing both hirings and dismissals, works councils seem to mainly represent the interests of the incumbent workforce and protect it from the pandemic. Our results indicate that the lower personnel turnover in co-determined plants found in previous studies that were conducted in normal times also holds in times of severe economic crisis.

Regarding the overall employment effect of co-determination in the crisis, we find that net employment growth does not differ between establishments with and without works councils. This finding might be interpreted as a confirmation that works council do not act as sand in the operation of German firms, e.g. by delaying employment decisions (see Schank et al. 2004). Interestingly, we also do not find substantial and statistically significant differences in the implementation of short-time work during the pandemic by co-determined and other establishments. This result suggests that the lower personnel fluctuation in establishments with works councils does not seem to be due to a higher prevalence of short-time work.

Some limitations must be taken into account when interpreting these results. First, our analysis is based on cross-sectional data and – despite a huge number of control variables that we were able to include in our regressions – our results cannot be interpreted in a strictly causal sense. Second, we were only able to include establishments that survived the pandemic, at least by July 2021. However, official statistics show that neither the number of bankruptcies nor business shutdowns increased during the pandemic (which is mainly due to extensive government support and specific bankruptcy regulations), and there is no reason to believe that co-determined establishments closed down disproportionately. Third, the number of observations in our survey data is limited, which does not allow us to investigate heterogeneities by economic sectors that were differently affected by the Covid-19 crisis. This leaves room for future research as soon as administrative data covering the entire period of the crisis are available. However, in contrast to the survey data used in this paper, German administrative data do not allow to distinguish dismissals from other separations, which is a clear advantage of our survey data.

Despite these caveats, our analysis provides first evidence that worker co-determination did indeed make a difference in terms of higher employment stability during the Covid-19 pandemic for the incumbent workforce. Future analyses could investigate whether such differences still hold in the economic upswing after the pandemic, provided they obtain (panel) data that cover a longer period. An interesting question in this context is whether establishments that were more reluctant to lay off workers during the crisis are also more reserved in hiring workers in the subsequent upswing and whether this applies to co-determined establishments in particular.

Accordingly, the protection of insiders and the lower hiring rates that we observe in establishments with works councils may come at the cost of unemployed outsiders who lost their jobs during the pandemic, were unemployed already beforehand, or who are trying to (re-)enter the labour market after completing education or after career breaks (Struck et al. 2021).

Hence, the employment dynamics of establishments in the crisis and their consequences for the labour market leave plenty of room for future research. A promising avenue is to investigate which groups of employees benefit most from the higher employment stability in co-determined establishments. Does this predominantly apply to highly qualified and experienced workers, whose dismissal would come along with huge human capital losses and adjustment costs? Another important topic is the long-term consequences for labour market entrants or for workers who got displaced during the pandemic. The extensive evidence about the negative consequences of job displacement (e.g., Fackler et al. 2021) highlights the importance of protecting workers from job loss, especially in times of severe recessions, and our study indicates that co-determination contributes to more job security.

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Table 1: Means of dependent variables by existence of a works council

	Works council		No works council	
	Mean	**Std. dev.**	**Mean**	**Std. dev.**
Hiring rate	0.0528	0.0645	0.0945	0.1778
Dismissal rate	0.0080	0.0279	0.0340	0.1060
Quit rate	0.0833	0.1827	0.1014	0.2160
Churning rate	0.0716	0.1033	0.1260	0.3067
Net employment growth rate	-0.0363	0.1857	-0.0263	0.2216
Short-time work (dummy)	0.4662	0.4998	0.5043	0.5003
No. of establishments	266		926	

Notes: Private sector, establishments with at least 5 employees.

Table 2: Determinants of establishments' personnel adjustments

Dependent variable	Hiring rate	Dismissal rate	Quit rate	Churning rate	Net employment growth rate	Short-time work (dummy)
Works council (dummy)	-0.0425 (0.0126)***	-0.0223 (0.0061)***	-0.0288 (0.0211)	-0.0785 (0.0221)***	0.0063 (0.0202)	-0.0169 (0.0413)
Collective agreement, sectoral level (dummy)	0.0238 (0.0142)	0.0056 (0.0076)	0.0194 (0.0161)	0.0643 (0.0250)**	-0.0015 (0.0145)	-0.0234 (0.0301)
Collective agreement, firm level (dummy)	-0.0015 (0.0105)	-.0092 (0.0054)*	0.0199 (0.0183)	0.0218 (0.0181)	-0.0116 (0.0189)	-0.0400 (0.0456)
Size 5-9 employees (reference)	---	---	---	---	---	---
Size 10-49 employees (dummy)	0.0017 (0.0118)	0.0131 (0.0074)*	0.0533 (0.0142)***	0.0274 (0.0182)	-0.0906 (0.0176)***	-0.0206 (0.0364)
Size 50-249 employees (dummy)	0.0032 (0.0156)	0.0167 (0.0095)*	0.0615 (0.0217)***	0.0460 (0.0267)*	-0.1102 (0.0228)***	-0.0138 (0.0428)
Size 500+ employees (dummy)	-0.0105 (0.0168)	0.0072 (0.0096)	0.0980 (0.0444)**	0.0120 (0.0265)	-0.1527 (0.0469)***	-0.0519 (0.0649)
Owner-managed (dummy)	0.0120 (0.0123)	-0.0045 (0.0084)	0.0148 (0.0177)	0.0021 (0.0212)	-0.0017 (0.0174)	-0.0511 (0.0313)
Single-plant firm (dummy)	-0.0400 (0.0177)**	0.0012 (0.0086)	-0.0567 (0.0207)***	-0.0684 (0.0310)**	0.0201 (0.0191)	0.0379 (0.0383)
Headquarter (dummy)	-0.0340 (0.0179)*	-0.0002 (0.0083)	-0.0106 (0.0261)	-0.0512 (0.0317)	-0.0187 (0.0246)	0.1206 (0.0452)***
Foreign ownership (dummy)	0.0063 (0.0146)	0.0059 (0.0082)	-0.0026 (0.0180)	-0.0090 (0.0209)	0.0057 (0.0214)	0.0063 (0.0519)
Good profit situation before crisis (dummy)	0.0001 (0.0084)	-0.0055 (0.0055)	0.0182 (0.0104)*	0.0138 (0.0131)	-0.0146 (0.0121)	-0.0707 (0.0302)**
Business volume decreased (dummy)	-0.0289 (0.0112)**	0.0225 (0.0052)***	0.0402 (0.0126)***	-0.0011 (0.0188)	-0.0934 (0.0118)***	0.3276 (0.0286)***
Government support (dummy)	-0.0050 (0.0103)	0.0080 (0.0076)	0.0209 (0.0139)	-0.0037 (0.0173)	-0.0375 (0.0144)***	0.1979 (0.0296)***

Export (dummy)	-0.0228 (0.0107)**	-0.0058 (0.0069)	-0.0152 (0.0158)	-0.0451 (0.0180)**	0.0039 (0.0165)	0.0680 (0.0297)**
Eastern Germany (dummy)	0.0005 (0.0137)	0.0011 (0.0056)	0.0447 (0.0183)**	0.0240 (0.0240)	-0.0495 (0.0169)***	0.0093 (0.0342)
Young establishment (dummy)	0.0795 (0.0351)**	0.0074 (0.0119)	0.0422 (0.0348)	0.0915 (0.0595)	0.0291 (0.0258)	0.0359 (0.0434)
Women (share)	0.0167 (0.0239)	-0.0147 (0.0146)	0.0149 (0.0310)	0.0209 (0.0411)	0.0162 (0.0324)	-0.1153 (0.0684)*
Low-skilled occupations (share)	0.0284 (0.0147)**	0.0186 (0.0112)*	-0.0020 (0.0229)	0.0444 (0.0246)*	0.0156 (0.0257)	-0.0653 (0.0527)
Highly-skilled occupations (share)	0.0393 (0.0466)	0.0003 (0.0114)	0.0067 (0.0457)	0.0577 (0.0777)	0.0323 (0.0318)	-0.4128 (0.0679)***
Marginal part-time employees (share)	-0.0441 (0.0345)	0.0105 (0.0243)	0.1196 (0.0515)**	-0.0543 (0.0589)	-0.1693 (0.0527)***	-0.0015 (0.0847)
Apprentices (share)	-0.1202 (0.0699)*	-0.0338 (0.0346)	-0.0728 (0.0777)	-0.2333 (0.1081)**	0.0537 (0.0890)	0.0886 (0.1857)
Part-time employees (share)	-0.0810 (0.0376)**	-0.0329 (0.0179)*	-0.0422 (0.0434)	-0.1652 (0.0636)**	0.0070 (0.0404)	0.0364 (0.0814)
Employees with fixed-term contract (share)	-0.0050 (0.0320)	-0.0146 (0.0169)	0.0145 (0.0477)	-0.0631 (0.0586)	-0.0136 (0.0449)	0.1094 (0.0758)
Employees with foreign nationality (share)	0.0774 (0.0452)*	0.0875 (0.0306)***	0.1497 (0.0537)***	0.1652 (0.0842)*	-0.1608 (0.0523)***	0.1631 (0.0848)*
8 industry dummies	Included***	Included**	Included***	Included***	Included	Included***
Intercept	0.1165 (0.0312)***	-0.0014 (0.0171)	0.0001 (0.0375)	0.1244 (0.0530)**	0.1472 (0.0375)***	0.4538 (0.0774)***
R-squared	0.1141	0.1050	0.1171	0.1071	0.1610	0.3301
No. of observations	1,192	1,192	1,192	1,192	1,192	1,192

Notes: OLS regressions; robust standard errors in parentheses; ***/**/* indicates statistical significance at the1/5/10 percent level, respectively; private sector, establishments with at least 5 employees; establishment size refers to February 2020, profit situation and workforce composition to 2019, and change in the business volume to 2020 compared to 2019.

Table 3: Determinants of establishments' personnel adjustments, including interaction terms of works council with collective bargaining agreements

Dependent variable	Hiring rate	Dismissal rate	Quit rate	Churning rate	Net employment growth rate	Short-time work (dummy)
Works council (dummy)	-0.0202 (0.0123)	-0.0197 (0.0074)***	-0.0102 (0.0190)	-0.0296 (0.0189)	0.0086 (0.0209)	-0.0230 (0.0619)
Works council * collective agreement, sectoral level (dummy)	-0.0519 (0.0257)**	-0.0125 (0.0113)	-0.0565 (0.0340)*	-0.1132 (0.0448)**	0.0161 (0.0304)	-0.0123 (0.0755)
Works council * collective agreement, firm level (dummy)	-0.0057 (0.0203)	0.0154 (0.0097)	0.0275 (0.0353)	-0.0138 (0.0347)	-0.0535 (0.0366)	0.0667 (0.0947)
Collective agreement, sectoral level (dummy)	0.0364 (0.0195)*	0.0092 (0.0099)	0.0343 (0.0202)*	0.0918 (0.0347)***	-0.0074 (0.0166)	-0.0179 (0.0330)
Collective agreement, firm level (dummy)	-0.0099 (0.0166)	-0.0200 (0.0076)***	-0.0068 (0.0241)	0.0042 (0.0294)	0.0200 (0.0249)	-0.0776 (0.0641)
R-squared	0.1176	0.1065	0.1206	0.1126	0.1627	0.3305
No. of observations	1,192	1,192	1,192	1,192	1,192	1,192

Notes: OLS regressions; robust standard errors in parentheses; ***/**/* indicates statistical significance at the1/5/10 percent level, respectively; private sector, establishments with at least 5 employees; further control variables as in Table 2.

Appendix Table A1: Means of explanatory variables by existence of a works council

	Works council		No works council	
	Mean	**Std. dev.**	**Mean**	**Std. dev.**
Collective agreement, sectoral level (dummy)	0.4511	0.4985	0.2624	0.4402
Collective agreement, firm level (dummy)	0.2481	0.4327	0.0486	0.2151
Size 5-9 employees (dummy)	0.0113	0.1058	0.2181	0.4132
Size 10-49 employees (dummy)	0.1504	0.3581	0.4881	0.5001
Size 50-249 employees (dummy)	0.5714	0.4958	0.2721	0.4453
Size 500+ employees (dummy)	0.2669	0.4432	0.0216	0.1454
Owner-managed (dummy)	0.1090	0.3123	0.6998	0.4586
Single-plant firm (dummy)	0.4098	0.4927	0.7570	0.4291
Headquarter (dummy)	0.2669	0.4432	0.1361	0.3430
Foreign ownership (dummy)	0.1391	0.3467	0.0378	0.1908
Good profit situation before crisis (dummy)	0.7105	0.4544	0.7937	0.4048
Business volume decreased (dummy)	0.4624	0.4995	0.4600	0.4987
Government support (dummy)	0.3083	0.4626	0.3672	0.4823
Export (dummy)	0.4737	0.5002	0.3499	0.4772
Eastern Germany (dummy)	0.1353	0.3427	0.1782	0.3829
Young establishment (dummy)	0.0526	0.2237	0.1069	0.3092
Women (share)	0.4477	0.2847	0.4794	0.2997
Low-skilled occupations (share)	0.3299	0.2823	0.4080	0.3312
Highly-skilled occupations (share)	0.2633	0.3018	0.1613	0.2660
Marginal part-time employees (share)	0.0633	0.0953	0.1803	0.1982
Apprentices (share)	0.0415	0.0465	0.0467	0.0769
Part-time employees (share)	0.2396	0.2362	0.2227	0.2143
Employees with fixed-term contract (share)	0.2108	0.1627	0.1537	0.1874
Employees with foreign nationality (share)	0.0840	0.1113	0.1185	0.1720
No. of establishments	266		926	

Notes: Private sector, establishments with at least 5 employees; establishment size refers to February 2020, profit situation and workforce composition to 2019, and change in the business volume to 2020 compared to 2019.