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ABSTRACT

The Heterogeneous Economic Consequences of Works Council Relations^{*}

I use a question about works council relations from the 2006 wave of the IAB Establishment panel to analyze the heterogeneous effects of works councils on productivity, wages, and profits. The results indicate that the effects differ significantly between works council relationship types in a systematic pattern. The overall findings are in line with productivity-enhancing and rent-sharing functions of works councils.

JEL Classification: J53, M54

Keywords: codetermination, firm performance, industrial relations, works councils

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1. Introduction

In the last two decades, many empirical studies have been conducted that analyze the economic consequences of works councils in German firms (for detailed literature reviews see Frege (2002), Addison, Schnabel and Wagner (2001; 2004), Jirjahn (2005; 2006), and articles by Jirjahn (2011) and Mueller (2011) in this special issue). Most of these studies use the IAB Establishment Panel or the Hannover Firm Panel and compare firms with and without works councils. The findings are mostly in line with theoretical considerations about productivity-enhancing and rent-sharing functions of works councils (Freeman and Lazear, 1995; Hübler and Jirjahn, 2003). For example, most studies report positive or at least non-negative effects of works councils on firms' labor productivity, positive effects on workers' wages, and negative or non-significant effects on profits.

One shortcoming of previous econometric studies is that they only look at the existence of a works council, but cannot look into the black box of works council-management-relations due to data limitations. The pioneering study of works council typology by Kotthoff (1981; 1994) follows a case study approach to analyze the social relationships between works councils and management in 63 German firms. Although Kotthoff does not explicitly analyze the economic consequences of different works council types, his study is important because it distinguishes between effective and ineffective works councils in terms of interest representation. Most firms in Kotthoff's sample have ineffective works councils that can be characterized as ignored by management or workers, as isolated by an authoritarian management, or as part of the management. On the other hand, effective works councils are characterized as respected regulators, as respected surveillance, or as cooperative counter-power. Nienhüser (2005) uses data

from a telephone survey with HR officers in firms that have a works council. He identifies four types of works councils along the two dimensions bargaining power and willingness to cooperate and examines their impact on firm-level bargaining agreements. A recent study by Jirjahn, Mohrenweiser, and Backes-Gellner (2009) uses a small works council survey to analyze the determinants of bad works council relations as perceived by management. Their main focus is on learning dynamics; economic consequences of works council relations are not considered.

An exception in the evaluation of economic consequences of works council types are studies by Dilger (2002; 2006). Dilger connects data from the NIFA-Panel with the Bochumer Survey of Works Councils. He uses perceptions of the relationship between management and works councils by both sides to identify different types such as antagonistic or cooperative works councils. The findings indicate that the effects of these works council types on labor turnover, flexible working time arrangements, product innovations, and profit situation differ significantly in size. For example, the cooperative type and a more positive perception of works council-management-relations reduces labor turnover by most.

In this paper, I use a question about works council relations from the 2006 wave of the large-scale IAB Establishment Panel to analyze the heterogeneous effects of three works council types on economic outcomes such as labor productivity, wages, and profits. The main results are that the effects between the three works council types differ significantly in a systematic pattern, which is consistent with theoretical expectations of productivity-enhancing and rent-sharing effects of works council types. For example, more cooperative works councils have stronger positive effects on productivity and more bargaining works councils have stronger positive effects on wages. Because I use

a sample of firms with and without works councils as well as firms with different works council types, the results are important for the economic consequences of works councils as a whole, which is most important for policy, and for the efficient organization of industrial relations on the firm level.

The remainder of the paper is structured as follows. The data set and variables are described in Section 2. Section 3 presents the econometric results. The paper concludes with a short summary and discussion of the results in Section 4.

2. Data and descriptive statistics

The IAB Establishment Panel contains rich data on establishments from all sixteen German federal states (“Bundesländer”) and all industries (Kölling, 2000). Every year more than 15,000 firms with at least one employee covered by social security are interviewed in an unbalanced panel design survey. The sample is stratified according to ten establishment sizes and sixteen industries, with oversampling of larger firms. The observational unit is the establishment, i.e., the local unit in which major activities of an enterprise are carried out. Main concern of the survey is to gain insights into the firm’s most important parts of operation, decision-making, and more specifically employment. For the purpose of this study, I can only use the wave 2006 because it is the only year that contains a question about works council-management-relations. Since productivity and profit information are stated for the last business year, these economic outcome variables are taken from the wave 2007. Thus, firms in the estimation sample have to participate in surveys in both years 2006 and 2007. Further sample restrictions had to be applied. First, the sample includes only firms with at least five employees, because

smaller firms do not need to establish works councils under the legislation of the Works Constitution Act ("Betriebsverfassungsgesetz"). Second, firms from agriculture, hotel, restaurant, education, health, social, non-profit, public, or financial sector are dropped, because they usually do not report profits or sales, which is important for the computation of the productivity variable. Third, only firms without missing values in the used variables are considered. Overall 4693 firms remain in my sample for the subsequent empirical analysis.

The question about works council relations and the three possible answer categories, from which the explanatory variables of interests are generated, are worded as follows:

How would you characterize the role of the works council in managerial decision making in your establishment?

(1) Works council is in line with management in most decisions from the outset.

⇒ Type 1: "mostly in line with management"

(2) Works council has often a different opinion, but in the end a consensus is reached.

⇒ Type 2: "different opinion but with consensus"

(3) Decisions have often to be enforced against the works council.

⇒ Type 3: "different opinion without consensus"

If the works council complies with most management decisions from the outset, this relationship type can have two reasons. One the one hand, the management decisions might take already employees' interests into account so that the works council must not

disagree with management. On the other hand, a works council might be simply too weak to bargain with management or might follow own interests instead of representing the workforce interests. The second type describes works councils that express different employee opinions and bargain successfully with management so that a consensus is reached in most cases. The third type is mostly against decisions of the management and agreements between works council and management are seldom reached so that decisions have to be enforced against the works council. The three works council types can be broadly characterized along the two dimensions cooperation and bargaining. Type 1 and type 2 can be seen as cooperative, whereas type 3 is likely to show few interests in cooperation with management or at least is unsuccessful in finding a consensus. Furthermore, type 1 is probably not strongly engaged in bargaining activities with management, whereas type 2 and type 3 are likely to bargain more and harder with management; the former mostly with and the latter mostly without a consensus. Because cooperation has productivity-enhancing effects and bargaining is often associated with rent-sharing activities, the effects of the three works council types on productivity, wages, and profits are expected to differ between each other, i.e., a homogeneous works council effect is rather unlikely.

Table 1 informs about the frequency of works councils and their relationship types. The incidence of works councils is about 31 percent among all firms in my sample. Almost three out of four firms with a works council judge their works council of type 2 ("different opinion but with consensus"), about 23 percent of type 1 ("mostly in line with management"), and less than 4 percent of type 3 ("different opinion without consensus"). Thus, the large majority of works councils has a rather cooperative relationship with firms' management. An important determinant of works council

relations seems to be the existence of a union bargained collective contract. Split samples for firms with and without collective contracts show that type 2 is more likely if the firm is bound to a collective contract. A rationale for this finding might be that unions strengthen works councils (e.g., advisory, financial, and personnel capacity) in their position to bargain with a firm's management.

insert Table 1 about here

To estimate the economic consequences of the works council types, three outcome variables are used: productivity, wages, and profits. A firm's average labor productivity is proxied by the log value added per employee, which is sales minus inputs in the entire business year 2006 divided by the number of employees in June 2006. Firm's average wages are proxied by the log of total gross monthly salaries divided by the number of employees in June 2006. The data also includes the perceived profit situation in 2006, which could be answered on a five-point scale ranging from one for very good to five for very bad. In addition to this ordinal profit measure, a binary indicator for an at least good profit situation is generated. The basic econometric model looks as in equation (1), in which Y denotes the outcome variable (log productivity, log wages, good profit dummy, or ordinal profit situation), WC indicates the existence of a works council as well as the three works council types (reference group are firms without works councils), X includes a set of control variables (union contract, mainly foreign capital owner, firm founded before 1990, state of technology, average working time, employment shares of qualification groups, part-time, fixed-term contracts and females, number of employees and squared term, 9 industry dummies, 16 regional dummies), Greek letters indicate parameters to be estimated, ε the usual residual term, and i is a firm index. Descriptive statistics for all variables are presented in Table 2.

$$Y_i = \alpha + \beta_1 WC_i^{\text{type}_1} + \beta_2 WC_i^{\text{type}_2} + \beta_3 WC_i^{\text{type}_3} + \gamma X_i + \varepsilon_i \quad (1)$$

insert Table 2 about here

For productivity as well as wages, linear regressions can be applied, whereas ordered probit estimates are the appropriate estimation technique for the ordered profit outcome and binary probit estimates for the binary profit situation. In all estimates, heteroskedasticity robust standard errors are computed. Also note that, though effects of works councils on outcomes are discussed, the applied regression analyses estimate in principal only correlations, which are not necessarily causal effects due to unobserved heterogeneity and reverse causality issues.

3. Econometric results

Table 3 presents the regression results for the complete estimation sample. The linear regression results for productivity (log value added per employee) are displayed in the second column. Firms with a works council of type 1 ("mostly in line with management") have on average a significant larger productivity (about 20 percent) than firms without a works council; and firms with a works council of type 2 ("different opinion but with consensus") have an even larger productivity (about 40 percent).¹ These findings are consistent with the consideration that cooperative works councils

¹ To compute the percentage change in productivity and wages measured in Euros from OLS coefficients of log-linear functions, the subsequent formula is applied: $(e^\beta - 1)$. The estimated productivity effects of up to 40 percent are quite large but fall into the range of previous findings (e.g., Addison, Schnabel, and Wagner, 2004; Jirjahn, 2011; Mueller, 2011).

have a productivity-enhancing effect. But to enhance productivity, an exchange of information between works council and management in bargaining processes seems to have an additional positive effect. Moreover, it is a remarkable result that the existence of a works council does not harm productivity even if management decisions have to be enforced against the works council (type 3). The estimated coefficients indicate that firms with a works council of type 3 ("different opinion without consensus") are on average not less productive than firms without works councils. In fact, these firms have on average a productivity that is about 15 percent higher than in firms without works councils. The estimated effect for works councils of type 3 is however not statistically significant. The large standard error might be reasoned by effect heterogeneity, which can be seen in separate estimates for firms with and without collective contracts in the robustness section.

insert Table 3 about here

The estimated coefficients for the wage function (log total salaries per employee) in the third column show that wages are significantly larger in firms with works councils. Wages in firms with a works council of type 1 ("mostly in line with management") are approximately 15 percent, in firms with a works council of type 2 ("different opinion but with consensus") approximately 17 percent, and in firms with a works council of type 3 ("different opinion without consensus") nearly 30 percent larger than in firms without works councils. The results are consistent with the rent-sharing function of works councils, i.e., works councils increase workers' share of the increased value added (Freeman and Lazear, 1995). That works councils of type 3 ("different opinion without consensus") have the largest effect on wages might be reasoned by strong works councils, which mostly care about income of workers and not about firm performance in

the longer run. It seems however questionable why firms can afford to pay such high wages, although the productivity estimates have shown no significant productivity-enhancing effect of this relationship type. An explanation might be that profits of capital owners are negatively affected, on which we focus in the next step.

Table 3 also informs about the results of the binary probit estimates for an at least good profit situation (marginal effects in fourth column) and ordered probit estimates for five profit categories (very good, good, satisfactory, bad, very bad) (coefficients in fifth column and marginal effects for single outcomes in subsequent columns). Firms with a works council of type 1 ("mostly in line with management"), which might be cooperative but not very strong in bargaining worker interests, have no significant different profit situation than firms without works councils but a significant better profit situation than firms with the two other works council types. Firms with a works council of type 2 ("different opinion but with consensus") are on average significantly less likely to perceive their profit situation as good or very good. The effect of a works council of type 3 ("different opinion without consensus") on profits is also significant negative and even stronger than for type 2. The last finding is consistent with the above consideration that high wages in firms with works council type 3 are not explained by large productivity-enhancement but by large rent-sharing effects, which reduce firms' profits.

The estimates in Table 3 reveal also some interesting results for the control variables. Union bargained collective contracts have only a significant effect in the ordered probit estimates for the perceived profit situation. Although only of weak significance, firms with collective contracts have a slightly better profit situation than firms without collective contracts. The dummy variable, which indicates if capital owners are mainly

foreign, has significant effects in the productivity and wage regression but not in the profit regressions. Firms with mainly foreign capital owners have on average a productivity that is nearly 20 percent larger and wages that are nearly 10 percent larger than in other firms. Firms founded before the year 1990, i.e., which are at least 17 years old, have on average significant larger productivity and wages but a slightly worse profit situation than younger firms. The state of the technology has significant positive effects on productivity, wages, and perceived profit situation. The newer the technology, the larger are the effects.

Some studies point out that results for works councils are not robust across different subsamples (e.g., Addison, Schnabel, and Wagner, 2004). Thus, I re-estimated the productivity, wage, and profit functions for different subsamples as a robustness check.² First, I split the sample into firm size classes. The main results are robust. As an example, the results for the subsample of firms with 21 to 100 employees are presented in Table 4. Second, the sample is split into firms with and without union bargained collective contracts. The results are also presented in Table 4. Whereas the overall results are qualitatively identical, it can be seen that the productivity enhancing effect of works councils is larger in firms with a collective contract. This finding is consistent with previous studies and might be explained by the fact that some distributional conflicts are solved outside the firm in collective contracts which might encourage the works council to engage more in productivity-enhancing activities (Hübler and Jirjahn, 2003).

insert Table 4 about here

² The complete results can be requested from the author.

4. Conclusion

The combined effects of works councils on the three outcomes productivity, wages, and profits are consistent with theoretical expectations about productivity-enhancing and rent-sharing functions. The results might also explain why management has an interest in cooperative but weak works councils (better profit situation in firms with works councils of type 1), whereas workers and their representatives have preferences for strong works councils that bargain with management about higher wages. From a total welfare perspective bargaining and cooperative works councils (type 2) seem to be most desirable, because the positive productivity effects are the largest, while showing also significant positive effects on workers' income and moderate negative effects on firms' profits. One limitation of this paper, which has to be addressed in future research, is the causality of the effects, because my regression analysis has only estimated correlations in cross sectional data. Due to the systematic findings that concur with theory and intuition, it is however not unrealistic to assume that the overall findings might indeed be causal.

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Tables to be inserted in text

Table 1: Frequencies of works council relationship types

| | Complete sample (n=4693) | Without union contract (n=2374) | With union contract (n=2319) |
|------------------------------------------------|-----------------------------|---------------------------------------|------------------------------------|
| Works council existence | 31.39 (100) | 13.31 (100) | 49.89 (100) |
| Type 1: "mostly in line with management" | 7.35 (23.42) | 3.96 (29.75) | 10.82 (21.69) |
| Type 2: "different opinion but with consensus" | 22.97 (73.19) | 9.01 (67.72) | 37.26 (74.68) |
| Type 3: "different opinion without consensus" | 1.07 (3.39) | 0.34 (2.53) | 1.81 (3.63) |

Notes: Frequencies in percent. All four variables are dummies. The reference group for works council types is no works council so that the frequencies of the types sum up to the frequency of works council existence. The relative frequencies for firms with a works council are in parentheses.

Source: IAB-Establishment Panel, 2006/2007 (controlled remote data access via FDZ); own computations.

Table 2: Descriptive statistics

| | Mean | Std. Dev. | Min. | Max. |
|--------------------------------------------------------------------------------------------------|----------|-----------|--------|---------|
| <i>Economic outcome variables</i> | | | | |
| PROD: log productivity per employee (sales minus inputs divided by number of employees) | 10.7360 | 0.8767 | 5.4146 | 14.3437 |
| WAGE: log wage per employee (total monthly salaries divided by number of employees) | 7.4890 | 0.5489 | 4.8721 | 8.9120 |
| PROFIT_G: at least good profit situation (dummy) | 0.4856 | 0.4998 | 0 | 1 |
| PROFIT_O: ordinal profit situation (1: very good, 2: good, 3: satisfactory, 4: bad, 5: very bad) | 2.6851 | 1.0389 | 1 | 5 |
| <i>Works council relations variables (reference group: no works council)</i> | | | | |
| Type 1: "mostly in line with management" (dummy) | 0.07351 | 0.26101 | 0 | 1 |
| Type 2: "different opinion but with consensus" (dummy) | 0.22970 | 0.42069 | 0 | 1 |
| Type 3: "different opinion without consensus" (dummy) | 0.01065 | 0.10268 | 0 | 1 |
| <i>Control variables</i> | | | | |
| Union bargained collective contract (dummy) | 0.4941 | 0.5000 | 0 | 1 |
| Mainly foreign capital owner (dummy) | 0.0712 | 0.2571 | 0 | 1 |
| Firm founded before the year 1990 (dummy) | 0.5172 | 0.4998 | 0 | 1 |
| State of technology is alright (dummy) | 0.2742 | 0.4462 | 0 | 1 |
| State of technology is new (dummy) | 0.5152 | 0.4998 | 0 | 1 |
| State of technology is very new (dummy) | 0.1784 | 0.3828 | 0 | 1 |
| Normal average working hours per week (hours) | 39.1895 | 2.1619 | 15 | 60 |
| Employees unskilled for easy tasks (share) | 0.1734 | 0.2437 | 0 | 1 |
| Employees with apprenticeships for qualified tasks (share) | 0.6199 | 0.2458 | 0 | 1 |
| Employees with college degrees for qualified tasks (share) | 0.0888 | 0.1595 | 0 | 1 |
| Apprentices (share) | 0.0513 | 0.0709 | 0 | 0.5625 |
| Employees with part-time work (share) | 0.1669 | 0.2144 | 0 | 1 |
| Employees with fixed-term contracts (share) | 0.0445 | 0.1069 | 0 | 0.9745 |
| Female employees (share) | 0.3192 | 0.2588 | 0 | 1 |
| Number of employees in June 2006 | 158.2924 | 791.6042 | 5 | 35019 |

Notes: Number of firms in the complete estimation sample is 4693.

Source: IAB-Establishment Panel, 2006/2007 (controlled remote data access via FDZ); own computations.

Table 3: Impact on productivity, wages, and profit situation in complete sample

| | <u>OLS coefficients</u> | | <u>Binary probit</u> | <u>Ordered probit</u> | <u>Marginal effects for ordered probit outcomes</u> | | | | |
|-------------------------------------------------------|-------------------------|-----------------------|-------------------------|------------------------|-----------------------------------------------------|-----------------------|------------------------|------------------------|------------------------|
| | <u>PROD</u> | <u>WAGE</u> | <u>marginal effects</u> | <u>coefficients</u> | <u>Profit=1</u> | <u>Profit=2</u> | <u>Profit=3</u> | <u>Profit=4</u> | <u>Profit=5</u> |
| Type 1: "mostly in line with management" | 0.1842*** (0.0468) | 0.1444*** (0.0187) | 0.0210 (0.0315) | -0.0293 (0.0655) | 0.0048 (0.0109) | 0.0069 (0.0152) | -0.0037 (0.0085) | -0.0047 (0.0104) | -0.0033 (0.0072) |
| Type 2: "different opinion but with consensus" | 0.3564*** (0.0351) | 0.1600*** (0.0153) | -0.0607*** (0.0230) | 0.1095** (0.0477) | -0.0169** (0.0071) | -0.0266** (0.0119) | 0.0127** (0.0052) | 0.0177** (0.0078) | 0.0131** (0.0060) |
| Type 3: "different opinion without consensus" | 0.1412 (0.1162) | 0.2594*** (0.0434) | -0.1401** (0.0691) | 0.4011** (0.1981) | -0.0490*** (0.0174) | -0.1057* (0.0547) | 0.0271*** (0.0025) | 0.0659** (0.0318) | 0.0618 (0.0392) |
| Union bargained collective contract | -0.0352 (0.0256) | -0.0002 (0.0122) | 0.0150 (0.0176) | -0.0642* (0.0355) | 0.0103* (0.0057) | 0.0153* (0.0084) | -0.0079* (0.0044) | -0.0103* (0.0057) | -0.0073* (0.0041) |
| Mainly foreign capital owner | 0.1707*** (0.0454) | 0.0885*** (0.0167) | 0.0361 (0.0303) | -0.0407 (0.0704) | 0.0067 (0.0119) | 0.0095 (0.0162) | -0.0052 (0.0093) | -0.0065 (0.0112) | -0.0045 (0.0076) |
| Firm founded before the year 1990 | 0.0525** (0.0254) | 0.0450*** (0.0128) | -0.0347* (0.0179) | 0.0672* (0.0369) | -0.0108* (0.0060) | -0.0160* (0.0088) | 0.0083* (0.0046) | 0.0108* (0.0059) | 0.0077* (0.0042) |
| State of technology is alright | 0.0665 (0.0598) | 0.0959*** (0.0308) | 0.0062 (0.0448) | -0.1282 (0.0954) | 0.0215 (0.0166) | 0.0297 (0.0214) | -0.0168 (0.0131) | -0.0203 (0.0149) | -0.0140 (0.0100) |
| State of technology is new | 0.1814*** (0.0596) | 0.0985*** (0.0302) | 0.1145*** (0.0435) | -0.3372*** (0.0941) | 0.0541*** (0.0152) | 0.0797*** (0.0220) | -0.0408*** (0.0111) | -0.0538*** (0.0149) | -0.0392*** (0.0113) |
| State of technology is very new | 0.2588*** (0.0645) | 0.1133*** (0.0323) | 0.1998*** (0.0439) | -0.5383*** (0.0996) | 0.1082*** (0.0242) | 0.1020*** (0.0135) | -0.0846*** (0.0181) | -0.0784*** (0.0129) | -0.0473*** (0.0069) |
| Normal average working hours | -0.0098 (0.0077) | -0.0033 (0.0036) | -0.0052 (0.0038) | 0.0121 (0.0082) | -0.0020 (0.0013) | -0.0029 (0.0019) | 0.0015 (0.0010) | 0.0019 (0.0013) | 0.0014 (0.0009) |
| Employees unskilled for easy tasks | 0.3682** (0.1516) | 1.0316*** (0.1006) | 0.3003*** (0.1054) | -0.5796*** (0.2030) | 0.0933*** (0.0328) | 0.1378*** (0.0498) | -0.0717*** (0.0269) | -0.0930*** (0.0327) | -0.0663*** (0.0233) |
| Employees with apprenticeships for qualified tasks | 0.7915*** (0.1508) | 1.4129*** (0.1015) | 0.3265*** (0.1052) | -0.6636*** (0.2037) | 0.1068*** (0.0329) | 0.1578*** (0.0504) | -0.0821*** (0.0274) | -0.1065*** (0.0329) | -0.0759*** (0.0234) |
| Employees with college degrees for qualified tasks | 1.5263*** (0.1608) | 2.1157*** (0.1024) | 0.4245*** (0.1130) | -0.7829*** (0.2168) | 0.1260*** (0.0351) | 0.1861*** (0.0537) | -0.0969*** (0.0293) | -0.1256*** (0.0351) | -0.0896*** (0.0250) |
| Apprentices | -0.4605** (0.2094) | 0.1176 (0.1283) | 0.3165** (0.1506) | -0.5205* (0.2962) | 0.0838* (0.0477) | 0.1238* (0.0714) | -0.0644* (0.0378) | -0.0835* (0.0477) | -0.0596* (0.0339) |

| | | | | | | | | | |
|-------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|
| Employees with part-time work | -1.1755*** (0.0770) | -0.9882*** (0.0435) | -0.1973*** (0.0467) | 0.3833*** (0.0899) | -0.0617*** (0.0146) | -0.0911*** (0.0216) | 0.0474*** (0.0117) | 0.0615*** (0.0145) | 0.0439*** (0.0104) |
| Employees with fixed-term contracts | -0.4959*** (0.1225) | -0.0960* (0.0548) | 0.1823** (0.0732) | -0.3971** (0.1563) | 0.0639** (0.0252) | 0.0944** (0.0372) | -0.0491** (0.0196) | -0.0637** (0.0251) | -0.0455** (0.0180) |
| Female employees | -0.1094* (0.0607) | -0.1558*** (0.0311) | -0.0129 (0.0389) | 0.0272 (0.0795) | -0.0044 (0.0128) | -0.0065 (0.0189) | 0.0034 (0.0098) | 0.0044 (0.0128) | 0.0031 (0.0091) |
| Number of employees in June 2006 | -0.0000 (0.0000) | 0.0000 (0.0000) | 0.0001*** (0.0000) | -0.0001 (0.0001) | 0.0000 (0.0000) | 0.0000 (0.0000) | -0.0000 (0.0000) | -0.0000 (0.0000) | -0.0000 (0.0000) |
| Number of employees squared | 0.0000 (0.0000) | -0.0000 (0.0000) | -0.0000*** (0.0000) | 0.0000** (0.0000) | -0.0000** (0.0000) | -0.0000** (0.0000) | 0.0000** (0.0000) | 0.0000** (0.0000) | 0.0000** (0.0000) |
| Constant | 10.7540*** (0.3684) | 6.5407*** (0.1874) | | | | | | | |
| Cut point 1 | | | | -1.6139*** (0.4139) | | | | | |
| Cut point 2 | | | | -0.3021 (0.4134) | | | | | |
| Cut point 3 | | | | 0.5965 (0.4134) | | | | | |
| Cut point 4 | | | | 1.3139*** (0.4139) | | | | | |
| Adjusted/Pseudo R ² | 0.3243 | 0.5998 | 0.0515 | 0.0261 | | | | | |

Notes: Number of firms in the complete estimation sample is 4693. All regressions include 9 industry dummies and 16 federal state dummies as further control variables. Reference group are firms without a works council. OLS is applied for productivity and wages (coefficients). Binary probit is applied for probability of at least good profit situation (marginal effects). Ordered probit is applied for ordered profit situation (coefficients and marginal effects for single outcomes). Robust standard errors in parentheses. Coefficients and marginal effects are statistical significant at * 10%, ** 5%, and ***1%.

Source: IAB-Establishment Panel, 2006/2007 (controlled remote data access via FDZ); own computations.

Table 4: Impact on productivity, wages, and profit situation in subsamples

| | <u>Complete sample (n=4693)</u> | | | |
|------------------------------------------------|----------------------------------------------------|-----------------------|------------------------|-----------------------|
| | PROD | WAGE | PROFIT_G | PROFIT_O |
| Type 1: "mostly in line with management" | 0.1842*** (0.0468) | 0.1444*** (0.0187) | 0.0210 (0.0315) | -0.0293 (0.0655) |
| Type 2: "different opinion but with consensus" | 0.3564*** (0.0351) | 0.1600*** (0.0153) | -0.0607*** (0.0230) | 0.1095** (0.0477) |
| Type 3: "different opinion without consensus" | 0.1412 (0.1162) | 0.2594*** (0.0434) | -0.1401** (0.0691) | 0.4011** (0.1981) |
| Adjusted/Pseudo R ² | 0.3243 | 0.5998 | 0.0515 | 0.0261 |
| | <u>Firms with 21 to 100 employees (n=1597)</u> | | | |
| | PROD | WAGE | PROFIT_G | PROFIT_O |
| Type 1: "mostly in line with management" | 0.2548*** (0.0676) | 0.1626*** (0.0276) | 0.0432 (0.0474) | -0.0518 (0.0953) |
| Type 2: "different opinion but with consensus" | 0.2753*** (0.0541) | 0.1241*** (0.0219) | -0.0925** (0.0373) | 0.2093*** (0.0789) |
| Type 3: "different opinion without consensus" | -0.0307 (0.1855) | 0.2682*** (0.0993) | -0.0158 (0.1278) | 0.1384 (0.2471) |
| Adjusted/Pseudo R ² | 0.2710 | 0.5509 | 0.0529 | 0.0276 |
| | <u>Firms without collective contracts (n=2374)</u> | | | |
| | PROD | WAGE | PROFIT_G | PROFIT_O |
| Type 1: "mostly in line with management" | 0.2364*** (0.0793) | 0.1390*** (0.0312) | 0.0114 (0.0588) | 0.0029 (0.1310) |
| Type 2: "different opinion but with consensus" | 0.2513*** (0.0652) | 0.1094*** (0.0270) | -0.0976** (0.0416) | 0.2194** (0.0881) |
| Type 3: "different opinion without consensus" | -0.1027 (0.2298) | 0.2243*** (0.0559) | 0.0782 (0.1773) | -0.0144 (0.5018) |
| Adjusted/Pseudo R ² | 0.2947 | 0.5771 | 0.0537 | 0.0277 |
| | <u>Firms with collective contracts (n=2319)</u> | | | |
| | PROD | WAGE | PROFIT_G | PROFIT_O |
| Type 1: "mostly in line with management" | 0.1775*** (0.0602) | 0.1483*** (0.0242) | -0.0061 (0.0395) | 0.0155 (0.0796) |
| Type 2: "different opinion but with consensus" | 0.3986*** (0.0448) | 0.1771*** (0.0207) | -0.0726** (0.0302) | 0.1178* (0.0613) |
| Type 3: "different opinion without consensus" | 0.2005 (0.1370) | 0.2794*** (0.0520) | -0.1999*** (0.0733) | 0.5325** (0.2156) |
| Adjusted/Pseudo R ² | 0.3410 | 0.6144 | 0.0588 | 0.0303 |

Notes: All regressions include the control variables also included in the estimates for the complete sample in Table 3. The results for the complete sample are summarized in the upper part of this table for comparison reasons. Reference group are firms without a works council. OLS is applied for productivity and wages (coefficients). Binary probit is applied for probability of at least good profit situation (marginal effects). Ordered probit is applied for ordered profit situation (coefficients). Robust standard errors in parentheses. Coefficients and marginal effects are statistical significant at * 10%, ** 5%, and ***1%.

Source: IAB-Establishment Panel, 2006/2007 (controlled remote data access via FDZ); own computations.