Works Councils and Flexible Collective Bargaining Agreements*

Evidence on Productivity and Wages in German Establishments

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Abstract

Based on the article by Hübler and Jirjahn (2003), we analyse the interaction effects of works councils and collective bargaining agreements (CBAs) on productivity and wages in German plants. Contrary to the previous literature we argue that newer developments in the system of industrial relations could countervail the moderating effects of collective bargaining on works council behaviour. Increased decentralisation and flexibility at the plant level induced by opening clauses and company-level employment pacts require works councils to negotiate over wages, which is usually forbidden by the Works Constitution Act. This could dampen their efforts on fostering productivity-enhancing measures. We find however, that works councils in plants with opening clauses actually increase productivity by twice the magnitude compared to plants without opening clauses, while wages stay the same. Further, we do not find different works council behaviour for plants with or without company-level pacts for employment.

Keywords: works councils, collective bargaining, employment pacts, opening clauses, wages, productivity

JEL code: J53, J31

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1 Introduction

In recent years the German system of industrial relations has changed significantly. While its dual structure of collective bargaining on the industry level and employee representation on the firm level still covers the majority of employees, there is a clear trend away from it (Ellguth and Kohaut 2010). Meanwhile, the social partners (unions and employers' associations) have introduced a number of measures to decentralise labour relations. Most collective contracts nowadays contain opening or hardship clauses, and plant-level pacts for employment are more and more common (Kohaut and Schnabel 2007, Ellguth and Kohaut 2008). In the light of these changes we question whether the findings of Hübler and Jirjahn (2003) still hold, that collective bargaining exerts a moderating effect on works council behaviour such that productivity-enhancing activities become more likely and rent-seeking becomes less likely. Our hypothesis is that increased flexibility and decentralisation of collective bargaining agreements leads to 'worse' works council behaviour, i.e. rent seeking, and finally to higher wages and lower productivity in covered firms.

Although the literature on works councils steadily grows and the interaction of works council behaviour with different institutions such as collective bargaining in Germany is well known, evidence on the changing extent of such interaction effects due to changes in the institutions themselves is scarce. First, this is particularly surprising as Germany is increasingly regarded as a role model for labour market reforms throughout Europe and beyond, and as it outperforms most of its neighbours in the aftermath of the 2009 bank and economic crisis in terms of (high) employment growth and (low) unemployment rates. Second, in the ongoing discussion on the economic effects of labour market reforms, the virtues of bargaining decentralisation seem to be unquestioned. This is particularly astonishing as deregulation is being increasingly questioned in other markets.

Within this paper we try to shed some light on changes in the interaction between collective bargaining and works council behaviour through bargaining decentralisation and their effects on wages and firm productivity. We show that, even if more decentralised collective bargaining increases the rent-seeking opportunities of works councils, this is not coming at the cost of reduced productivity. The literature so far indicates the existence of a trade-off for firms choosing their optimal level of bargaining. While central (collective) bargaining reduces distributional conflicts at the firm level, decentral (individual) bargaining increases firm performance. Works councils have so far been seen as to amplify this trade-off: they situate in a moderating role in collectively covered firms and engage in rent-seeking activities in non-covered firms. Our findings suggest that in a decentralised bargaining situation works council behaviour seems to be different.

According to the literature on industrial relations, works councils potentially affect firm performance via multiple possible roles, namely rent-seeking, voice, monopoly, and insurance (Hirsch et al. 2010). While early work on works council behaviour mostly suggest negative effects on firm performance (Fitzroy and Kraft 1990), the majority of newer studies comes to more differentiated results. In a review article, Addison et al. (2004) identify three phases of economic research, closely related to the evolution of suitable data. The first phase analyses mainly small cross-section samples up to the mid 1990s; the second phase analyses larger, regional or industry-specific data, for example the Hanover Firm Panel, mostly up to the mid 2000s, but also some recent studies, for example Jirjahn (2009, 2010); and the third phase analyses nationally representative data, for example the IAB establishment panel. Works councils have been found to engage in both rent-seeking and productivity-enhancing activities, but their impact differs largely by establishment size, collective bargaining coverage and employee involvement mechanism. An often-cited article by Hübler and Jirjahn (2003) finds that works councils behave differently depending on the collective coverage of a firm. The authors argue that the existence of a CBA greatly reduces the possibility of works councils to engage in rent-seeking. Instead, they focus on productivity-enhancing measures. Using data from the Hanover Firm Panel, they find that works councils have larger effects on productivity in collectively covered firms, while the wage effect stays the same.

A number of studies have analysed the effects of works councils on productivity more closely. Using the Hanover firm panel, Wagner et al. (2006) and Wagner (2008) use quantile regressions and nonparametric tests to find that the effect of works councils on productivity is mainly restricted to collectively covered firms in manufacturing. On the other side, the wage effects of works councils have only recently been looked at more closely due to the lack of suitable linked-employer-employee data. With the emergence of the IAB LIAB, it can be argued that the economic research on works councils has entered a fourth phase (in the sense of Addison et al. (2004)). The first article to our knowledge analysing the wage effects of bargaining institutions using linked-employer-employee data is Gürtzgen (2009). Works councils are associated with higher wages in collectively covered firms and for men, medium- and high-skilled and blue-collar workers. Addison et al. (2010) analyse the effects of works councils on wage specifically and find that works councils are associated with higher earnings, even after controlling for establishment-level- and worker heterogeneity. The works council wage premium is larger in collectively covered firms and the interaction effect is postive (as opposed to findings by Jirjahn (2003), for example). New work by Gartner et al. (2010) analyse wage dynamics and find that works councils only affect wage growth as a reaction to changes in unemployment in combination with collective bargaining agreements and cannot be seen as a substitute to sectoral wage

agreements.

Finally, the overall impact on profits depends on the relation of the two effects, rent-increasing and rent-seeking. Mueller (2010) uses the IAB establishment panel and an objective measure of firm profits to show that works councils increase profits mainly in collectively covered firms.[1]

We argue that the discrepancy in the literature could be explained by the introduction of flexible measures into CBAs in recent years. Most CBAs nowadays contain opening clauses which allow firms to deviate from the collectively negotiated wages to a certain extent at the plant level (Heinbach 2009). Also, employment pacts have become more widely accepted by unions as a tool to adapt collective agreements to firm-specific needs and to find efficient bargaining solutions together with the employees (Hübler 2005, Massa-Wirth and Seifert 2005). However, the bargaining partners have left the actual implementation of those measures largely to negotiations at the firm level between the management and either the respective employees, or, if applicable, works councils. We expect these developments to have a counteracting effect on the moderating role of CBAs on works councils, which was suggested by Hübler and Jirjahn (2003). Instead of focusing on productivity, works councils have to negotiate the implementation of opening clauses or employment pacts. Often, they find themselves in a position where management demands large concessions from employees in order to prevent job losses or react to increased competition. This does not necessarily foster trust and cooperation. Additionally, these negotiations take away time from other activities, and works councils could also be forced to sacrifice some productivity-enhancing work practices in the negotiations for plant agreements.

For our empirical estimation, we use the Establishment Panel (EP) of the Nürnberg Institute for Employment Research (IAB), a representative German establishment-level data set containing rich information on firm characteristics and industrial relations. We focus on the time period between 2005 and 2008 as information on employment pacts and opening clauses is restricted to those waves. We account for selectivity effects using a bivariate probit approach and estimate the effects of works councils with robust standard errors. We use interaction terms to measure the interaction effects of works councils and measures of CBA decentralisation and also perform separate regressions for collectively covered firms with and without flexible elements in their CBAs.

We find that works councils in plants with opening clauses in their collective con-

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[1]As regards the effect of works councils on employment, there is an ongoing debate between Addison and Teixeira (2006), who find a negative relationship between works councils and employment growth using the IAB establishment panel, and Jirjahn (2010), who finds a positive relationship using the Hanover panel. Two recent studies by Hirsch et al. (2010) and Boockmann and Steffes (2010) analyse separations rates and job durations for German employees using the linked-employer-employee data of the IAB (LIAB) and find that works councils reduce exit rates and separations.

tracts increase productivity by a larger magnitude than their counterparts in plants without such clauses, while wages stay the same. For employment pacts, we find works councils to have a larger, but insignificant effect on both wages and productivity in plants with an employment pact. The results show that the introduction of flexible measures into CBAs does not countervail the moderating role of works councils. In fact, in the case of opening clauses, works councils seem to concentrate even more on roles which allow them to increase the productivity of a plant.

The rest of the paper is structured as follows. Chapter 2 will shortly summarise newer developments in the German system of industrial relations. We lay down our data and econometric model in chapter 3 while chapter 4 contains the empirical results Chapter 5 concludes.

2 Newer Developments in the German System of Industrial Relations

In large parts of the German labour market, particularly in manufacturing, the German system of industrial relations has been established to reduce distributional conflicts at the plant level and to foster trust and cooperation. Therefore, wages are usually negotiated in regional, industry-wide collective bargaining agreements (*Flächentarifverträge*, CBAs) between trade unions and the respective employers' associations, while co-determination on the plant level between works councils and management focuses on optimising operational sequences.

The Collective Bargaining Agreement Act (*Tarifvertragsgesetz*, TVG) regulates the content, conclusion and termination of both collective and individual labour agreements. Collective contracts are negotiated between unions and either single employers (firm contracts) or employers' associations (CBAs), according to §§1,2 TVG. They are legally binding for all union members and member firms, but generally extended to all employees. Wages and working conditions negotiated in collective contracts serve as minimum standards and cannot be bypassed by negotiations at the plant level, which would usually take the form of so-called plant-level agreements (*Betriebsvereinbarungen*).

Works councils are regulated in the Works Constitution Act (*Betriebsverfassungsgesetz*, BVG). Electable in firms with at least five fulltime employees, they have been increasingly acquired generous codetermination rights. Section 77 (3) of the BVG formally bans works councils from negotiation over wages directly, but not on working time or other working conditions such as overtime payments or bonuses.

Encountering increasing pressure from employers, economists, politicians, and employees, unions have made concessions to allow for more flexibility within CBAs. For

example, most CBAs nowadays contain opening clauses which allow firms to deviate from the collectively negotiated wages to a certain extent at the plant level (Kohaut and Schnabel 2007). Also, company-level pacts for employment (or simply: employment pacts) have become more widely accepted by unions as a tool to adapt collective agreements to firm-specific needs and to find efficient bargaining solutions together with the employees (Ellguth and Kohaut 2008).

The differences between the two measures are as follows. Opening clauses are regulated in TVG section 4 and specify when and to what extent firms are allowed to reduce working conditions to below the normally binding standards. While most opening clauses nowadays contain elements that enable the reduction of wages, this has not been the case until the early 2000s, and still today there are opening clauses that only affect working time or other aspects of working conditions. Opening clauses are typically restricted in magnitude and time. For their actual application they rely on the agreement of the respective works council, or if none exists, of the employees. Unions, however, are not able to veto a plant-level agreement based on opening clauses (BAG AZR 105/09). Heinbach (2005) and Heinbach and Schröpfer (2007) use data from a national archive on CBAs to classify opening clauses and to create the IAW Data Set on Opening Clauses. They find that most CBAs nowadays contain opening clauses, and that while opening clauses on working time were dominant until the late 1990s, opening clauses on compensation are now the most common type.

Plant-level agreements on employment on the other side are not regulated by any law. Starting in the mid 1990s, they the social partners have used them to save jobs in the event of a firm crisis. They have become, however, more and more common and are often also signed preemptively, or to increase the competitive position of a firm. It is therefore important to distinguish between crisis pacts and competition pacts. An important difference from opening clauses is that employment pacts are necessarily limited in magnitude or time, and can therefore lead to more serious deviations from the collectively bargained minimum conditions. For further analyses on employment pacts see Massa-Wirth and Seifert (2005) or Hübler (2005).

3 Data and Econometric Model

3.1 Data

We use the Establishment Panel (EP) of the Nürnberg Institute for Employment Research (IAB), a German establishment-level data set containing up to 16,000 establishments and rich information on firm characteristics and industrial relations. Starting in 1993 for West Germany and 1996 for East Germany, the IAB conducts this survey every year

in personal interviews with owners or senior managers. The sample firms are a random stratum over 16 industries and 10 firm size clauses from the population of all German firms with employees subject to social security contribution. It contains about 1% of all firms and 7% of all employees in Germany. The IAB corrects for panel mortality, exits and newly founded firms. It is possible to use either a balanced or (larger) unbalanced panel. The data contain rich information on firm characteristics, such as the number of employees, turnover, ownership, investment activites, and economic prospects; and on labour market institutions, such as collective agreements, works councils, government subsidies, and active labour market policies. For more information, see the IAB website (www.iab.de) or Fischer et al. (2009). We are able to make use of this data set through controlled remote data access via FDZ (*Forschungsdatenzentrum*).

As information on employment pacts and opening clauses is restricted to certain newer waves, we focus on the time period between 2005 and 2008. In waves 2005 and 2007 the EP contains questions about opening clauses. Establishments respond as to whether they know if opening clauses exist in their firm-specific or collective bargaining agreement, whether they use such clauses, and which type of opening clause they use. Apart from being only available for two years, Kohaut and Schnabel (2007) analyse these questions and find that a large number of firms do not know if opening clauses actually exist. In waves 2006 and 2008 the EP contains questions about employment pacts. In the 2006 wave of the panel, there are numerous information about current and previous existence of employment pacts, their duration, legal form, which exact measures they contain and the reason they got signed in the first place. Ellguth and Kohaut (2008) analyse this data and find that the distinction whether employment pacts are signed because of a crisis in the firm or to get a competitive advantage is crucial. Firms with crisis pacts usually have a worse profit situation and fail to innovate. Firms with competition pacts are more innovative, pay higher wages to higher qualified employees and have more flexible working time conditions. Unfortunately, in the 2008 wave of the panel we can only observe whether and for how long an employment pact exists. When trying to distinguish between the two types of employment pacts, we therefore rely on the 2006 information. We restrict our sample to firms with at least 5 employees subject to social security contribution, because of the legal threshold for a works council introduction, and to firms in manufacturing and services.

Table 1 shows the incidence of collective bargaining, works councils, and the two measures of bargaining decentralisation in our data. About half of the firms in our data have collective contracts. While only one in ten non-covered firms have a works council, the majority of covered firms does. This well observed fact is documented in the literature of works councils and explained by other firm characteristics such as size (Jirjahn 2009).

Table 1: Empirical Distribution of Firms According to Different Institutions of Industrial Relations

	Works Council			
	No		Yes	
Collective Bargaining:				44,451
Individual Bargaining	17,210	(38.71%)	3,292	(07.40%)
Firm Agreement	1,248	(02.81%)	2,702	(06.08%)
Collective Agreement	9,672	(21.76%)	10,327	(23.23%)
Opening Clauses:				10,238
Existence of Opening Clauses				
No	4,060	(39.66%)	3,312	(32.35%)
Yes	794	(07.76%)	2,072	(20.23%)
Application of Opening Clauses				
No	4,474	(46.37%)	4,336	(42.35%)
Yes	380	(03.71%)	1,048	(10.23%)
Employment Pacts:				9,761
No	4,677	(47.92%)	3,697	(37.88%)
Yes	141	(01.44%)	1,246	(12.77%)

Note: Numbers denote frequencies; total shares in parentheses. Information on opening clauses restricted to collectively covered firms in 2005 and 2007. Information on employment pacts restricted to collectively covered firms in 2006 and 2008.
Source: IAB Establishment Panel Waves 2005 to 2008, own calculations (controlled remote data access via FDZ).

as regards opening clauses, we focus on collectively covered firms in 2005 and 2007. We distinguish between the existence of opening clauses and their application.[2] About a third of all firms state they do not have opening clauses in their CBAs. Among these firms, about half of them have opening clauses. About ten percent of all firms state they know they have opening clauses in their CBAs. Among these firms, almost three quarters also have a works council. As regards the actual application of opening clauses, about half of all firms with opening clauses use them. The distribution of works councils does not seem to differ between firms using opening clauses and firms not using them. When looking at employment pacts, we also focus on collectively covered firms, but in the years 2006 and 2008. We see that the majority of firms does not have an employment pact, and that only about a quarter of them have a works council. But for firms with an employment pact, about 14%, almost every firm also has a works council.

In table 2 we present descriptive statistics for the average levels and distributions

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[2]Missings are firms who do not know if they have an opening clause.

Table 2: Wage and Productivity Levels and Distribution by Different Institutions of Industrial Relations

| | Works Council | | | |
| | No | | Yes | |
Collective Bargaining	log. Wage	log. Prod.	log. Wage	log. Prod.
Individual Bargaining	7.27 (0.60)	15.83 (0.89)	7.71 (0.43)	16.34 (0.90)
Collective Agreement	7.32 (0.53)	15.80 (0.93)	7.81 (0.39)	16.61 (0.96)
Opening Clauses				
Existence of Opening Clauses				
No	7.29 (0.53)	15.82 (0.92)	7.74 (0.42)	16.50 (1.02)
Yes	7.45 (0.49)	15.90 (0.93)	7.91 (0.32)	16.74 (0.82)
Application of Opening Clauses				
No	7.31 (0.53)	15.83 (0.92)	7.79 (0.40)	16.58 (0.98)
Yes	7.39 (0.49)	15.89 (0.84)	7.89 (0.32)	16.70 (0.80)
Employment Pacts				
No	7.31 (0.53)	15.78 (0.93)	7.78 (0.41)	16.55 (1.02)
Yes	7.41 (0.48)	15.77 (0.86)	7.91 (0.35)	16.73 (0.82)

Note: Standard Deviations in parentheses. Information on opening clauses restricted to collectively covered firms in 2005 and 2007. Information on employment pacts restricted to collectively covered firms in 2006 and 2008.
Source: IAB Establishment Panel Waves 2005 to 2008, own calculations (controlled remote data access via FDZ).

of wages and productivity between the various regimes of industrial relations. We see that both wages and productivity are higher in firms which are collectively covered and have a works council. Both institutions are also associated with a lower distribution of wages across firms, while the distribution of productivity stays the same. For the existence of opening clauses, we can observe the same pattern. Wages and productivity are higher with opening clauses, and wages differ less between firms. For the actual application of opening clauses, however, this is not the case. Both the levels and the distribution of wages and productivity do not differ between firm applying opening clauses and those not applying them. Turning to employment pacts, the pattern again holds. Wages and productivity levels are higher in firms with employment pacts, while the distribution of wages between firms, and here also of productivity, is smaller.

To investigate the interaction effects between works councils and flexible collective bargaining, we turn to multivariate analysis.

3.2 Econometric Model

In our study, we determine the joint effects of the existence of works councils (WC) and various bargaining regimes (BR) on productivity and wages at the firm level. We measure wages as the sum of salaries in a firm divided by the number of employees, we call this the wage level in a firm. As a measure of productivity, we calculate value added as total turnover less intermediates per employee and call this the productivity level in a firm. In our multivariate analyses, we take the natural logarithm of both the wage and the productivity levels. For our independent variables of interest, we use dummy variables which indicate whether in a specific establishment a works council or an employment pact exists, or whether a specific establishment is covered by a collective contract at the industry level, and if it is, whether this collective contract contains opening clauses.

We start with the following basic model, similar to Hübler and Jirjahn (2003):

$$ y_k = X'_k \cdot \beta_k + WC \cdot \gamma_{k1} + BR \cdot \gamma_{k2} + \epsilon_k, k = 1, 2, \tag{1} $$

where y_1 is the wage level and y_2 the productivity level in a firm, X'_k a vector of firm characteristics and ϵ_k an error term. It is likely that there exist unobserved determinants of WC and BR that are correlated with the error term, which would result in inconsistent estimates of Ordinary Least Squares. Hübler and Jirjahn (2003) tackle this problem by using a bivariate probit selection model comparable with a Heckman selection model (Cameron and Trivedi 2006, p. 547ff.). Another way to control for potential endogeneity would be to use an instrument variable or treatment effects model. Jirjahn (2010) for example uses the presence of owners as an instrument of works councils presence. They do not, however control for joint endogeneity of works councils and collective bargaining agreements. Both methods find that selection matters, and that OLS underestimates positive productivity and wage effects of works councils.[3] We follow the literature and correct for the selection of firms into a specifica bargaining regime using a bivariate probit approach, similar to Addison et al. (2010). We add two selectivity terms to our basic model, λ^{WC} and λ^{BR}, the estimated inverse Mill' ratio terms obtained in a bivariate probit estimation:

$$ y_k = X'_k \cdot \beta_k + WC \cdot \gamma_{k1} + BR \cdot \gamma_{k2} + \lambda^{WC}_k \cdot \delta_{k1} + \lambda^{BR}_k \cdot \delta_{k2} + \epsilon_k, k = 1, 2. \tag{2} $$

In our bivariate probit estimation we model the decision of adopting a works council

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[3]Our OLS estimates could be also downward biased if there are unobserved economic factors that increase the probability that a works council exists in a firm, while having a negative influence on establishment performance or wages. So far, in the literature of works councils, this has been ruled out.

or bind collectively as interdependent, i.e. with correlated error terms. We can reject the null hypothesis of uncorrelated errors from out data. For the time being we use the same subsets of control variables.

Another way to control for potential selection of firms into different bargaining regimes would be the use of panel estimators. This is not feasible in our case, as our measures of bargaining decentralisation, opening clauses and employment pacts, are only measured at two points of time. The use of linked-employer-employee data (LEED) could furthermore enable us to control for observable selection on the individual level. Apart from being only useful in the wage equation, censoring of individual wages and poor matching quality between firms and employees in the LIAB would cause more problems than it would solve. This als ensures to make our analysis comparable to the article of Hübler and Jirjahn (2003).

To capture the interaction effects between works councils and the different bargaining regimes we augment our basic model with an interaction term between WC and BR:

$$y_k = X'_k \cdot \beta_k + WC \cdot \gamma_{k1} + BR \cdot \gamma_{k2} + WC \cdot BR \cdot \gamma_{k3} + \lambda_k^{WC} \cdot \delta_{k1} + \lambda_k^{BR} \cdot \delta_{k2} + \epsilon_k, k = 1, 2. \quad (3)$$

If works councils act differently depending on the respective bargaining regime of the firm, we would except a non-negative interaction effect. From a theoretical point of view, we would expect that the interaction effect of our bargaining decentralisation measures with the works council dummy would be positive or zero in the wage level regression and negative in the productivity level regression.

Additionally, we follow perform separate regressions for subsamples with different bargaining regimes. The different wage and productivity effects of works councils depending on the bargaining regime in a firm could also exist for other characteristics. We would then expect the works council dummy variable to have a more positive effect on wages in firms whose collective bargaining agreements contain opening clauses or with an employment pact, while the productivity effect of works councils should be smaller in such firms.

Table 6 gives an overview of all variables (potentially) used in our regressions. We control for firm size and sourcing activities, various measures of economic outlook as well as productivity measures, ownership, firm age and legal form. The possible selection of employees into firms with different bargaining regimes should be captured by various measures for the composition of the workforce and hiring activities. For collectively covered firms we also include a dummy variable if the firms pays above the bargained wage. Additionally, 37 industry, 10 region and up to 4 year dummy variables are included

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in our models. In later versions of the paper we also want to control for the application and the type of opening clause and for the reason behind the introduction of an employment pact.

4 Empirical Findings

4.1 Works Council Presence and Collective Coverage

Table 3: Wage and Productivity Estimates with Respect to Collective Bargaining and Works Councils

Dep. Variable Specification	log. Wage (1a)	log. Prod. (1b)	log. Wage (2a)	log. Prod. (2b)
Works Council	0.0795*** (0.0067)	0.2223*** (0.0153)	0.1029*** (0.0070)	0.1962*** (0.0163)
Collective Bargaining	0.0039 (0.0060)	0.0548*** (0.0126)	-0.0001 (0.0061)	0.0661*** (0.0129)
λ^{WC}			0.4488*** (0.0489)	-0.5307*** (0.0974)
λ^{BR}			-0.2315*** (0.0887)	0.8493*** (0.1807)
N. of Obs.	23261	22481	23261	22481
R Squared	0.65	0.49	0.65	0.49

Dep. Variable Specification	log. Wage (3a)	log. Prod. (3b)	log. Wage (4a)	log. Prod. (4b)
Works Council	0.0772*** (0.0078)	0.1748*** (0.0182)	0.0994*** (0.0081)	0.1519*** (0.0191)
Collective Bargaining	0.0019 (0.0075)	0.0189 (0.0145)	-0.0031 (0.0076)	0.0319** (0.0148)
CBA * WC	0.0061 (0.0096)	0.0996*** (0.0222)	0.0088 (0.0096)	0.0934*** (0.0222)
λ^{WC}			0.4485*** (0.0489)	-0.5230*** (0.0974)
λ^{BR}			-0.2365*** (0.0889)	0.7891*** (0.1810)
N. of Obs.	23219	22439	23219	22439
R Squared	0.65	0.49	0.65	0.49

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01.
All other Variables listed in Table 8. Source: IAB Establishment Panel waves 2005 to 2008, own calculations (controlled remote data access via FDZ).

At first we replicate the findings of Hübler and Jirjahn (2003). This is necessary, because they both use another dataset (the Hanover Panel) and another time span (1994-

1997). Table 3 shows the results for the variables of interest, while table 8 in the appendix also shows the coefficients and standard errors of all control variables. Specification 1b and 1b use the simple model 1 and each contain two dummy variables for works council presence and coverage by a collective agreement. The existence of a works council is associated with a 6.7% higher wage level and a 16.2% higher productivity level, both significant at the 1% level. The fact that a firm is covered by a collective contract is correlated with a 1.6% higher wage and a 4.4% higher productivity level, although only the latter is significant at the 1% level, while the forme is only marginally significant at the 10% level. Hence, for both measures works councils seem to have a much stronger impact.

When introducing an interaction effect in specification 2a and 2b, this picture becomes more explicit. While the significance and magnitude of the works council effects do not change drastically, those for collective coverage do. Collective coverage on its own is not associated with significantly different levels of wages or productivity. For the wage level, this also holds true, when collective coverage is interacted with works council presence. On the other hand, the interaction effect is significant in the productivity level regression and has the same magnitude as the works council dummy variable. So, while the presence of a works council seems to increase the wage level independently from the bargaining regime, its effect on productivity doubles in collectively covered firms.

In the lower half of the table, specifications 3a to 3d show the results for our variables of interest when estimating subsamples.[4] The presence of a works councils is associated with a 8.6% higher wage level in collectively covered firms and a 6.4% higher wage level in uncovered firms. On the other hand, works council presence seem to increase the producivity level by 20.2% in covered firms, while only by 9.6% in uncovered ones. These results are almost the same as in Hübler and Jirjahn (2003) for productivity, but somewhat different for wages. So it still seems to hold that works councils can focus much harder on increasing productivity in covered firms, where they do not have to engage in rent-seeking acitivities that much. Contrary, they might seek rents there, too, and even more successfully than in uncovered firms (2.1 percentage points or about 25%).In the next step we try to explain these findings with the changes in the system of industrial relations.

4.2 Decentralisation and Works Council Behaviour

We argue that measures of flexibility and decentralisation have been introduced that force works councils to negotiate over working conditions and wages at the firm level, even if firms are collectively covered. Table 4 shows our wage and productivity estimates

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[4]These are comparable to tables 5 and 6 of Hübler and Jirjahn (2003).

for collectively covered firms with and without opening clauses and, respectively works councils. Specifications 1a and 1b show the estimates on the whole sample with an interaction effect, while we obtain specifications 2a to 2d using subsample regressions on collectively covered firms with and without opening clauses. We see from column 1a that works councils are associated with a 11.9% higher wage level and opening clauses with a 4.3% higher wage level, but also that the interaction term is not significantly different from zero. Looking at panels 2a and 2c, there is no difference in the magnitude of the works council dummy variable on the wage level. For the productivity estimates in panels 1a and 1b we can observe a different situation. Works councils seem to increase the productivity by 26.9% and this effect is even larger when opening clauses are present, by 14.8%. Opening clauses themselves, however, are even associated with a negative productivity change, although not significant. So when looking at the subsample regressions, the magnitude of the works council dummy variable is much larger for collectively covered firms with opening clauses (45.2% against 24.0%).

Interpreting these results, we cannot identify opening clauses as a measure of collective bargaining decentralisation that changes the behaviour of works councils. In firms with opening clauses works councils do not seem to be engaged in more rent-seeking than in firms without. Contrary, works councils are associated with a much larger productivity in firms with opening clauses. Next, we take a look at employment pacts.

Table 5 again presents the variables of interest of our wage and productivity estimates. We distinguish collectively covered firms with respect to works council and employment pact presence. Specification 1a and 1b show the estimates on the whole sample including an interaction effect. We can observe firm with works councils to have both a higher wage level, by 8.4%, and a higher productivity level, by 30.45%. Contrary, neither employment pacts per se nor their interaction with works councils seem to have any effect on wages or productivity. The effects on productivity, although not significant, indicate a negative effect of employment pacts, which is matched by an equally positive interaction effect, of about 8%. A similar same picture emerges when estimating through subsamples. The magnitude and significance of the works council dummy with respect to productivity does not seem to differ between the two subsample, i.e. between firms with or without an employment pact. Considerung the wage level, the magnitude of the works council effect stays the same, but it loses significance in the subsample of firms with employment pacts. This could be the case because of the small number of observations.

The results show that our theoretical hypotheses cannot be confirmed. The introduction of measures of decentralisation into collective contracts does not seem to change works council behaviour. Theory suggests that when confronted with the need to negotiate the application of opening clauses or employment pacts, works councils could not sustain

their effort in increasing productivity at the firm level. This is not the case. Contrary, we can observe an increased productivity in firms with works councils and opening clauses, while we do at least not observe a significantly decreased productivity in firms with works councils and employment pacts. Considering wages, our theoretical considerations would suggest a smaller or at least not larger effect of works councils in collectively covered firms. Subsequently a larger or at least not smaller effect of works councils should be observed in decentralised bargaining regimes. We do not find evidence for both. Considering covered firms, we find opposite effects compared with those of Hübler and Jirjahn (2003), namely an increased wage level in firms with a works councils also in covered firms. We try to explain this by the introduction of measures of flexibility into central collective bargaining agreements. Our results do not confirm this suspicion. Firm with and without opening clauses or employment pacts do not show different wage levels depending on works council presence.

5   Conclusion

In their 2003 paper, Olaf Huebler and Uwe Jirjahn analyse the interaction effects of works councils and collective bargaining on wages and productivity at the firm level. They find that collective bargaining reduces the opportunities of rent-seeking for works councils and impel them to increasingly engage in productivity-enhancing activities. We analyse whether the recent decentralisation of collective bargaining agreements in the form of opening clauses and employment pacts counteracts the moderating role of collective contracts on works council behaviour.

Using recent waves of the IAB Establishment Panel, we try to replicate the findings by Hübler and Jirjahn (2003). We find very similar results for productivity, but not for wages. Works council presence is associated with a higher wage level even in collectively covered firms. We argue that this could be caused by works councils being forced to negotiate employment pacts and the actual implementation of opening clauses on the firm level. Our findings, however, do not confirm this hypothesis. We do not observe higher wage levels in collectively covered firms with opening clauses or employment pacts. Instead, we find that the existence of opening clauses is associated with even higher productivity levels.

The aim of our paper is to shed some light on the effects bargaining decentralisation. The literature on industrial relations is aware of the interdependence between collective bargaining and works councils. This is not the case for the context of various measures of bargaining decentralisation or measures to increase the flexibility of collective contracts. We contribute to the literature by trying to explain contradictory results found in previous

research. The results show that the introduction of flexible measures into CBAs does not countervail the moderating role of works councils. In fact, in the case of opening clauses, works councils seem to concentrate even more on roles which allow them to increase the productivity of a plant

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A   Appendix

Table 4: Wage and Productivity Estimates with Respect to Opening Clauses and Works Councils

Dep. Variable Specification	log. Wage (1a)	log. Prod. (1b)	log. Wage (2a)	log. Prod. (2b)
Works Council	0.1187***	0.2432***	0.1128***	0.2047***
	(0.0132)	(0.0299)	(0.0159)	(0.0356)
Opening Clauses	0.0434***	0.0729***	0.0409**	-0.0297
	(0.0089)	(0.0213)	(0.0162)	(0.0308)
WC * OC			0.0085	0.1625***
			(0.0199)	(0.0436)
λ^{BR}	0.8567*	1.1485	0.3831	1.9009*
	(0.5169)	(0.9021)	(0.5850)	(1.0171)
λ^{WC}	0.1102	-0.5997***	0.0061	-0.7882***
	(0.0973)	(0.2139)	(0.1042)	(0.2352)
N. of Obs.	6518	6285	5479	5245
R Squared	0.66	0.55	0.66	0.54

Opening Clauses Exist		No		Yes	
Dep. Variable Specification	log. Wage (1a)	log. Prod. (1b)	log. Wage (2a)	log. Prod. (2b)
Works Council	0.1194***	0.1839***	0.1141***	0.4084***
	(0.0150)	(0.0340)	(0.0268)	(0.0601)
λ^{BR}	0.5116	0.2164	1.1501	4.3015*
	(0.6171)	(1.0602)	(1.0435)	(2.3030)
λ^{WC}	0.2323**	-0.4011*	-0.1345	-0.8993**
	(0.1130)	(0.2362)	(0.1666)	(0.3839)
N. of Obs.	4570	4407	1948	1878
R Squared	0.64	0.56	0.65	0.48

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

All other Variables listed in Table 8. Source: IAB Establishment Panel waves 2005 and 2007, own calculations (controlled remote data access via FDZ).

Table 5: Wage and Productivity Estimates with Respect to Employment Pacts and Works Councils

Dep. Variable Specification	log. Wage (1a)	log. Prod. (1b)	log. Wage (2a)	log. Prod. (2b)
Works Council	0.0855***	0.2498***	0.0872***	0.2420***
	(0.0185)	(0.0439)	(0.0185)	(0.0447)
Employment Pact	0.0382**	-0.0312	0.0383	-0.0675
	(0.0160)	(0.0434)	(0.0594)	(0.0864)
WC * EP			-0.0004	0.0417
			(0.0619)	(0.0987)
λ^{BR}	0.1115	-2.4126***	0.1120	-2.3962***
	(0.2865)	(0.5958)	(0.2870)	(0.6009)
λ^{WC}	0.2313*	-0.0889	0.2440**	-0.1127
	(0.1230)	(0.2478)	(0.1233)	(0.2484)
N. of Obs.	3111	3012	3106	3007
R Squared	0.66	0.55	0.66	0.55

Employment Pact Exists	No		Yes	
Dep. Variable Specification	log. Wage (1a)	log. Prod. (1b)	log. Wage (2a)	log. Prod. (2b)
Works Council	0.0830***	0.2396***	0.0715	0.3035**
	(0.0190)	(0.0456)	(0.0932)	(0.1297)
λ^{BR}	-0.0536	-2.8965***	-0.2315	-2.0285
	(0.3324)	(0.7042)	(0.8700)	(2.2193)
λ^{WC}	0.2547*	-0.0567	-0.1422	-0.3135
	(0.1318)	(0.2616)	(0.3574)	(1.0815)
N. of Obs.	2696	2612	415	400
R Squared	0.65	0.55	0.58	0.50

Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

All other Variables listed in Table 8. Source: IAB Establishment Panel waves 2006 and 2008, own calculations (controlled remote data access via FDZ).

Table 6: Operationalisation and Summary Statistics of Covariates

Variable	Operationalisation	Observations	Mean	Std. Dev.
Labour Productivity	Log. (turnover-intermediates) divided by number of employee	41,745	15.94	0.97
Wage Level	Log. firm wage sum divided by number of employees	53,071	7.32	0.67
Collective Bargaining	Dummy variable (1 if covered by collective contract, 0 otherwise)	57,457	0.46	0.49
Works Council	Dummy Variable (1 if works council present, 0 otherwise)	62,115	0.33	0.47
Opening Clauses Existence	Dummy variable (1 if opening clauses exist, 0 otherwise)	13,966	0.31	0.46
Application of Opening Clauses	Dummy variable (1 if opening clauses applied, 0 otherwise)	4,035	0.53	0.49
Employment Pact	Dummy variable (1 employment pact exists, 0 does not exist)	32,880	0.14	0.35
Crisis Pact	Dummy variable (1 if pact is against firm crisis, 0 otherwise)	1,043	0.32	0.46
Competition Pact	Dummy variable (1 if pact to increase competitiveness, 0 otherwise)	1,043	0.45	0.49
Firm Size	Log. of employees	62,370	3.27	1.83
Firm Size squared	Log. of employees, squared	62,370	14.08	13.97
Outsourcing Activities	Dummy variable (1 if outsourcing present, 0 otherwise)	62,370	0.03	0.18
Insourcing Activities	Dummy variable (1 if insourcing present, 0 otherwise)	61,784	0.03	0.17
Employment Outlook	Index variable (1 risen employment, 2 stagnated employment, 3 fallen employment)	56,998	1.98	0.52
Turnover Outlook	Index variable (1 risen turnover, 2 stagnated turnover, 3 fallen turnover)	56,807	1.94	0.66
Economic Outlook	Dummy variable (1 good economic outlook, 0 otherwise)	51,754	0.37	0.48
Employment Outlook	Ratio of planned employment against actual employment	14,479	1.01	0.62
Export Activity	Dummy variable (1 positive exports, 0 zero exports)	49,967	0.22	0.41
Export Share	Share of exports on turnover	49,967	0.07	0.18
Investment Activity	Dummy variable (1 investments made, 0 no investments made)	62,007	0.64	0.47
Investments	Share of investments on turnover	44,470	0.06	0.35
Capital Intensity	Dummy variable (1 if technical condition of assets good, 0 otherwise)	62,027	0.66	0.47
Foreign Ownership	Dummy variable (1 in foreign ownership, 0 otherwise)	59,841	0.05	0.22
Public Ownership	Dummy variable (1 in public ownership, 0 otherwise)	59,841	0.09	0.29
Origin of Firm	Dummy variable (1 if newly founded firm, 0 otherwise)	29,154	1.43	0.74
New Firm	Dummy variable (1 younger than 1990, 0 older than 1990)	62,370	0.47	0.49
Firm Age	Firm age in years up to, censored at 20	61,782	15.26	6.08
Legal Form	Dummy variable (1 if publicly listed, 0 otherwise)	61,684	0.49	0.49
Subsidiary	Dummy variable (1 if independent firm, 0 subsidiary)	61,563	0.71	0.45
Craft	Dummy variable (1 member of a craft association, 0 not member)	61,758	0.22	0.41
Qualification	Share of skilled employees	62,356	0.57	0.27
	Share of highly skilled employees	62,357	0.21	0.23
	Share of female employees	46,873	0.43	0.30
Flexible Employment	Share of flexible employees	62,370	0.10	0.17
Hiring Activity	Share of newly hired employees	62,149	0.05	0.12
	Share of open positions	62,226	0.01	0.16
Dismissal Activity	Share of quits	62,120	0.06	0.71
Training	Share of apprentices and trainees	62,366	0.04	0.09
	Dummy Variable (1 if firm allowed to train apprentices, 0 otherwise)	62,302	0.72	0.44
Paying more than the bargained wage	Dummy variable (1 yes, 0 no)	46,574	0.19	0.39
Industry	Dummy variables for 37 different industries			
Region	Dummy variables for 10 different regions			
Year	Dummy variables for all years			

Table 7: Biprobit Selection Estimation of Collective Bargaining and Works Councils

Variable	Collective Bargaining		Works Council	
	Univatiate	Bivariate	Univariate	Bivariate
log. Size	-0.0251	0.9946***	-0.0346	0.9919***
	(0.0374)	(0.0647)	(0.0373)	(0.0633)
log. Size Squared	0.0175***	-0.0352***	0.0188***	-0.0350***
	(0.0044)	(0.0075)	(0.0044)	(0.0074)
Insourcing	-0.1540***	-0.0627	-0.1528***	-0.0692
	(0.0561)	(0.0608)	(0.0559)	(0.0603)
Outsourcing	-0.0031	0.0672	-0.0041	0.0690
	(0.0536)	(0.0580)	(0.0535)	(0.0575)
Paying Above CBA	1.7420***	0.3743***	1.7279***	0.3740***
	(0.0249)	(0.0261)	(0.0246)	(0.0258)
Craft	0.2970***	-0.3858***	0.2974***	-0.3724***
	(0.0245)	(0.0305)	(0.0245)	(0.0301)
Firm Age	-0.0053*	-0.0156***	-0.0053*	-0.0155***
	(0.0029)	(0.0037)	(0.0029)	(0.0037)
New firm	-0.2938***	-0.3869***	-0.2916***	-0.3860***
	(0.0386)	(0.0493)	(0.0386)	(0.0493)
Legal Form	-0.0656***	0.3076***	-0.0682***	0.3115***
	(0.0237)	(0.0335)	(0.0236)	(0.0336)
Foreign Ownership	0.0891**	0.2254***	0.0904**	0.2292***
	(0.0401)	(0.0421)	(0.0402)	(0.0423)
Public Ownership	0.5217***	1.5457***	0.5284***	1.5116***
	(0.0721)	(0.0884)	(0.0718)	(0.0885)
Investment Activity	-0.0976***	-0.0235	-0.0993***	-0.0226
	(0.0215)	(0.0275)	(0.0215)	(0.0274)
Capital Intensity	-0.0186	-0.1879***	-0.0185	-0.1870***
	(0.0241)	(0.0293)	(0.0240)	(0.0292)
Single Firm	-0.1475***	-0.5710***	-0.1413***	-0.5692***
	(0.0240)	(0.0256)	(0.0240)	(0.0256)
Flexible Employment	-0.1727***	-1.8284***	-0.1760***	-1.8358***
	(0.0627)	(0.1224)	(0.0626)	(0.1220)
Share of Women	0.0975**	0.0854	0.0949**	0.0892*
	(0.0409)	(0.0536)	(0.0409)	(0.0535)
Share of Skilled	0.0643	0.2640***	0.0658	0.2636***
	(0.0434)	(0.0542)	(0.0434)	(0.0536)
Share of Highly-Skilled	-0.6914***	0.4361***	-0.6858***	0.4692***
	(0.0730)	(0.0839)	(0.0728)	(0.0834)
Share of Trainees	0.1081	-0.8092***	0.0952	-0.7359***
	(0.1180)	(0.1807)	(0.1173)	(0.1809)
Share of Hires	0.0120	-2.7255***	0.0108	-2.6458***
	(0.0799)	(0.2346)	(0.0793)	(0.2291)
Share of Quits	0.0128	0.1689***	0.0156	0.1692***
	(0.0384)	(0.0611)	(0.0360)	(0.0592)
Share of Vacancies	0.0192	-1.5976***	0.0194	-1.5467***
	(0.0463)	(0.5210)	(0.0464)	(0.5091)
Training Firm	0.1381***	0.0014	0.1360***	0.0178
	(0.0265)	(0.0347)	(0.0265)	(0.0347)
Eonomic Outlook	-0.0599***	-0.0949***	-0.0611***	-0.0963***
	(0.0198)	(0.0237)	(0.0198)	(0.0237)
Export Activity	-0.3739***	-0.2143***	-0.3763***	-0.2120***
	(0.0326)	(0.0348)	(0.0328)	(0.0346)
Share of Exports	0.3894***	0.2244***	0.3906***	0.2294***
	(0.0703)	(0.0716)	(0.0706)	(0.0715)
Dummy variables	Yes	Yes	Yes	Yes
Constant	-0.6427***	-3.1384***	-0.6383***	-3.1681***
	(0.1187)	(0.1793)	(0.1186)	(0.1791)
Rho				0.3028***
				(0.0163)
N	26235	26235	26235	26235
Chi Squared	7073.16	15041.78	7767.84	15041.78
Pseudo R Squared	0.32		0.50	
Log-Likelihood	-12034.105	-20005.94	-8147.3224	-20005.94

*Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01.*
Source: IAB Establishment Panel waves 2005 to 2008, own calculations (controlled remote data access via FDZ).

Table 8: Wage and Productivity Estimates with Respect to Collective Bargaining and Works Councils

Collective Bargaining	No				Yes			
Dep. Variable Specification	log. Wage (1a)	log. Prod. (1b)	log. Wage (2a)	log. Prod. (2b)	log. Wage (3a)	log. Prod. (3b)	log. Wage (3c)	log. Prod. (3d)
Works Council	0.0684***	0.1493***	0.0949***	0.1268***	0.1030***	0.2746***	0.1137***	0.2578***
	(0.0091)	(0.0207)	(0.0095)	(0.0217)	(0.0102)	(0.0238)	(0.0106)	(0.0244)
log. Size	0.2164***	-0.0430	0.2486***	-0.0751***	0.1322***	-0.0569**	0.1614***	-0.0940***
	(0.0141)	(0.0265)	(0.0139)	(0.0270)	(0.0120)	(0.0255)	(0.0164)	(0.0318)
log. Size Squared	-0.0226***	0.0013	-0.0221***	0.0033	-0.0114***	0.0014	-0.0130***	0.0044
	(0.0018)	(0.0033)	(0.0017)	(0.0036)	(0.0012)	(0.0026)	(0.0014)	(0.0028)
Insourcing	0.0150	-0.0685*	0.0235	-0.1010**	0.0249	-0.0449	0.0249	-0.0550
	(0.0181)	(0.0381)	(0.0189)	(0.0393)	(0.0164)	(0.0411)	(0.0164)	(0.0411)
Outsourcing	0.0143	0.1631***	0.0173	0.1588***	0.0081	0.0274	0.0097	0.0238
	(0.0184)	(0.0405)	(0.0183)	(0.0405)	(0.0156)	(0.0372)	(0.0157)	(0.0373)
Paying Above CBA	0.0243*	-0.0163	-0.1194**	0.3833***	0.0274***	0.0699***	0.0125	0.2521***
	(0.0144)	(0.0296)	(0.0565)	(0.1200)	(0.0072)	(0.0156)	(0.0274)	(0.0559)
Craft	-0.0392***	-0.2442***	-0.0922***	-0.1493***	-0.0973***	-0.3638***	-0.1106***	-0.3230***
	(0.0083)	(0.0159)	(0.0133)	(0.0261)	(0.0089)	(0.0186)	(0.0105)	(0.0218)
Firm Age	0.0063***	0.0138***	0.0058***	0.0135***	0.0040***	0.0153***	0.0037***	0.0153***
	(0.0009)	(0.0019)	(0.0009)	(0.0019)	(0.0013)	(0.0029)	(0.0013)	(0.0030)
New Firm	0.0118	0.0448*	0.0167	-0.0019	0.0103	0.1113***	0.0050	0.0937**
	(0.0120)	(0.0234)	(0.0152)	(0.0298)	(0.0165)	(0.0382)	(0.0174)	(0.0397)
Legal Form	0.2702***	0.2525***	0.2819***	0.2331***	0.1627***	0.1540***	0.1680***	0.1408***
	(0.0084)	(0.0154)	(0.0087)	(0.0159)	(0.0094)	(0.0196)	(0.0096)	(0.0201)
Foreign Ownership	0.0766***	0.2837***	0.0921***	0.2799***	0.0273**	0.1749***	0.0327***	0.1765***
	(0.0133)	(0.0311)	(0.0137)	(0.0322)	(0.0109)	(0.0289)	(0.0112)	(0.0294)
Public Ownership	0.1623***	0.2085***	0.1946***	0.2576***	0.1512***	0.0341	0.1750***	0.0578
	(0.0248)	(0.0671)	(0.0310)	(0.0784)	(0.0183)	(0.0531)	(0.0222)	(0.0578)
Investment Activity	0.0367***	0.0635***	0.0460***	0.0410***	0.0351***	0.1348***	0.0364***	0.1235***
	(0.0075)	(0.0142)	(0.0080)	(0.0157)	(0.0088)	(0.0176)	(0.0089)	(0.0179)
Capital Intensity	0.0434***	0.0825***	0.0346***	0.0886***	0.0230**	0.0526***	0.0195**	0.0550***
	(0.0079)	(0.0159)	(0.0081)	(0.0161)	(0.0090)	(0.0199)	(0.0091)	(0.0200)
Single Firm	-0.0313***	-0.1389***	-0.0597***	-0.1344***	-0.0079	-0.1023***	-0.0218**	-0.0943***
	(0.0080)	(0.0184)	(0.0103)	(0.0227)	(0.0077)	(0.0191)	(0.0094)	(0.0221)
Flexible Employment	-1.3481***	-1.1333***	-1.3898***	-1.1211***	-1.2364***	-1.1073***	-1.2682***	-1.0829***
	(0.0278)	(0.0457)	(0.0295)	(0.0487)	(0.0353)	(0.0627)	(0.0377)	(0.0693)
Share of Women	-0.3026***	-0.4196***	-0.3090***	-0.3984***	-0.3735***	-0.3522***	-0.3719***	-0.3447***
	(0.0148)	(0.0281)	(0.0151)	(0.0291)	(0.0188)	(0.0400)	(0.0189)	(0.0402)
Share of Skilled	0.2771***	0.2638***	0.2847***	0.2654***	0.2821***	0.3477***	0.2883***	0.3435***
	(0.0158)	(0.0307)	(0.0159)	(0.0308)	(0.0166)	(0.0361)	(0.0168)	(0.0365)
Share of Highly-Skilled	0.6066***	0.3349***	0.6819***	0.1883***	0.7981***	1.0998***	0.8233***	1.0081***
	(0.0229)	(0.0470)	(0.0276)	(0.0560)	(0.0321)	(0.0744)	(0.0336)	(0.0786)
Share of Trainees	-0.9085***	-0.8474***	-0.9598***	-0.7836***	-0.6881***	-0.4814***	-0.7053***	-0.4527***
	(0.0486)	(0.0792)	(0.0493)	(0.0797)	(0.0556)	(0.0918)	(0.0565)	(0.0935)
Share of Hires	-0.1636***	-0.7414***	-0.2395***	-0.6637***	-0.2900***	-1.0365***	-0.3267***	-0.9730***
	(0.0303)	(0.0652)	(0.0337)	(0.0677)	(0.0450)	(0.0887)	(0.0522)	(0.0965)
Share of Quits	0.0009	0.2711***	0.0082	0.2712***	0.0538	0.1570*	0.0560	0.1551**
	(0.0158)	(0.0370)	(0.0150)	(0.0369)	(0.0367)	(0.0803)	(0.0383)	(0.0789)
Share of Vacancies	0.0028	-0.0593***	-0.0058	-0.0487***	-0.3552***	-0.7528***	-0.3809***	-0.7182***
	(0.0092)	(0.0225)	(0.0078)	(0.0184)	(0.0995)	(0.2695)	(0.1095)	(0.2632)
Trainee Firm	0.0381***	0.1450***	0.0302***	0.1696***	-0.0085	0.1617***	-0.0089	0.1763***
	(0.0091)	(0.0172)	(0.0098)	(0.0189)	(0.0126)	(0.0275)	(0.0128)	(0.0281)
Eonomic Outlook	0.0482***	0.1746***	0.0471***	0.1670***	0.0233***	0.1217***	0.0217***	0.1195***
	(0.0064)	(0.0129)	(0.0067)	(0.0134)	(0.0071)	(0.0160)	(0.0071)	(0.0160)
Export Activity	0.0463***	0.1646***	0.0684***	0.0941***	0.0491***	0.0881***	0.0503***	0.0582**
	(0.0089)	(0.0184)	(0.0137)	(0.0282)	(0.0107)	(0.0260)	(0.0117)	(0.0277)
Share of Exports	0.1093***	0.2018***	0.1001***	0.2624***	0.0888***	0.2575***	0.0884***	0.2890***
	(0.0192)	(0.0462)	(0.0219)	(0.0521)	(0.0202)	(0.0533)	(0.0208)	(0.0545)
λ^{BR}			-0.6074***	1.5245***			-0.0879	0.7489***
			(0.2014)	(0.4175)			(0.1083)	(0.2277)
λ^{WC}			0.6014***	-0.5482***			0.2324***	-0.3144*
			(0.0696)	(0.1437)			(0.0771)	(0.1646)
Constant	6.9009***	15.6587***	6.7667***	15.1165***	7.0018***	16.0480***	6.8430***	15.9068***
	(0.0424)	(0.1179)	(0.1165)	(0.3119)	(0.0828)	(0.1125)	(0.1246)	(0.2002)
Dummy Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. of Obs	13632	13184	13632	13184	9629	9297	9629	9297
F-Stat.	466.81	228.99	452.92	222.21	365.91	248.34	356.51	242.18
R Squared	0.64	0.45	0.65	0.45	0.66	0.54	0.66	0.54
Akaike- Criterion	10369.18	27146.14	10279.32	27117.52	5368.58	19476.67	5359.10	19467.42

*Robust standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01.*
Source: IAB Establishment Panel waves 2005 to 2008, own calculations (controlled remote data access via FDZ).