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Joachim Wagner

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German Works Councils and Productivity: First Evidence from a Nonparametric Test

Joachim Wagner

University of Lueneburg, Institute of Economics
Institute for the Study of Labor (IZA), Bonn
wagner@uni-lueneburg.de

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Abstract:

This paper presents the first nonparametric test whether German works councils go hand in hand with higher labor productivity or not. It distinguishes between establishments that are covered by collective bargaining or not. Results from a Kolmogorov-Smirnov test for first order stochastic dominance tend to indicate that pro-productive effects are found in firms with collective bargaining only. However, the significance level of the test statistic is higher than a usually applied critical level. This somewhat weak evidence casts doubts on the validity of results from recent parametric approaches using a regression framework that point to high positive effects of works councils on productivity.

Keywords: Works councils, productivity, stochastic dominance

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Address for correspondence:

Prof. Dr. Joachim Wagner
University of Lueneburg , Institute of Economics
Campus 4.210
D-21332 Lueneburg, Germany

Phone: +49-4131-78-2330
Fax: +49-4131-78-2026
http://www.uni-lueneburg.de/fb2/vwl/wifo

1. Motivation

The crucial role of productivity for prosperity and growth of an economy is one of the central findings from modern growth theory and empirics. As Elchanan Helpman (2004, p. 55) recently put is: "Productivity ... accounts for more than half the variation across countries in income per capita, and much more than half the variation across countries in growth rates of income per capita. Therefore, to understand the sources of economic growth, one must understand what causes productivity growth." He goes on to point out the crucial role of institutions (like property rights, and the rule of law) for growth, and argues that a better understanding of several features of modern societies, including the structure of labor relations, is extremely important for greater insight into modern economic growth (Helpman 2004, p. 141).

One of the institutions that are specific to labor relations in Germany is the works council. Workers in establishments with at least five employees have the right to elect a works council who has information, consultation, and codetermination rights. Note that works councils while mandatory are not automatic and, as a practical matter, their presence is sporadic in smaller establishments and near universal in large plants with 500 workers or more (for details, see Addison, Bellmann, Schnabel and Wagner 2004).

In theory, works councils can be expected to have both positive and negative impacts on firm performance due to its two faces: On the one hand, works councils can use their powers to delay or modify management decisions and shift rents to the employees. On the other hand, they can also improve the efficiency of the establishment through productive information exchange, consultation, and codetermination. A canonical reference for the theoretical discussion of these issues is the Freeman and Lazear (1995) model.

It follows that establishing the direction and extent of works councils' impact on productivity is an empirical question. The econometric literature on German works councils is a work in progress, so that there is ongoing debate as to the consequences of the institution (a recent contribution is Schank, Schnabel and Wagner 2004; for a comprehensive survey, see Addison, Schnabel and Wagner 2004). In an important contribution to this debate Hübler and Jirjahn (2003) use a bargaining model to derive the hypothesis that in establishments covered by collective bargaining agreements works councils are more likely to be engaged in productivity-enhancing activities and less engaged in rent-seeking activities than their counterparts in uncovered establishments. They argue that even if productivity-enhancing work practices must be negotiated at the establishment level between management and works councils, these are more easily negotiated when substantial distributional conflicts are moderated on a central level by unions and employers' associations. In an empirical analysis using a regression framework this hypothesis is confirmed.

This paper contributes to the literature on role of labor relations for productivity in Germany by providing the first nonparametric test of the hypothesis put forward by Hübler and Jirjahn (2003). The main advantage of the procedure used here is that it tests not only for differences in the mean productivity of both groups of establishments but for differences in all moments of the productivity distribution. Section 2 discusses the empirical strategy and the plant level data used; section 3 presents the empirical results; section 4 concludes.

2. Empirical strategy and data

The empirical strategy applied here to test the hypothesis stated above uses a non-parametric test for first order stochastic dominance of one productivity distribution over another (for a

recent application in a related area, see Wagner 2005): Let F and G denote the cumulative distribution functions of productivity for two groups of firms (say, firms with and without a works council). First order stochastic dominance of F relative to G is given if $F(z) - G(z)$ is less or equal zero for all z with strict inequality for some z. Given two independent random samples of plants from each group, the hypothesis that F is to the right of G can be tested by the Kolmogorov-Smirnov test based on the empirical distribution functions for F and G in the samples (for details, see Conover 1999, p. 456ff.). Note that this tests not only for differences in the mean productivity of both groups (like in almost all other papers in the literature on works councils and productivity) but for differences in all moments of the distribution.

The data used in this note were collected in personal interviews with firm owners or top managers. The population covered encompasses all manufacturing establishments with at least 5 employees in the German state of Lower Saxony. From this population a random sample (stratified by industry and size classes) was interviewed. Detailed information on the data set and how it can be accessed by researchers is given in Gerlach, Hübler and Meyer (2003). This survey has information on whether or not a plant had a works council in 1994, and whether or not it was covered by collective bargaining. Therefore, we can distinguish four groups of establishments: Group A with a works council and with coverage by collective bargaining, Group B without a works council and with coverage by collective bargaining, Group C with a works council and without coverage by collective bargaining, and Group D without a works council and without coverage by collective bargaining. According to the theoretical hypothesis stated above the distribution of productivity in Group A should dominate the distribution in Group B, while this should not be the case for Group C compared with Group D.

To test this hypothesis the sample is restricted to establishments with 21 to 100 employees for three reasons: First, works councils are more often found in larger establishments. If establishments from all size classes with and without works councils were compared, scale effects and works council effects might be mixed. Second, works council rights are a step-function of establishment size measured by the number of employees, with works councils in larger establishments having more far-reaching codetermination rights. These works council rights, however, are a datum in establishments with 21 to 100 employees. Third, works councils tend to be rare in establishments with less than 21 employees, and more or less the rule in establishments with more than 100 employees, while about half of all establishments with 21 to 100 employees have a works council. Therefore, looking at establishments with 21 to 100 employees separately is a common approach in the empirical literature dealing with works council's impacts.

A disadvantage which is common in the kind of survey data used here is that we do not have information on the capital stock; therefore, we cannot calculate total factor productivity. Instead, we use value added per employee as an indicator for labour productivity. To mitigate concerns that performance differences simply reflect differences in the sectoral composition of the firm types, value added per employee is calculated relative to the two-digit industry mean, and is in logged values.

3. Results

The sample used here is made of 294 manufacturing establishments, 160 (or 54 percent) of which had a works council. 126 establishments belong to Group A (works council, collective bargaining), 54 to Group B (no works council, collective bargaining), 34 to Group C (works

council, no collective bargaining), and 80 to Group D (no works council, no collective bargaining).

According to table I differences of the mean values for value added per employee (calculated relative to the two-digit industry mean, and logged) conform with the hypothesis stated above: The difference between Group A and Group B is positive and statistically significant at an error level of 2.2 percent, while the positive difference between Group C and Group D is not statistically significant at any conventional error level.

Results of the two-sample Kolmogorov-Smirnov tests reveal that not only the means of the productivity distributions are ranked in this way. Using an error level of 7.5 percent, we find that in line with the hypothesis stated above the productivity distribution of Group A dominates that of Group B, while the nonparametric test applied here does not reject the null hypothesis of no difference between the two productivity distributions for Group C and Group D at any conventional error level. Note, however, that the evidence might be considered somewhat weak – the error level of 7.5 percent lies well above the usually used critical level of 5 percent.

4. Conclusions

This paper presents the first non-parametric test of the hypothesis that German works councils go hand in hand with higher labor productivity in establishments that are covered by collective bargaining only. Results from a Kolmogorov-Smirnov test for first order stochastic dominance are in line with this hypothesis, although the significance level of the test statistic is 7.5 percent – higher than a usually applied critical level. This somewhat weak evidence

casts doubts on the validity of results from recent parametric approaches using a regression framework that point to high positive effects of works councils on productivity.

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Table I

Results of the empirical investigation

		Group A Firms with works council and with collective bargaining	Group B Firms without works council and with collective bargaining	Group C Firms with works council and without collective bargaining	Group D Firms without works council and without collective bargaining
Number of establishments		126	54	34	80
Value added/employee	mean	4.499	4.318	4.579	4.477
	standard deviation	0.403	0.506	0.441	0.479
			Group A vs. Group B	Group C vs. Group D	
Prob-values of t-tests for differences in the means[1]					
Value added/employee			0.022	0.137	
Prob-values of two-sample Kolmogorov-Smirnov test[2]					
Value added/employee			0.075	0.262	

[1] Test of H_0: mean of first group equal to mean of second group against H_a: mean of first group larger than mean of second group
[2] Test of H_0: distributions are equal against H_a: distribution of first group stochastically dominates distribution of second group

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Universität Lüneburg
Institut für Volkswirtschaftslehre
Scharnhorststr. 1
D-21332 Lüneburg
Tel: ++49 4131 78 2321
email: brodt@uni-lueneburg.de
www.uni-lueneburg.de/vwl/papers