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Payment Schemes, Returns and Works Councils

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Abstract

The interdependences of payment schemes, returns and the existence of a works council are analysed by using data collected on German firms in the sector of mechanical engineering. There is no connection between payment schemes and returns, whereas a works council has a negative effect on a firm's returns as has been found in former studies. Although a strong correlation between the use of different payment schemes and works councils exists, this is only due to firm size. Finally, a first model of the determinants of newly-founded works councils is estimated, validating the former results and suggesting a new direction for further research.

Zusammenfassung

Die Zusammenhänge zwischen Entlohungsformen, Erträgen und der Existenz eines Betriebsrats werden analysiert unter Verwendung von Daten deutscher Maschinenbaufirmen. Es gibt keine Verbindung zwischen Entlohnungsformen und Erträgen, während ein Betriebsrat einen negativen Effekt auf die betriebliche Ertragslage aufweist, wie bereits in früheren Studien gezeigt wurde. Obgleich eine starke Korrelation zwischen der Verwendung unterschiedlicher Entlohnungsformen und Betriebsräten besteht, ist diese allein auf Größeneffekte zurückzuführen. Schließlich wird erstmals ein Modell mit den Bestimmungsgründen für neugegründete Betriebsräte geschätzt, was die vorherigen Ergebnisse bestätigt und zugleich Möglichkeiten zur weiteren Forschung aufzeigt.

JEL Classification: M52, J53, J33

1. Introduction

Works councils are the central institution of co-determination on the plant level in Germany. They have no bargaining rights concerning the wage level.

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Wage negotiations are done between unions and firms' management or their employers' associations. However, works councils have legal rights in designing the payment schemes as well as forming flexible working hours.[1]

Therefore, the relationship between the used payment schemes in a firm and the existence of a works council is the subject of Section 2 of this article. For the first time, data of the *NIFA-Panel* are used to examine this relationship.[2] The *NIFA-Panel* is an annual survey of all firms (willing to answer) within the German sector of mechanical engineering from 1991 to 1998.[3]

Section 3 reports and discusses some results by Dilger (2002) regarding the relationship between works councils and the returns of firms. Section 4 examines the interdependence of returns and payment schemes. The interrelationship of all three variables, payment schemes, return and works councils, has a strange pattern. That is the reason why Section 5 employs logit models in an effort to find the true determinants of the payment schemes chosen in real firms. This will qualify the results of Section 2.

It might be that the existing payment schemes within a firm influence the founding of a works council instead of the other way round. Thus, in Section 6 logit models are estimated with new works councils as the dependent variable. Because there are more newly-founded works councils in the *NIFA-Panel* than in any other panel data set, this is possible for the first time, which is also interesting in its own right. Finally, Section 7 concludes.

2. Payment Schemes and Works Councils

In the 5th wave of the *NIFA-Panel,* conducted in 1995, a question is posed concerning the payment schemes for the workers handling the machines in the manufacturing sector. In all, 1,611 firms responded to this question. 89.4 % of the firms are paying time rates. 13.1 % are paying individual piece rates, whereas 6.1 % use group piece rates. 26.6 % of the firms have premium pay. Finally, 3.1 % employ other payment schemes. Almost every possible combination of these various payment schemes can be found in some firm or another.

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1 Cf. Niedenhoff (2002). See Federal Minister of Labour and Social Affairs (1990) for an official translation into English of the decisive "Betriebsverfassungsgesetz". The law has been changed last year (for an economic analysis of these changes see Addison / Bellmann / Schnabel / Wagner 2002), but not in the parts highly relevant to this paper.

2 Other studies are Hübler / Heywood / Jirjahn (1998), Hübler / Jirjahn (1998) and Heywood / Jirjahn (2002), finding a significantly positive influence of works councils on individual and group piece rates by using the *Hanover Panel.*

3 Cf. Schmidt / Widmaier (1992), Widmaier (1996) and especially Widmaier (2001), who explains how everyone can get the data for replications and other scientific purposes. Firms in the eastern part of Germany, the former GDR, have been questioned since 1993.

A question about the existence of a works council in the firm was included in the survey in 1994 and 1996. In 1996 works councils existed in 62.6 % of all firms.[4] The relevant issue here is the relationship between payment schemes and works councils. What can be expected? Time rates are negotiated between unions and firms, their correct payment is easy to monitor by the employees themselves or, in an unlikely dispute about this, by court. Therefore, works councils are not necessary to implement and supervise time rates, leading one to expect a negative correlation or no correlation at all between the two. The expected relationship is different for individual piece rates and also group piece rates. Works councils can help to develop them in more detail and monitor the proper use, preventing, for example, some kind of ratchet effect[5]. In a highly similar vein one can expect a positive relationship between works councils and premium pay. The remaining other payment schemes are way too heterogeneous in order to make any qualified guesses.

Table 1 shows that the relationship between payment schemes and works councils (in 1994 and 1996 compared to none in both years) is as anticipated.[6] For time rates the correlation is negative and statistically significant. For individual and group piece rates as well as for premium pay the correlation is significantly positive, whereas no difference can be found for other payment schemes when comparing firms with or without a works council.

Table 1

Payment Schemes and Works Councils

Payment Schemes	Without Works Council	With Works Council	Significance of x^2-Test
Time Rate	94.2%	86.5%	< 1‰
Individual Piece Rate	5.8%	17.6%	< 1‰
Group Piece Rate	3.1%	9.2%	< 1‰
Premium Pay	21.2%	29.5%	< 5 %
Others	2.4%	3.4 %	None

Data source are the 4th to 6th waves of the *NIFA-Panel,* 1994 to 1996.

4 Cf. Dilger (2002) with more details.

5 See Weitzman (1976, 1980) or Ickes / Samuelson (1987) for the ratchet effect. It means that workers are willing to work harder and earn more when piece rates are used, but hesitate to do so because they fear that the employers may lower the piece rates as soon as they see how much the workers really can do and that the hourly wages are very high by the initial piece rates. So both sides lose as long as the employers cannot bind themselves that they will not change the piece rates opportunistically.

6 These and all following calculations and estimations are done by using SPSS 10.0 for Windows.

3. Works Councils and Returns

The relationship between works councils and returns of the firms is very important and it has also been analysed quite thoroughly. See chapter 8 in Dilger (2002) for empirical results with data of the *NIFA-Panel* and references to other econometric studies. Moreover, see Table 2 in Section 4 of this article for the key result that works councils are correlated with or even bring about lower returns compared to firms without this form of co-determination.

There are some different explanations for this result, e.g. a possible inefficiency of co-determined management decisions, redistribution of rents by works councils or some kind of efficiency enhancing effects, benefiting workers more than costing owners.[7] In any case, only a negative influence on returns is plausible given the fact that works councils are mandated by law and would not exist otherwise, at least not in the German form. However, while the owners suffer independently of the type of works council, that is, whether the works council is antagonistic toward the management or cooperative or shows any other kind of behaviour, its negative effect on profits can be limited or even halted by management's readiness to truly integrate an existing works council into the decision making process rather than simply tolerate its existence as dictated by law. Hence, managers acting on behalf of the owners should do exactly that.[8]

4. Returns and Payment Schemes

Profit maximizing firms would always choose the optimal payment schemes. Piece rates, especially individual piece rates, and premium pay are said to have higher incentive (and also positive selection) effects.[9] That means, *ceteris paribus,* they increase the return compared to time rates. However, the circumstances are different (not *ceteris paribus*), if variable pay is applicable than if it is not.

Facing this, the relationship can be ascertained only empirically. Therefore an ordered logit model is estimated using the subjective evaluation of the firm's situation concerning returns as the dependent variable. The evaluation was given by the management of each firm for the year 1995, ranging from 1 = "very good" to 5 = "very bad". The different kinds of payment schemes are used as independent variables. The same is true for the existence of a works council and some other control variables with the *a priori* possibility of some influence on returns.

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7 Cf. also Dilger (2002), especially chapter 3 with further references.

8 Cf. Dilger (2002), pp. 191 f.

9 Cf. e.g. Lazear (1986, 1996, 1999, 2000).

The results of the estimate are given in Table 2. As can be seen, only the other payment schemes are statistically significant. The negative sign means that the influence on returns is positive (because a low value of the dependent variable stands for a good evaluation). The existence of a works council (in 1994 and 1996 compared to none in both years) lowers returns (this is no proof of any causal relationship). Both effects are not only statistically significant, but also economically important. The magnitude of these effects is not easy to see. However, a firm with median characteristics[10] has the following probability distribution of estimated returns: 1.2 % "very good", 11.1 % "good", 30.1 % "moderate", 29.9 % "bad" and 27.7 % "very bad". Without a works council this distribution improves to 2.7 % ("very good"), 21.1 %, 38.4 %, 23.2 % and 14.6 % ("very bad"). If such a firm gets other payment schemes, the distribution improves further to 6.9 %, 38.9 %, 35.8 %, 12.4 % and 6.0 %. Most other independent variables are not statistically significant. Notable and plausible exceptions are the turnover per capita, at least one product innovation and the capacity utilisation of machines or employees that improve the returns and the reversed influence of flexible working.

The evaluation of returns is known for more years, but without much difference. Using different correlation tests for the years 1996 to 1998 brings only one significant result concerning payment schemes: Individual piece rates are significantly (at the 5 % level) negatively correlated to the subjective evaluation of returns in 1996. In this case negatively implies that returns are lower. For the year 1995, the correlation tests imply the same as the ordered logit estimate of Table 2: Only other payment schemes improve the returns statistically significant at the 5 % level.

Furthermore, a question about the development of the firm's returns covering the last three years is included in the *NIFA-Panel*. Comparable correlation tests for this variable with the different payment schemes show a significantly (at the 5 % level) negative correlation of time rates in 1995, which indicates a worse past development of returns for those firms paying time rates to their employees. Premium pay is significantly positive at the 10 % level in 1994 and at the 5 % level in 1997. For the years 1996 and 1998 no payment scheme is significantly correlated to the past development of returns.

Finally, the expected development of returns in the following three years can be correlated to the payment schemes. In doing so, premium pay is significantly positive at the 1 % level in 1995, at the 5 % level in 1997 and at the 10 % level in 1998. Other payment schemes are positively related to expected

[10] That is a firm with a time rate and no other payment scheme, with a works council, 62 employees (squared 3,844), 17.3 % of them in administration, a turnover of 0.169 million DM per capita, not part of a branch, without working groups, flexible working time, product innovations, computerised machines or a company agreement, but with further training and an industrial agreement, a capacity utilisation of machines of 80.0 % and such a utilisation of its employees of 90.0 %.

returns in 1995, significantly at the 1‰ level. Individual piece rates are significantly positive at the 10% level in 1996. From the former results it can be concluded that these expectations did not come true. All other correlations are insignificant anyway.[11] All in all, no consistent pattern is evident behind the significant results, such that it seems reasonable to say that no systematic relationship exists between returns and payment schemes.

Table 2

Ordered Logit Estimate of Returns

Independent Variables	Coefficient	Standard Deviation
Time Rate	–0.008	0.275
Individual Piece Rate	–0.220	0.238
Group Piece Rate	0.261	0.321
Premium Pay	–0.244	0.163
Other Payment Schemes	–0.997*	0.445
Works Council	0.801***	0.177
Number of Employees	0.001	0.001
Number of Employees Squared	–0.000	0.000
Rate of Employees in Administration	0.008	0.006
Turnover per Capita	–3.011***	0.790
Branch Plant	–0.073	0.163
Working Groups	0.067	0.152
Flexible Working Time	0.507**	0.160
Further Training	–0.116	0.155
Product Innovation	-0.275^{+}	0.150
Computerised Machines	–0.043	0.153
Capacity Utilisation of Machines	–0.010*	0.005
Capacity Utilisation of Employees	–0.031***	0.007
Company Agreement	0.416	0.282
Industrial Agreement	0.194	0.165

Number of observations = 680, Cox & Snell R^2 = 0.168, Nagelkerke R^2 = 0.178, McFadden R^2 = 0.064, Model x^2 = 125.040***; data source is the 5th wave of the *NIFA-Panel,* that is 1995, for the 7th row also the 4th and 6th wave; $^{+}$/*/**/*** denote statistical significance at 0.1/0.05/0.01/0.001 levels.

[11] The detailed results are available from the author at request.

5. Payment Schemes and Works Councils Reconsidered

Summing up so far it seems that there exists a relationship between a works council and the chosen payment scheme as well as a relationship between works councils and returns, but no relationship between payment schemes and returns. This is weird because the interdependence of works councils with both payment schemes and returns appears to require some connection between the last two factors as well, at least for reasons of set theory.

Therefore, the results of Section 2 are reconsidered here in Section 5. The mere correlation between works councils and payment schemes could be influenced by a third factor linked with both, instead of being a sign of a real interdependence. One plausible candidate for such a factor is the size of the firm measured by the number of employees. It has been well proven that the probability of a works council will rise with the number of employees.[12] A works council in a larger firm has more rights and can benefit the employees better. Besides, three committed employees required by law to found a works council can be more easily found in a larger firm than in a smaller one.

A similar argument may apply to the effect of a firm's size on its payment schemes. The probability of different payment schemes within a firm should increase as the number of employees rises. One possible exception could be time rates as the most simple payment scheme, adequate especially for small firms. Table 3 shows the mean numbers of employees for firms with and without the different payment schemes as well as a works council, confirming the hypothesis of strong size effects.

Table 3

Mean of Employees Differentiated by Payment Schemes and Works Council

Payment Schemes	Without	With	Significance of *t*-Test
Time Rate	333.48	129.48	< 1 ‰
Individual Piece Rate	125.64	327.47	< 1 ‰
Group Piece Rate	122.75	598.19	< 1 ‰
Premium Pay	141.84	179.73	< 10 %
Other Payment Schemes	148.95	242.88	none
Works Council	47.76	206.08	< 1 ‰

Data source is the 5th wave of the *NIFA-Panel,* that is 1995, for the last row the 6th wave.

[12] See for example Addison / Schnabel / Wagner (1997) or Dilger (2002), pp. 87 f.

To find out more about the true relationship between payment schemes and works councils and the determinants of the former, it is convenient to estimate logit models using the different payment schemes as endogenous variables. The results of this exercise with some plausible independent variables are given in Table 4.

On the one hand, it can be seen that there is not really an influence of works councils on payment schemes[13] or at the most a weak one on individual piece rates,[14] statistically significant at the 10 % level. On the other hand, the size effect is quite strong, at least negatively on time rates and positively on piece rates, individual and group alike.

Most other variables are insignificant. The complete model for other payment schemes is insignificant, which may be due to the heterogeneity of the payment schemes covered under this label.

6. Determinants of Newly-Founded Works Councils

Just as models using the returns and the payment schemes as dependent variables have been estimated, so might this also be done for the third subject of this article, namely works councils. Some research papers use the existence of a works council as dependent variable in their estimates.[15] This seems to be problematic because most works councils are much older than the values of the other variables such that they cannot depend on them. Moreover, works councils are founded by the employees, not the firm. Nevertheless, it may be reasonable to estimate a model using the existence of a newly-founded works

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13 How can this be reconciled with the results of Hübler / Heywood / Jirjahn (1998), Hübler / Jirjahn (1998) and Heywood / Jirjahn (2002), who found an influence of works councils on payment schemes, although they also controlled for the number of employees? Perhaps the difference is due to the fact that the *NIFA-Panel* is restricted to the sector of mechanical engineering whereas the *Hanover Panel* includes firms of all manufacturing industries, thereby also showing differences between sectors (e.g. piece rates are more common in some sectors than in others), not necessarily existing within sectors, at least not in the sector of mechanical engineering. Other reasons could be differences in the available variables or problems of multicollinearity (there is the high correlation shown in Table 3; the same estimates as in Table 4 without the number of employees and its square show a significant effect of works councils). However, in the important class of firms with 21 to 100 employees (in which one half of the firms has a works council and the other half has not) there is no effect of works councils on payment schemes, neither if the number of employees is included in the estimates nor if it is excluded.

14 A median firm as described in note 10, which has no flexibility in work order, pays individual piece rates with a probability of 16.3 % according to this logit estimates. Without a works councils this probability drops to 9.6 %.

15 E.g. Frick / Sadowski (1995), Addison / Schnabel / Wagner (1997, 1998, 1999, 2000), Jirjahn (1998, 2002) and Schnabel / Wagner (2001).

Table 4: **Logit Estimates of Different Payment Schemes**

Independent Variables	Time Rate	Individual Piece Rate	Group Piece Rate	Premium Pay	Other Payment Schemes
Works Council	–0.186	0.605^{+}	–0.174	0.210	0.392
Number of Employees	–0.002*	0.003***	0.003**	0.000	0.002
Number of Employees Squared	0.000	0.000	0.000	0.000	0.000
Turnover per Capita	–1.108	2.205^{+}	2.673^{+}	–0.280	–1.747
Branch Plant	–0.134	0.178	0.380	0.257	–0.697
Working Groups	–0.359	–0.414	0.374	0.094	0.204
Flexible Working Time	–0.311	0.255	0.044	0.095	0.746
Further Training	–0.704*	0.489^{+}	0.554	0.640**	0.182
Computerised Machines	0.082	–0.385	0.230	0.133	–0.008
Company Agreement	0.455	–0.907	–0.174	–0.040	–0.590
Industrial Agreement	–0.202	0.221	0.092	0.210	–1.090*
Flexibility in Work Order	0.200	–0.032	0.123	–0.103	–0.236
Constant	3.616***	–3.518***	–4.651***	–1.894***	–3.396***
Number of observations	699	699	699	699	699
Cox & Snell R^2	0.071	0.110	0.083	0.038	0.017
Nagelkerke R^2	0.144	0.203	0.219	0.057	0.070
Model x^2	51.117***	81.664***	60.707***	27.283**	11.702

Data source is the 5th wave of the *NIFA-Panel,* that is 1995, for the 2nd row also the 4th and 6th wave; $^{+}$/*/**/*** denote statistical significance at 0.1 / 0.05 / 0.01 / 0.001 levels; the standard deviations are available from the author at request.

council as the dependent variable. Even though the employees are founding (or not founding) a works council, they are influenced in this decision by the characteristics of the firm, e.g. the payment schemes used in the firm, as was argued in Section 2.

Table 5

Logit Estimate of Newly-Founded Works Councils

Independent Variables	Coefficient	Standard Deviation
Time Rate	–0.756	0.814
Individual Piece Rate	0.721	0.776
Group Piece Rate	–7.552	19.532
Premium Pay	0.230	0.558
Other Payment Schemes	–1.146	1.480
Number of Employees	–0.004	0.014
Number of Employees Squared	0.000	0.000
Turnover per Capita	1.673	2.121
Branch Plant	–0.460	0.517
Working Groups	0.841*	0.362
Flexible Working Time	–0.156	0.409
Further Training	0.665^{+}	0.358
Product Innovation	–0.256	0.404
Process Innovation	–1.088**	0.384
Company Agreement	1.197^{+}	0.715
Industrial Agreement	–0.413	0.403
Satisfactory or Better Results	0.222	0.360
7 Different Groups of Employees	insignificant	
Constant	–1.864	1.794

Number of observations = 315, Cox & Snell R^2 = 0.095, Nagelkerke R^2 = 0.162, Model x^2 = 31.351; data source are the 4th to 6th waves of the *NIFA-Panel*, especially the 5th one from 1995; $^{+}$ / * / ** denote statistical significance at 0.1 / 0.05 / 0.01 levels.

A logit model for the founding of a works council has not been estimated before,[16] probably because the number of newly-founded works councils is

[16] For simultaneous work with the *IAB-Panel* see the article of Addison / Bellmann / Schnabel / Wagner (2003). Addison / Bellmann / Schnabel / Wagner (2002) use a matching approach to compare firms with a newly-founded works councils to matchable firms without one.

quite small in any given year. Fortunately, the data base of the *NIFA-Panel* includes enough suitable cases. It has been asked twice for the existence of a works council, in 1994 and 1996 respectively. There were 68 firms with a newly-founded works council 1996, that is, a works council did not exist at any of these firms in 1994. 354 firms did not have a works council in both years, in 1994 as well as in 1996. These 422 firms are included in the following logit estimate (107 have some missing data, such that 315 valid cases remain), whereas all firms with a works council in 1994 are excluded, since obviously the firms already with a works council lack the possibility to get a new one. See Table 5 for the results.

There is no significant influence of the payment schemes on the founding of a works council. The same is true concerning the influence of the firm's results, meaning works councils are not founded by the employees to reap high profits or to protect themselves against adverse effects of low returns. Interestingly, the number of employees is also unimportant in the decision to found a new works council, the insignificant sign is even negative. Only a few independent variables are significant at all, mostly so process innovations, which prevent instead of inspire the founding of new works councils. The positive influence of working groups is more plausible, because they may be complements to works councils[17] and also give the employees better opportunities to discuss the foundation of a works council. The existence of further training and company agreements are also weakly significant, whereas the model as a whole is insignificant. Consequently, further research is required.

7. Conclusions

The interdependence of payment schemes, returns and works councils has been analysed by using the *NIFA-Panel.* There is no special connection between payment schemes and returns. Piece rates are said to give employees better incentives, but the conditions in which they are suitable may be not the best ones for the firm or it may be that the positive effects are simply levelled out by the higher wages needed to bring them about.

The seeming correlation between works councils and payment schemes is probably due to size effects. As has been found in logit estimates, the existence of a works council does not influence the usage of special payment schemes; at most it raises the probability of individual piece rates slightly, even though works councils have a lot of rights in this regard.

The only stable relationship – that between works councils and (low) returns – has been shown before in other research and simply referred to here.

[17] However, Schnabel / Wagner (2001) find evidence that working groups and works councils may be substitutes instead.

Brought to light for the first time in this article is the estimate concerning the factors that determine the founding of a new works council. Most variables tried here have no significant effect; this is especially true for returns and payment schemes. This is an important result for the theme of this article and leaves plenty to do for further research.

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