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Executive Incentives, Works Councils and Firm Performance*

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Abstract

This paper investigates the interaction effect of works councils and managerial profit sharing on establishment performance. In the theoretical part, it is argued that this interaction effect depends on two relationships, namely the relationship between works councils and self-enforcing contracts and the relationship between agency and trust within establishments. The empirical analysis with data from German manufacturing establishments shows a negative interaction effect of managerial profit sharing and works councils on productivity. Works councils seem to be of particular importance for the economic success of establishments when no managerial profit sharing is in place. The theoretical interpretation of this finding is, however, complex. Moreover, it is implicitly shown that the negative interaction effect is particularly prevalent in larger establishments. Separate estimates are performed with a subsample of establishments employing 21 to 100 workers. While the estimates show positive productivity effects of managerial profit sharing and works councils also for this subsample of smaller establishments, no statistically significant interaction effect is found.

Zusammenfassung

Der vorliegende Beitrag untersucht die Wechselwirkungen, die zwischen betrieblicher Mitbestimmung und einer Erfolgsbeteiligung für die Geschäftsleitung eines Betriebs bestehen. Im theoretischen Teil des Beitrags wird argumentiert, dass der Interaktionseffekt beider Variablen von zwei Beziehungen abhängt. Zum einen ist es von Bedeutung, ob betriebliche Mitbestimmung und Reputationserwägungen des Managements substitutiv oder komplementär zueinander sind. Zum anderen spielt der Einfluss des Principal-Agent-Problems zwischen Eigentümern und Managern auf kooperative industrielle Beziehungen eine Rolle. Die empirische Analyse mit Daten des Hannoveraner Firmenpanels zeigt, dass Betriebsräte und eine Erfolgsbeteiligung für die Geschäftsleitung im Hinblick auf die Produktivität negativ miteinander interagieren. Betriebsräte scheinen somit dann von besonderer Bedeutung für den betrieblichen Erfolg zu sein,

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wenn es keine Erfolgsbeteiligung für die Geschäftsleitung gibt. Die theoretische Interpretation dieses Ergebnisses ist allerdings komplex. Die empirischen Resultate deuten zudem implizit darauf hin, dass der negative Interaktionseffekt insbesondere bei größeren Betrieben vorzufinden ist. Werden die Schätzungen nur für Betriebe mit 21 bis 100 Beschäftigten durchgeführt, dann zeigen sich zwar weiterhin positive Produktivitätseffekte betrieblicher Mitbestimmung und einer Erfolgsbeteiligung des Managements, während sich hingegen kein statistisch gesicherter Interaktionseffekt beider Variablen finden lässt.

JEL Classification: J24; J53; J33; D23; G32; L21

1. Introduction

FitzRoy and Kraft (1987) argue in their influential paper on works councils that the economic effects of codetermination depend on the managerial environment in the firm. In spite of the merits of this argument, the interaction effect of executive compensation and works councils on firm performance has not been examined up to now. Drawing on recent principal-agent theory, this paper provides both a non-technical theoretical framework for analysing the interaction of works councils with manager incentives and an empirical test of the hypotheses.

In the theoretical part of this paper, it is argued that the interaction of works councils and profit sharing for executive managers depends on two relationships. First, works councils may help to overcome employer opportunism. However, codetermination is not the only solution to the employer's commitment problem. Reputation concerns may also induce an employer to behave honestly. This raises the question whether codetermination and self-enforcing contracts are substitutes or complements. Second, the principal-agent problem between the owners and the managers of the firm may exert two opposite effects on trustful employer-employee relations. On the one hand, agency may have a commitment value, since managers are less likey to renege on implict contracts with the work force on behalf of short-term profits. On the other hand, rent-seeking activities by managers may hinder trust and loyality within establishments. Combining the relationship between works councils and self-enforcing contracts and the relationship between agency and trustful employer-employee relations, four situations with different implications for the interaction of managerial profit sharing and works councils are identified.

The empirical analysis uses pooled data from manufacturing establishments in the German federal state of Lower Saxony. While establishments with managerial profit sharing are more likely to have a works council, the productivity estimates show a negative interaction of works councils and profit sharing for executive managers. This negative interaction effect seems to be particularly prevalent in larger establishments. Separate estimates are performed with a subsample of establishments employing 21 to 100 workers. While the estimates show positive productivity effects of managerial profit sharing and works councils also for this subsample of smaller establishments, no statistically significant interaction effect can be found.

The theoretical framework of this paper suggests two alternative explanations for the negative interaction of managerial profit sharing and works councils. First, if managerial profit sharing decreases the commitment value of agency and works councils cannot foster trust and loyality without the managers' cooperation, a negative interaction effect on establishment performance may result. Second, if managerial profit sharing induces managers to reduce their rent-seeking activities and works councils are not so important for building trust in establishments with less severe manager opportunism, a negative interaction effect is also likely to be found.

The plan of the paper is as follows. Section 2 presents the theoretical framework. In Section 3, the data set employed is reviewed and the results are presented. Section 4 concludes.

2. Theoretical Framework

In this section, we argue that the interaction effect of works councils and managerial profit sharing depends on two relationships, namely the relationship between codetermination and self-enforcing contracts and the relationship between agency and trust within firms. In the first step, it is discussed whether works councils and self-enforcing contracts are substitutes or complements in building trustful employer-employee relation. In the next step, we analyse the implications of the agency problem between owners and executive managers for the employer-employee relations. The impact of agency on trustful industrial relations is not clear-cut. On the one hand, agency may increase the range of feasible self-enforcing contracts, because managers are less likely to neglect an implicit promise than the profit maximising owners of the firm. On the other hand, rent seeking activities by managers may hinder trustful industrial relations. These two effects of agency have different implications for the role of managerial profit sharing and its interaction with works councils. Finally, we summarise the hypotheses for the empirical analysis.

2.1 Works Councils and Self-Enforcing Contracts

The rights of the works councils are laid down in the Works Constitution Act (see Müller-Jentsch 1995 for a survey). Councils shall be elected by the whole work force of establishments with five or more permanent employees. However, their creation depends on the employees' initiative. Hence, works councils are not present in all eligible establishments. The powers of the works councils can be quite broad. They have full codetermination rights on a set of issues, including the introduction of new payment methods, the fixing of job and bonus rates, the allocation of working hours, the introduction and use of technical devices designed to monitor employee performance, and up and down grading. In these areas management cannot take action without the agreement of the works council. The councils have less strong consultation rights in matters such as changes in equipment and working methods that affect job requirements. Their participation rights in financial and economic matters cover only information provision. The Works Constitution Act ties works councils to the general obligation to cooperate with management 'in a spirit of mutual trust … for the good of the employees and of the establishment.'

There are two major explanations as to why codetermination may improve joint establishment surplus. First, councils may exert a collective voice role. Many working conditions are workplace public goods (Freeman 1976; Freeman and Medoff 1979). Works councils communicate worker preferences to management helping to optimise the provision of those public goods and to reduce personnel turnover (Frick and Sadowski 1995; Frick 1996). However, the strong codetermination rights of the works councils seem to go far beyond the rights of a pure collective voice institution (FitzRoy and Kraft 1987). This observation brings us to the second explanation. Works councils with codetermination rights may prevent employers from engaging in opportunistic behaviour (Smith 1991; Freeman and Lazear 1995). Employees will withhold effort and cooperation, when an employer cannot credible commit to take into account their interests. For example, employees fearing job loss due to technological change do not reveal information about potential productivity enhancing innovations. Providing works councils with codetermination rights is one mechanism for protecting the interests of the work force. Hence, works councils may foster the workers' cooperation with the introduction of efficiency enhancing work practices, including pay for performance and profit sharing for employees (Heywood, Hübler and Jirjahn 1998; Heywood and Jirjahn 2002), employer provided further training (Gerlach and Jirjahn 2001), flexible working time arrangements (Dilger 2002; Hübler and Jirjahn 2003), human resource management systems (Jirjahn 2002), flexible work systems (Hübler and Jirjahn 2002) and investments in improving local environmental quality (Askildsen, Jirjahn and Smith 2002).[1]

[1] The participatory rights of the works council may differ between the various work practices. However, the behaviour of works councils is not entirely predetermined by legislation. Works councils appear to play a very active role in decision-making that may go far beyond the rights laid down in the Works Constitution Act. First, managers often encourage works council participation in order to ensure the employees' cooperation and effort. Second, works councils may use their codetermination rights in social

Codetermination is not the only solution to the employer's commitment problem. Reputation concerns may induce an employer to behave honestly (Bull 1987). Therefore, self-enforcing contracts stand as an alternative in order to engender the trust, which is important for the workers' cooperation. This argument suggests that codetermination and self-enforcing contracts may be substitutive. Work councils should be of particular importance for building trustful industrial relations, when self-enforcing contracts are not feasible. The reputation mechanism is based on a repeated game between the employer and the employees. Such a repeated game requires long-term employment relationships and low discount rates. The reputation mechanism fails in case of short-term employment relationships and in case that the employer overly discounts the future loss of trust and cooperation. In these situations a council with codetermination rights may protect the workers' interests.

However, another way of looking at the relationship between codetermination and reputation effects suggests that both mechanisms may be complements. First, a works council facilitates communication and coordination among workers. To the extend coordinated actions of the work force result in a more severe punishment of employer opportunism, the employer's incentive to renege on an implicit agreement is reduced (Hogan 2001). Second, in an uncertain and complex world, it is necessary that workers have accurate information about the firm's economic situation to verify whether the employer behaves honestly or not (Kreps 1990). A works council with comprehensive information rights may enforce implicit agreements through a better flow of information between the employer and the work force. Third, in case of multiple equilibria, a council may help the employer and the employees to shift to an equilibrium with cooperative industrial relations. A firm, that is interested in building trustful industrial relations, needs to provide a credible signal in order to convince the employees of its intentions. Therefore, the employer may encourage the workers to elect a works council. Moreover, reputation concerns may increase the employer's willingness to cooperate with the council. The findings by Askildsen, Jirjahn and Smith (2002) and Dilger (2002) confirm that the effects of works councils depend on a positive management attitude toward worker involvement in decision making.

Up to this point, our discussion of employer-employee relations has been founded on the implicit assumption of a profit maximising employer. Now we turn to the principal-agent problem between owners and managers. Principal-agent theory assumes that executive managers have interests different from those of profit maximising owners. When it is difficult to monitor the managers' actions, managers have greater scope to pursue their own goals rather than the owners' interests. In what follows, we discuss the implications of the

or personnel matters to obtain employer concessions in other fields, in which they have no legal powers.

agency problem for the employer-employee relations. Moreover, the principal-agent problem brings us to the role of profit sharing. Profit sharing for executive managers may help reduce agency problems by aligning the interests of managers and owners. However, the impact of managerial profit sharing on trust and cooperation in firms is not clear-cut.

2.2 The Commitment Value of Agency

In standard principal-agent models, managers lack incentives to perform their tasks well, when they have a rather small stake in the firm's profit. The managers' incentives to control costs and to improve productivity are low. However, the agency problem has not only an impact on the managers' effort but also on the feasibility of self-enforcing contracts. Tao and Zhu (2000) argue that the managers' incentive to renege on an implicit contract on behalf of short-term profits is lower than that of the owners. While the managers obtain only a small proportion of the benefit from opportunism on behalf of the owners, they may entail a disproportionate personal cost from informal sanctions. Thus, agency has a commitment value for the owners of the firm in making self-enforcing contracts feasible.

The commitment value of agency does not only apply to the relationship between firms analysed by Tao and Zhu. It is also relevant for employer-employee relations within firms. To the extend the agency problem has a commitment value, it may imply an increased range of self-enforcing contracts between the firm and the employees, particularly when no profit sharing plan for executive managers is in place. Profit sharing for executive managers reduces agency problems by aligning the interests of managers and owners. It provides an incentive for managers to exert more effort. However, it also increases the managers' incentive to break implicit contracts with the employees on behalf of profit maximising owners.[2] Thus, trustful employer-employee relations are less likely feasible, when managerial profit sharing is in place.

The interaction effect of managerial profit sharing and works councils on firm performance depends crucially on the relationship between codetermination and self-enforcing contracts. If work councils and self-enforcing contracts are substitutes in building trustful and cooperative industrial relations, the impact of councils on firm performance will be stronger in firms with less severe agency problems. In these firms, it is more likely that an implicit promise is

2 In light of this argument, profit sharing induces managers to renege on implicit contracts only when opportunistic behaviour is in the owners' interest. Of course, profit sharing provides no incentive to break implicit contracts when opportunism is not in the owners' interest. Without profit sharing the interests of managers and owners are only loosely aligned. Therefore, managers who receive no profit sharing have little incentives to renege on implicit contracts regardless of the owners' interests.

neglected for the short-term benefit of profit maximising owners. Since managerial profit sharing reduces agency problems between owners and executive managers, a positive interaction effect of works councils and managerial profit sharing can be expected.

If codetermination is complementary to self-enforcing contracts, works councils will be more effective in firms, where agency increases the range of feasible self-enforcing contracts. This is more likely, when no profit sharing for executive managers is in place. In this case, it can be expected that works councils and managerial profit sharing have a negative interaction effect on firm performance.

2.3 Rent-Seeking Activities by Executive Managers

The assumption of rent-seeking activities contrasts the notion that agency has a commitment value in enforcing implicit contracts between the employer and the employees. Managers may use their discretionary power to their own benefit. Career concerns, status and power are important goals of managers. Smith (1991) provides a detailed description of various types of manager opportunism destroying trust and cooperation within firms. One source for manager opportunism results from their discretion over task assignment (Prendergast 1995). This discretion creates opportunities for the managers to hoard responsibility and authority. Another source of discretionary power are subjective performance evaluations by managers, which open the door to favoritism based on the managers' personal preferences toward subordinates (Prendergast and Topel 1996). Subjective performance evaluations allow managers to reward and to promote their preferred subordinates. Moreover, they may use the discretion in performance appraisal to extract private services from the employees (Laffont 1990).[3] This distorts the incentives for the employees to exert effort and reduces their loyality to the firm. Rent-seeking behaviour by managers decreases the range of feasible self-enforcing contracts between the firm and the employees. Even when the owners are interested in their reputation, the agency problem may hinder trustful and cooperative industrial relations within the firm.

Managerial profit sharing does not only provide an incentive for managers to exert more effort. Moreover, it generates an incentive to reduce rent-seeking activities by increasing the cost of these activities to the managers involved. In case of profit sharing, managers participate in the efficiency loss resulting

[3] The class of possible transfers can be quite large. Managers may take credit for the employees' innovative ideas. They even may sexually harass subordinates. Laband and Lentz (1998) show that sexual harassment by superiors has a strong and negative impact on the job satisfication of female lawyers in the US. Moreover, it increases their quit intentions.

from their rent-seeking activities. They may be rather inclined to foster the cooperative industrial relations, which improve firm performance.

The interaction effect of profit sharing for executive managers and works councils depends, again, on the relationship between codetermination and self-enforcing contracts. If works councils and self-enforcing contracts are substitutes in building trustful employer-employee relations, a negative interaction effect of works councils and profit sharing for executive managers on firm performance can be expected. Since rent-seeking activities by executive managers are more severe in firms without managerial profit sharing, works councils may play an important role in protecting workers against opportunistic managers in those firms. Works councils may have a less important role in increasing firm performance, when profit sharing provides an incentive for managers to establish trustful communication with the employees.

However, profit sharing for executive managers will interact positively with works council presence, when codetermination and self-enforcing contracts complement one another. Works councils will be more effective in firms, where managers have a positive attitude toward trust and cooperation. A cooperative managerial environment may help to avoid conflictual bargaining and excessive time spent in meetings and discussions. Managers, interested in long-term cooperation with the employees, may ask works councils to participate in a wide range of decisions in order to foster high-trust management-employee relationships. The managers' willingness to build cooperative industrial relations may be induced by managerial profit sharing.

2.4 Summary of Hypotheses

The interaction effect of managerial profit sharing and works councils depends on two relationships, namely the relationship between codetermination and self-enforcing contracts and the relationship between agency and trust within establishments. There are two different aspects of agency. On the one hand, agency may have a commitment value for the owners of the firm in making self-enforcing contracts feasible. On the other hand, managers have discretionary power, which they may use to their own benefit. While both aspects are likely to emerge simultaneously, the effect of profit sharing on trustful employer-employee relations depends on the dominating characteristic of agency. If the commitment value of agency dominates, profit sharing for executive managers will reduce trustful industrial relations within the establishment. If rent-seeking behaviour is the dominating characteristic of agency, managerial profit sharing will foster trustful employer-employee relations. In both cases, the interaction of profit sharing with works councils depends on a substitutive or complementary relationship between codetermination and self-enforcing contracts. Table 1 summarises the hypotheses on the interaction effect.

Table 1

Summary of Hypotheses on Positive (+) or Negative (–) Interaction Effects of Managerial Profit Sharing and Works Councils

	Commitment value of agency	Rent-seeking activities by executive managers
Works councils and self-enforcing contracts are substitutes	+	–
Works councils and self-enforcing contracts are complements	–	+

There are two constellations that imply a positive interaction effect of works councils and managerial profit sharing on firm performance. First, a positive interaction effect will result, when agency has a commitment value and works councils protect the employees in situations, in which self-enforcing contracts are not feasible. Since mangerial profit sharing decreases the commitment value of agency and thus the range of feasible self-enforcing contracts, works councils are of particular importance to prevent employer opportunism in firms with such profit sharing plans. Second, a positive interaction effect of works councils and managerial profit sharing will result in a situation characterised by rent-seeking or slack managers and a complementarity between codetermination and self-enforcing contracts. Managerial profit sharing increases the managers' incentive to cooperate with the works council in order to foster the workers' trust and cooperation.

Two other constellations imply a negative interaction effect of works councils and profit sharing for executive managers. First, if agency has a commitment value and codetermination fosters self-enforcing contracts between the employer and the employees, we will observe a negative interaction effect on firm performance. Managers are more likely to neglect an implicit promise for the short-term benefit of profit maximising owners, when managerial profit sharing is in place. They are less likely to cooperate with the works councils to foster long-term cooperation and trustful employer-employee relations. Second, if rent-seeking behaviour is the primary characteristic of agency and codetermination is a substitute to self-enforcing contracts, a negative interaction effect of managerial profit sharing and works councils can be expected. Managerial profit sharing induces managers to reduce their rent-seeking activities. Moreover, managers are more willing to build trustful and cooperative relationship with the employees. This reduces the necessity to prevent manager opportunism through works councils.

We conclude this section with some remarks on the incidence of managerial profit sharing and works councils. A negative interaction effect of the two variables on firm performance does not imply a certain link between the use of managerial profit sharing and the presence of a works council. On the one hand, managers with a stake in the firm's profit may discourage the work force from electing a works council. If profit sharing induces managers not to build trust but rather to neglect implicit contracts on behalf of the owners, managers have an obvious interest to hinder the election of a works council. However, even if profit sharing provides an incentive for managers to build trust and cooperation, the managerial competence hypothesis by FitzRoy and Kraft (1987) contends that motivated managers may render a works council superfluous.

On the other hand, there may be a positive association between the use of managerial profit sharing and the presence of works councils, even when both variables exert a negative interaction effect on firm performance. In case that managerial profit sharing increases the danger of employer opportunism, employees may elect a works council for a minimum protection against employer opportunism, although the hostile industrial relations do not contribute to firm performance. If profit sharing induces managers not only to build trust but also to increase the pressure for harder work, the managerial pressure hypothesis by FitzRoy and Kraft (1987) contends that workers may elect a works council for their protection against too high effort.

Similar arguments can be applied to show that a positive interaction effect does not imply a certain link between profit sharing for executive managers and works councils. A positive interaction effect of the two variables on firm performance is consistent with both a positive or a negative association between the use of managerial profit sharing and works council presence.

3. Empirical Analysis

The empirical analysis proceeds with two steps. After reviewing the data set, the link between managerial profit sharing and works council presence is examined in the first step. The productivity effects of profit sharing for executive managers and works councils are investigated in the second step.

3.1 Data Set and Variables

The empirical investigation is based on the Hannover Panel (Brand et al. 1996), a four wave panel study of manufacturing establishments in the German federal state of Lower Saxony. The population consists of all manufacturing establishments with five or more employees. The sample is stratified according to establishment size and industry. Interviews were conducted by Infratest Sozialforschung, a German survey and opinion institute. The data were collected on the basis of a questionnaire in personal interviews with the owner, top manager or head of the personnel department. In the first wave (1994), 51 percent of the establishments in the sample agreed to participate. In spite of the non-response rate the difference between the planned and realised stratification is so small that the data are representative of the manufacturing establishments in Lower Saxony in 1994 and the subsequent years. The number of establishments taking part in the panel study declined over the four waves: from 1025 in 1994, to 849 in 1995, to 721 in 1996, and finally to 709 in 1997. The questionnaire covered various aspects of establishment structure, establishment behaviour and establishment performance with an emphasis on issues relating to personnel. A nucleus of themes was addressed annually. Different additional topics were sampled in consecutive waves.

We are particularly interested in the productivity effects of both works councils and managerial profit sharing. Information on labour productivity is available in each wave for the preceding year. Thus, the productivity data refer to the years 1993 to 1996. Labour productivity is defined as value-added per employee divided by 1000. Informations on works councils and profit sharing for executive managers, however, are only available in the first and in the third wave. These informations refer to the years of the survey, namely 1994 and 1996. The variables are whether or not a works council is present in the establishment and whether or not executive managers have a profit sharing plan.[4]

The dropping and the introduction of works councils between 1994 and 1996 is small. 705 establishments answered in both years the question dealing with works councils. 56.2 percent of these establishments had a works council in 1994 and 1996, 2.3 percent only in 1994 and 2.8 percent only in 1996. The percentage of switches is small compared to the percentage of establishments without any moves.[5] In contrast, there is a remarkable variation in the use of profit sharing for executive managers over the short period 1994 – 1996.[6] The question dealing with managerial profit sharing was answered by 712 establishments in both years. 32 percent of these establishments had a profit sharing plan for executive managers in 1994 and 1996, 11.1 percent only in 1994 and

[4] These binary dependent variables indicate only the incidence of works councils and managerial profit sharing but not their detailed characteristics. There are different forms of profit sharing for executive managers, which differ in the performance measures used (Murphy 1999). Moreover, the pay-performance sensitivity remains a matter of debate (Hall and Liebman 1998). The profit-relatedness of managers' salaries in Germany is analysed by Schwalbach and Graßhoff (1997) and Kraft and Niederprüm (1999a, 1999b).

[5] Using the IAB Establishment Panel, Bellmann, Kohaut and Schnabel (1999) obtain a similar result.

[6] Interestingly, there are not only substantial moves in profit sharing plans for executive managers but also in the use of performance pay for employees (Jirjahn 2002). Obviously, establishments undertake a remarkable process of trial and error to find proper incentive schemes for managers and employees.

15.7 only in 1996. Put differently, the share of establishments that dropped old plans or started new ones is 26.8 percent, while the share that kept existing plans is 32 percent. Since there is substantial churning is one of our central variables, the analysis is restricted to the years with availabe informations on managerial profit sharing and works councils.[7] The estimates are based on pooled data for the years 1994 and 1996.

The sample includes establishments with and without active owners. While it seems evident that agency problems are less severe in establishment with active owners (Jirjahn 2003b), the presence of active owners does not imply the total absence of agency problems. Accordingly, managerial profit sharing plays a role in both types of establishments. For 1994 we obtain: 51.8 percent of the establishments without active owners and 36.7 percent of the establishments with active owners had a profit sharing plan for executive managers. While establishments without active owners are more likely to use managerial profit sharing, there is also a substantial percentage of establishments with active owners using profit sharing for executive managers.

3.2 The Link Between Managerial Profit Sharing and Works Councils

In a first step, we examine the link between profit sharing for executive managers and works councils. The covariates of works council presence are estimated with the probit procedure. Of course, the direction of causality remains a matter of debate. This requires a cautious interpretation of the findings. We share this limitation with other studies of works council incidence. Addison et al. (2002) suggest that the problem of causality might be resolved by examining the introduction of works councils instead of their incidence. Such a research strategy is not fully convincing for at least two reasons. First, it fails to address the main issue of causality. Even when we observe the introduction of shift work before a works council is elected, the direction of causality may remain an open question. The employer may introduce shift work, because he anticipates the election of the works council and the resulting increase in trust and loyality. Second, given the small number of switchers, examining the introduction of works councils results in a severe reduction of the number of cases. This in turn implies less degrees of freedom.[8]

7 If the primary focus is only on works councils, the works council variable can be used as a quasi time-invariant variable in random effects estimates with all four waves of the Hannover Panel (Askildsen, Jirjahn and Smith 2002, Jirjahn 2003a).

8 Particularly, it leaves only a handful of cases for an investigation of the economic "effects" of works councils. Addison et al. (2002) examine the economic "effects" of a works council introduction with the IAB Establishment Panel. Several thousand establishments are surveyed each year. However, the matched-plants approach used by Addi-

Table 2 presents the probit estimates. Results for the total establishment sample are shown in column (1). Separate results for a subsample of establishments with 21 to 100 employees are provided in column (2). Estimates with this subsample are sensible in order to investigate if the determinants and effects of works councils depend on establishment size. All estimates contain 13 of 19 broader defined industry dummies. While the survey provides a more detailed set of 31 industry variables, it is not reasonable to use this narrow classification in the regressions. Several of the narrow industries contain only 1 to 5 establishments in the sample. However, Addison, Schnabel and Wagner (1997) claim that 30 of these 31 industry dummies are used in their study with the first wave of the Hannover Panel.

Since the findings for the control variables are interesting in their own right, we start with a somewhat extensive discussion of these results. The structure of the work force has an impact on works council presence. The share of part-time workers decreases the probability of the existence of a works council. Establishments with a large proportion of blue collar workers are more likely to have a works council. However, the second result is not statistically significant in the estimates with the subsample. Moreover, works council presence depends on establishment characteristics. The size of the establishment increases the chance of works councils (but at a decreasing rate in the estimates with the overall sample). Establishments founded before 1960 are more likely to have a works council. The positive link between establishment age and works councils may also explain the negative association between the use of a state-of-the-art production technology and works council incidence. Interestingly, an employment reduction in the last two years increases the probability of having a works council. This result is consistent with the hypothesis that workers are more willing to elect a works council, when it is of particular importance to protect their interests.

Further, establishments covered by a collective bargaining agreement are more likely to have a works council. This link fits the theoretical model and the empirical results by Hübler and Jirjahn (2003). Collective bargaining agreements reduce distributional conflicts on the establishment level, since they are usually negotiated between unions and employers' associations on a broad industrial level. Works councils are more likely to be engaged in efficiency enhancing work practices and less engaged in the redistribution of firm surplus, when substantial distributional conflicts are moderated outside the establishment. Thus, an employer, anticipating the election of a works council, has an incentive to join an employers' association in order to increase the positive economic effects of the works council.

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son et al. leaves 62 establishments for the analysis. Thus, it is not surprising that Addison et al. fail to find any economic "effects".

Table 2

Pooled Probit ML Estimates of Works Council Presence for 1994 and 1996

Variable	All Establishments (1)	Establishments with 21 – 100 Employees (2)
Constant	–1.765 [–0.427] (6.77)***	–1.869 [–0.731] (3.25)***
Establishment size (number of employees)	0.010 [0.002] (12.16)***	0.039 [0.015] (2.33)**
Establishment size squared	$-6 \cdot 10^{-6}$ [-10^{-7}] (10.86)***	-10^{-4} [$-5 \cdot 10^{-5}$] (0.94)
Establishment founded before 1960	0.415 [0.100] (4.21)***	0.445 [0.174] (3.13)***
Production technology at the newest level	–0.371 [–0.090] (4.21)***	–0.626 [–0.245] (4.26)***
No employment reduction in the last two years	–0.309 [–0.075] (3.32)***	–0.364 [–0.142] (2.72)***
Proportion of blue collar workers	0.573 [0.138] (1.98)**	0.209 [0.082] (0.49)
Proportion of part-time workers	–2.105 [–0.509] (4.55)***	–1.955 [–0.764] (2.67)***
Coverage by a collective agreement	0.866 [0.210] (8.89)***	0.959 [0.375] (6.81)***
Employer provided further training	0.431 [0.104] (4.32)***	0.328 [0.128] (2.36)**
Piece rates for blue collar workers	0.504 [0.122] (3.52)**	0.328 [0.128] (1.74)*
Shift work	0.447 [0.108] (4.03)***	0.147 [0.057] (0.95)
Flexible working hours	0.165 [0.040] (1.69)*	0.414 [0.162] (2.84)***
Production teams	–0.231 [–0.056] (2.48)**	–0.232 [–0.091] (1.74)*
Profit sharing for executive managers	0.212 [0.051] (2.19)**	–0.145 [–0.057] (1.04)
Industry dummies	Included	Included
Number of observations	1447	572
McFadden R^2	0.484	0.340
Correct Predictions (%)	85.28	76.62

*, ** or *** denote significance at $\alpha = 0.10, 0.05$ or 0.01. T-statistics are in parentheses. Marginal effects are in square brackets.

Most noteworthy, several innovative work practices are positively linked to the presence of works councils. The results clearly indicate that works councils may play a cruical role in establishing or maintaining these work practices. Employer provided further training is a statistically significant covariate of works council presence in both the estimates with the full sample and the estimates with the subsample. This finding confirms the study by Gerlach and Jirjahn (2001). It is consistent with the hypothesis that employee representation may alleviate market failures in human capital investments such as hold-ups, poaching externalities and coordination problems (see Askildsen and Ireland 1993; Smith 1991, 1994; Soskice 1994; Askildsen, Jirjahn and Smith 2002a for a theoretical discussion). Further, the use of piece rates is positively linked to works council presence in the estimates with the overall sample and also in the estimates with the subsample of establishments employing 21 – 100 workers. This result is consistent with the hypothesis that works councils may help to overcome the ratchet effect.[9] It confirms the studies by Heywood, Hübler and Jirjahn (1998) and Heywood and Jirjahn (2002). These studies show that the link is particularly due to the positive association between performance pay and works councils in establishments covered by collective bargaining agreements.[10] Moreover, flexible working hours (Arbeitszeitkonten) are positively linked to works council presence in both the estimates with the full sample and the estimates with the subsample. There is also a significant positive association between shift work and the incidence of works councils in the regression with the full sample. These findings indicate that works councils may play a mediating role in the joint determination of working time schedules by the employer and the employees.[11]

9 Workers will withhold effort when they fear an increase in performance standards after a period of good performance. They are less likely to fear the ratchet effect and to withhold effort, when a works council prevents an inappropriate increase in performance standards.

10 Using cross section data from the NIFA Panel, Dilger (2003) finds no robust association between works councils and performance pay. It is argued that the works council effect may simply reflect a size effect. However, considering the results with the Hannover Panel, this interpretation lacks plausibility. Even when controlling for establishment size, there is a positive link between performance pay and works councils. Moreover, the association between the use of piece rates and works council presence can also be found in the subsample of smaller establishments with 21 – 100 employees. There may be other reasons for the results found by Dilger: First, separate estimates for covered and uncovered establishments are not performed. Therefore, it is not clear if the results are due to the uncovered establishments in the NIFA Panel. Second, compared to other international studies on the determinants of performance pay, only a thin set of control variables is used. Therefore, Dilger's study is likely to suffer from an omitted variable bias. Third, the NIFA Panel is restricted to the narrow sector of mechanical engineering. Further, the link between works councils and establishment size should be interpreted with caution. A related study by Hübler and Meyer (2001) indicates that establishment size may mask the "true effects" of works councils. This study clearly contradicts the interpretation that a works council effect is simply a size effect.

The negative link between the incidence of production teams and works council presence is not easy to interpret. Addison, Schnabel and Wagner (1997) argue that works councils and teams might be substitutive forms of participation in the workers' eyes. However, the relationship between these two forms of employee participation seems to be more complex than this interpretation suggests. There may be direct and indirect links between teams and works councils, operating in opposite directions. On the one hand, it might be more difficult for a works council to represent the interests of the entire work force, when individual work groups directly communicate with the management. On the other hand, works council presence is positively associated with training and performance pay. Several arguments suggest that these human resource management practices are complements to teams. Establishments do not choose a single work practice. They choose an entire system of more or less interrelated and internally consistent practices. Jirjahn (2002) uses more precise informations on employee participation, which are only available in the third wave of the Hannover Panel. It is shown that the dual system of worker representation in Germany is not only associated with a traditonal system of mass production but also with a flexible production system characterised by group incentives, training, teams and regular meetings of managers and workers. This finding accords with a study by Hübler and Jirjahn (2002). Using the IAB Establishment Panel, Hübler and Jirjahn do not investigate the incidence but the introduction of teams. It is shown that establishments with works councils are more likely to introduce teams. Moreover, taking into account the endogenity of teams, the study shows a positive interaction effect of works councils and the introduction of teams on firm performance.[12]

Returning to the main focus of this paper, there is a positive and statistically significant link between profit sharing for executive managers and works council presence for the full sample. No statistically significant association between managerial profit sharing and the incidence of works councils can be found for subsample of smaller establishments. These results with the pooled data for 1994 and 1996 confirm studies using the first wave of the Hannover Panel (Addison, Schnabel and Wagner 1997; Jirjahn 1998). The findings implicitly mean that there is a positive association between managerial profit sharing and works councils in larger establishments. However, this positive association does not imply a particular interaction effect of managerial profit sharing and works councils on establishment performance. As the theoretical arguments in Section 2 show, the positive link between the two variables is

[11] These findings accord with other international studies, which show that union presence is positively linked to the incidence of shift work (Duncan and Stafford 1980) and to compensating wage differentials for shift work (Kostiuk 1990).

[12] The last finding accords with studies for the US. Cooke (1994) and also Black and Lynch (2000) obtain positive interaction effects of unions and alternative forms of employee participation on firm performance.

consistent with both a positive or a negative interaction effect. In case of a positive interaction effect, managers may encourage employees to elect a works council, when they are motivated by profit sharing. In case of a negative interaction effect, wokers may be more willing to elect a works council for their protection against too high managerial pressure or for a minimum protection against employer opportunism. This may be the case, even when profit sharing induces more managerial resistance to codetermination and the hostile industrial relations do not contribute to establishment performance. In order to examine the relationship between profit sharing for executive managers and works councils in more detail, we have to investigate the interaction effect of the two variables on productivity in the next step.

3.3 Managerial Profit Sharing, Works Councils and Labour Productivity

Table 3 presents the pooled productivity estimates with the full establishment sample. The coefficient estimates for the control variables are well determined and accord with theoretical standard expectations. The relationships between these variables and productivity are robust to the specification changes shown in Table 3. First, the structure of the work force plays an important role for productivity. The proportions of part-time workers, women, apprentices and blue-collar workers have negative productivity effects, while the share of university graduates exerts a positive impact on productivity. Second, there are also several relevant establishment characteristics. Rather interestingly, shift work has a strong positive impact on productivity.[13] Moreover, establishment size and a modern production technology increase productivity. Single establishments, which have no subsidiaries and are not themselves subsidiaries, are characterised by lower productivity. Further, the coefficient estimate for the time dummy for 1996 is positive and statistically significant. The coefficient on the coverage by a collective agreement is negative but statistically insignificant. Finally, note that 13 of 19 broader defined industry dummies are contained in all estimates.

The estimates shown in column (1) and (2) do not take into account the interaction of managerial profit sharing and works councils. Starting with the results in column (1), it can be seen that establishments with a works council have a significantly higher productivity. However, it is not controlled for shift work and managerial profit sharing. The regression in column (2) includes these variables. Both shift work and profit sharing for executive managers exert a strong impact on productivity. The positive influence of managerial profit sharing is consistent with the hypothesis that profit sharing may help to reduce agency problems. However, the coefficient on works council presence is now

13 This finding is consistent with the formal model by Mayshar and Halevy (1997).

Table 3

Pooled Productivity Estimates for 1994 and 1996
(All Establishments)

Variable	(1)	(2)	(3)	(4)
Constant	158.70 (11.25)***	158.14 (11.18)***	148.53 (10.56)***	153.41 (10.90)***
Time dummy 1996	9.409 (2.52)**	7.847 (2.11)***	8.748 (2.35)**	7.876 (2.13)**
Establishment size (number of employees)	0.009 (2.40)**	0.005 (2.43)**	0.008 (2.34)**	0.005 (2.53)**
Production technology at the newest level	20.031 (4.80)***	16.149 (3.79)***	19.29 (4.59)***	15.78 (3.71)***
Single establishment	–11.42 (2.75)***	–7.123 (1.69)*	–10.422 (2.49)**	–7.367 (1.76)*
Proportion of blue collar workers (%)	–0.346 (2.46)**	–0.442 (3.11)***	–0.313 (2.23)**	–0.434 (3.08)***
Proportion of part-time workers (%)	–0.726 (3.27)***	–0.633 (2.87)***	–0.663 (2.99)***	–0.610 (2.77)***
Proportion of women (%)	–0.566 (4.73)***	–0.576 (4.89)***	–0.579 (4.86)***	–0.579 (4.93)***
Proportion of apprentices (%)	–1.924 (6.88)***	–1.899 (6.85)***	–1.867 (6.71)***	–1.873 (6.79)***
Proportion of university graduates (%)	0.967 (2.05)**	0.933 (2.06)**	0.982 (2.15)**	0.966 (2.16)**
Coverage by a collective agreement	–4.079 (0.88)	–5.286 (1.16)	–2.847 (0.618)	–4.588 (1.01)
Works council	13.413 (2.79)***	4.447 (0.88)	18.197 (3.35)***	11.637 (2.15)**
Shift work		24.174 (5.30)***		24.393 (5.36)***
Profit sharing for executive managers		10.707 (2.65)***	22.550 (3.26)***	22.129 (3.24)***
Profit sharing for executive manager * works council			–17.261 (2.09)**	–18.186 (2.23)**
Industry dummies	Included	Included	Included	Included
Number of observations	1057	1057	1057	1057
R^2	0.256	0.284	0.266	0.287

Method: OLS. *, ** or *** denote significance at $\alpha = 0.10$, 0.05 or 0.01. Heteroscedastic-consistent t-statistics are in parentheses, White's (1980) method.

statistically insignificant. There are two explanations for this result. First, as shown in Table 2, both shift work and managerial profit sharing are positive covariates of works council presence. If for example work councils have positive productivity effects through their role in establishing and maintaining shift work, the inclusion of a shift work variable will decrease the coefficient on works council presence. Second, the coefficient on works council presence will be over- or underestimated, if it is not controlled for the interaction of works councils with other variables. The estimates in column (3) and (4) of Table 3 show that there is a strong and negative interaction effect of works councils and managerial profit sharing on productivity. Taking into account this interaction effect, both the coefficient on profit sharing for executive managers and the coefficient on works council presence increase substantially. Moreover, the impact of works councils is statistically significant regardless of the inclusion of shift work in the regression. However, the coefficient on works council presence is clearly smaller when controlling for shift work.

Interestingly, the negative interaction effect of managerial profit sharing and works councils contrasts with the positive interaction effect of profit sharing for employees and works councils in the study by FitzRoy and Kraft (1995). This clearly indicates that works councils may play a different role for managerial profit sharing and for profit sharing applied to the work force as a whole. The negative interaction effect shown in Table 3 is consistent with the notion that works councils are of particular importance for the economic success of establishments, when no managerial profit sharing is in place. However, the theoretical explanation for the interaction effect of profit sharing for executive managers and works councils is complex. The hypotheses summarised in Table 1 show that there are at least two possible explanations. First, if profit sharing decreases the commitment value of agency and works councils cannot foster trust and loyality without the managers' cooperation, a negative interaction effect on establishment performance may result. Second, if managerial profit sharing induces managers to reduce their rent-seeking activities and works councils are not so important for building cooperation in establishments with less severe manager opportunism, a negative interaction effect is also likely to be found.

Finally, we perform the estimates for the subsample of establishment with 21 to 100 employees. The results are shown in Table 4. With the exception of the insignificant coefficient estimates for establishment size and the time dummy, the results for the control variables are similar to those shown in the estimates with the full sample. Managerial profit sharing exerts a positive influence on productivity also in the estimates with the subsample of smaller establishments.[14] However, no statistically significant interaction effect of

[14] Mueller and Spitz (2001) obtain a similar result for small and medium-sized firms. In their study, managerial ownership up to around 80 percent increases firm performance.

Table 4

Pooled Productivity Estimates for 1994 and 1996
(Establishments with 21 – 100 Employees)

Variable	(1)	(2)	(3)	(4)
Constant	165.59 (8.06)***	167.39 (7.95)***	157.60 (7.66)***	165.38 (8.05)***
Time dummy 1996	–2.496 (0.49)	–3.204 (0.64)	–2.973 (0.59)	–3.277 (0.65)
Establishment size (number of employees)	0.010 (0.83)	0.017 (0.14)	0.074 (0.62)	0.021 (0.17)
Production technology at the newest level	22.052 (3.40)***	19.097 (2.88)***	21.455 (3.30)***	18.952 (2.85)***
Single establishment	–16.12 (2.52)**	–14.71 (2.29)**	–15.031 (2.32)**	–14.668 (2.29)**
Proportion of blue collar workers (%)	–0.628 (2.95)***	-0.700 (3.30)***	-0.581 (2.71)***	-0.700 (3.31)***
Proportion of part-time workers (%)	–0.872 (2.43)**	–0.851 (2.40)**	–0.865 (2.41)**	–0.861 (2.39)**
Proportion of women (%)	–0.409 (2.60)***	–0.392 (2.49)**	–0.410 (2.63)***	–0.393 (2.50)**
Proportion of apprentices (%)	–2.026 (4.95)***	–2.050 (4.98)***	–1.954 (4.69)***	–2.061 (5.00)***
Proportion of university graduates (%)	2.096 (2.11)**	1.945 (1.98)**	2.053 (2.10)**	1.942 (2.00)**
Coverage by a collective agreement	–8.861 (1.53)	–8.79 (1.53)	–8.360 (1.44)	–8.739 (1.52)
Works council	15.989 (2.32)**	14.532 (2.14)**	18.180 (2.60)***	18.066 (2.56)**
Shift work		18.456 (2.82)***		18.674 (2.84)***
Profit sharing for executive managers		12.375 (2.65)***	15.652 (2.01)**	16.740 (2.20)**
Profit sharing for executive manager * works council			–6.354 (0.60)	–7.789 (0.74)
Industry dummies	Included	Included	Included	Included
Number of observations	438	438	438	438
R^2	0.323	0.343	0.331	0.344

Method: OLS. *, ** or *** denote significance at $\alpha = 0.10$, 0.05 or 0.01. Heteroscedastic-consistent t-statistics are in parentheses, White's (1980) method.

managerial profit sharing and works council on productivity can be found. This result indicates implicitly that the negative interaction effect, shown in Table 3, is particularly prevalent in larger establishments. Most noteworthy, the positive coefficient on works council presence is statistically significant, even when controlling for managerial profit sharing and shift work. The finding accords with the missing interaction effect and with the missing association of works council presence with managerial profit sharing and shift work in this subsample of smaller establishments (see Table 2).

An earlier study by Smith (1994) with data provided by the Institut für Arbeit und Technik shows also positive productivity effects of works councils for smaller establishments. Addison, Schnabel and Wagner (2001) fail to find a statistically significant productivity effect of works councils for smaller establishments. However, they restrict their analysis to productivity estimates for 1993 with the first wave of the Hannover Panel.[15] In contrast, the results in Table 4 show that it is reasonable to use the full information provided in a data set. The coefficient estimates for the various variables in Table 4 are generally better determined compared to those provided by Addison, Schnabel and Wagner. This casts some doubts on the specification used by Addison, Schnabel and Wagner and on their restriction of the analysis to the first wave. Finally, Jirjahn (2003a) examines the productivity effects for establishments with 21 to 100 employees in more detail. Confirming the theoretical models in Freeman and Lazear (1995) and Hübler and Jirjahn (2003), the study by Jirjahn (2003a) shows that this positive productivity effect of works councils can be only found for smaller establishments covered by collective agreements but not for smaller establishments without collective agreements.

4. Concluding Remarks

For our understanding of works councils it is crucial to take into account the factors that influence their economic effects. This study confirms the notion that the managerial environment plays an important role. The theoretical framework provided in this paper identifies two relevant relationships for the interaction of executive compensation and works councils, namely the relationship between codetermination and self-enforcing contracts and the relationship between agency problems and trustful employer-employee relations. The empirical analysis shows a negative interaction effect of profit sharing for ex-

15 Addison, Schnabel and Wagner (2001) justify their restriction with the sample attrition over the waves of the Hannover panel. However, they do not provide any evidence that panel attrition causes serious problems on using the entire data set. The ad hoc restriction used by Addison, Schnabel and Wagner allows no use of the various advantages a panel data analysis provides (e.g. less collinearity, identification of outliers, controlling for establishment-specific heterogenity).

ecutive managers and works councils on productivity. This negative interaction effect seems to be particularly prevalent in larger establishments.

The results of this paper clearly call for further research. First, the negative interaction effect of managerial profit sharing and works councils is consistent with at least two explanations. In order to test these two explanations, we need more direct information on the managers' willingness to cooperate with the works councils. One way would be to examine the impact of managerial profit sharing on the managers' attitudes toward codetermination. If managerial profit sharing reduces the commitment value of agency, a negative impact of profit sharing on the managers' attitudes toward works councils can be expected. In contrast, if profit sharing reduces rent-seeking activities of managers, a positive impact of profit sharing on the managers' willingness to cooperate with works councils can be expected. Second, the relationship between codetermination and the form of profit sharing deserves greater scrutiny. Third, further research should not only take into account the managers' compensation but also variables, which indicate the severity of information asymmetries between owners and managers. Fourth, further insights could obtained by combining the analysis of this paper with an analysis of additional interactions such as the interplay of works councils and collective bargaining.

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