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Does Profit Sharing Reduce Conflict with the Boss? Evidence from Germany

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ABSTRACT This paper argues that, in general, profit sharing aligns the interests of workers and the firm and that this alignment reduces the extent of conflict between workers and management. This paper also argues that this general result will not carry over to the workers least able to respond to the alignment of interests with greater effort and that it will not apply to supervisors. After describing the German use of profit sharing, we use German data to show that for non-supervisory workers in excellent health, profit sharing reduces conflict but that for those who are not in excellent health and for supervisors, profit sharing does not reduce conflict. We also show that independent from profit sharing, conflict with the boss is greater for the aged and for those not in excellent health.

KEY WORDS: Profit sharing, mutual monitoring, cooperation, supervisor, health
JEL CLASSIFICATION: J33

Introduction

In a workplace with profit sharing, a worker's earnings depend on the productivity of his or her co-workers and this dependence creates an incentive for the worker to increase the productivity of those co-workers. The resulting increase in mutual monitoring and helping effort among workers suggests that the nature of the relationship between supervisors and workers will also

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change.[1] To the extent that the interests of workers and supervisors are more nearly aligned and fit with profit maximization, the conflict between workers and supervisors may be reduced. Moreover, if profit sharing is simply risk sharing between the firm and workers (Lazear, 1998: Ch. 11), its presence reduces the potential deviation in the fortunes of workers from that of the firm. This reduction may also help reduce conflict between supervisors and workers. Yet, these basic points may not apply to all workers.

Those workers who are unable to respond to increased pressure with greater effort may find themselves singled out by co-workers and subject to harsher treatment by supervisors. The earnings and success of supervisors depend on such worker's productivity and attempts to elicit additional productivity may generate added conflict. Thus, there appear to be two types of offsetting influences that might alter the extent of conflict between workers and supervisors. The aligning of interests between supervisors and workers would tend to reduce conflict but the link of pay to performance may create additional pressure on those least able to respond to that same alignment of interests.

We formulate hypotheses on these circumstances. We imagine workers have differential abilities to increase their own productivity and that of their co-workers. We make this point more precise by distinguishing between subordinates and supervisors, between the healthy and not healthy and by considering the age of the workers. Our theoretical considerations present testable hypotheses on the circumstances under which profit sharing has either a positive or a negative effect on workplace conflict between workers and supervisors.

We use the employee data of the German Socio-Economic Panel to demonstrate the influence of profit sharing on conflict with the supervisor. This demonstration supports the idea that it is crucial to distinguish between different subgroups of employees facing different situations on their job. The next section reviews the theoretical relationships predicting an association between conflict and profit sharing. The section after presents the data and testing methodology. The subsequent section presents the estimations and the final section summarizes.

Profit Sharing and Conflict

We first describe profit sharing in Germany and then sketch the available theories on the connection between workplace conflict and profit sharing. We next draw on this sketch to develop specific hypotheses involving three variables, supervisory status, health and age.

[1]For evidence on the extent of increased mutual monitoring (peer pressure) versus increased helping effort see Heywood *et al.* (2003). For evidence on the ease with which workers can monitor each other and on worker attitudes toward poorly performing co-workers see Freeman *et al.* (2004).

Profit Sharing in Germany

Profit sharing is thought to enhance labour market efficiency. It elicits increased effort from existing workers and it may help firms attract inherently more productive workers. In addition, profit sharing is thought to help maintain full employment (or at least increase employment) over the business cycle by decreasing the marginal cost of labour (Weitzman, 1984). Yet despite these supposed advantages, the use of profit sharing in Germany is relatively modest. Our evidence will suggest that only one in ten German workers receives profit sharing. This is far less than the 1/3 of all workers who receive a combination of voluntary and mandated profit sharing in France (Fakhfakh & Perotin, 2002). It is also far less than estimates from micro data sets in the US which suggest 17 to 33% of workers receive profit sharing (Parent, 2002). While establishment provision rates will yield different percentages, the patterns across countries are broadly similar. Virtually all large French firms have profit sharing (Fakhfakh & Perotin, 2002) and survey data from Canada indicates that as many as 32% of firms with 200 or more employees provide profit sharing (Long, 2002). Survey data on manufacturing establishments in Germany indicate that only 14.7% provide profit sharing (Jirjahn, 2002).

While these data are drawn from a variety of surveys using different definitions and examining different samples, the OECD (1995) has tried to perform some standardization. Examining eight countries they suggest that Germany ranks ahead of Finland but behind Australia, Belgium, Canada, France, the United Kingdom and the United States in the share of firms that offer profit sharing. Examining nine countries they suggest that Germany ranks ahead of Australia, about the same as the United Kingdom but behind Belgium, Finland, France, the Netherlands and the United States in the share of employees receiving profit sharing.[2]

The unique German system of industrial relations may play a role in explaining the apparently modest incidence of profit sharing. The German system of industrial relations is characterized by dual employee representation through both unions and work councils.[3] Heywood *et al.* (1998) find that establishments covered by collective bargaining agreements are less likely to use profit sharing. This negative link between collective bargaining and profit sharing may reflect the generally recognized scepticism of German unions toward formal profit sharing plans. However, collective bargaining not only has a direct impact on the incidence of profit sharing but also an indirect effect through the role of German works councils. Works councils provide a highly developed mechanism to build a cooperative industrial relations climate that is crucial for a successful implementation of profit sharing and other forms of variable pay. Freeman & Lazear (1995)

[2]While the OECD attempts to standardize the presentation of the data as much as possible, these orderings are still based on separate country specific surveys and do not have exactly the same definitions or sampling universes (see OECD, 1995: 142–144).
[3]See Hübler & Jirjahn (2003) for more details.

hypothesize that councils are more likely to build trust and cooperation when substantial distributional conflicts are moderated by unions and employers' associations outside the firm. This hypothesis is supported by Heywood *et al.* (1998) who find a positive link between the presence of a works council and the use of profit sharing in establishments covered by collective agreements but not in uncovered establishments.

While there are opposing effects of the German system of industrial relations on adopting profit sharing, this system provides stronger support for the adoption of more traditional variable payment schemes. Often, collective bargaining agreements contain more or less detailed regulations concerning the design of piece rates and premium pay whereas profit sharing usually is not regulated.[4] This fits with the fact that works councils have stronger constitutional codetermination rights in the case of piece rates than in the case of profit sharing. As a consequence, Germany makes surprisingly extensive use of piece rates. In 1995, 26.6% of blue-collar men and 35.7% of blue-collar women were paid by piece rates or closely related premium pay (Jirjahn, 2002). Similarly, the same survey of manufacturing establishments that identified 14.7% with profit sharing found 18.2% with piece rates and 16.1% with premium pay. While some establishments may offer both premium pay and piece rates, it remains apparent that such individual and small group incentives are more common than profit sharing in Germany.[5] To the extent that these incentives play similar roles as profit sharing, their prevalence may help explain the relatively modest use of profit sharing.

Two additional points deserve noting. First, unlike the United States where profit sharing is often deferred, it is nearly all contemporaneous in Germany (Heywood & Jirjahn, 2002). Second, there appears to be substantial churning among German profit sharing plans. Panel data from the German State of Lower Saxony shows that between 1994 and 1996 many more establishments either dropped or added plans than those that continued an existing plan across the two survey years. Specifically, 8.9% of establishments had a profit sharing plan in 1994 but not in 1996 while 6.7% had no plan in 1994 but had a plan in 1996. These compare to only 8.1% that had a plan in both 1994 and 1996 (Jirjahn, 2002).

Despite the relatively modest use of profit sharing and the high apparent turnover in plan use, the motivations for using profit sharing in Germany mirrors that in other countries. Profit sharing in Germany emerges as part of a broader package of associated policies that includes greater and more frequent training, the use of teams in production and the implementation of programmes to improve communication between workers and with supervisors (Jirjahn, 2002). The elements of this broader package can be seen as reinforcing profit sharing in tying together the interests of the worker and

[4]Premium pay rewards an objective measure of productivity other than output. These include reduced waste, speed of task completion or quality.

[5]US micro data reveal just the opposite pattern with very few workers paid by piece rates or related schemes (see Parent, 2002).

firm. We now turn to examine the relationship between conflict with supervisors and that tying together of interests.

Profit Sharing and Conflict with the Boss

Using a survey of US firms, Kruse (1993: 33) points out that the most prevalent reason given by managers for providing contemporaneous profit sharing is to motivate employees. 'Profit sharing has long been promoted as a way to improve company performance by tying the incentives of employees more closely to those of owners and managers' (Kruse, 1993: 45). The expectation is that workers will put forth more effort individually but also that the nature of group interaction will be changed as well. Profit sharing provides incentives for increased cooperation and helping on the job. It also provides incentives for increased peer pressure. In both cases, the workers may be likely to take a share of the responsibility for what were previously exclusive managerial duties. As the workers support supervisors in their managerial functions, conflicts between the workers and the supervisors should diminish.

The basic managerial function of monitoring effort is replaced, in part, by 'horizontal monitoring' by co-workers. Workers are often in a better position than managers to monitor effort. As workers conduct their activities, they gain knowledge about the productivity of their co-workers. There is no incentive for this information to be provided to supervisors when payment is based on time or individual productivity. Profit sharing provides an incentive for workers to identify for supervisors which workers have low productivity. Thus, the supervisor obtains knowledge otherwise absent or only available at greater cost. The exchange of this information should reduce conflict between the supervisor and the productive workers who provide it.

In addition to simply providing information about which employees have low productivity, workers may also try to improve these employees' productivity. They may do so by creating peer pressure (Kandel & Lazear, 1992). Since a worker's effort affects the income of the other workers, they have an incentive to exert pressure on the worker in order to induce a higher effort level. Of course, a crucial requirement is that the colleagues are able to exert pressure. If they are able, workers receiving profit sharing will invest in both mutual monitoring and the creation of peer pressure. Kandel & Lazear discuss several examples of peer pressure including internal pressure by guilt and external pressure by shame, ostracism or physical punishment when a worker is caught shirking by his colleagues. Recent case studies provide evidence. Knez & Simester (2001) identify a high incidence of mutual monitoring and peer pressure induced by profit sharing at Continental Airlines, where employees monitored colleagues who called in sick. We emphasize that this represents workers partially taking over a managerial function. The assigning of punishments for low productivity workers is surely at the heart of the managerial function. It usually involves actions that generate conflicts between workers and supervisors. To the extent that workers take these actions themselves, conflict with the supervisor is again mitigated.

The second fashion in which workers can influence co-workers' productivity is by providing helping effort, cooperating with them in ways that make them more productive (Drago & Turnbull, 1998; FitzRoy & Kraft, 1986; Rotemberg, 1994). Evidence of helping effort is provided by Encinosa *et al.* (1997) who examine physicians' finding that medical partnerships with equal sharing of profits among partners – as opposed to payment schemes based on the partners' individual contributions – report a significant higher frequency of physicians consulting one another about cases. Importantly, to the extent that helping effort increases, workers have again taken a share of the responsibility for a critical managerial function. The organization of workers into productive cooperative relationships is obviously more easily accomplished when profit sharing creates financial incentives that encourage workers to participate in these relationships.

We recognize that peer pressure and cooperation may go hand in hand to some degree. Thus, some kinds of peer pressure may require that a worker in some way cares about the things his colleagues are saying and thinking. In addition, the incentive to engage in mutual monitoring and peer pressure may be enhanced by norms and reciprocity (Bowles & Gintis 1998). Thus, while cooperation and mutual monitoring may overlap to some degree, we emphasize that both should reduce conflict between the supervisor and a representative worker.

Finally, profit sharing may cause supervisors to behave with greater fairness toward subordinates. This, in turn, may reduce the scope of conflict between workers and supervisors. Prendergast & Topel (1993) argue that favouritism by supervisors is more likely when the superiors are not the residual claimants of the subordinates' outputs. Profit sharing makes supervisors residual claimants. Laffont (1990) also shows that a supervisor's incentive to engage in hidden gaming and favouritism is reduced if the supervisor receives profit sharing that implicitly penalizes them for such behaviour. Thus, to the extent that workers with profit sharing have supervisors with profit sharing we anticipate a further reduction in conflict between supervisors and those workers who are able to increase their own productivity or the productivity of their co-workers. In contrast we expect increased conflict between supervisors and those employees who have a low productivity. A supervisor remunerated by profit sharing has an increased interest in the subordinates' productive efforts. Thus, the supervisor, who often has substantial powers of reward and punishment, will increase the pressure on the subordinates to elicit productive effort. This brings us to the issue of health.

Health

It is apparent from the description of mutual monitoring that not all workers benefit equally. While the overall influence may be to create a higher group norm and increase average performance, there will remain variations within that average. Inherently low productivity workers will be the least able to respond to the financial reward for performance created by profit sharing. These same lower productivity workers will be worse off as peer

pressure is applied, to which they also have less ability to respond. Similarly, these same low productivity workers are unlikely to be the beneficiaries of helping effort because of their lower ability to reciprocate. In the end, these are workers who will be reported to the supervisor as not carrying their weight and as worthy of punishment. Thus, the very information that enhances the ability to detect and punish low productivity will have, as a by-product, greater conflict between lower productivity workers and their boss.

Thus, we anticipate that indicators of low productivity may be associated with conflict in any workplace but that these indicators will be associated with even greater conflict in the face of profit sharing. Our data have only oblique indicators of productivity with the best being a three-way indicator of health status. We suspect that those with worse health status, all else equal, will be less productive workers. This would follow evidence that those with health limitations both earn less and report lower job satisfaction (Clark & Oswald, 1996). A second potential indicator could be age. Workers who are very old or very young may be less productive. Moreover, age and health status may be closely related with older workers more likely to have worse health status. In what follows, we will examine the relationships between health, age and profit sharing in determining conflict with the boss.

Subordinates vs. Supervisors

While profit sharing may reduce the conflict between productive line workers and their supervisor, it may not have that influence on the relationship between the supervisor and her boss. Profit sharing is thought not only to elicit additional individual effort from line workers (working harder) but also to encourage them to improve processes, reduce costs and improve quality (working smarter).[6] This changes the direction in which ideas, suggestions and authority may flow. While the traditional firm has each of these flowing from upper management to the work floor, profit sharing is thought to introduce a countervailing flow from the work floor back up the organization (Nalbantian, 1987). Thus, most supervisors will find themselves in the middle of this two-way flow, a position that may increase conflict with their own bosses. They have suggestions and ideas from the shop floor that they will be responsible for presenting to their superiors while at the same time having directives from the superiors that they are to deliver to the shop floor. Indeed, if the supervisor receives profit sharing she will have greater incentives than previously existed to move information up to her boss.

Moreover, even if most line workers more nearly identify with management and report reduced conflict as a result of profit sharing, the supervisor receiving profit sharing has a stronger incentive to identify and punish poorly performing workers. If this latter aspect dominates the supervisor's attention, it is possible that the average line worker reports reduced conflict but the

[6]For a model of these relationships see Jirjahn (2000).

Table 1. Relative frequency distribution of conflict with the supervisor by profit sharing status

	No Conflict	Partial Conflict	Complete Conflict	Total
No Profit Sharing	0.651	0.217	0.027	0.895
Profit Sharing	0.074	0.028	0.003	0.105
Total	0.725	0.245	0.030	1.000

Note: This is based on the full sample size of 2,015.

supervisor reports greater conflict with her subordinates (for evidence see Heywood *et al.* 2003). To the extent that this conflict is moved up the line, supervisors may report greater conflict with their own boss. Thus, in sum, we expect no link or even a negative link between profit sharing and conflict with the boss for supervisors.

Data and Descriptive Statistics

Our empirical study uses the 1995 wave of the German Socioeconomic Panel (hereafter GSEOP), the most recent wave with information on 'conflicts with the supervisor.'[7] The GSOEP is a representative longitudinal study of private households in Germany. It started in 1984 with collection of data in the former West Germany and was extended to East Germany in 1990. Based on face-to-face interviews, a nucleus of socio-economic and demographic questions is asked annually. Different 'special' topics are sampled in specific waves. The analysis of the 1995 wave is restricted to German employees in the private sector. Thus, self-employed respondents, foreigners, public sector employees and those with unclear sectoral affiliations are excluded. We also limit our attention to male workers. We justify this by noting the men and women have different wage formation processes, select differently into performance pay schemes and also have different attitudes toward profit sharing.[8]

The measure of conflict asks workers 'Do you have difficulties or conflicts with your supervisor?' and allows three ordered responses: no, partially or fully. Table 1 presents the frequency of responses divided by whether or not the workers receive profit sharing. No strong pattern emerges. The distributions are very similar for those who receive and do not receive profit sharing, with perhaps those not receiving profit sharing slightly more concentrated in the extremes. It would seem that there is little influence for profit sharing or that the opposing influences identified in theory offset each other. Thus, uncovering any empirical influence for profit sharing may depend on controlling for other determinants.

[7]See SOEP Group (2001) for a more detailed description of the data set.
[8]For more on gender differences in attitudes toward incentive pay see Goldin (1986), Geddes & Heywood (2003) and Heywood & Wei (2004).

Table 2 presents the variable definitions and descriptive statistics. Recall we identified two critical variables we felt would be linked to the offsetting influences of profit sharing: supervisory status and worker health. In addition to the indicator of profit sharing and these environmental variables, a variety of controls are included to account for other influences on cooperation. To the extent that age is associated with productivity, we anticipate it may influence conflict. We have already anticipated that those with worse physical health will be less likely to cooperate and will have less satisfactory relations with co-workers and with their boss. We recognize that age and health may be related and will account for this in our ultimate estimations. Workers who have a wide variety of tasks are likely to be involved with a wide variety of co-workers in situations in which cooperation has large advantages. Those workers who have a job that is 'closely controlled' may have less scope for cooperation if that control is by a machine and may well have more conflict with a supervisor if that control is by the supervisor. We include indicators of risk and stress in the expectation that these dimensions diminish job satisfaction and enhance the possibility for conflict with the supervisor. Indeed, we recognize that conflict with the supervisor may be a source of stress and so must remain agnostic about the direction of causation. We include a control identifying those for whom success on the job is very important, in the expectation that such workers will avoid conflict with the boss, seeing such conflict as detrimental to success. Further controls include those for part time status, working in a blue-collar occupation and a series of broad industry indicators.

Table 2. Variable definitions and descriptive statistics (mean, standard deviation)

Conflict – 'Do you have difficulties or conflicts with your supervisor?' Three possible answers: 1 = No, 2 = partially, 3 = fully (1.30, 0.52).
Age – age of employee (39.3, 10.5).
Married – dummy = 1 if married (0.716, 0.451).
Job Variation – dummy = 1, if job involves a large degree of task variation (0.648, 0.478).
Control – dummy = 1, if 'job output is strictly controlled' applies fully or partly; 0, if does not apply (0.619, 0.486).
Risk – dummy = 1, if the statement: 'increased risks of work related accident' applies fully or partly; 0, if does not apply (0.568, 0.495).
Stress – dummy = 1 if 'job is high stress' applies fully or partly; 0, if does not apply (0.794, 0.405).
Part time – dummy = 1, if part time worker (0.009, 0.094).
Blue collar – dummy = 1, if the employee is a blue collar worker (0.605, 0.489).
Success – dummy = 1, if success on the job is very important (0.333, 0.471).
Profit Sharing – dummy = 1, if employee received profit sharing payment last year (0.104, 0.306).
Supervisor – dummy = 1, if supervisor from foreman to manager (0.132, 0.388).
Lesshealthy – 3 = bad health condition, 2 = middle health condition, 1 = excellent health condition (1.627, 0.676).
Industry Indicators – Eight broad categories of industrial groups.

Our methodology is to build up the sample using the two key variables and estimating the determinants of conflict at each stage. We start with what we identify as the basic subsample. This consists of non-supervisory workers who do not report being less healthy. Despite these limitations, the subsample retains more than 40% of all observations (849 out of 2,015). We then progressively add first supervisors and then those with lower health status. At each stage we add a control for identifying those added to the subsample and interact that control with the presence of profit sharing. In this fashion we can test the hypotheses outlined in the previous section. As the dependent variable is an ordered ranking, we shall fit its responses to a cumulative normal using ordered probit estimation.

Estimation Results

Table 3 presents the series of ordered probit estimations on the determinants of conflict with the supervisor. The first column presents our estimation on the subsample of non-supervisory workers with the best health status. The controls largely fit with expectations. There appears to be no evidence of age, marital status or job variation influencing the extent of conflict with the boss. On the other hand, workers who claim that their job is closely controlled report far greater conflict. Similarly, workers reporting stress on the job are also likely to report greater conflict with their boss. Part-time, importance of success and blue-collar status are not significant determinants. Those workers on profit sharing report a significantly smaller degree of conflict than their otherwise equal counterparts not receiving profit sharing. Thus, to return to the title of the paper, profit sharing does appear to reduce conflict with the boss among this subsample.

The next subsample adds supervisors to those respondents from the first subsample. The ordered probit is re-estimated with a dummy variable for supervisors and its interaction with profit sharing. The controls continue to exhibit the same general pattern with the addition that jobs exposing workers to a higher risk of accident are associated with greater conflict with the boss. The basic profit sharing variable continues to take a positive and significant coefficient of approximately the same size. The insignificant coefficient on the supervisor variable demonstrates that there is no difference in the extent of conflict that supervisors have with their bosses when compared to those who are not supervisors. The coefficient on the interaction of supervisor and profit sharing is positive and statistically significant. It is roughly three times the magnitude (but of opposite sign) of that for basic profit sharing variable. The null hypothesis that profit sharing has no influence on the conflict of supervisors with their boss cannot be rejected.

The second subsample adds those with lower health status. The re-estimation continues to show the role of job control, stress and risk but new controls also emerge as significant. Older workers and blue-collar workers now emerge as having less conflict. Profit sharing continues to be associated with reduced conflict among our base subsample. Supervisors continue to have no greater conflict than the base group but they are influenced

Table 3. Determinants of conflict (ordered probit)

	(1) Non-supervisory Less Healthy = 1,2	(2) (1) + Supervisor	(3) (2) + Less Healthy = 3	(4) (2) + Less Healthy = 3
Age	0.0074 (1.30)	0.0039 (0.75)	−0.0054* (1.65)	0.0137* (1.71)
Married	0.0762 (0.64)	0.0491 (0.44)	0.0192 (0.26)	0.0074 (0.10)
Job Variation	−0.0672 (0.63)	−0.0479 (0.48)	−0.0105 (0.16)	−0.0057 (0.09)
Control	0.4235*** (3.91)	0.4663*** (4.65)	0.5220*** (7.74)	0.5272*** (7.81)
Risk	0.1662 (1.36)	0.1884* (1.66)	0.2134*** (2.90)	0.2207*** (3.01)
Stress	0.3237*** (2.62)	0.3102*** (2.61)	0.3295*** (3.98)	0.3266*** (3.94)
Part time	−0.1869 (0.30)	−0.2794 (0.45)	0.1861 (0.62)	0.2167 (0.72)
Blue collar	−0.0502 (0.38)	−0.1329 (1.07)	−0.2299*** (2.92)	−0.2177*** (2.76)
Success	0.0234 (0.23)	0.0040 (0.04)	−0.0273 (0.43)	−0.0284 (0.44)
Profit Sharing	−0.3331* (1.73)	−0.3443* (1.79)	−0.5182* (1.83)	−0.5240* (1.85)
Supervisor		−0.0718 (0.47)	0.1104 (1.17)	0.0998 (1.06)
Supervisor × Profit Sharing		0.9843** (2.34)	0.4681* (1.88)	0.5072** (2.04)
Lesshealthy			0.2152*** (4.58)	0.6434*** (3.75)
Lesshealthy × Profit Sharing			0.2858** (1.98)	0.2811* (1.94)
Age × Lesshealthy				−0.0108*** (2.60)
μ_1	1.744	1.621	1.38	2.135
μ_2	3.093	2.980	2.758	3.516
Industries	YES	YES	YES	YES
Chi-Squared	43.01***	51.60***	162.03***	172.76***
N	859	977	2015	2015

Notes: *statistically significant at 10%; **statistically significant at 5%; ***statistically significant at 1%.

by profit sharing differently. The interaction of supervisor with profit sharing continues to be positive and with a coefficient approximately the same absolute value as that for the base subsample. Thus, profit sharing has no influence on the level of conflict for supervisors.

The results indicate that less healthy workers have greater levels of conflicts with their supervisors. Moreover, less healthy workers on profit sharing have an even greater level of conflict than less healthy workers in general. As suggested, this might be indicative of less healthy workers being more likely to be identified as low productivity workers and being subject to peer pressure and being reported to the supervisor. This reporting will presumably be associated with efforts by the supervisor to increase the workers' productivity, which will be a likely source of additional conflict between these workers and their supervisor.

Finally, we attempt to capture the interaction between age and health status in our final estimation. The re-estimation in column 4 of Table 3 largely mimics what has already been shown. Job control, risk and stress all emerge as very strong positive indicators of increased conflict (each as a t-statistic larger than 3.0) and blue-collar workers continue to report less conflict. Profit sharing continues to be associated with significantly reduced conflict among the base group. The coefficient on the interaction of profit sharing with the supervisor is nearly of identical size but of the opposite sign. Thus, profit sharing appears to have no effect on the level of conflict for supervisors with their supervisors. Those with worse health status continue to emerge with greater conflict with their supervisors. In addition, the presence of profit sharing continues to further increase the level of conflict for those with worse health status.

Significant age results emerge from this final specification. First, the early suggestion that older workers may have less conflict is replaced with the finding that older workers have more conflict with their supervisors when comparing workers with the best health status. The interaction of worse health status and age has a significant negative coefficient. The pattern is then the following: older workers have more conflict and less healthy workers have more conflict but the effects are not fully additive. Workers who are both older and less healthy have roughly the same level of conflict as workers who are either older or less healthy.

The magnitude of the influences we identify in Column 4 of Table 3 can be demonstrated by projecting the probability of reporting each of the three levels of cooperation:

$$\begin{aligned} &\text{Prob(No Conflict)} = \Phi(\mu_1 - \hat{\beta}'\mathbf{x}) \\ &\text{Prob(Partial Conflict)} = \Phi(\mu_2 - \hat{\beta}'\mathbf{x}) - \Phi(\mu_1 - \hat{\beta}'\mathbf{x}) \\ &\text{Prob(Full Conflict)} = 1 - \Phi(\mu_2 - \hat{\beta}'\mathbf{x}) \end{aligned} \tag{1}$$

where μ_i $(i = 1, 2)$ is the cut-off level, $\hat{\beta}$ is the vector of estimated coefficients and $\boldsymbol{x}$ is the vector of independent variables. The projections are shown in Table 4. For each type of worker, the probabilities without and with

Table 4. Projected probabilities of conflict and the influence of profit sharing

	Conflict No	Conflict Partially	Conflict Fully
Non-supervisory (Lesshealthy = 1)	0.780	0.204	0.016
	0.845	0.147	0.008
Non-supervisory (Lesshealthy = 2)	0.710	0.264	0.027
	0.697	0.274	0.029
Non-supervisory (Lesshealthy = 3)	0.631	0.326	0.043
	0.506	0.413	0.082
Supervisory (Lesshealthy = 1)	0.780	0.204	0.016
	0.694	0.276	0.030
Supervisory (Lesshealthy = 2)	0.710	0.264	0.027
	0.503	0.414	0.083
Supervisory (Lesshealthy = 3)	0.631	0.326	0.043
	0.311	0.502	0.187

Note: The first entry in each cell is the projection without profit sharing and the second (bold) entry is that with profit sharing. All probabilities are projected using the estimation in Table 3, Column 4. All variables other than those examined and variables for all insignificant coefficients are assumed to be at their mean level.

profit sharing are calculated. All variables other than those examined and all variables with insignificant coefficients are assumed to be at their mean level.

Considering non-supervisory employees with the best health status, the projections confirm a large positive impact of profit sharing. As the first row of Table 4 shows, profit sharing results in a 50% decrease in the probability of being in complete conflict and a 28% decrease in the probability of being in partial conflict. These reductions come with a matching increase in the likelihood of reporting no conflict. In contrast, the second row reveals almost no impact of profit sharing on the extent of conflict for those in the middle health status category. The third row examines the influence of profit sharing on non-supervisory workers with the worst health status. For these workers, profit sharing dramatically increases the extent of conflict. The probability of reporting complete conflict nearly doubles under profit sharing regimes while the probability of reporting partial conflict increases 27%. The consequence is that nearly half of all workers in this subsample report some degree of conflict. The remaining three rows examine the influence of profit sharing for supervisors. In every instance, profit sharing increases the amount of conflict. This increase is relatively modest for those supervisors with the best health status but the size of the increase grows as health status deteriorates. The projections for supervisory employees with the worst health status are very dramatic. Profit sharing for these workers is associated with a more than fourfold increase in the probability of reporting complete conflict and a very large increase in reporting partial conflict. Of this subsample, only 31% report the absence of conflict while this figure in the full sample is 73% (the raw percentage, not a projection).

The Endogeneity of Profit Sharing

While our base result has been that non-supervisory workers in the best health have less conflict when receiving profit sharing, the analysis implicitly assumes that the determinants of profit sharing are independent of the other determinants of conflict. It seems conceivable that some of the determinants of conflict missing from our estimation are correlated with the presence of profit sharing. Thus, characteristics that give workers a predisposition toward reduced conflict may also make them more likely to select an employer offering profit sharing. If true, the coefficient we estimated for the influence of profit sharing would be biased.

To address the implied sample selection bias, we performed a series of treatment variable estimations in which profit sharing was a dummy endogenous variable. Each began with a first-stage probit estimation of the determinants of profit sharing on the entire sample using the all the explanatory variables from column 4 of Table 3.[9] From this the inverse mills ratio (IMR) was computed and included in the second stage estimation of the determinants of conflict for a base sample. The variations included returning the IMR directly to the ordered probit, returning the IMR to an ordinary least squares estimation of getting along with colleagues that assumed the dependent variable was continuous, and returning the IMR to the ordered probit but also adjusting the standard errors of the second stage by internal resampling (bootstrapping). All three present the identical pattern. The coefficient on the IMR is statistically insignificant at the 10% level, leaving the results of Table 3 largely unchanged.

An alternative test of exogeneity calculated the residuals from the first stage equation and included them in the second stage equation. Despite several variations, the residuals were always insignificant, never allowing us to reject the hypothesis that profit sharing is exogenous in our estimations. Thus, the influence of profit sharing on conflict among the base sample persists.

Conclusion

This work highlights one of the major supposed advantages of profit sharing, that workers will behave more like owners. Profit sharing is thought to elicit additional effort from workers, cause them to monitor each other, to work together more productively, to communicate productivity enhancements to managers and to report low productivity workers to managers. In short, the typical worker takes over many quintessential managerial duties. We speculate that the taking over of such duties should be reflected in better relations with the boss as measured by the degree of workplace conflict with the boss. We found that profit sharing does, indeed, substantially reduce conflict for our base group of non-supervisory workers with the best heath status.

[9]Obviously the interactions were excluded.

We then examined two variables suggesting that this pattern may not be replicated for the associated subsamples. The estimates confirmed that profit sharing is not associated with reduced conflict among any of our other subsamples. While non-supervisory workers in the middle health status showed virtually no effect from profit sharing, those in the worst health status and all supervisory workers reported more conflict in the face of profit sharing. We speculated that less healthy workers are those more likely to be singled out as less productive and so the advent of profit sharing is associated with greater conflict with both co-workers and the boss for these workers. Supervisors are thought to have increased conflict with their own bosses as profit sharing brings incentives to move information and policy decisions both down and up the firm hierarchy. Being in the middle of such a situation may well be the source of the greater conflict supervisors report with profit sharing. Finally, we showed that older workers as well as less healthy workers report greater conflict but that the effect of these two circumstances is not additive.

While our estimates show that the link between profit sharing and the degree of conflict varies by circumstance and type of worker, we end with a comment about future research. Examining the impact of profit sharing on job satisfaction stands as an important future topic. Our findings suggest that this impact depends on the circumstance and the type of worker since these are crucial for the influence of profit sharing on workplace conflict. Thus, to the extent that increased conflict reduces job satisfaction, we anticipate a positive influence of profit sharing on job satisfaction independent of any effect working through increased earnings or other channels.

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