

## Identity, Supervision, and Work Groups

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“I want to tell my foreman to f\*\*\* off, but I can’t.” So says “Mike,” a steel handler we meet in Stud Terkel’s book *Working* (1974, xxxv). Many workers’ stories we read in *Working* and in ethnographies suggest workers greatly resent supervision. As a result, they exert lower effort and may sabotage production. Mike puts dents in the steel. Ethnographies also reveal workers who are not strictly monitored develop work group output norms. This paper uses the concept of identity to study trade-offs in supervisory policy.<sup>1</sup> We follow the social psychology literature and examine intrinsic incentives that depend on how workers see themselves in relation to the firm. When a supervisor monitors workers, workers adopt an identity in opposition to the firm. The firm gains information and can fine-tune its incentive pay. But resentful workers require high compensation to work in the firm’s interest. With no monitoring, workers are less hostile to the firm. But they may forge a work group identity, with norms that restrict output. We show that a firm may find it profitable to have lax supervision. When workers take on a work group identity, the cost per unit of effort can be lower than when workers view themselves in opposition to the firm. We shall present the model, and then discuss some classic studies of workplaces that portray these trade-offs.

Our identity framework synthesizes an emerging body of economic theory and empirics on incentives and monitoring (e.g., Bruno Frey 1993; Gary Charness 2000; Daniel S. Nagin et al. 2002; Michael T. Rauh and Giulio Seccia

2005). Our model follows much ethnography of firms and social psychology (e.g., S. Alexander Haslam 2004; Steven L. Blader and Tom R. Tyler 2007). What matters is not more or less monitoring per se, but how employees think of themselves in relation to the firm. While we construct a reduced-form model of monitoring versus not monitoring, firms can affect employee’s identifications with a variety of policies. Such policies include job rotation, work group composition, the layout of the work space, and sponsored activities (sports teams, company gatherings, and retreats). Our analysis of work groups thus adds to our understanding of management; it also gives a new perspective on mergers and firm boundaries.

### I. Model of Supervision and Worker Identity

Workers are risk averse and have utility from income and effort of  $\ln y - e$ . They have a choice of three actions: action A at cost  $e_A$ , action B at cost  $e_B$ , and action  $\Gamma$  at cost  $e_\Gamma$ , where  $e_A > e_\Gamma > e_B$ . The firm’s revenues are random and conditional on agents’ actions. When an agent takes action A, with probability  $\frac{1}{2}$  revenues are high,  $\pi_H$ , and with probability  $\frac{1}{2}$  revenues are low,  $\pi_L$ . When an agent takes action B, revenues are always  $\pi_L$ . When the agent takes action  $\Gamma$ , the probability of  $\pi_H$  is  $\gamma/2$  and the probability of  $\pi_L$  is  $1 - (\gamma/2)$ , where  $0 \leq \gamma \leq 1$ . The parameter  $\gamma$  represents how work group interaction—time spent socializing, refusal to report on a fellow worker to management, norms of lower output, etc.—may reduce productivity. The principal can observe and verify the realized revenues, but not the action itself.

We suppose that the agent could primarily identify as part of a work group, or as an outsider to the firm. Following ethnographies and social psychology experiments, we assume that appointing a supervisor who reports on workers creates a rift between the worker and the firm: the agent adopts an *Outsider* identity. If a supervisor does not report, or if no supervisor is appointed, the work group is cohesive, and the agent adopts a work group identity,  $G$ .

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<sup>1</sup> This paper provides a simple formal model of trade-offs described loosely in Akerlof and Kranton (2005). We also discuss further implications of supervision versus work group cohesion.

Each identity maps to an ideal level of effort, and workers' utility falls when their efforts deviate from their ideals. Together with utility from income and direct effort costs, we specify the overall utility of a worker with identity  $c = \{G, O\}$  as

$$(1) \quad U(y, e; c) = \ln y - e - t_c |e^*(c) - e|,$$

where  $e$  is the agent's choice of effort,  $e^*(c)$  is the ideal effort for a worker with identity  $c$ , and  $t_c \geq 0$  scales the loss of utility for a worker of category  $c$  by deviating from  $e^*(c)$ .

The principal has a choice whether or not to appoint a supervisor to observe and report on a worker's action. For simplicity, we assume that the supervisor observes and reports the worker's action at no cost: if the worker has chosen B, the supervisor can verify this action with probability  $p$ . Action A is never verifiable.

#### A. Supervision and Monitoring

Suppose, first, the principal appoints a supervisor to report on workers. By assumption, the agent takes on identity  $O$ . To give the agent an incentive to choose A, the principal can pay different wages for different revenue outcomes, and fine the worker an amount  $f$  if the supervisor verifies she has taken action B. Let  $w_H^O$  be the wage when revenues are high, and  $w_L^O$  the wage when revenues are low. The principal's expected profits are<sup>2</sup>

$$(2) \quad \Pi(O) = \frac{1}{2}[\pi_H + \pi_L] - \frac{1}{2}[w_H^O + w_L^O].$$

The participation constraint (PC), the incentive constraint (IC), and limited liability constraint (LLC) for a worker with an outsider identity, respectively, are:

$$(3) \quad \frac{1}{2} \ln w_H^O + \frac{1}{2} \ln w_L^O - e_A \quad (\text{PC}) \\ - t_O |e_B - e_A| \geq \bar{u},$$

$$(4) \quad \frac{1}{2} \ln w_H^O + \frac{1}{2} \ln w_L^O - e_A \quad (\text{IC}) \\ - t_O |e_B - e_A| \geq \ln w_L^O \\ + p \ln (w_L^O - f) - e_B,$$

<sup>2</sup> These profits are exclusive of the costs of supervision, which we consider to be fixed.

$$(5) \quad b \leq w_L^O - f, \quad (\text{LLC})$$

where  $\bar{u}$  is the worker's outside opportunity and  $b > 0$ . When all constraints are binding,<sup>3</sup> we have  $f = w_L^O - b$ ,  $w_L^O = \exp[1/(1-p)][\bar{u} + e_B - p \ln b]$ , and  $w_H^O = \exp\{[(1-2p)/(1-p)][\bar{u} + e_B] + 2(1+t_O)(e_A - e_B) + [p^2/(1-p)] \ln b\}$ .

We see here the trade-offs of introducing supervision and monitoring. As  $p$  increases, the gap between  $w_L^O$  and  $w_H^O$  decreases.<sup>4</sup> Supervision thus lowers the cost of incentive pay to the principal. But strict supervision also tightens the participation constraint. An  $O$ -worker who is performing effort  $e_A$  must be compensated for the gap between  $e_A$  and  $e_B$ , rather than for the smaller gap between  $e_A$  and  $e_\Gamma$ , as would be the case with a  $G$ -worker, whom we shall now examine.

#### B. Work Groups

We now consider a principal who does not monitor workers. The workers, by assumption, have a work group identity, and their ideal effort level is  $\Gamma$ . The principal can either elicit A from workers through wage incentives or let workers simply do their ideal effort  $\Gamma$ .

If the principal pays a wage scheme to induce A, the principal receives expected profits

$$(8) \quad \Pi(G) = \frac{1}{2}[\pi_H + \pi_L] - \frac{1}{2}[w_H^G + w_L^G],$$

and the workers have the following participation and incentive constraints:

$$(9) \quad \frac{1}{2} \ln w_H^G + \frac{1}{2} \ln w_L^G - e_A \quad (\text{PC}) \\ - t_G |e_\Gamma - e_A| \geq \bar{u},$$

$$(10) \quad \frac{1}{2} \ln w_H^G + \frac{1}{2} \ln w_L^G - e_A \quad (\text{IC1}) \\ - t_G |e_\Gamma - e_A| \\ \geq (\gamma/2) \ln w_H^G \\ + (1 - (\gamma/2)) \ln w_L^G - e_\Gamma,$$

<sup>3</sup> If  $p$  is sufficiently close to one, the IC is not binding and the principal sets a constant wage.

<sup>4</sup> More precisely,  $w_L^O$  increases and  $w_H^O$  decreases.

$$\begin{aligned}
 (11) \quad & \frac{1}{2} \ln w_H^G + \frac{1}{2} \ln w_L^G - e_A \quad (\text{IC2}) \\
 & - t_G |e_\Gamma - e_A| \\
 & \geq \ln w_L^G - e_B \\
 & - t_G |e_\Gamma - e_B|,
 \end{aligned}$$

where IC1 shows an agent's incentive to do action A rather than  $\Gamma$ , and IC2 shows an agent's incentive to do action A rather than B. These constraints show the costs and benefits to the principal of no supervision. The worker has an ideal action of  $\Gamma$ —rather than of B under monitoring. On the other hand, the principal receives no information on the agent's action. When  $\gamma$  is sufficiently close to one, IC1 will be the tighter constraint, and we work with that case here. When PC and IC1 bind, the optimal wages are

$$\begin{aligned}
 (12) \quad w_H^G &= \exp[\bar{u} + e_A + t_G(e_A - e_\Gamma) \\
 & + ((1 + t_G)/(1 - \gamma))(e_A - e_\Gamma)],
 \end{aligned}$$

$$\begin{aligned}
 (13) \quad w_L^G &= \exp[\bar{u} + e_A + t_G(e_A - e_\Gamma) \\
 & - ((1 + t_G)/(1 - \gamma))(e_A - e_\Gamma)].
 \end{aligned}$$

Comparison with previous wages shows one reason for lower wage costs. Because  $(e_A - e_\Gamma)$  is less than  $(e_A - e_B)$ , the participation constraint is relaxed.

But the wages also show another problem of no supervision that makes eliciting action A from  $G$  workers difficult. The difference in wages between  $\ln w_H^G$  and  $\ln w_L^G$  is

$$\begin{aligned}
 (14) \quad \ln w_H^G - \ln w_L^G &= 2(e_A - e_\Gamma) \\
 & [(1 + t_G)/(1 - \gamma)].
 \end{aligned}$$

This difference may be quite large, and especially so as  $\gamma$  approaches unity. In this case, high revenues are realized more often, and thus it is costly to compensate for high effort. Indeed, as  $\gamma$  approaches one, the added compensation to induce A becomes prohibitively costly. The principal must either monitor, as examined above, or elicit the work group norm,  $\Gamma$ .

With no supervisor, the firm can elicit  $\Gamma$  with a lower wage differential than it would take to

elicit A.<sup>5</sup> There is an effort cost of  $\Gamma$  over B of  $(e_\Gamma - e_B)$ , which is only partially offset for  $t_G < 1$  by the utility gain of  $t_G(e_\Gamma - e_B)$ . The IC constraint of  $\Gamma$  relative to B is

$$\begin{aligned}
 (15) \quad & \gamma/2 \ln w_H^G + (1 - \gamma/2) \ln w_L^G - e_\Gamma \\
 & \geq \ln w_L^G - e_B - t_G |e_\Gamma - e_B|.
 \end{aligned}$$

If this constraint is binding, the difference in log wages is  $\ln w_H^G - \ln w_L^G = 2/\gamma(1 - t_G)(e_\Gamma - e_B)$ . With  $\gamma$  fairly close to one, if  $t_G$  is fairly high, or if  $e_\Gamma$  is close to  $e_B$ , this differential is moderate, and the principal would prefer to elicit the work group norm  $e_\Gamma$  than elicit the higher action  $e_A$ .

Comparing across the principal's three options, we see that there exists a  $p' > 0$  such that for all lower levels of  $p$  the principal would prefer not to supervise his workers. That is, even if the principal can possibly detect workers' low actions, he might not want to institute a supervisory scheme along with contingent wages. Introducing a supervisor can lead to a resentful workforce. Eliciting performance from a work group may be relatively inexpensive.

This outcome could match actual practice in many firms. We discuss here some classic studies of workplaces in the United States that reveal central trade-offs in the model.

## II. Two Classic Workplace Studies

### A. The Wallboard Plant

Alvin W. Gouldner's (1954) *Patterns in Industrial Bureaucracy* studied a wallboard plant in the Great Lakes region. The manager, Doug Godfrey, died and was replaced by a new manager, Vincent Peele. This "natural experiment" shows the trade-off in our model. The old manager governed the plant by what Gouldner calls the "indulgency system" (1954, 45). This management style would correspond to our work group model. Workers' morale was good, and Godfrey rewarded them with perks that were formally against company rules. Discipline was lax. Workers not assigned specific tasks were free to wander at will; they were given only mild rebukes for lateness or for absenteeism,

<sup>5</sup> Provided  $t_G < 1$ . If  $t_G \geq 1$  there will be no wage differential.

which was especially frequent in the hunting season; they were allowed to sign in early to collect overtime; there was preferential hiring of relatives; relatives often worked together, sometimes as father-son work teams; workers injured inside or outside the plant were given easy sit-down work; workers took material for their own construction projects and used company tools. Under Godfrey's regime, workers were satisfied and expressed appreciation for their workplace.

Godfrey's untimely death gave central headquarters an opportunity to shape up the plant. It appointed Vincent Peele as the plant's new director. Whereas Godfrey had been loyal to his men, Peele was loyal to central headquarters, which had been the source of his promotion. Peele was an active supervisor, and his regime corresponds to our strict supervisory regime. Peele quickly ended the indulgences. Workers needed explicit permission to move about the plant and be away from their work stations; absenteeism was punished by layoff of equal duration; workers could no longer sign in early for overtime; the new personnel manager gave no special preference for relatives; Peele considered workers limited by off-the-job injuries "shirkers" and no longer gave them easier jobs; in a test case, Peele fired a worker who had taken some sticks of dynamite (for fishing or for his personal construction project), even though the worker had explicit permission from his direct supervisor. Peele's actions fostered, in terms of our model, an "outsider identity." The workers were angry; they became hostile and resisted Peele's policies. Peele faced considerable difficulty working with the workers' leaders, who insinuated to top management that Peele was irresponsible<sup>6</sup> and his policies led to widespread worker resentment.<sup>7</sup> Thus, the strict supervisor led workers to resent their position in the firm, with the corresponding incentive issues we model.

<sup>6</sup> For example, when Peele was simply away from the office, the office manager would try to make him look irresponsibly absent (Gouldner 1954, 75).

<sup>7</sup> For example, when Peele was hospitalized, the acting plant manager appeared to inflame union sentiments during wage negotiations (Gouldner 1954, 75).

### B. *The Bank Wiring Observation Room*

In 1931 the Western Electric Company, at the behest of the pioneering industrial sociologists, Mayo, Roethlisberger, and Dickson, observed a small group of workers in an isolated room within a communications equipment assembly plant. Mazmanian and Allen were the two inspectors for most of the life of the experiment. We take our account of this "controlled experiment" from George C. Homans (1951), whose interpretation conforms to the basic trade-offs we model.

Mazmanian was a strict supervisor and reported on his workers, who began to resent him and eventually sabotaged production. Mazmanian's term began badly when he was learning how to use the test equipment. He slowed the workers down and interpreted the rules against them, failing to give them credit for their lost time. He also took a hard line in inspections. The workers escalated the confrontation—for example, by misaligning his test set when his back was turned. Mazmanian then committed the ultimate act. He "squealed," reporting infractions and output restrictions to the Personnel Department. The company had to transfer him elsewhere.

In contrast, Allen, who was well aware of the workers' output reductions, maintained his silence about them, as well as about the workers' other failures to adhere to company rules. The work group maintained production according to its own norms.

In the military, loyalty to their men and loyalty to higher command frames the classic dilemma of unit leaders, and especially of non-commissioned officers, as we see in questionnaires described in the comprehensive study by Stouffer et al. (1949) of the Armed Forces during World War II. Officers, privates, and NCOs were variously asked their opinion regarding appropriate discipline in different situations. In each and every case, reflecting the ambiguous position of the "supervisor" in our model, the NCOs took a middle ground between the officers and the enlisted men (Stouffer et al. 1949a, vol. 1, table 13, 409). For example, interviewees were asked how they would behave "as a platoon sergeant [who] find[s] that one of the men in your barrack has brought a bottle of liquor into camp." Seventy percent of privates and 59 percent of noncoms, but only 35 percent

of officers, said they would just “warn him to be careful and not do it again.”

### III. Conclusion

This paper examines implications of work group identity for worker incentives. The seminal studies of Tajfel and Turner in the 1970s showed how easily experimental subjects could be made to act as if they belong to different groups. This malleability and group identification is the building block of our model, where the firm affects this identification through management policy. The analysis shows that even when work groups may have ideals different from those of the principal, it is still likely that optimal management will rely on workers' identification with a group. In terms of the model, optimal strategy will be to encourage an ideal effort of  $e_T$ . This may not be as productive as the principal's goal of  $e_A$ , but neither is it as unproductive as  $e_B$ , which is workers' ideal if they view themselves as outsiders to the firm. We have discussed evidence of such behavior in the classic descriptions of civilian workplaces.

There are other social factors that can weigh in the trade-offs of supervisory policy. It is easy to see, for example, how social distance between workers and supervisors can feed worker resentment of supervision. The reaction to Mazmanian's behavior, for example, was exacerbated by the social difference between him and the other Observation Room workers (Homans 1951, 54). While the workers were all between 20 and 26 years of age with no college education, Mazmanian was 40 and had attended three years of college. The example demonstrates precisely the assumption in the model that if the supervisor is not seen as part of the work group, the workers can turn against the firm. The findings on NCOs in WWII echoes this outcome.

Our analysis also has implications for understanding firm boundaries. For decades economists have tried to define the boundary of a firm. Researchers have focused on the difference between internal labor transactions—when a person is an employee of a firm—and external transactions—when a person works for a firm as a subcontractor. One view is that there is no inherent difference between the two, as contracts for external transactions can mimic internal labor contracts (e.g., Armen A. Alchian and

Harold Demsetz 1972). Other researchers study transactions costs associated with external transactions (e.g., Patrick Bolton and Ashvin Rajan 2001; George Baker, Robert Gibbons, and Kevin J. Murphy 2001). In our view, there is an inherent difference between internal and external transactions, beyond transactions costs. An employee of a firm is, by definition, a part of a group. The organization of employees into groups, as well as group labels themselves, change self-perceptions, have an impact on incentives, and affect job performance. Thus, for example, the success of a merger often depends on employee identifications. There are prominent examples where the employees maintained their prior organizational identifications, leading to the failure of the merged firm.<sup>8</sup> Similar incentive issues could arise between workers who think of themselves as a firm's employees and workers who think of themselves as outside contractors.

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<sup>8</sup> Haslam (2001, 36–7) reports on studies of such failure in the merger of banks, hospitals, airlines, government departments, and nursing groups.

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