

Leadership Style and Incentives

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We study the relationship between a firm's environment and its optimal leadership style. We use a model in which contracts between the firm and managers are incomplete so that providing incentives to subordinates is not straightforward. Leadership style, whether based on organizational culture or on the personality of the leader, then affects the incentive contracts that can be offered to subordinates. We show that leaders who empathize with their employees adopt a participatory style and that shareholders gain from appointing such leaders when the firm has the potential for exploiting numerous innovative ideas. By contrast, when the environment is poor in new ideas, shareholders benefit from hiring a more selfish (i.e., more profit maximizing) leader whose style is more autocratic.

(Leadership Style; Employee Participation; Incomplete Contracts; Incentives for Innovation)

Students of business organizations have long recognized that the heads of different companies exercise their authority in different ways. Some leaders are quite autocratic; they seek and receive only minimal advice from their subordinates. Other leaders are more democratic and seek consensus within their organizations. Some chief executive officers issue directives concerning minute details of operation. Others suggest only broad principles and give considerable autonomy to those below them.

In this paper we provide an economic model in which leadership style has an important effect on firm profitability. We show that senior management's style can alter the incentives that can be provided for subordinates to ferret out profitable opportunities for the firm. The resulting theory has predictions for the circumstances where shareholders benefit from having either autocratic or democratic leaders.

We consider a setting where the adoption of new methods can increase firm profitability. By adoption of new methods we have in mind everything from simple changes in the configuration of production equipment to the introduction of completely new products. All of these require that employees first think about ways of changing the firm's operations and that, later, the employees' proposals for change be implemented. In fact,

most large scale changes in the firm go through a variety of stages of this type from conceptualization to eventual adoption and implementation. What changes in business operations have in common is that they do not occur without prior effort by the firm's employees in generating viable proposals.

From the firm's point of view the generation of proposals is extremely valuable. Proposal generation has value in part because the firm learns which changes would not be profitable and can then choose not to implement them. This is argued forcefully by Roberts and Weitzman (1981) in the closely related setting of sequential investment. There, firms benefit from starting many sequential investment projects because, as they proceed, they learn whether it is worth shutting the project down. The firm should even initiate some projects for which the expected cost if the project is funded to completion exceeds the corresponding expected revenue. The reason is that the option to shut down projects is valuable.

One can interpret the Roberts and Weitzman (1981) setting as one where firms pay people to start investment projects that might lead to change. Our setting differs in that it is not possible to ensure that employees work hard at generating viable proposals simply by paying them for doing so. This is the appropriate assumption

whenever the activity of proposal generation cannot itself be structured and monitored. The problem is that the outside appearance of a proposal need not bear a close relationship to the amount of effort and care that went into developing it because it is hard to monitor and measure intellectual activity. This problem arises not only in the research laboratory but also where a large number of employees is expected to develop ideas for continuous improvement. In conclusion, when the firm wants employees to generate proposals for change they confront a difficult incentive problem. We argue in this paper that the personality of the leader affects both the management style and the ease with which this incentive problem is overcome.

As noted by Levinthal (1985) a simple incentive scheme that the firm can offer employees to induce them to generate options for change is to reward employees whose projects are carried through to fruition. Here, however, the valuable option that the firm has to close projects down midway interferes with its ability to provide the appropriate incentives to its managers. In particular, the existence of payments to employees each time one of their ideas is adopted reduces the firm's benefits from adopting innovations. At the same time, the knowledge that the senior management may fail to implement their projects reduces the incentive for the subordinates to generate potentially profitable ventures in the first place.

We investigate the effect of different management styles on the properties of this incentive scheme. One management style we consider is one where the senior management cares only about profits. We also consider the possibility that decision making is sensitive to the preferences of employees. The advantage of this latter approach is that it is more likely to lead to the implementation of the employee's ideas. As a result, it is easier to motivate employees to search for new methods. Our main finding is that in environments which are rich in potential new ideas which the firm could exploit—and where it is correspondingly more important to provide incentives to employees to ferret out those ideas—the latter approach can actually lead to higher profits than singleminded profit maximization. On the other hand, the opposite tends to be true when the environment is less rich in new ideas. In emphasizing that the most effective management style depends on the circum-

stances, we are following the contingency view that has come to prevail since the work of Lawrence and Lorsch (1967) and Perrow (1970).

A management style where employee wishes play a role in decision making can arise in at least two ways. First, the firm may be able to appoint an empathic leader who experiences vicariously the happiness of his subordinates. Second, the firm may be able to establish a culture in which the desires of employees are taken into account. This culture may be established as in O'Reilly (1989) where a CEO can create a "social control system" which affects employee behavior by using the right words and symbols. Or, it may be established as in Kreps (1990) where managers consider their subordinates' wishes because making a decision that the subordinates dislike would cause a loss of reputation. Our conclusions regarding the desirability of taking into account employee desires does not really depend on whether the leader's attributes or organizational culture are the source of this management style. We will nonetheless discuss leadership style as if it were due to the personality of the leader. We do this because the analysis of the effects of personality is more straightforward and because it allows us to link our work to the substantial empirical literature on personality and leadership style.

This literature provides some support for the idea that the personality of the leader affects the organization. Graves (1986) reports the following example (p. 123): "A likable but indecisive leader, who coordinated but did not interfere with the efforts of able subordinates, provided the culture of expansionism necessary for a business to make its mark in the marketplace. He was succeeded by one of those subordinates who consolidated the position and quadrupled profitability of the organization in six years. . . ."

Fiedler (1965) also gives great weight to the psychological characteristics of the leader. He shows that leaders who have a more participatory style also have higher esteem for their coworkers. He regards esteem for coworkers as a personality trait (which appears related to empathy which we stress). He concludes that, because different leadership styles are successful in different settings, firms ought to select managers using information on the managers' tendency to esteem their coworkers. While he also studies the effect of the groups' task on the ideal personality of the leader, Fiedler em-

phasizes that the leader's ideal type depends on the psychological relationship between the leader and his subordinates (i.e., on whether the subordinates like the leader).

In the model we develop in this paper, we consider two possible personalities for the leader. We call this leader the CEO even though other people in the organization, depending on the amount of power delegated to them, may fit the model as well. As we discussed, empathic CEOs take into account the desires of their subordinates. By contrast, selfish CEOs maximize profits as long as they are given a small share of the profits as a personal reward. The personality of the leader also has other effects. In particular, empathic leaders tend to be more participatory while more selfish CEOs tend to be more autocratic. Because empathic CEOs care for their employees they are more likely to elicit their preferences and to allow them to do what they prefer (even if this is costly for the firm). Given this relationship between CEO personality and leadership style we tend to speak interchangeably of choosing a leadership style and a CEO type.

There exists a vast literature classifying leadership styles along a democratic-autocratic continuum. This literature originates with Lewin and Lippitt (1938). An example of a subsequent classification can be found in Likert (1967) who views organizations as adopting one of four "systems," labelled 1 through 4. These systems differ in a variety of characteristics. System 1 is more autocratic in that subordinates are consulted less than systems 2, 3, and 4. System 4 has the most subordinate participation. Managers are increasingly friendlier (and subordinates grow less afraid of their superiors) as one goes from system 1 to 4. A summary of related classifications is provided in Bass (1981, p. 289-290).

Without offering as complete a classification, Pascale and Athos (1981) stress similar contrasts. They compare Harold S. Geneen who managed ITT from 1960 to 1979 to the management of Matsushita. Geneen emphasized "unshakeable facts" and obtained these "unshakeable facts" by promoting confrontation between line managers and those in charge of staff functions. Geneen is famous for his pressure-cooker meetings where managers had to defend their results in the face of aggressive questioning by Geneen and other managers. To some extent, these meetings provided subordinates with the

ability to express their opinions. However, the unshakeable facts were often used to remove employees whose performance was less than completely satisfactory.

The management style at Matsushita was much more participatory. Decision making there involved seeking consensus and not unilateral decision making by the CEO. The company also spent considerably more resources developing and training its employees. As we discuss later, this latter tendency may also be related to the participatory style.

Our paper is closely related to the work based on Coase (1937) which argues that firms arise as a partial solution to the intrinsic incompleteness of contracts between parties.¹ Firms are seen as creating rights of control, and those who are given these rights make those decisions that cannot be contractually stipulated. This solution is generally only partial in that control structures are typically not sufficient to obtain the outcome that is possible with complete contracts. A better outcome would be possible if the universe of available contracts were expanded. For this reason firms do better when, as is proposed by Shleifer and Summers (1990), they hire "fair-minded" CEOs who can be trusted to follow through on implicit promises. Shleifer and Summers' (1990) proposal is similar to ours in that personal characteristics of the CEO matter because contracts are incomplete. The main difference is that "fair-mindedness" is a desirable characteristic for all CEOs whereas we focus on personal characteristics that are appropriate in some contexts and inappropriate in others.

Our paper proceeds as follows. In the next section we present our basic model. In the interest of obtaining a simple characterization of the benefits of different CEO-types, we make several simplifying assumptions in this section that we later relax. Section 2 analyzes this simple model and compares the outcome under two extreme types of CEO, one who cares only about profits whereas the other cares only about the welfare of his subordinates. Section 3 formulates and solves the problem of maximizing the fit between CEO personality and the environment of the enterprise. Section 4 extends

¹ See Holmstrom and Tirole (1989) for a survey.

the model to show that CEOs who care more about the welfare of their subordinates are also more participatory.

Up to this point we emphasize that effort is required to generate new ideas and that one key managerial problem is to reward this effort. To develop this idea we assume the firm and its potential employees are symmetrically informed about their ability. This is relaxed in §5 where we consider the case where the employees have superior information about their ability. We show that the main result, that an empathic CEO can be profitable when the environment is rich in potential ideas, survives in this setting. In that section we show also that autocracy and empathy have different implications regarding self-selection of employees. Depending on the setting, empathic or autocratic CEOs will find it easier to induce only the most able employees to join their firms. Section 6 presents our conclusions.

1. The Model

The situation we examine is one in which a manager can expend effort developing an idea which, if successfully implemented, might improve firm profitability. This effort might entail the search for an improvement in either product design or delivery to the final customer, the investigation of a method to reduce costs, or the development of a new product. Firms obviously differ in their potential for undertaking such profit-enhancing ventures so that only some managers are in a position to pursue them. For example, in mature industries with stable markets and established technologies such opportunities are likely to be rarer than in emerging industries.

We have in mind product enhancements that go through two stages. In the first, the manager invests a great deal of personal time and effort in researching the profit-enhancing idea and developing a proposal for its implementation. The second stage consists of the implementation itself, which may be carried out by the manager or by others. Importantly, however, the final decision as to whether or not to implement the project is in the hands of a more senior manager whom we call the CEO.

The fruits of the manager's efforts are assumed to be stochastic. That is, the potential profit to be reaped by

the firm if it eventually implements a manager's project is uncertain at the time that the manager must decide whether or not to put his effort into the project. While some projects will look better than others, the exact profitability of the venture is unknown until the project has been researched by the manager.

1.1. Notation and Timing

It is useful to think of events as unfolding over three periods. Managerial effort to develop the idea takes place in the first period. In the second period, the idea is implemented. Implementation usually requires that the firm spend additional resources on the project. Finally, in the third period, the implemented project bears fruit. The random variable \tilde{G} denotes the profit of an implemented project from the second period on.

Ignoring discounting, \tilde{G} equals the increased revenue (or reduced cost) in the third period minus the implementation costs incurred in period two. We let the realization G of the random variable \tilde{G} have a cumulative distribution function $F(G)$ and corresponding density function $f(G)$. It is important to stress that the realizations of \tilde{G} can be negative. A negative G simply means that the costs of implementing the idea exceed the benefits. The less "rich" the environment in terms of the profit opportunities it presents, the higher the likelihood that G is negative, i.e., the greater is $F(0)$.

Good projects only become available if the manager devotes effort. We initially make two assumptions that simplify the exposition. First, we assume that all managers are equally capable of uncovering valuable projects. We relax this assumption in §5. Second, we assume that managers who make an effort always have some project that the CEO might implement while those who do not make an effort have no project that could be implemented. It would probably be more realistic to assume instead that some managers who make no effort can present a project for the CEO to implement and that, on the other hand, some of the managers who do make an effort are actually unable to put together a project that would appear viable. We consider the first possibility in §3 and the second in §5. For the moment we assume that a project with payoff \tilde{G} becomes available if and only if the manager devotes effort to it during the first period. If he does so, the variable we denote e

equals 1 and, otherwise, it equals 0. If $e = 1$, the potential gain from the project G becomes known to both the manager and the CEO at the end of the first period.²

The CEO must then decide whether or not to implement the project during the second period. We denote the implementation decision by I : $I = 1$ if a project is implemented and $I = 0$ if it is not. Finally, at the end of the second period, the profit from any project which is researched and implemented is earned by the firm.

1.2. Preferences and Profits

We assume that the manager's utility depends only on his effort e and on his income. We break down the manager's compensation into the wage, w , for a manager who does not have the opportunity of undertaking a profit-enhancing project and who thus performs only his "usual" tasks, and the "incentive" payment k which is tied to the effort e . As we discuss more fully below, we do not let k depend on the actual effort made. It will depend instead on whether the CEO actually implements the project to which the employee devoted effort. Depending on the project, its implementation could also affect the manager's utility function directly. For instance, some individuals like to travel and so would like to be in charge of implementing international projects. Also, the improvement in the manager's prospects in the external labor market following implementation of his project could generate some direct utility of this sort. For the moment we consider projects whose implementation does not give the manager any direct utility. The extension to those that do is brought up in §4.³

² It is not important for our analysis whether the actual value of \tilde{G} becomes known at the end of the first period or whether the CEO and manager simply have a more accurate estimate of what G will be. For simplicity we assume G becomes known, but the results can be derived by having manager and CEO obtain an estimate, say G' , of what G will be.

³ In structure, the model is thus similar to Hart and Moore (1988) who consider the relationship between a buyer and a seller. In their model both of these can make an effort to raise the value of their future transaction with each other. This effort is noncontractible. All that can be contracted on is the price at which the good will be delivered. If the seller has the option of not buying at this prespecified price, he is in a position analogous to our CEO who must pay a price k for implementation but can choose not to implement the project at all.

As is typical in principal-agent models, we suppose that there is some minimum level of w below which the manager will refuse to work. This minimum level of w for performing "normal" tasks can be thought of as being determined in a competitive market for managerial talent.

We assume that the manager's utility is linear in k (so that he is risk-neutral over income in excess of w) and that exerting the effort e gives him disutility d .⁴ Since we are interested in the change in the manager's utility from undertaking projects, we normalize his utility so that his utility when he receives w is zero. Then the manager's expected utility as a function of k and e can simply be written as $u(k, e) = E(k) - ed$ where $E(k)$ is the expectation of k .

The focus of our analysis is the utility function of the CEO. In a traditional microeconomic model in which the CEO maximizes profits, the CEO would seek to maximize $I(G - k)$. This assumption can be justified by thinking of the CEO as selfish and having a contract that gives him a (possibly trivial) fraction of the firm's profits. Here we consider not only selfish CEOs but also CEOs who are concerned about the well-being of their subordinates. CEOs whose utility depends on the utility of their manager will be termed empathic. Formally, we suppose that at the time he makes his implementation decision, the CEO places weight θ on profits and weight $1 - \theta$ on the manager's utility. Thus the CEO seeks to maximize:

$$I[(1 - \theta)(G - k) + \theta k]. \quad (1)$$

Note that any effort that might have been expended by the manager prior to the implementation decision is

⁴ Letting the manager's utility be linear in income beyond w implies a form of risk aversion since the worker does not accept a wage below w . This form of risk aversion is not, per se central to our analysis. What is central is that the employee remain an employee and not become the owner of the enterprise. In other words, we cannot let the employee become the residual claimant on all the firm's cash flows. It might be thought that a risk neutral employee would be willing to become the owner. However, this becomes impossible once it is recognized that a company has many interdependent employees and that they cannot each become the residual claimant of the entire firm. If, for instance, there are n employees and each is given one share in the firm then each gets only $1/n$ of the profits that he generates so that he will not act as the residual claimant.

“water under the bridge” and therefore the disutility of that effort doesn’t enter the CEO’s preferences.

The variable θ is the key variable in our analysis. It can be thought of as representing the “personality type” of the CEO. A CEO whose $\theta = 0$ is a selfish profit-maximizer: he cares only about the “bottom line” and not at all about the utility of the manager who works for him. As θ rises, the CEO becomes more empathic so that his concern for profit declines vis-à-vis his concern for his manager’s welfare. In the extreme case where $\theta = 1$ he cares *only* about the welfare of his manager.

Given the motivation for the paper we offered in the introduction, we would like to equate selfish CEOs (those whose $\theta = 0$) with an autocratic leadership style and empathic ones with a more participatory one. In §4 we explain why such labels might be appropriate. For the moment it should suffice to say that those CEOs whose θ is positive care about the manager’s welfare. One would thus expect them to ask the manager how his utility can be increased and trust the manager to take desirable actions. (Even actions that increase the manager’s utility at the expense of the firm’s profits may be desirable to an empathic CEO.) This tendency of empathic CEOs to give resources to their employees may well be costly to the shareholders.⁵ We denote the *increase* in costs from having an empathic CEO over what they would be under profit-maximization by $C(\theta)$ (so that $C(0) \equiv 0$).⁶

In the “background” are the firm’s shareholders who have the authority to hire the CEO. Since they are removed from the day-to-day operations of the firm, they are assumed to be solely interested in profit-maximization and to be unconcerned about the manager’s utility as long as he is compensated sufficiently to induce him to do his job. Thus the CEO is the intermediary between two sets of stakeholders, the manager

and the shareholders, and his preferences play a role in determining the sharing of the profits between them.

1.3. Informational Assumptions and Contractibility

An important distinction in our model is whether or not the CEO is able to base the manager’s compensation directly on the manager’s effort. Consistent with the contracting literature⁷ we term the case where the CEO can do so, the “complete contracts” case. One simple condition that makes complete contracts possible is that e be verifiable.

“Verifiability” means not only that the relevant information is observable by the CEO, but also that it can be established by the body responsible for enforcing the compensation agreement between manager and CEO. In an extreme case this enforcement body might be the Courts, in which case verifiability refers to the ability to establish the facts before a judge or jury. More often, however, the enforcement is performed by other employees. If the CEO is observed to have reneged on an implicit agreement with the manager (for example by withholding payment of a “bonus” when it is understood by the employees that the circumstances warrant a bonus being paid) this has deleterious effects on his reputation for “fair dealing.” In this context, verifiability refers to the manager’s ability to convince the other employees in the firm that he did indeed carry out the required effort.

Typically e is not verifiable because it is difficult to distinguish cases in which the manager is really putting in the necessary effort and when he is simply going through the motions. Indeed, in the agency literature it is typically assumed that the effort cannot be precisely observed by anyone other than the manager himself.

The lack of observability of e does not, by itself, prevent a complete contract from being written in our setting. A complete contract will still be possible as long as G is verifiable. Since the manager is assumed to be risk-neutral, he is indifferent between receiving a direct payment d for exerting effort and receiving a larger payment (which depends on G) when G turns out to be positive, i.e., only in those cases where he in fact

⁵ A countervailing benefit exists when manager and CEO do not observe the actual value of G in the second period. Then, a CEO who maximizes profits will tend to spend too much in finding out the true value of G . He may, for example, have to appoint separate “task force” to perform this function.

⁶ Little hinges on this assumption, and indeed the opposite assumption (that the participatory manager is more efficient) simply involves reinterpreting $C(\theta)$ as a cost saving, rather than a cost increase.

⁷ See Holmstrom and Tirole (1989).

comes up with a profitable proposal. Formally, the manager is indifferent between receiving d always and receiving a payment ϕG where $\phi \equiv d/E(G)$. This is because the expected value of ϕG at the beginning of the first period is simply $E(\phi G) = E(kG/E(G)) = d$. On average, G is a perfect indicator of whether or not the manager exerted the effort and therefore he is as happy to have his compensation based indirectly on the outcome of his effort as directly on the effort itself.

In practice, however, even G is likely to be very difficult to verify. Accounting profit figures are subject to manipulation through the allocation of overhead and other cost items. This manipulation is extremely costly to detect. Moreover, this form of manipulation is not easy to reduce by making partial audits and imposing big fines on firms found to have manipulated their books. The reason is that many of these manipulations are conceivably justified so that it is hard to decide, even *ex post*, the correct procedure for determining costs.

In any event the principal force that ensures that managers receive their incentive payments is probably reputational. When a particular manager has been successful, this becomes known to those that work with him. These also learn whether that employee is treated "unfairly." If the firm treats its employee unfairly, this peer group lets others know. This loss of reputation, in turn, makes it harder for the firm to attract new employees. Making payments to the employee depend on G is not possible if other employees do not readily observe G . It is for this reason that we ignore such contracts.

What peers can easily observe is whether the manager's project is implemented. They can determine this because, through their contact with the manager, they know the basic content of the project so the firm is unable to implement the project and pretend that it obtained the idea elsewhere. Thus contracts that make the payment to the manager depend on whether his ideas are implemented are relatively easy to enforce. No outside enforcement party is even needed. Because of this we focus on these contracts.

These contracts differ in one fundamental respect from contracts studied in the traditional principal-agent literature.⁸ In that literature, as in our model, contracts

⁸ See, for instance, Holmstrom (1979).

depend on a variable which is imperfectly related to effort. The difference is that, in the traditional literature, the variable is manipulable only by the agent who is making the effort. Here, the variable also depends on the decision of the principal who is paying the agent which is why the personality of the CEO plays such a crucial role.

Since the only action on which the manager's compensation can be made contingent is whether or not the project is implemented, a contract in this incomplete contracts setting consists only of the promise of some payment k if the project is implemented.⁹

Given this contract, managers ought to be keen on having their projects implemented. While empirical evidence on this is sparse, some support comes from the study by Ritti (1968). He asks engineers and scientists working in the private sector about their goals and aspirations. Among the engineers, 67% say that it is very important to work on problems that have practical applications important to their company, and 69% say that it is very important to have the opportunity to help their company increase its profits. Among research scientists, only 28% deem the latter very important. By contrast, 88% of the scientists view publication in technical journals as very important.¹⁰

Ritti (1968) views these differences as matters of basic personality. A different interpretation, and one that is consistent with our model, is that because engineers work on applied problems it is possible to provide them with compensation schemes that depend on the final implementation of their projects. Accordingly, engineers do in fact care that their work has valuable practical implications to their company. By contrast, scientists involved in basic research cannot be compensated for the implementation of their ideas. Accordingly, given the incentives they face, they tend to be more concerned with outside recognition than with enhancing the profitability of their firms.

⁹ If the idea is not implemented, the manager simply earns his reservation wage w . Paying the employee more would be wasteful. Paying him less is impossible given our specification of employee tastes. Our results would still go through if there was no minimum payment but the k has to be thought of as the difference between the payment if the project is implemented and the payments if it is not.

¹⁰ See also Badawy (1971).

The contract that specifies the contingent payment k is entered into between the CEO and the manager. As discussed above, the "contract" may be implicit rather than explicit, relying on enforcement through reputation rather than litigation. In either case, however, it is subject to the oversight of the shareholders. While the shareholders cannot be expected to monitor the detailed operations of the firm (such as which projects should be implemented and which should not), they can be expected to monitor the broad structure and level of the compensation packages that the managers are offered.¹¹ In our model this is captured by assuming that when the contract is specified at the beginning of the first period, the shareholders can object if k is set "too high." Formally, we shall assume that, as profit-maximizers, the shareholders insist that k is set no higher than is absolutely necessary in order to elicit effort.

2. Analysis

2.1. The Complete Contracts Case

The case in which the CEO is a profit-maximizer and faces no contracting or informational difficulties provides a useful benchmark for the more interesting cases that follow. In this case the CEO would be able to induce the manager to research those projects which he wished researched simply by offering the manager a payment of d (the manager's disutility of effort) to undertake the task.

The CEO would therefore instruct the manager to research certain projects. He would then implement any project for which $G \geq 0$. Therefore, the expected net gain from researching a project is:

$$\int_0^{\infty} GdF(G) - d. \quad (2)$$

Note that expression (2) exceeds $E(G) - d$ precisely because the CEO has the option of not implementing projects whose G is less than zero. Therefore, there exist projects for which $E(G) - d$ is negative which are worth

investigating.¹² Starting projects gives the CEO the option of shutting them down, and this option is itself valuable. What our paper demonstrates is that this option is not as worthwhile once contracts are incomplete.

With complete contracts any project for which (2) is positive is researched and is implemented whenever its realization of G is positive. As discussed above, this outcome can be implemented even if e is not contractible as long as the value of G at the end of the first period (before implementation) is contractible. In particular, we argued that the manager would make the requisite effort if his payment equals $dG/E(G)$. However, this would induce the manager to exert effort in *all* projects, including those for which (2) is negative. Thus, the CEO would also have to tell the manager for which projects he will give him this incentive payment.

Another among many schemes for implementing the complete contract involves paying the manager $d/(1 - F(0))$ whenever $G \geq 0$. Then the average payment to the manager equals d , and the manager is willing to make the requisite effort.

2.2. The Incomplete Contracts Case

The difficulty that arises when complete contracts are impossible to enter into can be seen by contemplating the use of a contract analogous to the second one discussed above. In that scheme, the manager is effectively paid only when the project is implemented. Suppose that the contract continues to ensure that the manager is paid $d/(1 - F(0))$ when the project is implemented but that it is not possible to ensure that all projects with $G \geq 0$ are implemented.

At the implementation stage (period 2), the CEO expects the firm to earn additional profits of $G - d/(1 - F(0))$ if the project is implemented. If the project is not implemented the CEO expects the firm to earn no additional profits, but since the payment of $d/(1 - F(0))$ is contingent on implementation, he also need not compensate the manager for his additional effort. Thus a profit-maximizing CEO implements projects only if $G \geq d/(1 - F(0))$. Therefore, in contrast to the complete contracts case, the CEO does not implement those projects for which $0 < G$

¹¹ Monitoring by outsiders, be they shareholders via the Board of Directors or other creditors, is undoubtedly imperfect, and our analysis takes into account some of these imperfections.

¹² This is precisely the point of Roberts and Weitzman (1981) referred to in the introduction.

$< d/(1 - F(0))$. Some projects which would be profitable were it not for the increased compensation to the manager that their implementation would imply, are not implemented. This inefficiency was also noted by Levinthal (1985).¹³

The net result is that if the manager exerts effort he is paid $d/(1 - F(0))$ with probability smaller than $(1 - F(0))$. His expected compensation from exerting effort therefore falls short of d with the result that he will choose not to exert the effort, and the project, which on average is profitable, will not be undertaken.

Of course the optimal contract in the complete contracts case is not the optimal contract when contracts must be incomplete. We therefore now examine the optimal contracts in an incomplete contracts setting and contrast the outcomes when there is autocratic and when there is participatory top management.

2.3. Selfish Top Management

With incomplete contracting the CEO can only offer a contract which specifies a payment k which depends on whether the project is implemented. With such a contract in place, the selfish CEO would choose to implement any project for which $G \geq k$. The probability that a project that a manager researches will eventually be implemented is therefore $1 - F(k)$. Knowing this, the manager would be willing to exert effort only if

$$k[1 - F(k)] \geq d, \quad (3)$$

i.e., if his expected increase in utility outweighs the cost of effort.

The lowest cost contract which induces the manager to put in the effort is therefore that with the lowest value of k which satisfies Equation (3). Since both the shareholders and the CEO want to maximize profits in the autocratic case, they are in agreement that the CEO should choose a payment just large enough that the manager's increase in expected utility from exerting effort is exactly equal to his disutility of doing so. This payment by the autocratic CEO to the manager which we denote k^a is defined implicitly by

$$k^a[1 - F(k^a)] = d. \quad (4)$$

¹³ He views this inefficiency as due to double sided moral hazard because the CEO's failure to implement the project in some instances in which $G > 0$ can be thought of resulting from the CEO's moral hazard.

Notice that k^a must be at least as large as d since $F(k^a) \geq 0$. In the special case where $F(d) = 0$, i.e., where the increased profitability of every project exceeds d , then k^a is equal to d . In that case if the manager is paid d if the project is implemented he is certain that every project that he researches will in fact be implemented. Hence he is happy to receive a payment of d contingent on implementation.

If $F(d) > 0$, however, so that there exist some projects which ex post will turn out not to have been worth the manager's effort, then k^a will exceed d . That is, the profit-maximizing CEO must pay the manager more than his disutility of effort when his project is implemented in order to induce him to research the project in the first place. The reason for this is that the manager realizes that he will only be paid some of the time even if he puts in the effort. In particular, if $0 \leq G \leq k^a$ the CEO will choose not to implement the project. Thus the manager insists that he be paid more when he is paid.

This can lead to a difficulty. As the project becomes implemented less often, the manager requires a higher payment when the project is implemented. But, this higher payment leads the CEO to implement the project less often. There might thus exist no payment for which the project is ever implemented; Equation (4) might not have a solution.

A necessary condition for (4) to have a solution is that increases in k raise the left-hand side of (4). They do so only if F changes relatively slowly as G changes. In particular, the left-hand side of (4) rises with k only if the elasticity of F with respect to its argument is smaller than one. If it is bigger, it is impossible to induce the employee to make the necessary effort when management is autocratic.

Assuming a solution to (4) exists, and given that the CEO implements any project for which $G \geq k^a$, the autocratic CEO's firm's expected profits with this optimal contract are given by:

$$\begin{aligned} \int_{k^a}^{\infty} (G - k^a) dF(G) &= \int_{k^a}^{\infty} G dF(G) - k^a[1 - F(k^a)] \\ &= \int_{k^a}^{\infty} G dF(G) - d. \end{aligned} \quad (5)$$

The second term in (5) reflects the fact that on average

the manager is paid d . The first term simply represents the average profitability of the project and is the average value of G for a project that is implemented *ex post*, i.e., the average value of G given that $G \geq k^a$. This term is decreasing in k^a , i.e., the higher k^a is, the lower are the expected profits from undertaking the project in the first place. This is because as k^a rises it becomes less likely that the CEO will ultimately implement the project, even when it turns out that $G > 0$.

Comparing (2) and (5), the expected payment to the manager is d both in the complete contracts case and this incomplete contracts autocratic CEO case. However, the increase in expected profits to the firm is lower with incomplete contracts by

$$\int_0^{k^a} GdF(G). \quad (6)$$

This is because the firm loses those profit opportunities where $0 \leq G \leq k^a$.

These lost profit opportunities can sometimes be sufficient to eliminate altogether the benefits from exploring the project. The solution to (4), assuming it exists, will often involve a high value of k^a . This occurs in particular when $[1 - F(d)]$ is small, i.e., if a relatively small fraction of the projects are worth doing. However, it is apparent from (5) that if k^a gets "too large" it may not be worthwhile to have the manager exert the effort in the first place: the firm may not be able to exploit its possible profitable opportunities at all. This can occur even if it would be worthwhile to undertake the project with complete contracts.

2.4. Empathic Management

To keep the presentation simple we now turn to the other extreme, the CEO whose θ equals one so that he cares *only* about the manager's utility. Given the incomplete contract, such a CEO implements *any* project which is recommended to him. The contingent payment k in this empathic (and participatory) case is denoted k^p . The manager undertakes the project provided $k^p > d$.

The shareholders would choose a level of compensation for the manager that is just sufficient to elicit effort. Thus they would insist that the CEO set $k^p = d$ even though the CEO would like to pay the manager more. We assume that they succeed in enforcing this

though this assumption is not restrictive since any additional payments the CEO makes to the manager are captured by $C(1)$. Since the project is undertaken regardless of its merits, shareholders' profits are

$$E(G) - d - C(1). \quad (7)$$

This participatory style has two disadvantages vis-à-vis profit-maximization with complete contracts. First, $C(1)$, if positive, contributes negatively to profits. Second, this CEO implements projects even if they are not worthwhile ($G < 0$). Thus, ignoring $C(1)$, the net benefits from the project equal $E(G) - d$. As discussed above, this is the value of the project when the CEO gives up his option to shut down unprofitable projects.

2.5. Selfishness and Empathy Compared

In this subsection we show that even the extreme CEO who cares only about the manager can obtain higher profits than those that follow from period-by-period profit maximization. We do this by comparing the firm's profits when $\theta = 0$ and when $\theta = 1$. The difference in expected profits is

$$\begin{aligned} \Delta &\equiv [E(G) - d - C(1)] - \left[\int_{k^a}^{\infty} GdF(G) - d \right] \\ &= \int_{-\infty}^{k^a} GdF(G) - C(1). \end{aligned} \quad (8)$$

The sign of Δ is ambiguous in general. The inefficiency of participation, represented by $C(1)$, weighs the scales in favor of autocracy. Apart from this effect, the relative profitability of the two regimes is ambiguous: it depends on the sign of the first term in (8) which may be positive or negative. That is, even if the selfish CEO is more efficient at carrying out the operations of the firm, his firm may nonetheless be less profitable than that of a non-profit-maximizing participatory CEO!

The intuition for this result is the following. As long as the manager stands to gain if the CEO implements his project, the CEO whose $\theta = 1$ will implement it. As a result, the manager can easily be induced to undertake his project, and the net result is that every project is researched and implemented. While this means that some unprofitable projects are implemented, it also means that all of the profitable ones are, too.

The profit-maximizing CEO is unable to achieve this outcome. Both he and the manager understand that as

long as the CEO is required to compensate the manager if he implements his project, the CEO will have an incentive not to implement some projects. In particular, the CEO will not implement projects which would be profitable but for the manager's compensation. However, this problem then feeds on itself. Knowing that he will be compensated only for some fraction of the projects that he researches, the manager demands a high rate of compensation for those which are implemented and on which he is thereby compensated. This in turn reduces the incentive for the CEO to implement the project, since the expected profit threshold that the project must achieve is higher.

The net result of this is that some profitable projects are foregone. Even if the autocratic CEO would make higher profits if he had a participatory style, and therefore be better off himself, there is nothing he can do about it. While he would like to promise to respect only his manager's desires and ignore profits in the second period, his inability to credibly commit to such a promise renders the promise ineffectual.

To see when the participatory style dominates it is useful to decompose Δ as follows:

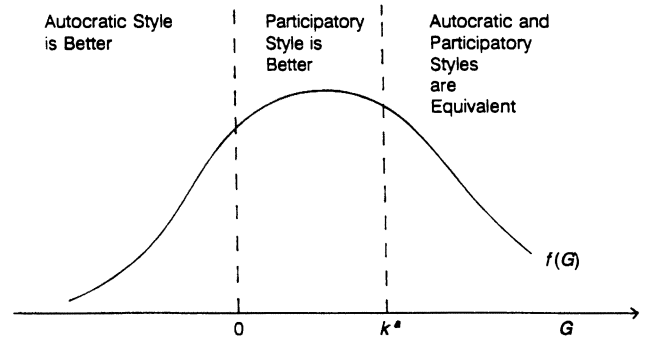
$$\Delta = \int_0^{k^a} GdF(G) + \int_{-\infty}^0 GdF(G) - C(1). \quad (9)$$

The first term demonstrates the advantage of participation: for projects in the range $0 < G < k^a$ participation ensures that profitable projects are implemented whereas they are not implemented under selfish (or autocratic) management. Conversely, the second term illustrates the relative advantage of selfishness: unprofitable projects which are adopted under participation are not adopted under autocracy.

The effect of the first two terms of (9) is demonstrated in Figure 1. As that figure shows, when the proportion of projects with $G < 0$ is low, the participatory style is particularly attractive. It is in this region that the effect of the CEO's overindulgence of his manager's pursuit of unprofitable projects is felt, and where the autocrats intolerance for *ex post* unprofitable projects is costly. Thus a participatory management style is particularly attractive in environments which are relatively rich in available profitable opportunities.

Selfish CEOs are particularly profitable when d is small relative to the possible G 's. From Equation (4),

Figure 1 Comparison of Autocratic and Participatory Styles for the Case where $C(\theta)$ is Zero



k^a is positively related to d . In the limit as $d \rightarrow 0$ then $k^a \rightarrow 0$ as well. Thus the smaller is d the smaller is the region in which the selfish CEO foregoes profitable opportunities. Then his operating efficiency and intolerance for unprofitable projects are assets to the shareholders. Therefore if the manager's disutility for effort is small compared to the potential gains from his effort, autocracy is likely to dominate the participatory style.

Notice too that to the right of k^a in Figure 1 the two regimes are equivalent, except that autocracy is more efficient. This has two related implications. First, if the entire distribution of G lies to the right of d so that every project that is researched will be implemented, the more efficient autocratic CEO will be more profitable.

Selfish CEOs are also attractive in the other extreme where there are essentially no worthwhile projects. In this case, few projects will be researched in either regime, and the third term in (9) will weigh against the participatory style.

By contrast, any change in the distribution which results in less weight in "the tails" and more weight in the middle region $[0, k^a]$ will be more suited to participatory management. That is, if an outcome in the region $[0, k^a]$ becomes more likely and an outcome below 0 becomes correspondingly less likely, the participatory style becomes more attractive.

Once a firm has adopted this style, it benefits disproportionately from having employees develop new proposals. This may rationalize the type of training which Pascale and Athos (1981) report is extensively used at Matsushita. They show that Matsushita develops its employees by making them spend time in different parts of the company. This presumably is costly but it also

facilitates the generation of new ideas. Insofar as the autocratic style does not reap as many of the benefits from new ideas, shareholders of firms whose CEOs are autocratic do not benefit from this type of training.

3. The Best CEO for the Job

Thus far we have contrasted the extreme selfish and empathic management styles and have discussed the circumstances under which each style is the preferred one. The main result so far is that profit-maximizing shareholders may choose to hire a non-profit-maximizing CEO. In this section we go one step further and suppose that the shareholders can choose among candidate CEOs with different personalities as measured by their concern for their workers. That is, we suppose that the shareholders can choose a CEO whose personal " θ " is best suited to the environment in which the firm operates. In order to do this we examine how shareholder profitability varies with θ .

A secondary objective of this section is to show that our basic results extend to the more realistic case where managers can generate proposals even without exerting effort. Lack of effort results instead in proposals of low quality. In particular, these proposals would, if implemented, lead to net revenues equal to $\underline{G} < 0$. The result of this modification is that CEOs with $\theta = 1$ become undesirable because they implement the manager's project even in the absence of any effort. Thus, such extremely empathic CEOs do not lead the manager to expend any effort. Nonetheless, the basic insight of the previous section that some degree of empathy can improve incentives remains valid in this case.

We suppose that the CEO is of type θ and that the manager is offered a contract which pays him k^θ if his project is implemented. In that case, in the second period the CEO will choose to implement a project that the manager has researched if

$$(1 - \theta)(G - k^\theta) + \theta k^\theta \geq 0,$$

that is, if

$$G \geq \left(\frac{1 - 2\theta}{1 - \theta} \right) k^\theta. \quad (10)$$

If \underline{G} satisfies (10), then the manager will surely make no effort since he receives k^θ in any event. We thus

assume for the moment that \underline{G} does not satisfy (10). We show below that this is indeed true for the optimal CEO. As a result, the manager exerts effort (sets $e = 1$) during the first period if his expected future incentive payments exceed his disutility of effort. That is, if

$$\int_{((1-2\theta)/(1-\theta))k^\theta}^{\infty} k^\theta dF(G) \geq d,$$

i.e., if

$$\left[1 - F\left(\frac{1 - 2\theta}{1 - \theta} k^\theta \right) \right] k^\theta \geq d. \quad (11)$$

The shareholders would like the manager to be paid no more than is absolutely essential in order to induce him to work. They would thus like (11) to hold as an equality. We once again assume that they succeed in enforcing these incentive payments and that any compensation the manager receives over and above what they desire is captured by $C(\theta)$. The resulting k^θ , which we denote $k^{\theta*}$, is that for which

$$\left[1 - F\left(\frac{1 - 2\theta}{1 - \theta} k^{\theta*} \right) \right] k^{\theta*} = d. \quad (12)$$

The firm's expected profits are then given by:

$$\int_{((1-2\theta)/(1-\theta))k^{\theta*}}^{\infty} (G - k^{\theta*}) dF(G) - C(\theta), \quad (13)$$

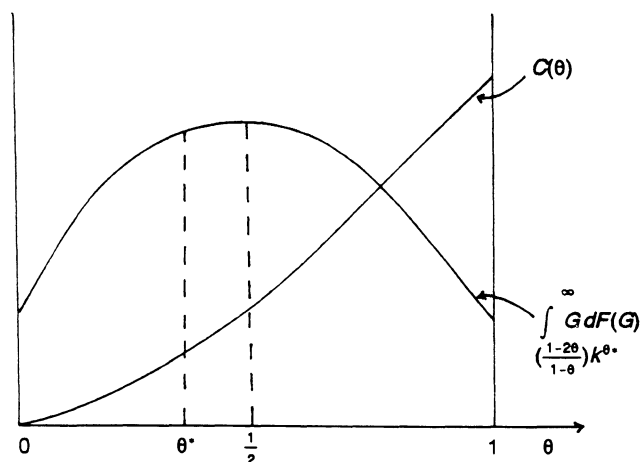
which, using (12), can be written as:

$$\begin{aligned} & \int_{((1-2\theta)/(1-\theta))k^{\theta*}}^{\infty} G dF(G) - [1 - F(k^{\theta*})] k^{\theta*} - C(\theta) \\ &= \int_{((1-2\theta)/(1-\theta))k^{\theta*}}^{\infty} G dF(G) - d - C(\theta). \end{aligned} \quad (14)$$

Notice first that, assuming the manager makes an effort, the cases we considered in the previous section are indeed special cases of this more general formulation. If $\theta = 0$, $k^{\theta*} \equiv k^a$ from Equation (12) (since $((1 - 2\theta)/(1 - \theta)) = 1$ in this case). But then the expression for expected profits in Equation (14) is identical to that in Equation (5). Similarly, the extreme empathic case is approached as the limit as $\theta \rightarrow 1$. Then, $((1 - 2\theta)/(1 - \theta)) \rightarrow -\infty$ so that the expression for expected profits in Equation (14) reduces to that given in Equation (7).

Two terms in Equation (14) depend on θ : the integral and $C(\theta)$. Consider the integral first. The integral

Figure 2 The Optimal Value of θ



reaches a maximum when the lower limit of the integral is zero. If the lower limit is any lower, negative-profit projects are included; if the lower limit is any higher, positive-profit projects are excluded. How the integral varies as θ varies, therefore, depends on how the lower limit varies with θ . In fact it is straightforward to show that the lower limit is strictly decreasing in θ and that it is equal to zero when $\theta = 1/2$.¹⁴ The value of the integral as a function of θ is therefore as represented in Figure 2. $C(\theta)$, which is increasing in θ , is also depicted there.

If there is no difference in efficiency across regimes, that is if $C(\theta)$ is the same for all θ , then profits are maximized if $\theta = 1/2$: The "best" CEO is one who cares equally about profits and his manager's utility. The intuition for this is that at the implementation stage a CEO with $\theta = 1/2$ cares as much about the benefit that the manager obtains from his additional compensation as he cares about the effect of that compensation on the profitability of the firm. Overall, therefore, he does not

¹⁴ To see this notice that

$$\frac{d}{d\theta} \left(\frac{1-2\theta}{1-\theta} \right) = \frac{-1}{(1-\theta)^2} < 0,$$

so that $((1-2\theta)/(1-\theta))$ is a decreasing function of θ which is equal to 1 when $\theta = 0$, is positive when $k^{**} < 1/2$, and negative thereafter. The term k^{**} is positive, and from (12), is decreasing in θ . Therefore the lower limit, which is the product of $((1-2\theta)/(1-\theta))$ and k^{**} is strictly decreasing in θ and is zero when $\theta = 1/2$.

care about the manager's compensation but, instead, worries only about whether $G > 0$: i.e., whether or not the profits of the firm will increase as a result of implementing the project.

Thus the CEO's ex post incentives are optimal: he implements exactly those projects which should be implemented from a profit-maximizing point of view. The manager's compensation is then set so that he is willing to exert the effort necessary to research the project even though the project will only be implemented if it turns out to be profitable. The overall outcome is identical to that which would be achieved if the firm were able to write a complete contract with the manager. Note that, as a consequence of the fact that only projects whose G exceed zero are implemented, (10) is violated for G , and managers who exert no effort do not receive any incentive payments.

One can also see from Figure 2 that if $C(\theta)$ is increasing in θ , the optimal θ for the firm, θ^* , is strictly less than $1/2$. Thus the firm should lean in the direction of autocracy (from $\theta = 1/2$) when the participatory style is less efficient in conducting the day-to-day operations. This strengthens the conclusion that, for the optimal θ , the manager is not paid if he does not exert any effort. The extent to which a firm should reduce the θ of its CEO depends on the distribution function F . It is for this reason that different firms must in general have CEOs with different personalities. In particular, for the same $C(\theta)$, firms for which the integral in Figure 2 rises rapidly because they have access to many valuable projects should end up with a higher θ^* than firms without access to such projects (whose integral is flat).

The management style, and hence the θ that firms choose obviously affects the range of projects that the firm should seek to explore. In other words it affects that range of projects for which (14) is positive. The investment rules derived by Roberts and Weitzman (1981) apply only in the case of complete contracts, and they have to be suitably modified, depending on the management style of the firm.

4. Empathy and Participation

So far we have simply asserted that more empathic CEOs also have more participatory management styles. In this section we show this is true in the sense that a

more empathic CEO will ask his manager questions about a broader range of issues than a more selfish one. Also, a more empathic CEO is more likely to delegate decision making to his manager. To obtain this result, we require that there exists a larger menu of courses of action available to the CEO. Thus we assume that after spending effort, the manager produces two alternative projects, which we label 1 and 2. These are alternatives in the sense that only one can be implemented profitably. The net revenue from implementing only project 1 is G_1 while that from implementing project 2 is G_2 . Both of these values are drawn independently from the same distribution function F .

The mere existence of a wider menu need not affect differentially the communications of selfish and empathic CEOs with their managers. Such differences do arise if, as we now assume, the manager's utility depends on the project that is implemented. We assume implementation of project i gives the manager utility equivalent to z_i units of income and that the realizations z_1 and z_2 are independent draws from a distribution function H (and density function h) whose mean is $\bar{z} \geq 0$.¹⁵

As before, the outcome of the manager-CEO interaction depends on what is contractible. Given that we now have a choice of projects, it depends in particular on whether contracts can specify payments which depend on the z_i of the implemented project. For a variety of reasons this seems implausible so that we continue to assume that payment can only depend on whether a project is implemented at all.¹⁶ Then, assuming he

implements any project at all, the CEO implement the one which maximizes $(1 - \theta)G_i + \theta z_i$. For the purely selfish CEO whose θ is zero this is equivalent to just maximizing net revenues G . Thus such a CEO has nothing to gain by learning which project the manager prefers. He will act autocratically. By contrast, a more empathic CEO's implementation decision depends on the manager's preferences so that he will elicit them.

One weakness of this formal model is that this elicitation of the manager's preferences is the same for any CEO whose θ is even slightly above zero. So the degree of participation is discontinuous in θ . However, this weakness can probably be remedied in a more elaborate model where learning about the manager's preferences takes time. Then such learning becomes more worthwhile for the CEO the more his own utility depends on making a decision that the manager likes. Thus this sort of learning would tend to rise continuously with θ . Note also that, for θ sufficiently high, the CEO will simply let the manager pick which project gets implemented since the difference in their G 's will be of little relevance relative to the difference in their z 's.

We have now shown that CEOs with higher θ are indeed more participatory in that they are more likely to ask their employees which project they would like to see implemented. The question is then whether tending to implement the project which the manager likes best is bad for the shareholders. To answer this question, we will neglect the issues discussed in the previous section and assume that the CEO always implements one of the two projects. This would follow from assuming that, given that the manager makes an effort, the smallest G in the support of F is larger than d . Then, even the completely selfish CEO is willing to pay d to implement one project, and this payment is sufficient to induce the manager to make an effort.

A CEO of type θ chooses to implement project 1 if $G_1 - G_2 \geq \phi(z_2 - z_1)$ where ϕ equals $\theta/(1 - \theta)$. So we introduce the indicator function I_θ such that

also be at freedom to demand payment in exchange for not making the job worse. If this were possible, the manager might never be paid more than the minimum wage w needed to keep him from leaving. The reason is that the CEO could always extract any incentive payment such as k by threatening to make the job less pleasant.

¹⁵ This mean would be strictly positive if the manager's prospects in the external labor market improve following implementation of his idea.

¹⁶ It should be clear that such payments would tend to arise if contracts were complete. To see this, note that overall efficiency demands that the project be implemented whose $G_i + z_i$ is highest. One simple scheme that would achieve this under full information is having the manager pay the CEO z_i in exchange for implementation of project i . From the CEO's perspective, profits are then equal to $G_i + z_i$. One problem with this scheme is that the manager knows z_i better than the CEO and is unlikely to volunteer the information if he must also pay z_i in exchange for having project i implemented.

A different problem arises even when the CEO knows z_i as well. The existence of this type of payments then open the door to more exploitative treatment of the manager. If the CEO is always at freedom to demand payment from the manager to improve the job he may

$$I_\theta(G_1, G_2, z_1, z_2)$$

$$I_\theta(G_1, G_2, z_1, z_2) = \begin{cases} 1, & \text{if } G_1 - G_2 \geq \phi(z_2 - z_1), \\ 0, & \text{otherwise.} \end{cases} \quad (15)$$

Given a payment to the manager k^θ whenever a project is implemented and ignoring $C(\theta)$, expected profits are then equal to

$$\int_{z_2} \int_{z_1} \int_{G_2} \int_{G_1} [I_\theta G_1 + (1 - I_\theta) G_2] \times dF(G_1) dF(G_2) dH(z_1) DH(z_2) - k^\theta. \quad (16)$$

After receiving his subsistence wage w , the manager's expected utility when his CEO is of type θ is

$$k^\theta + \int_{z_2} \int_{z_1} \int_{G_2} \int_{G_1} [I_\theta z_1 + (1 - I_\theta) z_2] \times dF(G_1) dF(G_2) dH(z_1) DH(z_2) - d. \quad (17)$$

From the shareholders' point of view, the ideal k^θ is the one that makes the expression in (17) equal to zero. Assuming once again that shareholders succeed in inducing the CEO to give this incentive payment, (16) becomes

$$\int_{z_2} \int_{z_1} \int_{G_2} \int_{G_1} [I_\theta(G_1 + z_1) + (1 - I_\theta)(G_2 + z_2)] \times dF(G_1) dF(G_2) dH(z_1) DH(z_2). \quad (18)$$

For θ equal to zero, the autocratic case, I_0 picks the project whose G is highest. To see the advantages of empathy, it is useful to compare this case with that in which $\theta = 0.5$. As we showed in the previous section, this is the optimal θ when $C(\theta)$ can be neglected. In this case ϕ equals one so that the CEO picks the project whose $G_i + z_i$ is highest as efficiency demands. Now consider any realization of $\{G_i, G_j, z_i, z_j\}$. If $G_i \geq G_j$ and $G_i + z_i \geq G_j + z_j$, then, since both types pick project i , the contribution to (18) is the same. If, instead, $G_i \geq G_j$ but $G_i + z_i < G_j + z_j$, then $I(O)$ picks project i while $I(1/2)$ picks project j so that $I_0(G_i + z_i) + (1 - I_0)(G_j + z_j)$ is smaller than $I_{1/2}(G_i + z_i) + (1 - I_{1/2})(G_j + z_j)$. Therefore, overall expected profits are higher when $\theta = \frac{1}{2}$.

We have thus shown that shareholders benefit from

an empathic CEO's choice of projects (at least if his θ equals 0.5). This may be surprising since, ex post such a CEO tends to choose the projects that the manager likes even when this project does not maximize profits. However, insofar as this allows the contract with the manager to have correspondingly lower wages (as occurs when (17) is zero), the shareholders benefit.

The issue is then whether, in practice, it is possible for shareholders to ensure that CEOs whose θ is higher pay lower incentive payments. If they are completely unable to do this, so that k^θ is the same for all θ , profits are highest with the most autocratic manager. Such a manager ensures that, for each realization of $\{G_1, G_2, z_1, z_2\}$, $I_\theta G_1 + (1 - I_\theta) G_2$ is as high as possible so that (16) is maximized. In practice, shareholders probably are neither able to completely determine k nor totally unable to have any influence. Then, a θ somewhat smaller than 0.5 will be appropriate.

In conclusion, this section has shown that, if the manager cares about which project is implemented, there is an additional reason to hire an empathic CEO. Such a CEO will tend to implement the project that the manager likes, and this participatory behavior raises profits if wages are adjusted accordingly.

5. Managers of Varying Abilities

To keep the presentation straightforward we have assumed that all managers have the same *ex ante* ability to generate valuable projects. The analysis also applies directly to certain cases where managerial ability differs. One key issue, as stressed for instance, by Amit et al. (1990) is whether the difference in ability between managers is common knowledge. There is common knowledge when the manager's own perception of his ability matches the CEO's and both are aware of this commonality of opinion. Thus, there trivially exists common knowledge about ability when managers do not have any particular information about their own ability that is not based on their publicly known record of accomplishment. We would then expect the market wage w of managers of different abilities to differ as well. Whether it differs or not, the analysis in the previous sections applies directly; it determines the optimal arrangements for each particular type of manager, where a type of manager is defined by his or her F . For

each type of manager there would be a different k which would itself depend on the management style of the firm.

We will now deal with the case where the CEO and the manager are differentially informed about the manager's ability. This complicates the analysis in two ways. First, the payment k provides different incentives for effort to managers who see themselves as having different abilities. Thus, the choice of a payment k affects which sorts of managers will exercise effort. Second, if the k is chosen so that managers of differing abilities make an effort, then their expected total payments will differ. This affects the attractiveness of the firm to different potential employees; it can induce "self-selection" of relatively able or unable managers.

We show that, as before, empathic CEOs have a particular advantage in generating effort when the resulting ideas are likely to have small positive payoffs. The main novelty in this section's analysis is that empathic CEOs find it relatively costless to generate effort by the relatively less able managers. In particular, unlike the case of autocracy, inducing these to make an effort does not require that more able managers be given a large rent. Thus empathic CEOs are particularly desirable when the effort of people without unusually great talent is valuable to the firm. Matters are different when only the effort of the particularly able employees is profitable. Then, the firm may gain by having the opportunity to give large rents to more able employees without creating an incentive for less able individuals to exert effort. The reason this can be beneficial is that these rents make it easier to recruit relatively capable employees. When this is an important consideration, autocratic CEOs may thus have an edge.

Suppose that there are two different types of managers. Type h has high ability. By exerting an effort that costs him d , he develops a project with probability P_h . The payoff of a project developed by a high ability manager has a c.d.f. given by $H(G)$. In the current notation, the model of the previous sections had P^h equal to 1. The reason we want to consider the case where effort does not automatically lead to a project is that this seems realistic. There are cases where it is common knowledge that the effort has been in vain. One could, of course, think of these as situations where G is low. What distinguishes these outcomes from those that

simply have low G is that failure to generate a project is common knowledge whereas G is known only by the manager and the CEO. As we shall see below, this distinction matters and this realistic modification makes participatory management more attractive.

There also exist lower ability managers whose type we denote by l . By exerting effort which also costs him d , such a manager develops a potentially viable project with probability P_l . The payoff of a project developed by a low ability manager has a c.d.f. given by $L(G)$. Because type l managers have lower ability, $P_l \leq P_h$ and $L(\tilde{G}) \geq H(\tilde{G})$ for all \tilde{G} .

An additional complication in the case of asymmetric information about types is that the reservation wages of the two types might be different. For simplicity of exposition, we first ignore this possibility so that base wages w and required average wages are the same for both types. We consider the case with differential required wages below because it affects the relative ease with which employees of the two types can be recruited.

With complete contracts and perfect information, the benefit to the firm from paying d to the type h manager to make an effort is

$$\int_0^\infty GdH(G) - d \quad (19)$$

while the analogous expression for the type l manager is

$$\int_0^\infty GdL(G) - d. \quad (20)$$

With incomplete contracts, the CEO's only method for providing incentives is, again, the payment k which is conditional on implementation. With a purely selfish CEO, the high ability manager will make an effort only if this payment satisfies (3) which here is given by

$$kP_h[1 - H(k)] \geq d. \quad (21)$$

If there exist k 's that satisfy this inequality, the smallest of these is the most profitable one, assuming the CEO wants only the high ability manager to make an effort. Denote that k by k_h^a . The resulting profits from the effort by the high ability manager are then equal to

$$P_h \int_{k_h^a}^\infty (G - k_h^a)dH(G) = P_h \int_{k_h^a}^\infty GdH(G) - d \quad (22)$$

where the equality follows from the definition of k_h^a . To obtain effort from the low ability manager as well, requires that k satisfy

$$kP_l[1 - L(k)] \geq d. \tag{23}$$

Because P_l is lower than P_h and $L(k)$ is larger than $H(k)$, the left-hand side of (23) is larger than that of (21) for any value of k . Therefore, if k 's exist that satisfy (23), they are larger than k_h^a and they automatically satisfy (21). Let the minimum k that satisfies (23) be given by k_l^a . This is the k that maximized profits assuming the CEO induces both types to make an effort. Assuming there are N_h managers of type h and N_l managers of type l , the resulting profits are given by

$$\begin{aligned} & N_h P_h \int_{k_l^a}^{\infty} (G - k_l^a) dH(G) + N_l P_l \int_{k_l^a}^{\infty} (G \\ & N_h P_h \int_{k_l^a}^{\infty} (G - k_l^a) dH(G) + N_l P_l \int_{k_l^a}^{\infty} (G - k_l^a) dL(G) \\ & = N_h P_h \int_{k_l^a}^{\infty} G dH(G) + N_l P_l \int_{k_l^a}^{\infty} G dL(G) \\ & - (N_h + N_l)d - \left\{ \frac{P_h[1 - H(k_l^a)]}{P_l[1 - L(k_l^a)]} - 1 \right\} N_h d \end{aligned} \tag{24}$$

where the equality follows from the definition of k_l^a .

The CEO essentially has a choice between setting k so that only the high ability manager makes an effort and setting it at a level that induces both types to exert effort. He prefers the former if N_h times the expression in (22) is larger than (24). Then, profits are maximized by setting k equal to k_h^a , otherwise they are maximized by setting it equal to k_l^a .

We see that the selfish CEO does not extract as much benefit from either type of manager as would be possible with complete contracts. In both cases, projects whose G is relatively low are ignored. This problem is more severe if the low ability manager is also induced to make an effort because, in this case, the cutoff k is higher. When the lower ability manager is induced to make an effort, the higher ability manager earns a surplus above d for making an effort. The existence of such a surplus, which equals the expression in braces in (24), is standard in adverse selection models.

Consider now the empathic CEO whose θ equals one. The choice of k must now be made directly by the

shareholders since such a CEO presumably always prefers a higher k . For any positive k , the empathic CEO will implement any viable project obtained by any employee. If P_h or P_l is lower than one, managers who make an effort do not always receive the payment k . The reason is that with some probability they do not develop a viable project. Even if the empathic CEO wishes to pay k to these unlucky employees, he cannot. Assuming these probabilities are less than one thus recognizes that shareholders exercise some leeway even if the CEO is very empathic. For a project to be implemented requires that it have some minimum level of plausibility and managers, particularly lower ability managers, cannot be sure that their ideas will pass this test.

If their CEO is empathic high ability managers will make an effort if

$$P_h k \geq d. \tag{25}$$

The lower ability manager will make an effort if

$$P_l k \geq d. \tag{26}$$

Since $P_h \geq P_l$, the minimum k that induces type l to make an effort, which we denote by k_l^p is no smaller than k_h^p , the minimum k that leads type h to the make an effort. In the special case where $P_h = P_l$, these two k 's are identical.

Profits when only type h managers make an effort are given by

$$N_h P_h \int_{-\infty}^{+\infty} G dH(G) - N_h d - C(1) \tag{27}$$

whereas when k is such that both make an effort profits equal

$$\begin{aligned} & N_h P_h \int_{-\infty}^{+\infty} G dH(G) + N_l P_l \int_{-\infty}^{+\infty} G dL(G) \\ & - 2d - C(1) - N_h \{ (P_h/P_l - 1)d \}. \end{aligned} \tag{28}$$

The expression in braces is, once again, the rent extracted by each type h manager. We are now in a position to compare the two extreme types of CEO. We see first that, if P_h is equal to P_l , the purely empathic CEO has a disadvantage in that he cannot induce only one type of manager to exert an effort. It is important to note, however that this is a weakness only of the

CEO whose θ is exactly one. Even slightly smaller values of θ generally imply that there are some realizations of G for which the CEO does not implement the project. As a result, the high ability manager receives the payment k more frequently even when both types make an effort. It is then possible to set k so that only the high ability manager makes an effort.

Suppose that, indeed, k is set that so that only type h makes an effort with either management style. Then, the difference in profits is the difference between the expression in (27) and N_h times the expression in (22). It equals

$$\begin{aligned} & N_h P_h \int_{-\infty}^{+\infty} G dH(G) - C(1) - P_h \int_{k_h^a}^{\infty} G dH(G) \\ &= N_h \int_{-\infty}^{k_h^a} G dH(G) - C(1) \end{aligned} \quad (29)$$

which is ambiguous in precisely the same way as (8), the expression when there was only one type of manager.

We now consider the case where the autocratic and the empathic CEO set k so that both types of manager make an effort. The difference between the profits earned with autocracy and those earned with participatory management is now the difference between (28) and (24)

$$\begin{aligned} & N_h \int_{-\infty}^{k_h^a} G dH(G) - N_l \int_{-\infty}^{k_l^a} G dL(G) - C(1) \\ & \quad - \left\{ \frac{P_h[1 - H(k_h^a)]}{P_h[1 - L(k_l^a)]} - \frac{P_h}{P_l} \right\} dN_h. \end{aligned} \quad (30)$$

The first three terms in this expression are analogous to those in (8). Inducing the effort of the low ability type requires a higher k so that the benefits from the high ability type's effort are lower under autocracy while they remain unchanged under participation. Whether the autocratic CEO or the empathic one benefits more from the effort of the type l manager is again ambiguous. If the type l manager produces relatively many projects with negative G 's then the autocratic manager is better in this regard while if many of his projects have positive but small G 's the empathic one is better. The term in braces is positive so that it makes the empathic style more desirable. It captures the difference in the rents

garnered by the type h managers under the two management regimes. The rents are higher under autocracy because the autocratic CEO makes the payment k relatively more often to the type h manager. Thus, for any given k , there is a bigger difference between the earnings of the two types under autocracy than under participation. This means that, when the k 's are adjusted so type l managers receive d , type h managers receive more under autocracy.

In the current model these rents represent a cost to having a selfish CEO. The reason is that, because the required wages are the same for the two types, the firm has no difficulty in attracting type h managers. Large rents for type h employees can, however, be a benefit to the firm if it is necessary to pay type h managers more in order to attract them to the firm.

We thus consider now a situation where the reservation wages of the two types differ. Type l 's reservation wage when he makes zero effort remains equal to w while type h 's is now $w + z$. We let the cost of effort remain equal to d for both types. Thus type h managers would only join the firm and expect to make an effort if their expected payments equal at least $w + d + z$. Since the firm does not know the individual's type, its only mechanism for giving type h managers the extra income z is to increase k .

The consequence of such an increase in k is that type l managers become more likely to make an effort. This is not, per se, bad for the selfish CEO since he only implements projects on which his firm gains profits. It is potentially bad for the empathic CEO, however. Suppose in particular, that the effort of type l managers is unprofitable on average if his projects are always implemented so that $P_l \int G dL(G) < d$. Then, the fact that an increase in k makes the type l manager make an effort has a deleterious consequence on the empathic CEO's profits.

One is tempted to conclude from this analysis that the selfish CEO finds it easier to recruit top talent. The intuition for such a result would be that relatively ineffective managers do not thrive under such a bottom-line oriented CEO. This intuition is only partly right, however, because the selfish CEO sometimes finds it difficult to take advantage of good managers. Suppose in particular that, because of the form of the distribution function H , there exists no k which satisfies (21). Then,

the selfish CEO cannot induce a type h manager to make an effort by paying him d for it, let alone give him the extra z that he requires. By contrast, a k of $(d + z)/P_h$ is sufficient to attract such a manager to a firm run by an empathic CEO. Moreover, if P_h is sufficiently higher than P_l , this k is not sufficient to induce the type l manager to make an effort. Thus, there even exist situations where the empathic CEO finds it easier to recruit talented managers.

On the other hand, in situations where type h managers produce projects whose G is very high (so that they are very able) while type l managers produce projects whose G is very low, the autocratic CEO has an edge in attracting type h managers. He can set k quite high without fear of eliminating the effort of his type h manager or of reducing his profits from the type l managers. By contrast the empathic manager would lose from his type l managers if his firm raised k .

In this case, where the adverse selection problem is very severe because the types are very different we would expect autocratic and participatory firms to use very different recruitment methods. Autocratic firms would need to do only a cursory examination of their job candidates because the less able would not cost the firm very much. By contrast, shareholders in participatory firms would have to take greater precautions against hiring relatively inept managers; their recruitment process would have to be more selective.

6. Conclusions

We have presented a model where shareholders select the firm's leadership style to maximize *ex ante* profits. Leadership style affects the corporate culture of the organization in that employee's beliefs about how they will be treated in various circumstances depend on it. In the model, maximization of *ex ante* profits sometimes requires that the firm not be too keen on maximizing *ex post* profits. Leadership style matters because it can achieve this aim.

The principal open question left by this research is its empirical relevance. To what extent does the distinction between participatory and autocratic styles help us understand the effectiveness of research inside firms? To what extent are these differences in leadership style opportunistic facades that any manager can adopt, and

to what extent do they hinge instead on the CEO's inherent personality traits?

Fiedler (1965) shows that the extent to which the leader gives a favorable description of his least preferred coworker is positively correlated with the permissiveness and human-relations orientation of the leader. He also shows that leaders who give such favorable descriptions tend to be more successful in decision and policy making teams and in groups that have a creative task. These activities certainly seem to involve more research of the type that we have considered than the groups in which the more autocratic leaders performed well. These latter groups include basketball and surveying teams, open hearth shops and military combat crews. One question that is left open by Fiedler's research is whether the regard one has for one's least favored coworker is a feature of one's personality or whether it is molded by the work environment.

Miller et al. (1982) and Miller and Toulouse (1986) study more directly the extent to which CEO personality affects both strategy (i.e., whether the firms are innovative) and structure (i.e., whether the firms are autocratic). Miller and Toulouse (1985) consider three personality traits. The first is locus of control. Individuals with internal locus of control feel that what happens to them is the result of their own actions, while those with more external locus of control tend to view their environment as having a larger role in shaping their life. Miller and Toulouse report that firms whose executives have an internal locus of control tend to innovate more and also tend to delegate more. The relationship between locus of control and innovation is statistically very significant while that between locus of control and delegation is significant only at the 10% level.

Another personality attribute they consider is flexibility. Those who are flexible are adventurous and adapt easily, those who are not tend to be more rigid. According to their study, CEOs whose personalities are more flexible tend to lead firms that innovate and delegate more, though only the latter relationship is statistically significant. The finding that there exist personality traits which lead to both more innovation and more delegation seems broadly consistent with our theory if one views most innovations as being the result of research whose payoff tends to lie in the "middle" region $[0, k^a]$.

Finally, Miller and Toulouse (1986) consider need for achievement (nAch) of various executives. Individuals with high nAch set relatively difficult goals for themselves and try to achieve them with little outside help. Miller and Toulouse show that executives with a high need for achievement tend to lead innovative firms that delegate little. This seems inconsistent with our story that innovative firms delegate. However, closer inspection of their results show that this correlation is true only for small firms. Thus they seem to be picking up the existence of individual innovators whose need for achievement is high and, in part as a result, succeed in creating viable companies. This is not inconsistent with our theory if these innovations are made by the CEO himself. Our theory implies that delegation helps subordinates (not the CEO) to be innovative.

One of the reasons the results of Miller et al. (1982) and Miller and Toulouse (1986) are only partial is that they focus on different psychological traits than those that emerge naturally from our theory. In our theory, what is important is the extent to which a CEO cares for the welfare of his employees. This might well be measurable by some index of empathy like the one proposed by Mehrabian and Epstein (1972). Mehrabian and Epstein (1972) report that subjects whose index of empathy was high were also willing to spend more time helping others. This suggests that it is quite possible that CEOs measuring high on this index might want to treat their employees well. Thus one implication of our theory is that firms that do relatively well in innovative sectors ought to have CEOs with a high index of empathy, holding everything else constant.¹⁷

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References

- Amit, Raphael, Lawrence Glosten, and Eitan Muller, "Entrepreneurial Ability, Venture Investments, and Risk Sharing," *Management Sci.*, 36 (October 1990), 1232-1245.
- Badawy, M. K., "Industrial Scientists and Engineers: Motivational Style Differences," *California Management Review* (Fall 1971), 11-16.
- Bass, Bernard, *Stodgill's Handbook of Leadership*, The Free Press, New York, 1981.
- Buss, Arnold H. and Stephen E. Finn, "Classification of Personality Traits," *J. Personality and Social Psychology*, 52 (1987), 432-444.
- Coase, Ronald, "The Nature of The Firm," *Economica* (November 1937), 386-405.
- Fiedler, Fred E., "Engineer the Job to Fit the Manager," *Harvard Business Review*, 43 (Sept.-Oct. 1965), 115-122.
- Graves, Desmond, *Corporate Culture—Diagnosis and Change*, St Martin's Press, New York, 1986.
- Hart, Oliver and John Moore, "Incomplete Contracts and Renegotiation," *Econometrica*, 56 (July 1988), 755-786.
- Holmström, Bengt, "Moral Hazard and Observability," *Bell J. Economics* (Spring 1979), 74-91.
- and Jean Tirole, "The Theory of the Firm" in Richard Schmalensee and Robert Willig (Eds.), *Handbook of Industrial Organization*, North Holland, Amsterdam, 1989.
- Kreps, David, "Corporate Culture and Economic Theory," in J. Alte and K. Shepsle (Eds.), *Rational Perspectives on Positive Political Economy*, Cambridge University Press, Cambridge, 1990, 90-143.
- Lawrence, Paul R. and Jay W. Lorsch, *Organization and Environment*, Harvard Business School Press, Boston, MA, 1967.
- Levinthal, Daniel A., *Three Essays on Economic Models of Organizations*, Stanford Graduate School of Business Ph.D. Thesis, 1985.
- Lewin, K. and R. Lippitt, "An Experimental Approach to the Study of Autocracy and Democracy: A Preliminary Note," *Sociometry* (1938), 292-300.
- Likert, Rensis, *Human Organization*, McGraw-Hill, New York, 1967.
- Mehrabian, Albert and Norman Epstein, "A Measure of Emotional Empathy," *J. Personality*, 40 (1972), 525-543.
- Miller, Danny, Manfred F. R. De Vries, and Jean-Marie Toulouse, "Top Executive Locus of Control and Its Relationship to Strategy-Making, Structure and Environment," *Academy of Management J.*, 25 (1982), 237-253.
- and Jean-Marie Toulouse, "Chief Executive Personality and Corporate Strategy and Structure in Small Firms," *Management Sci.*, 11 (1986), 1389-1409.
- O'Reilly, Charles, "Corporations, Culture and Commitment: Motivation and Social Control in Organizations," *California Management Review*, 31 (Summer 1989), 9-25.
- Pascale, Richard T. and Anthony G. Athos, *The Art of Japanese Management*, Warner Books, New York, NY, 1981.
- Perrow, Charles, *Organizational Analysis: A Sociological View*, Wadsworth Publishing, Belmont, CA, 1970.
- Ritti, Richard, "Work Goals of Scientists and Engineers," *Industrial Relations*, (February 1968), 118-131.
- Roberts, Kevin and Martin L. Weitzman, "Funding Criteria for Research, Development and Exploration Projects," *Econometrica*, 49 (September 1981), 1261-1288.
- Shleifer, Andrei and Lawrence H. Summers, "Breach of Trust in Corporate Takeovers," in Alan Auerbach (Ed.), *Corporate Takeovers, Causes and Consequences*, Chicago University Press, Chicago, Illinois, 1990.

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