

Tying the Owner's Hands: The Moral Hazard of Profit-Maximization

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The enforcement problem can be overcome only by bringing in a principal (or a party) who will assume the residual of the nonbudget-balancing sharing rules (Holmstrom 1982).

By introducing a third party to break the budget-balancing constraint, one also gives him the clear incentive to engage in morally hazardous behavior (Eswaran and Kotwal 1984).

Holmstrom's "Moral Hazard in Teams" (1982) demonstrates that no budget-balanced incentive mechanism can induce an efficient Nash equilibrium. An implication of this result is that profit-maximization threatens firm efficiency. To attain efficiency, a firm's owners must constrain themselves from interfering with management. Mechanisms aimed at aligning the interests of managers and owners thus miss the point that a fundamental advantage of separating ownership from control is the enhanced ability of owners to credibly commit against playing opportunistic strategies. In particular, the costs of acting collectively within a diffuse ownership can aid efficiency by creating a system in which owners rationally uphold efficient informal contracts that they would otherwise have an incentive to renege on. In a similar manner, institutions that encourage passive rather than active ownership can enhance a firm's survival capability.

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For decades, the most important theme running through the dialogue about the American corporation has been the separation of ownership and control. "As the ownership of corporate wealth has become more widely dispersed, ownership of that wealth and control over it have come to lie less and less in the same hands (Berle and Means 1932, 69)." Berle and Means argued that managers used the machinery of voting to seize control of decision-making authority in the firm. "The proxy machinery has thus become one of the principal instruments not by which a stockholder exercises power over management of the enterprise, but by which his power is separated from him (Ibid 129)." Outside directors, it was argued, were co-opted and passive, and the board was an ineffectual means for serving shareholder interests (Ibid 233-246).

Dispersion of ownership gave managers discretion to pursue goals other than profit-maximization. The concern, of course, is that this discretion may be used for the diversion of revenues to relatively unproductive, self-serving uses. This concern was supported by journalistic accounts of the airplanes, resort condos, and ostentatious lifestyles purchased for top executives by RJR-Nabisco (Burrough and Helyar 1990). The concern has also been shared by serious academics, who document inefficient uses of free cash flows (Jensen 1984). Managers have been presumed to be

maximizing "managerial discretionary profit" (Migue and Belanger 1974), rather than owners' profit. The separation of ownership and control has been seen as a source of economic inefficiency, as a well as an injustice to the owners.

The separation of ownership and control is frequently characterized as creating a principal-agent relationship where firm-owners are principals and managers are agents. Since this characterization defines the problem as managerial deviation from owners' interests, anything that serves to re-assert owner control of firms has been applauded.

Indeed, recent years have seen a re-emergence of owner activism. For example, the increased incidence of takeover bids and leveraged buy-outs is interpreted as disciplining managers to maximize shareholder value (Jensen 1988). In the late eighties, institutional investors took a more active role in the management of many firms, asserting the need to focus on bottom-line performance for the shareholders they represented. Outside directors staged a coup at General Motors in 1992, and implemented outside director John Smale as chairman of the board. This action served as a model that other outside directors were urged to follow (Lublin 1992). Executive compensation has evolved to provide top managers with increasingly huge stock options and cash bonuses linked to shareholder profits, that

presumably go far to align interests of managers with shareholders (Coughlan and Schmidt 1985). These recent developments are commonly interpreted as having created a new dedication to owners' profit maximization (Jensen 1989).

With very few exceptions, the commitment to profit-maximization has been applauded by academics as well as institutional investors. While differences of opinion exist regarding the best way to assert owners' interests, the goal of profit-maximization has been subject to only limited debate, at least within the economic paradigm.¹

However, a key result in economic theory provides the basis for questioning the re-assertion of shareholder dominance in American firms. The result comes from Holmstrom's effort to explain the separation of ownership and control (1982).

Holmstrom formally describes a team production system in which an efficient equilibrium can only occur when the revenues generated by the joint effort of individual team members are not exactly divided among those individuals. In other words, to induce efficiency, any product that exceeds the compensation of team members must go outside the team to a party who has no active role in the firm's management. For Holmstrom, the key contribution of outside-owners in modern firms is to *passively* accept the residual profits

generated by the team; allowing residual-owners to take any unobservable action that increases residual earnings is inconsistent with efficiency. We discuss Holmstrom's argument at greater length shortly but note here that, if Holmstrom is correct, the re-invigoration of shareholder activism may detract rather than enhance the ability of firms to arrive at efficient equilibria. That is, the entire firm, including owners, may be worse off when the principal-agency "problem" is "solved" by reining in managerial independence.

On examination of Holmstrom's argument, it is clear that profit-maximization is itself at odds with Pareto optimality. The reason that the owner of residual-profits must be kept out of active management is that profit-maximizing interventions necessarily generate inefficient outcomes for the firm as a whole. Separation of ownership and control can be understood as a credible commitment device that enhances the welfare of *all* stakeholders in a firm; shareholders themselves may be best served by institutions that guarantee their own powerlessness.

In this manner, we interpret Holmstrom's result as highlighting the role of credible commitments, as articulated by North (1981) and others, within the firm. North claims persuasively, on the basis of historical evidence, that there is a tension between the self-interest of rulers and efficiency for society. As Root (1989) has graphically stated, "tying the king's hands" is a prerequisite

for economic development. However, the literature provides no underlying theoretical rationale for the need to tie the king's hands--why should the self-interest of rulers necessarily be inconsistent with efficiency? There is no answer to this in the literature on credible commitment, other than historical observation.

Holmstrom demonstrates the necessity of conflict between the interests of residual owners and requirements for efficient equilibria to obtain in both the firm and the state. The need to credibly constrain the ability of owners to employ profit-maximizing strategies draws attention to constitutional issues in the firm, as well as in the state. As the autonomous power of managers is reined in, and as owners become more active in pursuit of their own interests, the need to address these constitutional issues becomes more, not less, pressing. "Tying the owner's hands" is, in fact, a pre-requisite for efficiency in the firm, contrary to the bulk of the literature on corporate governance.

In the present paper, we thus attempt to address a question that receives relatively little attention in the literature; what constrains owners from taking self-interested but efficiency-reducing actions? Holmstrom's characterization of the team production problem implies that, when inputs are unobservable, individuals cannot efficiently distribute the product of their

actions without the presence of an external agent (e.g., a firm-owner). In this setting, productive members of the firm have an incentive to “hire” an owner; doing so potentially increases the utility of each member. Interpreted in this light, employees are principals and owners are agents. The fundamental obstacle to efficiency-enhancing cooperation thus becomes the incentive for owners to play actions that are inconsistent with the objectives of other stakeholders. By focusing on owners as principals and other stakeholders as agents, the received literature tends to ignore this question.¹

In the present paper, we attempt to address this question as follows. First, we review how Holmstrom’s result formally highlights the necessity for a team to produce residual earnings (i.e., that portion of the team’s product that is not distributed among the team members) if it is to induce an efficient equilibrium. In doing so, we highlight the importance of understanding how organizational structures such as firms channel competition over residuals in an efficiency enhancing manner.² Second, we provide a formal justification

¹ Treatment of this question is not, however, entirely absent from the literature. For example, Radner (1987) contrasts profit-maximization and efficiency for a similar problem. Garvey and Gaston (1991) present empirical evidence that is consistent with relatively diffuse sets of owners (i.e., owners who are theoretically passive) being better able to maintain efficiency-enhancing implicit contracts such as deferred compensation agreements. Blair and Stout (1999) argue that formal legal institutions (i.e., corporate law) can enhance efficiency by credible constraining the rights and powers of owners over directors and thus strengthening the ability of owners to act as passive budget-breakers.

² Authors such as Chapman (1993) appear to recognize that competitive forces need not induce Pareto efficient outcomes. Eswaran and Kotwal (1984) formally characterize a team production system in which competitive forces *cannot* induce efficient outcomes.

for why delegation (i.e., separation of control from ownership) may enhance the ability of owners to sustain otherwise unenforceable but efficiency-enhancing contracts (e.g., deferred compensation schemes). Finally, we highlight the empirical relevance of these arguments by reviewing evidence from case studies as well as formal econometric examinations; this evidence is consistent with rational, self-interested firm-owners having an incentive to implement institutions that tie their own hands.

I. MORAL HAZARD IN TEAMS

It is undoubtedly true that moral hazard in teams can be done away with if budget-breaking can be credibly enforced.
(Eswaran and Kotwal 1984: 581)

Holmstrom wrote his article in response to the explanation of firms provided by Alchian and Demsetz (1972). Alchian and Demsetz were concerned with the actions of an interdependent team, which when operating efficiently can generate earnings that exceed the effort costs of the team members. The actions of the team members are individually costly, and therefore need to be induced by a system of incentives. The word "team" indicates that the actions of the agents are inter-dependent; the marginal productivity of each worker increases with the effort levels of **other** workers.

Alchian and Demsetz pointed out that the members of such a team are in a prisoners' dilemma: they all prefer the outcome in which everyone works, but individually each has an incentive to shirk, whether or not others are shirking. Alchian and Demsetz proposed that this prisoners' dilemma may be resolved by creating a supervisor whose job it is to monitor and reward effort by individuals. Giving the monitor an ownership right to the residual (the earnings net of the incentive payments to the team members) provides an incentive for the monitor to do his task well. Thus, for Alchian and Demsetz, an essential feature of the firm is that the manager (who monitors employees) and the owner (who accepts the residual profits after employees have been paid) are unified. It is the ownership of the residual profits that serves as the motivation for effective monitoring of employees. The firm, then, is best organized hierarchically, and at the top of the hierarchy is the owner, actively using the hierarchy as a means of controlling actions throughout the firm.

For Holmstrom, the problem is much the same, but the solution is entirely different. Holmstrom, like Alchian and Demsetz, assumes that teams generate revenues via the actions of a variety of employees. Interdependence of these actions, however, makes it difficult to determine the

actual contribution of any one team member.³ The individual effort levels are not observable, or at least not verifiable, and therefore cannot be contracted on. However, the overall revenue output is jointly observable and may be contracted on.

The immediate problem is how to divide the team's earnings exactly among its members. Again, the team consists of everyone whose efforts contribute to the earnings; if the team is organized hierarchically as a firm, the actions of management help determine the revenue, and managers are considered team members. We would like to divide the team's revenues so that the sum of individual allocations exactly equals the amount to be divided, with no deficit, and no unused surplus. Holmstrom calls this the **budget-balancing** requirement.

In addition, we should recognize that the rules for dividing the revenue constitute an incentive scheme for the employees; an individual will act in equilibrium in such a way that her marginal cost of effort equals her marginal return under the incentive scheme. For example, if a worker will receive exactly $1/3$ of the revenue generated, then in equilibrium, his marginal cost of effort will equal $1/3$ of his marginal productivity, given the effort levels of other

³ Holmstrom's result holds, however, even if there is no interaction between workers' inputs (i.e., even if the production technology is additively separable). "The free-rider problem is exclusively driven by informational externalities caused by the inability to identify individual contributions"(Holmstrom 1999, 78).

team members. A **Nash equilibrium** will be characterized as a situation in which each individual has equalized marginal cost and individual marginal return, given the actions of others. Anything else would imply irrationality by some member of the team.

Finally, we would like to have the ultimate outcome be **Pareto-optimal**. Pareto-optimality, of course, is a minimal definition of efficiency. It means that there is no other possible outcome, consisting of effort levels and distributions of revenue, that everyone would prefer to the one in question.

Holmstrom's result is simple and profound. It states simply that, to satisfy the budget-balancing condition, an incentive scheme must sacrifice efficiency or sustainability. To put it another way, every budget-balancing incentive scheme must have a Pareto sub-optimal Nash equilibrium.

This can be demonstrated by showing that the conditions of Nash equilibrium and Pareto optimality are inconsistent, as long as budget-balancing is required. Pareto optimality requires that team members take actions for which the marginal cost is less than the marginal return to the team. For example, if an employee can generate an extra \$100 of profit for the firm by taking an action that will cost him only \$75, it is an efficient action.

Pareto optimality, then, requires that marginal revenue equals marginal cost for each member of the team.

Nash equilibrium, however, assumes that each team member will equate marginal cost with marginal revenue **discounted** by the share of the marginal revenue that the team member receives herself. If an employee contemplates an action that will bring the team \$100 and cost himself only \$75, then he will not take the action if he is to receive less than 75% of that \$100. Pareto optimality requires that every team member gets 100% of the marginal product of his actions, which is mathematically impossible in an interdependent team, as long as budget-balancing is required.⁴

Holmstrom's Group Penalty Solution: The Owner as Sponge

Thus, there will inevitably be some incentive for shirking in a team as long as budget-balancing is required. Holmstrom feels that the two requirements of Nash equilibrium and Pareto optimality are paramount; each team member must feel that it is personally worthwhile to take actions that provide the team with \$100 of earnings, as long as the personal cost is

⁴ All Pareto improving actions will be played in equilibrium only if each team member receives 100% of the marginal product that his or her effort generates for the team. But, this is impossible if the sharing rule must be budget-balancing; the sum of each individual's share of total output must exceed total output if each individual is to receive the entire marginal product associated with his or her marginal effort. "The problem is that there are not enough margins to go around...each worker should receive 100% of his marginal product, but the budget offers only a total margin of 100% to be divided among the workers. The split of the total margin leads to a suboptimal choice of inputs" (Holmstrom 1999, 78). "It is worth emphasizing that the free-rider problem has nothing to do with externalities in the production function (as argued by Alchian and Demsetz)...the problem arises just as easily with an additive production function in which there are no interactions between the workers' inputs. The free-rider problem is exclusively driven by informational externalities caused by the inability to identify individual contributions" (Holmstrom 1999, 78).

less than \$100. But if Nash equilibrium and Pareto optimality are paramount, then budget-balancing must be sacrificed. Revenue from the team must leave the team.

In order to create a Nash equilibrium that is Pareto optimal, an incentive system must be designed that induces efficient behavior by the team members, but does *not* exactly distribute the earnings among the team members. The residual profits or losses, after fulfilling the incentive contracts to the productive team members, must be metaphorically thrown away. For Holmstrom, the thrown-away residual goes to the shareholders. As Holmstrom reports, schemes that eliminate shirking in teams:

require penalties that waste output or bonuses that exceed output. In both cases the principal is needed, either to enforce the penalties or to finance the bonuses. Thus, the principal's primary role is to break the budget-balancing constraint" (1982, 325).

Holmstrom provides an example of an incentive contract, called a group penalty contract, which satisfies the requirements of Pareto optimality and Nash equilibrium, while breaking the budget-balancing constraint. The efficient level of earnings for the team as a whole is observable; the group penalty contract states that every team member will receive a payoff equal to or greater than his opportunity costs as long as the efficient level of earnings is observed. If the efficient level of output is not achieved, then no one is

paid anything. The cooperative Nash equilibrium under this scheme is Pareto optimal. Since the efficient level of earnings can only be achieved if every individual works at a given level of effort consistent with the outcome, then no team member will have an incentive to be the first to shirk.

The group punishment scheme is not the only possible incentive scheme that will result in an efficient Nash equilibrium. In fact, there is a family of such schemes, in which each active team member gets at least his opportunity cost, and the sum of the payments is less than or equal to the revenue generated by the team. In the incentive scheme that Holmstrom proposes, the sum of the payments exactly equals the revenue generated in equilibrium, so that the owner gets nothing if none of the team members shirk. If at least one team member shirks, then no team member is paid, and the "owner" gets the entire surplus. Every possible such scheme will have a passive owner whose job is to absorb any residual generated by the team. As Holmstrom correctly observes, "My point is therefore not that group punishments are the only effective scheme, but rather that budget breaking is the essential instrument in neutralizing externalities from joint production" (Ibid, 328).

Holmstrom argues that this problem illustrates deficiencies in partnerships:

The reason capitalistic firms enjoy an advantage over partnerships in controlling incentives is that they can (and will) **independently of the level of internal monitoring** employ schemes that are infeasible in closed (budget-balancing) organizations. There is little to suggest that either of the two forms of organization would stand at a comparative advantage when it comes to monitoring alone. (1982:328)

In other words, the true advantage of the modern firm is that, by separating ownership from control, it violates the budget-balancing constraint.

Holmstrom is emphatic that the advantage of separating ownership and control has nothing to do with active monitoring. Indeed, the case is stronger than that. It is not the case that the residual owners **need** not monitor the members of the firm, they **cannot** engage in active monitoring if in doing so they contribute unobservable inputs to the team production process.

The Necessary Passivity of the Residual Owner

Holmstrom writes, "Note that it is important that the principal not provide any (unobservable) productive inputs" (1982:328). The reason for this is that the principal as residual-owner must necessarily have incentives that are contrary to efficiency—a moral hazard problem. This can be demonstrated by a reapplication of Holmstrom's theorem.

Under the group penalty scheme, none of the N team members has an incentive to shirk. However, the N team members plus the owner

constitute a closed, budget-balancing system of $N+1$ actors (Eswaran and Kotwal 1984, 581). But Holmstrom's impossibility result says that in any budget-balanced equilibrium, some actor must have an incentive to behave inefficiently. Consequently, one of the $N+1$ actors must have an incentive to shirk; since by construction it is not the original N team members, then it must be the owner. Under any incentive scheme that motivates efficient actions on the part of the employees of the firm, the owner necessarily has an incentive to create inefficiency, in order to increase profits. Separation of ownership and control is essential precisely because the residual-absorbing owner necessarily has incentives to undermine efficiency. In effect, the passive owner is created to bear the moral hazard for the entire team, and the owner's moral hazard must be constrained in order to be serve its purpose effectively. In this manner, Holmstrom's formalization of the team production problem highlights the necessity of constraining owners from playing morally hazardous actions.

If the owner can take any unobservable actions which impact the output of the firm, budget-balancing will once again be satisfied, and as a result, the Nash equilibrium must be inefficient. Put bluntly, given anything to do, the owner's interest in the residual profit guides the owner inevitably to the inefficient alternative. Thus, Holmstrom's group punishment incentive

scheme is efficient, as he proposes, only as long as the owner is kept passive. It works only by depriving one actor (the owner) of the power to act on her incentives. So Holmstrom argues, contrary to Alchian and Demsetz, for a passive owner. The owner may not manage individual behavior.

The Efficient Group Penalty Scheme Does not Maximize Residual Profits

But if the owner does not monitor the manager, what does the owner do? Holmstrom says, "The primary role of the principal is to administer incentive schemes that police agents in a credible way rather than to monitor agents as in Alchian and Demsetz's story. (1982:328)." But even this may be allowing the owner too large a role. Can the owner "administer incentive schemes" efficiently?

In fact, the owner cannot even be allowed to choose incentive schemes, because given a choice, she will subvert Holmstrom's efficient group penalty incentive scheme in favor of another which generates more earnings, but inefficient outcomes. This is revealed in a brilliant commentary on Holmstrom by Eswaran and Kotwal (1984).

Eswaran and Kotwal suppose that Holmstrom's efficient incentive system is imposed on the team, and show that the owner must have an incentive to alter incentives. Remember that in the group penalty plan

proposed by Holmstrom, the owner can expect to get nothing, because in equilibrium team members do not shirk, and everyone is paid their share of the revenues. However, the owner will not have to pay any wages if just one team member shirks slightly, keeping the team as a whole from meeting its goal. A bribe to one team member would result in a slightly smaller level of team revenue, but a much smaller set of wages to subtract from the earnings.

The bribe offered by an owner constitutes a different incentive scheme, preferred by the owner, but inefficient. And Eswaran and Kotwal show that it must be ever thus. The incentive scheme that maximizes the profit residual for the owner cannot be one that is Pareto optimal for the firm. The owner will always prefer an incentive scheme that sacrifices Pareto optimality for a larger profit residual. Therefore, the owner cannot be trusted to create incentives for the firm.

This graphically illustrates the tension between Pareto optimality and profit-maximization. While it undermines the credibility of Holmstrom's proposed incentive scheme, it also illustrates why shareholders must be passive.

Nor can a subset of employees, whom we can designate as the management, act in the interests of the owners. If the manager acts in the interests of the shareholders, then she will just take those actions which the

shareholders would take if they were managing the firm--and those actions are inconsistent with efficiency.

For Holmstrom, then, managers and other employees operate under an efficient but budget-breaking incentive scheme, and shareholders are kept in a state of passivity. The problems that Berle and Means point out--the collective action problems in representing shareholders, the inability to wage proxy fights, the dependence of the board on managers—are in fact actual advantages in light of Holmstrom's result. Separation of ownership and control is a necessary condition for efficiency.

Who Will Watch the Watcher?

The conflict between the residual-owners' interests and those of employees can even undermine the efficiency of Holmstrom's group-penalty scheme. Eswaran and Kotwal point out that the employees must be aware that none of them will be paid if the owners bribe any one of the employees to shirk. Anticipating that this will happen, none of the employees have any incentive to work themselves. As long as the incentives of the owner are common-knowledge, the Nash equilibrium under any version of Holmstrom's group incentive scheme is zero effort and zero output. As long as the incentive scheme is "enforced by a self-interested principal [owner]," even budget-breaking is insufficient to generate efficient effort (Eswaran and

Kotwal 1984:580).

Thus, the residual-owner cannot be allowed to administer the incentive scheme within the firm, because someone would have to monitor her to make sure she did not give in to moral hazard, and subvert the efficient incentive scheme in the interest of greater residual profits. Again, when the external residual-owner has the opportunity to bribe, then the original N team members plus the owner constitute a closed (budget-balanced) system that cannot reconcile Nash equilibrium and Pareto optimality. As Eswaran and Kotwal point out,

a $(n+2)^{\text{nd}}$ individual will be required to break the budget constraint of the $n+1$ individuals, and so on. The crucial necessity of monitoring the monitor is thus not met in the budget-breaking scheme. If the monitor is a rational, self-seeking individual or entity, the problem of moral hazard takes a different form but remains unsolved. (1984:581).

It is clear that employees must have some assurance or trust that they will not be cheated. If they are not assured that the owner-as-sponge is credibly constrained from bribing one of their co-workers, then they will have to worry that their wage will be denied them as a result of the bribe.

In game-theoretic terms, not only must the owner-as-sponge be constrained from managing the firm, it must be **common knowledge** that the owner is so constrained. Otherwise, Holmstrom's scheme will not motivate

efficient levels of effort by employees. In fact, lacking that common knowledge, there is no reason for employees to accept Holmstrom's scheme, when offered.

Is there any way that owners, freed from the passivity of managerial capitalism, can credibly commit themselves to actions that enhance the efficiency of the firm? Is there any reason for them to do so?

II. PROFIT-MAXIMIZATION VS. EFFICIENCY

While the problem as articulated by Holmstrom may seem abstract, the implications of the argument may be seen working themselves out in the management of real firms. In these cases, the profit-maximizing incentive may be seen to work against the efficiency of the firm in several ways. Some of the most successful firms are precisely those whose employees believe that owners will not opportunistically violate implicit commitments.

Empirical Manifestations of Owner Moral Hazard

Can the manifestations of owner moral hazard be seen in the operation of the firm? One clear example is the piece-rate incentive system, instituted in the theory that piece-rates motivate high levels of effort by employees. However, in most piece-rate firms, abnormally high take-home wages are an occasion for owners to cut piece-rates in an attempt to reclaim

excess wages as profits. Employees are fully aware of this, and counsel each other against maximal effort under a beneficial piece-rate, for fear of this downward adjustment (Whyte 1955). The piece-rate is, in other words, an occasion for gaming over earnings that typically results in severe limitations on efficiency. The insight that gaming over distribution necessarily impairs efficiency is the true underlying message of Holmstrom's theorem.

Furthermore, at most piece-rate plants, hard work and productivity increases will normally result in built-up inventories and layoffs. A rational concern about layoffs therefore further limits the productivity of employees. Technical suggestions from employees that could increase productivity are thus not encouraged. Employees regard both a downward adjustment in piece-rates, and layoffs during recessions, as opportunistic profit-seeking by owners. They respond accordingly in ways that limit productivity.

Profit-maximization vs. Efficiency in Deferred Compensation

Given the limited effectiveness of piece-rates in most firms, how are employees compensated? A much studied manifestation of the implicit contract is the deferred compensation scheme. Labor economists (e.g., Lazear 1979) have noticed that labor contracts do not seem to offer employees a wage that is equivalent to their individual marginal products. Rather, employees evidently are paid less than their marginal products early

in their careers. Later in their careers, their compensation increases more sharply than would seem to be attributable to increased productivity alone.

The standard interpretation of this is that employees are in effect bonding themselves as diligent workers by accepting the low wage early in their careers, for a long enough time that their true effort can be discerned by the firm. The firm then rewards them with sharp increases later in their careers. This has efficiency benefits as regards both adverse selection and the moral hazard of shirking within large teams. Both as an initial hire, and as a member of working groups throughout his career, it may be difficult or impossible to tell whether an individual is shirking or not. But over an entire career, the probability of discerning that individual's true commitment to the firm is much easier, and can be rewarded at the end.

The point, of course, is that this pattern of deferred compensation has the potential to significantly improve efficiency: productive types of employees select themselves into firms in anticipation of receiving appropriate rewards once their types are verified.⁵ Shleifer and Summers (1988) argue that many employees and suppliers make efficiency-enhancing transaction-specific investments only because they expect an entrenched

⁵ In this sense, deferred compensation schemes mitigate the consequences of adverse selection in the labor market. The schemes initially pay employees below their opportunity cost and, after verifying that employees are productive types, pay them above their opportunity cost. Unproductive types never receive their opportunity cost and thus have no

management team to persist in a relationship long enough to reward those investments.

Of course, this solution offers a temptation to the firm; let employees work at low wages early in their careers, and then fire them, or simply refuse to pay the career-ending bonuses. Consequently, employees must be willing to trust the firm not to renege on an implicit contract--one that is not enforceable in courts.

What kinds of firms are employees willing to trust in this way? Since profit-maximization is exactly the incentive that could lead the firm to renege, the firm that is dominated by shareholder interests is the firm that would be least trustworthy, and therefore least likely to receive the efficiency benefits of the deferred compensation scheme.

And this is precisely the result that Garvey and Gaston (1991) found in their empirical analysis of Australian firms. Those firms characterized by ownership concentration and incentive pay for the CEO are the ones in which owners' interests are most emphatically served. But these are also the firms which are least characterized by deferred compensation. As Garvey and Gaston (1991:105) write, "managers who are not `forced' to serve shareholder interests are in fact inclined to fulfill implicit contracts." In Garvey and Gaston's interpretation of their data, firms that are committed to serving

shareholder interests are not able to offer a credible deferred compensation scheme. Employees are rationally suspicious of a firm's commitment to profit-maximization, and the efficiency benefits of deferred compensation are not attempted.

Of course, subsequent years have demonstrated the rationality of this employee suspicion. A good many firms that historically relied on schemes of deferred compensation, such as General Electric and AT&T, have been forced to renege on those implicit contracts by wage cutbacks and layoffs of employees who fully expected to reap the rewards of their efforts at the end of their careers.

Incentives and Downsizing

As a result of more independent boards, more active shareholders, and a more efficient market, managers are disciplined as never before to act in the interests of shareholders. As one of the leading executive compensation consultants recently observed, "Almost every executive-compensation package is oriented toward maximizing the shareholders' position" (Baker 1995). Managers, as a result, have been much more aggressive about costs than they were during the period of corporate welfare.

The predictable result is downsizing. The figures are by now familiar: Sears Roebuck CEO Edward Brennan laid off 50,000 employees in the

period from 1991 to 1994, and received compensation of over \$3 million for 1993 alone. Robert Allen at AT&T laid off 83,500 employees in the same time, and received compensation in 1993 of \$2.5 million. John Reed's CITICORP laid off 13,000 employees and received \$4.15 million for that year (Baker 1995). In 1993, corporate job cutbacks in American firms totaled more than 615,000 (Chilton 1994: 7).

Has downsizing had the effects it was intended to have? Downsizing should have had a clear positive effect on productivity ratios, by decreasing the denominator. However, a survey of 531 large companies found that only 34% had experienced a productivity increase in a two-year period following downsizing (Chilton 1994: 9). The American Management Association said that 43% of a sample of about one thousand firms had downsized in two or more years between 1987 and 1992. Most of these reported a drop in morale, no increase in efficiency, and half saw no improvements in profits, as well (Chilton 1994:10).

Overall, by 1996 there was increasing doubt that the downsizing of 1993 and 1994 had had the unambiguously beneficial effects expected. Revised Commerce Department figures that GDP based on a chain-weighted calculation showed that output per worker was about 1.4%, instead of the 2.2% previously reported. These figures indicated that "economic growth in

1993 and 1994 was considerably slower than previously reported, casting grave doubt on the view that the wrenching process of corporate downsizing has been paying off in big gains in efficiency" (Passell 1996, 17).

There are of course, many reasons why downsizing could produce a disproportionate decrease in output. As management consultant Rick Maurer observes, "Cost-cutting has become the holy grail of corporate management. But what helps the financial statement up front can end up hurting it down the road" (Markels and Murray, 1996: A1).

Downsizing poses a danger not because of the decreased size of the workforce, but to the incentive effects on the employees left behind. It is a truism in modern technology that every firm requires its employees to take actions that cannot be coerced--quality-improving suggestions, transaction-cost decreasing cooperation with other employees, customer-pleasing friendliness. These actions, by their very nature, cannot be induced by any formal incentive system. The danger of downsizing, then, is simply that efficiency-enhancing implicit contracts will be called off by employees who recognize that fulfilling such commitments is a time inconsistent strategy for profit-maximizing owners. This is exactly the kind of tension between profit and Pareto optimality that Holmstrom's theorem alerts us to.

III. CREDIBLE COMMITMENT: THE ADVANTAGE OF DELEGATION

. . . it is **not** necessarily true that maximum profits are earned by firms whose objective is profit-maximisation.
(Vickers 1985:138)

While manifestations of owners' moral hazard are apparent in the governance of American corporations, there exist ways in which owners' moral hazard can be mitigated. These are, of course, mechanisms of credible commitment. As long as the owner can convince other stakeholders that profit-maximization is constrained, then they can trust the firm to make long-term commitments that are essential for the firm's efficiency.

Delegation

The analysis of credible commitment was initiated by Schelling (1960, 29). While the book he was writing at the time addressed international conflict, much of what he had to say about credible commitment is relevant for corporate governance as well. Schelling noted that commitments can be made more credible by delegating decision authority to someone whose interests are known to be different than one's own.

Notice that delegation to a manager only serves as a commitment device to solve the trust-honor problem if the manager's compensation is not strongly tied to profits. The manager creates trust only by being divorced

from the profit-maximizing motives of the owner. Conversely, a decision by an owner to revoke the delegated authority of a non-profit-maximizing manager must be interpreted by the employee as a clear indication of an intention to "violate trust".

The Advantages of Managerial Delegation in Interdependent Markets

Vickers (1985) points out that the same problem of credible commitment can explain why the long-run interests of residual owners is best served by limiting their own authority.

If control of my decisions is in the hands of an agent whose preferences are different from my own, I may nevertheless prefer the results to those that would come about if I took my own decisions. This has some interesting implications for the theory of the firm. For example, in markets where firms are interdependent, it is **not** necessarily true that maximum profits are earned by firms whose objective is profit-maximisation. (1985:138)

While Vickers makes a general argument, his most extended example is of the classic Cournot problem. In this game, if one producer can credibly commit himself to a production level before the other producers, he can earn excess profits. This requires a credible commitment, because after the other producers have revealed their production levels, he would prefer to adjust his own production level. This adjustment, however, would cause another round

of adjustments which would finally result in the Cournot equilibrium. The only way the Stackelberg profits can be maintained is by credibly committing to a level of output that is higher than the Cournot equilibrium. Vickers shows that this credible commitment can be made by delegating the production decision to a manager who is paid as a function of sales as well as profits. By inducing the correct sensitivity to sales in the agent, the outcome of the game will give the non-profit-maximizing firm an extraordinary profit bonus.

This shows rather vividly the extent to which non-profit-maximisers can surpass profit-maximisers in terms of profits. Indeed, here the non-profit-maximiser earns greater profits than those of his rivals added together, no matter how many rivals there are. (Vickers 1985, 142)

This advantage, of course, can be mimicked by other profit-maximising firms, who have the option of creating managers who are similarly insensitive to profits. He shows that owners must play a game with each other in setting the payoff functions for their agents. Furthermore, he shows that, in the Nash equilibrium of this payoff-setting game, **each** profit-maximizing owner will make her agent responsive to sales and profits, rather than to profits alone. Thus, a status quo of profit-maximizing owners is unstable; they will race to an equilibrium in which each owner has delegated decision-making to an imperfect, sales-sensitive agent.

Fershtman and Judd (1987) make a similar argument as regards the

chain store paradox. Because the threat to engage in predatory pricing is not credible for a weak firm, it will not deter entry. However, rewarding managers based on market share rather than profits is a way of committing the firm to an incredible threat. Once again, aligning managerial interests with those of profit-maximizing owners is a mistake for the firm--and ultimately, for the owners themselves.

Nor are the Cournot or the chain store example special cases. As Vickers shows, hiring an agent is equivalent to revealing your preferences. Additionally, hiring an agent with identical preferences to your own is equivalent to revealing your preferences accurately. But the literature on incentive compatibility has demonstrated that, in general, actors have an incentive to reveal preferences accurately only under highly restrictive conditions (Gibbard 1973; Satterthwaite 1975). Consequently, in interactive markets, there must always be reasons for firms to rely on managers who do not act as perfect agents for owners.

Delegation of Contracting Relationships

Clearly, the point that Vickers makes with regard to the advantages of delegation to managers is most clearly illustrated by contractual relations with employees, sub-contractors and other key stakeholders. Suppose the owner openly and completely delegates managerial decisions to a manager, whose

compensation is independent of residual profit. Clearly, such a delegation would greatly increase the willingness of employees, suppliers, and other stakeholders to trust pledges to reward long-term investments in firm-specific capital and other forms of loyalty to the firm.

It is no coincidence that the era of high employee loyalty in such firms as General Electric and Kodak was also associated with managerial, rather than shareholder, dominance in the governance of the firm. In the era before downsizing, employees were willing to make enormous commitments in firm-specific human capital in the confidence that the implicit contracts would be honored by managers who felt little pressure from owners to maximize profits.⁶

Shleifer and Summers (1988) point out, however, that the proliferation of hostile takeovers may have constituted a “breach of trust”, in which shareholders reneged on implicit contracts, and redistributed wealth that would have gone to other stakeholders. But Shleifer and Summers also point out that, despite the dominant incentive for owners to engage in wealth-transferring takeovers, owners would themselves be better off if they could commit to honoring long-term implicit contracts that enhance firm-efficiency;

⁶ Garvey and Gaston (1991) find evidence that is consistent with higher levels of deferred compensation being paid in firms whose ownership is relatively diffuse (i.e., their evidence is consistent with diffuse sets of owners being relatively capable of credibly committing against playing opportunistic actions).

“the corporation must be trusted to deliver on the implicit contracts even without enforcement by courts. To the extent that long-term contracts reduce costs, such trustworthiness is a valuable asset of the corporation.” (1988; 37)

The fact that profit-maximization is known to encourage efficiency-destroying actions is the basis for the advantage of delegation. Indeed, as is the case in every credible commitment problem, the owner of the firm is *better off* by delegating these key contracting relationships to a manager and to make it common knowledge that the manager is not swayed by the owner’s dominant strategy to maximize profits. The point of this paper is that the entrenchment of managers who are *not* committed to profit-maximization is rationalizable in light of Holmstrom’s theorem.

IV. TYING THE OWNERS’ HANDS: ENTRENCHING MANAGERS

To dispel the fear of breach on the part of stakeholders, shareholders find it value maximizing to seek out or train individuals who are capable of commitment to stakeholders, elevate them to management, and entrench them.
Shleifer and Summers, 1988, p. 40.

Having established that delegation of contractual relationships is an effective means of tying the owners’ hands, the credible commitment of the owners is only as iron-clad as that delegation. What is to keep owners from withdrawing their delegation at any time that they feel they would like to “cash

out” by reneging on long-term implicit contracts?

Shareholder Fragmentation

An effective form of credible commitment appears to be one that characterized the American firm for most the of the twentieth century—shareholder fragmentation. As long as the shareholders were numbered in the tens and hundreds of thousands, with no individual shareholder owning even as much as 1% of the total value of the firm, then the cost of collective action served as a visible and tangible impediment to the kind of reneging described by Shleifer and Summers.

In fact, we may use the Holmstrom theorem itself to formalize this concept. Let us think of the group of shareholders as a “team”, whose actions can result in increased monitoring of the firm, increased diversion of revenues away from employee wages and managerial perquisites, and increased extraction of firm revenues in the form of profits. We may think of the firm as a resource which generates profits that are distributed among the shareholders. Of course, the profits extracted from the firm are distributed *exactly* among the shareholders. Consequently, the shareholders can be thought of as a “team” that “produces” profits; the distribution of profits among this team is “budget-balancing”—profits (by definition) go to no one other than shareholders. But because it is budget-balancing, we know that the

shareholders will not be able to extract profits efficiently in Nash equilibrium—they will free-ride on each others' monitoring and oversight activities.

The net result, then, is that the fragmentation of ownership creates a system in which shareholders cannot efficiently pursue their objective of maximizing the residual profit that can be extracted from the firm. This inefficiency of the owners to act in their own interests is itself a form of credible commitment—restraining the very force that is inconsistent with efficiency for the firm as a whole.

Contractual Supports for Managerial Delegation

As ownership becomes increasingly concentrated in retirement funds or other concentrations of capital, the credibility of shareholder fragmentation as a constraint on owner interests diminishes. But, if the analysis in this paper is correct, then a concentrated set of owners has an incentive to implement credibility-enhancing mechanisms that substitute for shareholder fragmentation.

It is interesting to evaluate the empirical relevance of this hypothesis regarding the contractual relationship between owners and managers. Falaschetti (1999) has examined the incidence of golden parachute agreements. If golden parachutes were to be a manifestation of

destructive managerial insulation, then presumably they would disappear in firms in which owners are sufficiently concentrated and powerful to eliminate them. They would be in existence only in firms in which shareholders are so fragmented that they can do nothing to prevent managers from forcing them on the firm.

What Falaschetti finds, however, is just the opposite. Firms tend to maintain golden parachutes precisely when owners are theoretically most capable of efficiently producing monitoring services; i.e., when ownership is concentrated and thus forces associated with the team production problem are relatively weak (Falaschetti 1999). If concentrated sets of owners are relatively efficient monitors, why is the incidence of golden parachute agreements positively associated with shareholder concentration?

The arguments we make in the present paper can rationalize this pattern. If forces associated with the team production problem diminish as groups become more concentrated, then the efficiency with which external agents can produce either opportunistic rents (or monitoring services) increases with ownership concentration. Because concentrated sets of owners pose a relatively large threat to playing opportunistic but efficiency-reducing actions, they face greater selection-pressures to

implement institutions that insulate other stakeholders from the consequences of those actions. The empirical distribution of golden parachute provisions is thus consistent with an incentive for concentrated sets of owners to implement efficiency-enhancing, hand-tying mechanisms.

Corporate Law

Yet another source of credible constraint on owners is corporate law. While corporate law has often been interpreted as guaranteeing shareholder rights, new research indicates that it keeps owners relatively passive. The present paper provides an efficiency-based explanation for constraints on shareholder initiative: shareholder initiatives would be a radical break in the separation of ownership and control that Holmstrom argues is essential for efficiency.

Other features of corporate law, documented by Blair and Stout (1997), also serve to tie the owners' hands. Corporate directors "are not subject to direct control or supervision of anyone, including the firm's shareholders. This rule of directorial discretion, which is a fundamental principle of U.S. corporate law, cannot be explained away as a legal response to the practical difficulties associated with shareholder voting" (Blair and Stout 1997, 20). Shareholders may under restricted circumstances step

in for the directors and sue on behalf of the firm, but "shareholders can only bring a successful derivative claim against directors in circumstances where bringing such claim benefits not only shareholders, but other stakeholders in the coalition as well" (Ibid p. 23, emphasis in the original). Through the business judgment rule and other features of corporate law, say Blair and Stout, "modern corporate law does not adhere to the norm of shareholder primacy. To the contrary, case law interpreting the business judgement rule explicitly authorizes directors to sacrifice shareholders' interests for other constituencies" (Ibid, 27).

The directors of Delta exemplify the importance that directors may place on insulating stakeholders from efficiency-reducing opportunistic action. Delta had been known for its largely union-free "family-style" culture and high customer satisfaction. Ronald Allen had been Chairman of Delta Airline since 1987. Since 1994, he had sharply reduced operating costs, in part by slashing 12,000 jobs from a work force of 69,000. He accepted lowered employee morale with the oft-quoted phrase, "So be it." After years of heavy losses in the early part of the decade, Delta had eight consecutive quarters of record profits (Brannigan and White, 1997, A1).

While profits increased, so did customer baggage complaints, while on-time performance and customer service satisfaction plummeted.

Employee morale was low, and unionization efforts greatly increased. Directors felt that these costs were too high a price to pay for the short-term gain in profits, and felt that Allen's combative style had become a liability. Instead of rewarding Allen, Delta's board fired him in May of 1997. The directors announced that they intended to look for a new CEO who would place "a high value on Delta's culture of respect, unity and deep regard for our heritage. They intend to select a person as our next leader who will work well within this culture we all value so highly" (Ibid). Corporate law insulates the directors who choose to sacrifice short-term profits at the cost of alienating other stakeholders vital to the long-run success of the firm.

Internal Constitutional Features

Besides corporate law, internal constitutional features may be constrain shareholder interests. In many high-commitment firms, like Lincoln Electric, employees are given a voice on major decision-making boards within the firm. This kind of representation serves the equally important purpose of being a source of reliable information from the managers to the employees, who can more easily believe information when it is provided by their own peers.

Some high-commitment firms place a good deal of emphasis on internal promotion. This policy has a down-side--it creates an insular,

parochial attitude which may be detrimental to innovation. On the other hand, it guarantees that managers, themselves recruited from the ranks of employees, share a commitment to traditional implicit contracts. It minimizes the kind of uncertainty that can disrupt long-run efficient patterns of behavior.

Employee stock ownership plans serve as a radical blurring of the lines in a firm's constitutional arrangement. When employees own part of the firm, then it should be easier for them to feel that their long-term investments in the firm will be protected. Employees own 11% of Southwest Airlines, for example (Welles 1992,46).⁷

Further, long-term arrangements like Lincoln Electric's "no layoffs" policy may be thought of as part of the firm's constitution. Of course, the constitutional "bill of rights" is only as secure as the parties that strike the deal; for that reason, employees in firms such as these may benefit from corporate governance reforms that insulate managers from takeovers. And, as Shleifer and Summers point out, shareholders themselves may benefit from the credible containment of their own authority in the firm (1988:40).

Taken together, the ideal corporate constitution would create a separation of powers in which owners and employees may keep managers

⁷ If employee ownership enhances efficiency, it probably doesn't do so because employees expect to receive a larger share of the product associated with their efforts. Rather, given the arguments made in the present paper, employee-ownership can enhance efficiency because it potentially lowers the cost to employees of opportunistic

from willful self-dealing, in which owners and managers could be protected from employee extortion or shirking, and in which managers and employees could be assured that opportunism by owners would not keep them from realizing a reasonable return on their firm-specific investments. We have no theorem that demonstrates beneficial effects of separation of powers, either in the state or in the firm. What we do know, however, are the advantages outlined by Madison in The Federalist #10 two centuries ago: that a separation of powers keeps any one coalition of powers from taking unilateral actions that can do harm to others. This capacity for mutual blocking gives economic actors the security to take risky investments with some assurance that their returns will not be expropriated.

More positively, by blocking unilateral action, a separation of powers forces multi-lateral negotiation. The goal of multi-lateral negotiations is to achieve Pareto optimal moves that move the firm to the efficiency frontier. While negotiation success is not guaranteed, surely there is survival advantage to successful negotiations. This fosters the view that, in the long run, the essential negotiating skill for top management is brokering cooperative agreements, rather than imposing redistributions of rents from other stakeholders to shareholders.

V. CONCLUSION

The benefits derived from more active disciplining of managers have been adequately documented elsewhere. Shareholder wealth has been increased, often greatly increased in the case of individual leveraged buy-outs, indicating that the extent of managerial misuse or underuse of assets must have been considerable. By putting free cash in the hands of shareholders, it allows investment decisions to be made by the capital market as a whole, rather than individual firms' managers. The active owner has demonstrated a real capacity to root out managerial perquisites and other forms of waste in the interests of greater profits. The minimization of managerial opportunism by more vigilant owners cannot be criticized.

At the same time, Holmstrom's impossibility result has supplied an alternative vision of opportunism--opportunism on the part of owners themselves. An interdependent technology requires cooperation by a variety of stakeholders--cooperation that is inhibited by the unilateral commitment of the firm to shareholder profits. Maximization of share-holder influence is inadequate as a guide to the constitutional development of the firm.

To be efficient, firms should and sometimes do devise constitutional checks and balances that constrain, rather than unleash, shareholder profit-maximization as a motive for the firm. Delegation to managers with a

reputation for trustworthiness, and charged with the negotiation of efficient long-term contracts with vital stakeholders, is one such commitment device. As Vickers shows, this delegation is essential for firm strategy in any interdependent market. It is also essential for the development of the long-term human capital that is vital to the success of most firms.

The primary significance of the Holmstrom argument is its insight into the fundamentally political nature of social groupings, including firms. Given an interactive team of individuals producing value, imagine that the Holmstrom result did not apply. Then a budget-balancing scheme satisfying Nash equilibrium and Pareto optimality could be implemented, ending conflicts between self-interest and group well-being forever. Under this ideal scheme, individuals would consult their self-interest and act in socially responsible ways. There would be no need to construct hierarchies, to create and delegate authority, or to hold people responsible for their actions. Constitutions would be irrelevant, and so would politics.

But Holmstrom's impossibility result holds, and because it does, we know that there is no neat, mechanical solution to collective action. Construct a sharing mechanism as you will, and you may only relocate the incentives for inefficient action. There is an inevitable tension between social efficiency and the distribution of the surplus of social effort. The distribution of that

surplus inevitably raises the central constitutional questions that Holmstrom hoped to bypass by means of his joint forcing contract: who will monitor the distribution of the surplus, and who will monitor the monitors? In the long-run, the most effective firms will, like the most effective states, address the issue of opportunism by means of constitutional commitment, to ensure the trust of those agents whose long-term investments are essential for success.

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