ELSEVIER

Journal of Corporate Finance 8 (2002) 159–178

Journal of CORPORATE FINANCE

www.elsevier.com/locate/econbase

Golden parachutes: credible commitments or evidence of shirking?

Dino Falaschetti *

School of Public Health, University of California, Berkeley, CA 94720-7360, USA

Accepted 22 June 2001

Abstract

External agents are frequently characterized as necessary for efficiency in team production settings. At the same time, these agents must be constrained from opportunistically exercising their enforcement capabilities. I argue that collective action costs and formal institutions (e.g., golden parachute agreements) can act as substitute factors in producing this constraint. The incidence of golden parachutes in a sample of S&P 500 firms is consistent with this conjecture: golden parachutes are more likely in firms with concentrated ownership. Interpreted in this light, golden parachutes enhance efficiency by increasing the credibility with which owners can commit against opportunism.

JEL classification: D23; L14; L23
Keywords: Credible commitment; Ownership structure

1. Introduction

The relationship between a firm's owners and managers is frequently characterized as one in which owners are principals and managers are agents. Given this characterization, the literature tends to focus on mechanisms that constrain *managers* from playing self-interested actions that are inconsistent with firm-efficiency. However, this specification of the principal–agent problem discourages analysis of a fundamental obstacle to efficient

* On leave 2001–2003 from the Department of Economics, University of Tennessee, Knoxville, TN 37996-0550, USA.
E-mail address: dino@gsb.uchicago.edu (D. Falaschetti).

0929-1199/02/$ - see front matter
PII: S0929-1199(01)00032-3

outcomes in firms; namely, the dominant strategy for *owners* to expropriate the product of their employees. Confronted with this strategy, managers rationally refrain from contributing individually costly inputs to team production processes. The resulting Pareto inferior outcome will endure if owners cannot credibly commit against acting opportunistically.

How might owners produce such a commitment? In the present paper, I argue that the costs owners face to act collectively and formal institutions such as golden parachute agreements can act as substitute factors in producing credible commitments.[1] I begin the argument in Section 2 by reviewing seminal contributions to the literature on how firms address moral hazard in teams. These contributions establish that external agents are necessary to mitigate moral hazard, but do not address how firms check these agents' dominant strategy to act opportunistically. Without this check, rational team members will curb their efforts and team production systems will settle on inefficient equilibria.

Also in Section 2, I argue that collective action costs and formal institutions can check the incentive for owners to employ dominant but efficiency-retarding strategies. In short, if forces associated with the team production problem (e.g., the incentive to free ride) intensify as teams become more diffuse, and if owners must solve this problem to produce opportunistic rents, then diffusion of ownership can credibly constrain owners from expropriating their team's product.

Interpreted in this light, firms with relatively concentrated sets of owners face a strong incentive to implement substitute constraints. These constraints may take the form of 'hand-tying' institutions that increase the cost of employing opportunistic strategies (e.g., golden parachute agreements). Concentrated ownerships that do not adopt such institutions may be at a competitive disadvantage when addressing the team production problem.

To test the empirical relevance of this argument, I examine how the potential for owner-opportunism relates to the incidence of a formal hand-tying institution. I begin this examination in Section 3 by reviewing arguments (i.e., Knoeber, 1986; Shleifer and Summers, 1988) that accepting a hostile takeover bid may reflect owner-opportunism. Given the arguments from Section 2, the threat of such behavior is, ceteris paribus, theoretically small in firms with relatively diffuse ownership. Hence, the marginal benefit of maintaining an associated hand-tying institution (e.g., a golden parachute agreement) is also relatively small. On the other hand, the marginal benefit of maintaining such an institution can be significant when ownership is concentrated.

Hence, if accepting a hostile-takeover bid represents an opportunistic action, and if golden parachutes act as hand-tying institutions, then *golden parachutes should be observed more frequently in firms with relatively concentrated ownership*. In this light,

[1] Under a golden parachute agreement, executive managers receive lump sum distributions (frequently, three year's salary) plus other benefits (e.g., insurance) if the firm's ownership experiences a change in control.

golden parachutes promote efficiency by enhancing the credibility with which owners can commit against playing opportunistic actions.

This implication opposes predictions from received principal–agent models of the firm. Interpreted within these models, golden parachutes are management perquisites and should thus be observed more frequently as the ability of owners to produce monitoring services decreases. If owners must solve a team production problem to produce such services, and if forces associated with this problem intensify as teams become diffuse, then received principal–agent models imply that *golden parachutes should be observed more frequently in firms with relatively diffuse ownership*.

In Section 4, I present evidence that is consistent with collective action costs and formal institutions acting as substitute factors in checking owner-opportunism. In particular, I show that golden parachute agreements are more likely in a sample of S&P 500 firms when ownership is concentrated in at least one external-owner. This evidence is consistent with diffuse ownership and golden parachutes acting as substitute factors in producing credible commitments, but inconsistent with parachutes evidencing executive-shirking: why would the incidence of shirking increase with the capacity for owners to produce monitoring services? I conclude in Section 5.

2. The necessity of credible commitments in firms

Theories of the firm suggest that external enforcement agents are necessary to mitigate moral hazard in teams but disagree about whether these agents play a monitoring or budget-breaking role.[2] To enhance efficiency via either role, however, external agents must credibly commit against opportunistically exercising their enforcement capabilities. When such commitments are missing (or are not common knowledge), mechanisms that might otherwise sustain efficient outcomes are not individually rational; the threat of owner-opportunism deters team members from 'entering the game.'

In the present section, I evaluate monitoring and budget-breaking schemes to highlight the fundamental role that credible commitments against opportunism play in making efficient equilibria feasible in team production settings. Additionally, I argue that collective action costs and formal institutions (e.g., golden parachutes) can act as substitutes to enhance the credibility with which external agents (e.g., shareholders) commit against playing opportunistic actions.

2.1. Monitoring as a solution to moral hazard in teams

Following Alchian and Demsetz (1996), a common interpretation of the owner–employee relationship is one in which owners mitigate moral hazard in teams by actively

[2] Under a monitoring scheme, sharing rules (i.e., mechanisms that distribute a team's joint product to its members and/or external agents such as shareholders) remunerate team members as a function of inputs, whereas, under a budget-breaking scheme, they remunerate members as a function of outputs. Hence, to the extent that outputs are less costly to observe than are inputs, budget-breaking schemes can induce equilibria that dominate those which are feasible under monitoring.

monitoring their employees' inputs.[3] For Alchian and Demsetz (1996, p. 194), firms facilitate gains from team production by providing a *centralized agent* (italics in original). If these agents have a comparative advantage in monitoring inputs, they can enhance efficiency by increasing the correlation between team members' productivity and the rewards that firms confer upon those members.

But what incentive does a centralized agent have to supply this service? For Alchian and Demsetz, firms provide this incentive by endowing such agents with ownership of the team's residual earnings.[4] Given this endowment, 'centralized agents' such as shareholders have an incentive to produce monitoring services because doing so enhances their share of associated efficiency-gains.

Enhancing efficiency, however, is not the only action by which an external agent can increase its share of efficiency-gains. These agents also have an incentive to strategically manipulate the distribution of such gains; i.e., a large share of a small gain may exceed a small share of a large gain. Only external agents who are constrained to receive a fixed share of efficiency-gains find it optimal to pursue their objectives by ignoring redistributive strategies.[5]

If the incentive for monitors to strategically manipulate the distribution of efficiency gains is unchecked, and if this incentive is common knowledge, then team members will not 'enter the game' since the product of their efforts will be expropriated. Reliance on residual claimant status is insufficient for avoiding this Pareto inferior outcome: a mechanism is also necessary that enhances the ability of monitors to credibly commit against opportunistic actions.

2.2. Budget-breaking as a solution to moral hazard in teams

Alchian and Demsetz suggest that moral hazard in teams arises from the inability to perfectly observe inputs and thus the incentive for individuals to free ride off others' efforts. Because it is prohibitively costly to measure *every* input, however, even monitors cannot extinguish the incentive to free ride. Holmstrom (1982) thus develops a mechanism for eliminating free riding, *even when observing inputs is prohibitively costly.*

[3] By "team," I refer to a team production process. For Alchian and Demsetz, this process is one in which at least two factors (not owned by a single individual) with interdependent productivities (i.e., the marginal product of each factor is a function of at least one other factor) are combined to produce some output. Moral hazard in teams arises to the extent that observing inputs is costly; the inability to perfectly observe inputs creates an incentive for individuals to free ride off others' efforts. "If detecting such behavior were costless, neither party would have an incentive to shirk, because neither could impose the cost of his shirking on the other" (Alchian and Demsetz, 1996, p. 197).

[4] "One method of reducing shirking is for someone to specialize as a monitor to check the input performance of team members. But who will monitor the monitor?... Another constraint can be imposed on the monitor: give him title to the net earnings of the team, net of payments to other inputs... Specialization in monitoring plus reliance on a residual claimant status will reduce shirking" (Alchian and Demsetz, 1996, pp. 199–200).

[5] Holmstrom (1999, p. 79) also recognizes this difficulty by asking "What assures that the monitor does not cheat on payments when performance meets the standard?" Holmstrom suggests that, in a repeated game setting, an owner's interest in its reputation may preclude opportunistic actions. Reliance on repeated game phenomena, however, may not be valid in the present application since owners (e.g., shareholders) are relatively anonymous.

As with monitoring mechanisms, however, Holmstrom's 'budget-breaking' mechanism requires an external agent who can credibly commit against playing opportunistic actions. For Holmstrom, the essential efficiency-enhancing feature of separating ownership from control is *not* that it encourages owners to efficiently monitor their employees.[6] Instead, separating ownership from control creates an external-agent or 'budget-breaker' that can credibly penalize team members when they have no incentive to punish themselves.[7] Budget breakers implement these penalties via sharing rules that, as opposed to those under monitoring schemes, are functions only of observed outputs.

Note, however, that outputs are frequently observable only with long and variable lags. Consequently, to be implementable, budget-breaking mechanisms must rely on deferred compensation contracts.[8] But, just as the incentive for external agents to cheat on payments creates a credible commitment problem for monitors, so does the necessity of relying on deferred compensation schemes for budget-breakers.

This problem arises because the optimal strategy in a deferred compensation scheme is time inconsistent; after learning the level of output, the owner's dominant strategy is to not remunerate its employees (i.e., to expropriate its employees' product).[9] If this strategy is common-knowledge, rational employees will not enter the firm and all players (including the owner) will recognize a strictly inferior payoff.[10] To avoid this inferior equilibrium, the external agent has an incentive to constrain itself by 'pre-committing' to an optimal plan. Hence, whether external agents produce monitoring or budget-breaking services, credible

[6] Holmstrom argues that monitoring is important when the production technology is stochastic and there are many risk-averse team members. In such a case, if the output of one member provides information about the other's state uncertainty, then relative performance evaluations can efficiently provide information about input choices (Holmstrom, 1982, p. 325).

[7] In short, "budget-breaking" sharing rules make feasible the punishments that are necessary to sustain Pareto efficient outcomes as Nash equilibria, even when inputs are unobservable. Holmstrom shows that any sharing rule that allocates the joint-product of individual team members exactly among those members (i.e., a "budget-balancing" sharing rule) must induce either an inefficient equilibrium or an efficient but unstable outcome. He formally deduces this result from the assumptions that inputs are unobservable, externalities exist in production (i.e., the effort choice of each individual team member influences the team's total product), and the firm's production technology is non-stochastic. Holmstrom's is a more general framework than that of Alchian and Demsetz since it does not require interdependence between marginal productivities of factors. Please see Appendix A for a more detailed summary of Holmstrom's model.

[8] "Optimal contracts between a manager and shareholders (via the board of directors) will often involve deferring compensation until better information about manager performance becomes available. These contracts will necessarily be long term and likely be implicit [given the prohibitive cost of identifying every future possibility and contingent payment]" (Knoeber, 1986, p. 159). Note that monitoring schemes need not employ deferred compensation contracts since remuneration to team members is a function of inputs.

[9] More formally, the external agent's optimal plan is time inconsistent because future decisions that appear optimal at an initial date are not optimal from a later date's viewpoint (Blanchard and Fischer, 1989, p. 592).

[10] Moreover, notice that repeated interaction may not alleviate this credible commitment problem. First, the notion of a repeated game may be strained in this context since shareholders constitute a relatively anonymous group whose membership is constantly changing. The payoffs that any individual shareholder can recognize from building a reputation for cooperative dealings may thus be insignificant. In addition, while repeated interaction might sustain a cooperative outcome, it can sustain other outcomes as well. Hence, a model of equilibrium selection must accompany any reference to repeated interaction as a mechanism for producing cooperative outcomes.

commitments against opportunistic action are necessary to preclude team production systems from settling on inferior equilibria.

2.3. Collective action costs, formal institutions, and credible commitments

In outlining the potential for monitors or budget-breakers to play opportunistic actions, I have implicitly assumed that these necessary external agents are unitary actors. Suppose, however, that these agents are themselves a 'team.' Then, for external agents such as shareholders to opportunistically expropriate the product of their employees, they too must address a free rider problem. Moreover, if the incentive to free ride intensifies with team size, then diffuse external agents will be relatively inefficient expropriators.

In this manner, forces that create the team production problem (e.g., the incentive to free ride) also mitigate the potential for owners to expropriate their team members' product. Diffusing ownership can thus promote efficiency by enhancing the credibility with which shareholders can promise (explicitly or implicitly) to forego opportunistic strategies. To the extent that optimal expropriation is not feasible, a firm's employees have the necessary ex-ante assurance to contribute to team production processes.[11]

3. Hostile takeovers as opportunistic behavior

The relatively strong forces that diffuse owners must overcome to act opportunistically can encourage team members that their product will not be expropriated. Firms with diffuse ownership may thus have a comparative advantage in addressing moral hazard in teams.[12] If firms with concentrated ownership lack this inherent advantage, then they have an increased incentive to employ formal institutions that substitute for diffusion's credibility-enhancing role.

In the following section, I report test results that are consistent with this conjecture. Before doing so, however, I explain in the present section why my choice of dependent variable (i.e., an indicator of whether a firm maintains a golden parachute agreement) is appropriate. In particular, I review arguments that accepting hostile takeover bids represents owner-opportunism. Given these arguments, and those in the preceding section,

[11] Garvey and Gaston (1991) present evidence that is consistent with this conjecture. In a sample of Australian firms, they show that payments made via deferred compensation schemes increase with ownership diffusion.

[12] Note that diffusion of ownership is frequently interpreted as only diminishing the capacity for owners to produce monitoring services and is thus associated with an increased capacity for employees to shirk. However, interpreted within the monitoring framework, diffusion of ownership also creates an opposing force by enhancing the capacity of monitors to credibly commit against opportunism. Additionally, as external agents become more diffuse, their capacity to produce budget-breaking services increases (budget-breakers must be passive to induce efficient equilibria in Holmstrom's model). In short, interpreted within the monitoring framework, collective action costs for external agents create forces that push firms both toward and away from efficient equilibria while, interpreted within the budget-breaking framework, these costs create forces that only push firms toward efficient equilibria. Hence, in theory, increasing owner passivity need not have any efficiency-reducing consequences.

it follows that firms with concentrated ownership have an increased incentive to maintain institutions (e.g., golden parachutes) that augment the cost of accepting these bids.[13]

When a firm becomes a takeover target, its market value frequently increases. This increase, however, need not evidence expected efficiency gains. Rather, such an increase could evidence a redistribution (as opposed to a creation) of value (Shleifer and Summers, 1988, p. 34).

> Since firms' labor costs far exceed their profits and since even poor capital investments yield some returns, very small differences in firms' success in extracting rents from workers and other corporate stakeholders are likely to be much more important in determining market value than the differences in corporate waste associated with differences in firms' volume of reinvestment... These considerations suggest that takeovers that limit managerial discretion increase the acquired firm's market value primarily by redistributing wealth from corporate stakeholders to share owners

(Shleifer and Summers, 1988, pp. 36–37).

To the extent that hostile takeovers represent an otherwise unavailable mechanism for transferring resources from stakeholders to owners, accepting them represents owner-opportunism.[14] To see how accepting a hostile tender offer can be interpreted as opportunistic, consider the case of deferred compensation agreements. Because managers and boards of directors enter these agreements (either implicitly or explicitly), shareholders may little or no alternatives for opportunistically breaching them.

> A tender offer bypasses the board of directors and appeals directly to shareholders to sell their shares. Once control has changed hands, a manager may be discharged or, if retained, not paid deferred compensation due. The acquiring firm then appropriates this delayed compensation (the prospect of which may be partially responsible for a premium over current stock price paid to tendering shareholders of the acquired firm)

(Knoeber, 1986, p. 160).

In this manner, the incentive for shareholders to opportunistically accept tender offers can disrupt potentially efficiency enhancing contractual relationships between owners and managers.[15]

If ownership is diffuse, however, the potential for such opportunistic behavior may be insignificant; forces associated with the team production problem may be sufficiently

[13] The evidence I present in the following section is consistent with this implication; relatively concentrated sets of owners maintain golden parachute agreements (i.e., mechanisms that increase the cost of acting opportunistically) more frequently than do relatively diffuse sets of owners. It is difficult to rationalize this evidence within a received principal–agent framework: why would the incidence of management shirking (as proxied by golden parachutes) increase with owners' monitoring-capabilities?

[14] Takeovers might represent an otherwise unavailable mechanism for transferring resources from a firm's stakeholders to its owners if new owners face lower costs to break contracts (implicit or explicit) than do old owners.

[15] Agrawal and Knoeber (1996, p. 381) recognize a related phenomenon; namely that an increased risk of takeover "makes shareholder assurances to managers less credible".

strong to preclude owners from producing opportunistic rents.[16] Hence, when ownership is concentrated, shareholders may face a stronger incentive to implement institutions such as golden parachutes to constrain themselves from accepting hostile takeover bids.[17] Without such institutions, and absent any substitutes,[18] members will not contribute inputs that are necessary to push firms toward efficient equilibria.

4. Are insulating-institutions credible commitments or evidence of shirking?

4.1. The credible commitment versus shirking hypotheses

To the extent that takeovers transfer resources from a firm's stakeholders to its owners, the capacity to accept hostile tender offers enhances an owner's ability to act opportunistically. Moreover, absent an opposing force, the threat of such action reduces stakeholder-incentives to contribute to team production processes. To avoid the resulting Pareto inferior equilibrium, owners have an incentive to implement institutions that increase the cost of exercising their own dominant strategies.

If forces associated with the team production problem (e.g., the incentive to free-ride) diminish as groups become more concentrated, then a concentrated set of owners will be relatively efficient at opportunistically expropriating its team's product. In this light, rational managers will view a relatively concentrated set of owners as a significant threat to producing opportunistic rents. To induce such managers to contribute desired levels of effort, these firms might maintain institutions that increase the cost of opportunism. In this section, I evaluate the empirical relevance of this conjecture by examining the incidence of golden parachutes in CEO compensation agreements.

To guide this examination, I develop two competing hypotheses: the 'credible commitment' and 'shirking' hypotheses. If the cost for owners to play opportunistic actions

[16] Because of asymmetric tax implications, owners may not have homogenous preferences with respect to tender offers. Moreover, even if owners agree that each of them will be better off by collectively accepting a takeover offer, preference homogeneity is insufficient for resolving collective action problems (e.g., see Olson, 1971). This difficulty may be particularly severe when offers are contingent on a certain percentage of shares being tendered. Shareholders thus face a team production problem when attempting to opportunistically expropriate the product of their agents. This interpretation of the shareholders' problem is consistent with Agrawal and Knoeber's (1996, p. 380) observation that "bigger blocks [of shares] held by outsiders" might facilitate takeovers because "the size of these holdings would reduce the free-rider problem that could lead small shareholders to refuse to tender".

[17] Knoeber (1986, p. 160) describes the potential advantage to shareholders of golden parachutes as follows. "The advantage to current shareholders of a firm providing golden parachutes... is that by doing so, these shareholders can assure managers that *implicit* deferred compensation contracts will not be reneged. Without this assurance, managers would not agree to such contracts. They would require immediate compensation that would necessitate the use of a less precise measure of manager performance and so... less shareholder wealth. These obstructions to hostile takeovers, then, allow better contracting between manager and shareholders" (Knoeber 1986, p. 160, emphasis added).

[18] Blair and Stout (1999) interpret corporate law as one such substitute. In the following section, I present evidence that is consistent with golden parachutes (i.e., institutions that constrain shareholders from accepting hostile takeover bids) and corporate law acting as substitute mechanisms to protect team members from opportunistic expropriation.

decreases with ownership concentration, and if accepting a hostile takeover bid is an opportunistic action, then associated hand-tying institutions should be more likely, ceteris paribus, as ownership concentration increases. I refer to this conjecture as the 'credible commitment hypothesis.'

Hypothesis (Credible Commitment). The incidence of management insulating institutions (e.g., golden parachute agreements) increases with ownership concentration.

The credible commitment hypothesis contrasts conventional wisdom that management-insulating mechanisms are evidence of shirking.[19] Such interpretations rely on the argument that, since monitoring is costly, agents can pursue strategies that enhance their own welfare, even if doing so is inconsistent with the principal's objective. Additionally, if forces associated with the team production problem become stronger as teams become more diffuse, then diffuse owners are relatively inefficient producers of monitoring services.[20] In this light, management-insulating institutions such as golden parachute agreements are more likely as ownership becomes more diffuse.[21] I refer to this conjecture as the 'shirking hypothesis.'

Hypothesis (Shirking). The incidence of management insulating institutions (e.g., golden parachute agreements) decreases with ownership concentration.

In the remainder of this section, I formally evaluate the empirical relevance of these competing hypotheses. I find that the incidence of golden parachutes is higher, ceteris paribus, for sampled firms whose ownership is concentrated. This evidence is consistent with the credible commitment hypothesis, but cannot be rationalized within conventional interpretations of the monitoring framework.

4.2. Specification of the model

To formally evaluate the empirical relevance of the credible commitment and shirking hypotheses, I estimate the following reduced form model.

$$y_i = 1 - F(-\beta_0 - \beta_1 x_{1i} - \beta_2 x_{2i}) + \varepsilon_i,$$

[19] "At least in the United States, the financial press is filled with notions such as... 'golden parachutes,' where incumbent management provides itself with employment contracts that transfer a lot of wealth to themselves and away from the firm in the event that the firm is taken over and they are discharged" (Kreps 1990, p. 725). In addition, "those who believe in the beneficial effect of hostile tender offers on manager performance typically deplore... [golden parachutes] which discourage hostile offers... These criticisms have led to several proposals to regulate such actions... (A)n advisory committee to the SEC has recommended... bylaws and restrictions on the use of golden parachutes" (Knoeber, 1986, p. 156).

[20] "The most obvious disadvantage [of ownership diffusion] is the greater incentive for shirking by *owners* that results" (Demsetz and Lehn, 1988, pp. 202–203).

[21] Ceteris paribus, golden parachute agreements enhance the welfare of relevant executive managers. If they do so without also significantly benefiting shareholders, then the incidence of such agreements should increase as the ability of shareholders to block the implementation of such agreements decreases (i.e., as shareholders become more diffuse). It follows that, if the incidence of such agreements increases with shareholder concentration, then implementing or maintaining golden parachute agreements must significantly benefit shareholders. One such benefit is enhancing the ability of shareholders to credibly commit against playing opportunistic actions.

Table 1
Dependent variable

Variable	Mean	Source
Parachute	0.66	Proxy statement[a]

[a] Proxy statements filed with the SEC (available at http://www.sec.gov) disclose whether a firm maintained a golden parachute agreement with its chief executive in 1998. Under the Securities and Exchange Act of 1934, Item 402 (Executive Compensation), Section h. (Employment Contracts and Termination of Employment and Change-in-Control Arrangements), firms are required to disclose the terms and conditions of any "golden parachute" agreements they enter with executive officers (including the chief executive). Information regarding disclosure requirements is available at the University of Cincinnati's law-web site at http://www.law.uc.edu/CCL/34ActRls/reg14A.html. Please see Appendix B for an example of a firm's golden parachute disclosure.

where y_i equals 1 if firm i maintains a golden parachute agreement with its chief executive officer and 0 otherwise; $F{:}R\rightarrow[0,1]$ is a continuous, strictly increasing function (e.g., a cumulative distribution function);[22] x_{1i} denotes a vector whose components characterize the concentration of firm i's external-ownership; x_{2i} denotes a vector of control variables; and ε_i denotes the deviation of y_i from its conditional mean.

The shirking hypothesis implies that $\beta_1<0$ (i.e., the incidence of management-insulating mechanisms *decreases* as ownership concentration increases) while the credible commitment hypothesis implies $\beta_1>0$ (i.e., the incidence of management-insulating mechanisms *increases* as ownership concentration increases).

4.3. Definition of variables

The dependent variable, *Parachute*, equals 1 for firms that maintain golden parachute agreements with their chief executive officers and 0 otherwise.[23] I summarize this information in Table 1. Since *Parachute* is a dummy variable, its mean indicates the proportion of sampled firms that maintained a golden parachute agreement with their chief executives in 1998.

Independent variables in the reduced form model include the vector x_{1i}. Variables that comprise this vector characterize firm i's external-ownership concentration. I describe these variables in Table 2. To the extent that forces associated by the credible commitment hypothesis act on firms, estimated coefficients on the variables included in x_1 should be positive and significant (i.e., formal institutions that check the incentive for opportunistic behavior should increase with the capacity for owners to act on that incentive).

[22] For purposes of the present application, the range of F can be interpreted as the conditional probability that the dependent variable equals zero. To generate the parameter estimates presented in this section, I assume that F is the cdf of the logistic distribution. In unreported regressions, I estimate parameters under the assumption that F is the cdf of the standard normal and Type-I extreme value distributions. Inference that can be drawn under these alternative assumptions does not differ from that presented in this section.

[23] My sample is a cross-section of 100 firms in 1998. To construct this sample, I selected the fifth, 10th, 15th, . . ., and 500th firm from an alphabetical listing of S&P 500 firms. My sample includes each firm selected in this manner that has an electronically filed proxy available from the SEC's EDGAR database. Only one of the originally selected firms does not have an electronic filing available; I replaced this observation with its immediate successor in the alphabetical listing of S&P 500 firms.

Table 2
Independent variables: ownership concentration

Variable	Description	Mean	S.D.	Source
5% Owner	Equals 1 for firms that have at least one *external* beneficial shareholder that owns 5% or more of the firm's stock.[a]	0.76	n/a	Proxy statement[b]
Owner1	Percentage of shares beneficially owned by each firm's largest external shareholder.[c]	7.38	5.99	Proxy statement
Sum Owner[d]	Sum of the percentage of shares beneficially owned by the four largest external shareholders.	12.34	11.78	Calculated

[a] "External" refers to beneficial owners who are not executives or directors of the firm.

[b] Proxy statements filed with the SEC are available at http://www.sec.gov.

[c] This variable is observable only for beneficial owners of more than 5% of a firm's stock. In unreported regressions, I also include as regressors the percentage of shares beneficially owned by each firm's second, third, and fourth largest external shareholders. Inclusion of these variables does not influence the inference that can be drawn from results reported here.

[d] In unreported regressions, I also include as a regressor a Herfindahl index for the concentration of external beneficial shareholders that own 5% or more of the firm's stock. Including this variable does not alter the inference that can be drawn from estimates reported in Table 4.

The right-hand-side of the reduced form model also includes the vector x_{2i}. Variables that comprise this vector control for forces that are not related to a firm's external-ownership structure but can nevertheless influence its propensity to maintain a golden parachute agreement. I describe these variables in Table 3.

To the extent that concentration of ownership in either the chief executive or 'insiders' (i.e., directors and executive managers) constrains external owners from acting opportunistically, the credible commitment hypothesis implies that estimated parameters on *CEO Share* and *Insider Share* should be negative and significant. However, the shirking hypothesis creates the same observable implication; if the shirking-costs that insiders internalize increases with their ownership shares, then estimated parameters on *CEO Share* and *Insider Share* should be negative and significant. Hence, parameter estimates on these variables cannot be used to distinguish the empirical relevance of the competing hypotheses. Nevertheless, I include these variables as regressors to mitigate any bias in estimating other parameters of interest.

Additionally, if accepting a hostile takeover redistributes rather than creates value, then the extent to which Delaware legislation increases the cost of takeover activity diminishes the threat of owner-opportunism.[24] In this light, the marginal benefit for Delaware firms to

[24] This conjecture is consistent with Blair and Stout (1999) who argue that, by constraining shareholder-activism, corporate law enhances efficiency by creating a system in which owners can credibly commit to uphold implicit contracts. Takeover activity may be relatively costly in Delaware since, for example, the state's case law allows boards of directors to cite the welfare of non-shareholder stakeholders in attempting to resist a hostile tender offer (Blair and Stout, 1999, p. 308). Stock market reaction to such case law is consistent with Delaware managers having an increased ability to resist takeovers even when they might disadvantage target shareholders (Kamma et al., 1988). While other states may have enacted antitakeover laws before Delaware, "Delaware's case law precedent arguably has made hostile takeovers more difficult. State antitakeover laws, for example, face the risk of being declared unconstitutional while Delaware case law on takeovers has a firmer constitutional basis" (Netter and Poulsen, 1989, p. 32).

Table 3
Independent variables: controls

Variable	Description	Mean	S.D.	Source[a]
CEO Share	Percentage of shares beneficially owned by the firm's chief executive officer.[b]	2.01	6.30	Proxy statement
Insider Share	Percentage of shares beneficially owned by the firm's directors and executive management.[c]	5.64	10.72	Proxy statement
Delaware	Equals 1 if the firm is incorporated in the state of Delaware	0.48	n/a	Proxy statement
Assets	Book value (in millions) of firm's assets on 12/31/97	18,501	38,299	10-K
PE Ratio	Price-earnings ratio on 12/31/97	30.74	24.96	Wall Street Journal
Cap Exp	Capital expenditures for 1997	625.7	972.5	10-K
SIC1	Firm's whose SIC code[d]begins with 1.	0.30	n/a	Proxy statement
SIC2	Firm's whose SIC code begins with 2.	0.18	n/a	Proxy statement
SIC3	Firm's whose SIC code begins with 3.	0.29	n/a	Proxy statement
SIC4	Firm's whose SIC code begins with 4.	0.14	n/a	Proxy statement
SIC5	Firm's whose SIC code begins with 5.	0.15	n/a	Proxy statement
SIC6	Firm's whose SIC code begins with 6.	0.14	n/a	Proxy statement
SIC7	Firm's whose SIC code begins with 7.	0.05	n/a	Proxy statement
SIC8	Firm's whose SIC code begins with 8.	0.02	n/a	Proxy statement

[a] Proxy statements and forms 10-K filed with the SEC are available from , http://www.sec.gov.

[b] This variable is observable only if the chief executive officer beneficially owns more than 1% of a firm's shares.

[c] This variable is observable only if directors and executive managers beneficially own, in aggregate, more than 1% of a firm's shares.

[d] Standard Industrial Classification numbers (i.e., SIC codes) classify firms according to the primary types of operations in which they engage.

implement institutions that constrain such opportunistic behavior is relatively small. Accordingly, the credible commitment hypothesis implies that parameter estimates on the variable *Delaware* should be significant and negative. If, on the other hand, takeover-threats create value by increasing the supply of monitoring services, then the shirking hypothesis suggests exactly the opposite implication; the parameter estimate on *Delaware* should be significant and positive.

Notes to Table 4:

[a] Firms with Standard Industrial Classifications beginning with "4" operate in the transportation, communications, and public utilities sectors.

[b] The restricted log likelihood, or the maximum of the likelihood function when all of the coefficients (except the constant term) are restricted to equal zero, is −64.1036.

[c] 'H–L Statistic' denotes the Hosmer–Lemeshow goodness-of-fit test statistic. This statistic measures how 'large' the difference is between the model's fitted values and the actual values. As evidenced by the associated probability values, the statistical difference between the fitted and true values is insignificant (i.e., each of the H–L statistics reported in this table is statistically insignificant). In this light, the reported standard errors do not indicate significant mis-specification of the model (EViews, 1998, p. 428).

* Significant at the 90% confidence level.

** Significant at the 95% confidence level.

*** Significant at the 99% confidence level.

Table 4
Logit estimates: dependent variable is *Parachute*

Variable	(1)		(2)		(3)		(4)	
	Coeff.	S.D.	Coeff.	S.D.	Coeff.	S.D.	Coeff.	S.D.
Constant	0.0015	1.4804	0.9054	1.4037	1.1424	1.4115	0.0309	1.5708
5% Owner	1.6430	0.6757**					3.0900	1.5442**
Owner1			0.0755	0.0668			−0.2463	0.2248
Sum Owner					0.0355	0.0321	0.0588	0.0805
CEO Share	−0.0516	0.0726	−0.0263	0.0746	−0.0317	0.0697	−0.0988	0.0869
Insider Share	−0.0759	0.0411*	−0.0820	0.0465*	−0.0760	0.0437*	−0.0554	0.0458
Delaware	−0.9516	0.5697*	−0.9187	0.5532*	−0.8937	0.5510*	−0.9395	0.5836
Assets	−0.0000	0.0000	−0.0000	0.0000	−0.0000	0.0000	−0.0000	0.0000
PE Ratio	0.0077	0.0118	0.0072	0.0118	0.0057	0.0124	0.0078	0.0127
Cap Exp	−0.0011	0.0009	−0.0012	0.0009	−0.0012	0.0009	−0.0010	0.0008
SIC1	0.0476	1.3543	−0.6288	1.3646	−0.6359	1.4103	0.2879	1.4539
SIC2	1.2502	1.1553	1.1386	1.1511	1.0475	1.1453	0.9787	1.2270
SIC3	0.6419	1.1405	0.5915	1.1215	0.4821	1.1513	0.4124	1.2119
SIC4[a]	3.7108	1.9817*	3.4435	1.8191*	3.3609	1.8154*	3.8922	2.2726*
SIC5	−0.2196	1.2434	−0.3456	1.2400	−0.5216	1.3018	−0.4675	1.3828
SIC6	1.4419	1.7302	1.1740	1.6396	1.1014	1.5947	1.3447	1.7045
SIC7	1.3375	1.1128	1.0098	1.1295	0.9615	1.1465	1.1698	1.1905
Log Likelihood[b]	−43.27		−45.67		−45.76		−42.14	
LR Statistic	41.67***		36.87***		36.68***		43.93***	
Akaike Info. Criterion	1.1653		1.2134		1.2152		1.1828	
Schwarz Criterion	1.5561		1.6042		1.6060		1.6257	
McFadden R^2	0.3250		0.2876		0.2861		0.3426	
H−L Statistic[c]	7.1759		5.8529		5.3140		8.6533	

I also include regressors that have no bearing on the credible commitment and shirking hypotheses but may, nevertheless, influence the distribution of parachute agreements across firms. For example, evidence exists that the likelihood of being acquired decreases with firm size (as measured in assets) and the market value of outstanding stock relative to earnings (i.e., price-to-earnings ratio) (e.g., see Harris, 1982; Schwartz, 1982). If the likelihood of being acquired decreases with these variables, then the demand for management insulating mechanisms in associated firms may be relatively low. In this case, parameter estimates on the variables *Assets* and *PE Ratio* should be significant and negative.

On the other hand, Knoeber (1986) suggests that, because increases in firm size and price-earnings ratios reduce the likelihood of a tender offer, the opportunity cost of supplying golden parachutes should be lower. In this light, smaller firms and those with relatively low price-earnings ratios may be less likely to employ golden parachutes. The expected sign for parameter estimates on *Assets* and *PE Ratio* is thus indeterminate.

Knoeber also suggests (and produces supporting evidence) that the incidence of golden parachutes increases with capital expenditures. As waiting for future information to assess firm performance becomes more valuable, so might the value of being able to employ deferred compensation schemes. Knoeber (1986, p. 162) argues that such a lag might be important for capital expenditure decisions. In this light, firms with relatively large capital expenditures are more likely to employ golden parachutes. Hence, the expected sign for parameter estimates on *Cap Exp* is positive.

Finally, if either the threat of hostile takeovers or the inherent cost of monitoring varies systematically across sectors of the economy, then the credible commitment and shirking hypotheses imply that parameter estimates for the *SIC* variables should be significant. The hypotheses developed in the present paper, however, do not imply a prediction regarding the sign of such estimates. Nevertheless, I include these variables as regressors to mitigate bias in estimating other parameters of interest.

4.4. Empirical results

I estimate the reduced form model using several different procedures and sets of regressors.[25] The resulting parameter estimates appear robust across these dimensions and consistent with the credible commitment hypothesis. Table 4 reports a representative sample of these estimates.

The credible commitment hypothesis implies that the incidence of management insulating institutions should increase with the potential for owner-opportunism. If this potential is positively associated with ownership concentration, then the incidence of such institutions should increase as ownership becomes more concentrated. Estimates presented in Table 4 are consistent with this implication. In particular, firms whose ownership is

[25] To generate the parameters reported in Table 4, I assume that F in the reduced form model is the cdf of the logistic distribution (i.e., I use the logit model). In unreported regressions, I estimate parameters under the assumptions that F is the cdf of the standard normal and Type-I extreme value distributions (i.e., I estimate parameters using the probit and gompit models, respectively). Inference that can be drawn under these alternative assumptions does not differ qualitatively from that presented in this section.

concentrated in at least one external agent (i.e., firms for which the variable *5% Owner* equals 1) are significantly more likely to maintain a golden parachute agreement with their chief executives.[26]

This relationship also appears to be economically significant. To see this, consider how the probability that a firm maintains a golden parachute agreement varies with ownership concentration. For specification (1), the probability (estimated at the mean of the regressors) that a firm maintains a golden parachute agreement when it's in SIC4, not incorporated in Delaware, and has at least one large shareholder (i.e., when *5% Owner*=1) is about 88%. On the other hand, the probability that such a firm maintains a parachute agreement when it does not have at least one large shareholder (i.e., when *5% Owner*=0) is about 32%.[27]

Additionally, parameter estimates on the variable *Delaware* are consistent with firms incorporated in Delaware being significantly less likely to maintain golden parachute agreements.[28] Interpreted within the credible commitment framework, this empirical relationship may reflect forces created by Delaware legislation that increase the cost of takeover activity. In other words, Delaware firms may not have a significant incentive to enhance owners' ability to credibly commit against opportunistic behavior; state statutes might already supply this enhancement. This empirical relationship cannot be rationalized within the shirking hypothesis; if takeover activity significantly contributes to the supply of monitoring services, then the incidence of management insulating institutions such as golden parachutes should be relatively high among Delaware firms.

Parameter estimates on the variables *5% Owner* and *Delaware* are consistent with the credible commitment hypothesis. Moreover, none of the evidence presented in Table 4 is consistent with the shirking hypothesis. If external agents produce monitoring services, and if golden parachutes are evidence of management shirking, then the incidence of these institutions should decrease as the availability of monitoring services increases. Parameter estimates on both the variables *5% Owner* and *Delaware* are inconsistent with this conjecture; why would the incidence of shirking increase with the availability of monitoring services? Instead, these estimates suggest that, if external owners produce monitoring services, then their capacity to produce such services must be offset by formal institutions that constrain them from acting opportunistically.

[26] Note that, while the coefficient estimates on *Owner1* and *Sum Owner* are statistically insignificant, their signs are consistent with the credible commitment hypothesis.

[27] An estimate of how the probability that a firm maintains a golden parachute responds to a change in the independent variable can be misleading in this case since the postulated change in the independent variable (i.e., *5% Owner*) is not infinitesimal. A more valid approach is to compare the estimated probability that the dependent variable equals one before and after a change in the relevant independent variable (Kennedy, 1992, p. 235).

[28] For specification (1), the probability (estimated at the mean of the regressors) that a firm in SIC 4 that has at least one large shareholder (i.e., *5% Owner* = 1) maintains a golden parachute agreement when it's incorporated in Delaware (i.e., when *Delaware* = 1) is about 59%. On the other hand, the probability (estimated at the mean of the regressors) that such a firm maintains a golden parachute agreement when it is not incorporated in Delaware (i.e., when *Delaware* = 0) is about 88%. The corresponding probabilities for a firm that does not have at least one large shareholder (i.e., *5% Owner* = 0) are 8% and 32%, respectively.

On the other hand, if external agents produce budget-breaking services, then the sign and magnitude of parameter estimates on *5% Owner* and *Delaware* are precisely what we expect to observe. Budget-breakers implement sharing rules that are functions of observed outputs. Because outputs are frequently observed with long and variable lags, however, a budget-breaker's optimal strategy is time inconsistent. Hence, to avoid Pareto inferior equilibria, a check is necessary on the capacity for budget-breakers to play opportunistic actions. Because the value of this check increases with the capacity for budget-breakers to produce opportunistic redistributions, the incidence of golden parachutes should be higher where shareholders are relatively concentrated (i.e., in firms where *5% Owner* = 1) and where substitute checks are unavailable (i.e., in firms where *Delaware* = 0).

5. Conclusion

Theories of the firm imply that external agents are necessary to induce efficient equilibria in team production settings. However, they tend to ignore that constraining such agents from opportunistically exercising their enforcement capabilities is also necessary. While external agents may be necessary, they cannot sustain an efficient outcome if subjects do not have some assurance that their product will not be expropriated. In this sense, the ability to credibly commit against opportunistically pursuing one's own self-interest is pivotal.[29]

To enhance the credibility with which they can commit against opportunistic actions, relevant actors can implement formal 'hand-tying' institutions that increase the cost of associated behavior. Interpreted in this light, such institutions enhance efficiency by offering assurance that necessary external agents will not expropriate the product of other stakeholders. I refer to this implication as the 'credible commitment hypothesis.'

The credible commitment hypothesis stands in stark contrast to the more familiar 'shirking hypothesis.' Developed within the conventional principal–agent framework, this hypothesis provides a very different interpretation of relevant formal institutions. In particular, it implies that such institutions reduce, rather than enhance, efficiency; i.e., they are evidence of shirking.

I empirically evaluate these competing hypotheses by examining the incidence of a formal institution that insulates chief executives from high-powered market incentives (i.e., golden parachutes). Such institutions are frequently interpreted as reflecting the ability of managers to 'capture' firms. In this light, management shirking, and thus the incidence of insulating-institutions, should increase as oversight capabilities of owners diminish.

As the cost for owners to act collectively decreases, however, executives face an increasing risk that the product of their efforts will be expropriated. Hence, as collective action costs diminish, the incentive increases for owners to credibly commit against exercising their enforcement capabilities opportunistically. One way to enhance this

[29] Understanding the manner in which such commitments are made is a fundamental goal of social theory (e.g., see Guth and Kliemt, 1997).

credibility is to implement institutions that insulate executives from the consequences of opportunistic behavior. Interpreted in this light, rather than evidencing the ability of managers to shirk, insulating-institutions are rational responses from owners to credibly constrain their own opportunistic behavior.

Evidence that I develop for the present paper is consistent with the credible commitment hypothesis; collective action costs and insulating-institutions appear to act as substitute factors in producing credible commitments against opportunism. This result provides new insight to how firms might mitigate team production problems by employing institutions that are frequently interpreted as evidence of shirking.[30]

Acknowledgements

I am deeply indebted to Gary Miller for countless stimulating discussions regarding these issues. I also received helpful comments from an anonymous referee, Lee Benham, Marcus Berliant, Randy Calvert, Marco Castaneda, Ivan Jeliazkov, Krishna Ladha, James Morley, John Nachbar, Bob Parks, Rudy Santore, Norman Schofield, seminar participants at Washington University and the 2000 Midwest Economic Association meetings, and especially Kurt Annen and Joe Tonon. Finally, I gratefully acknowledge financial support from Washington University's Department of Economics and Center in Political Economy where much of this research was completed.

Appendix A. Overview of Holmstrom's result

Holmstrom (1982) formally examines a team production system in which input choices are unobservable and transformed to outputs without error (i.e., the production technology is non-stochastic). In this system, non-cooperative behavior induces inefficient outcomes when joint output is allocated exactly among a team's members. Only by introducing a *passive* "budget-breaker" can such outcomes be avoided. Holmstrom thus argues that an external-owner's essential role is *not* one of monitoring. To see this, consider the following formalization of the team production problem.[31]

Suppose the joint actions of a team's members produce an outcome $x{:}A \rightarrow R$ where A denotes the Cartesian product of each agent i's action choice a_i, $i = 1,\ldots,n$, and R the set of real numbers. Holmstrom asks whether a sharing rule $s_i(x) \geq 0$ can distribute the joint product of each individual's effort (i.e., x) exactly among the team members (i.e., such that the rule is budget-balancing or $\sum_i s_i(x) = x \ \forall x$) and induce a Pareto efficient equilibrium. The answer to this question is no; any budget-balanced sharing rule cannot induce an outcome that simultaneously satisfies the conditions of Nash equilibrium and Pareto efficiency.

[30] Moreover, if nation-states can also be characterized as facing a team production problem, then this evidence also has the potential to improve our understanding of how polities induce efficient equilibria. Falaschetti and Miller (2001) consider more carefully the parallels between firms and states.

[31] This formalization summarizes Holmstrom (1982, pp. 326–327).

For a sharing rule to induce a Nash equilibrium, it must elicit a set of actions from which no player has an incentive to unilaterally deviate. If each player's objective is to maximize $s_i(x(a)) - v_i(a_i)$ where $a \in A$ and v_i is an increasing function and denotes the cost to individual i of playing action a_i, then the condition $s_i' x_i' - v_i' = 0$ must be satisfied $\forall i$ in a Nash equilibrium. Additionally, if the set of actions that induces a Pareto optimal outcome is defined by:

$$a^* = \underset{a \in A}{\operatorname{argmax}} \left[x(a) - \sum_i v_i(a_i) \right],$$

then $x_i' - v_i' = 0 \; \forall i$ in a Pareto optimal outcome. Hence, an efficient equilibrium requires $s_i' = 1$ for each individual; i.e., the sharing rule must allocate all of (and only) the marginal product of an individual's effort to that individual.[32]

But a budget balanced sharing rule cannot satisfy this condition. This impossibility follows from the imperfect observation of inputs. When inputs are costly to observe, individuals can hide behind the efforts of others[33] and thus command "informational rents" (i.e., remuneration in *excess* of their marginal products). A sharing rule that pays such rents, however, must break the budget.

The contrapositive of Holmstrom's result is that, if a sharing rule induces an efficient equilibrium, then it must "break the budget." Breaking the budget makes feasible a class of group punishment sharing rules that induce efficient outcomes by making each individual pivotal in the sense that if any one shirks, then no one gets paid. Relaxing the budget-balancing constraint permits group penalties that are sufficient to "police all agents' behavior" (Holmstrom, 1982, p. 327). Hence, for Holmstrom, the primary role of external-owners is to administer incentive schemes that police agents in a credible way (as opposed to actively supplying monitoring services) (Holmstrom, 1982, p. 328).

Appendix B. Disclosure of golden parachute agreement for Ameren[34]

Under the Ameren Change of Control Severance Plan, designated officers of Ameren and its subsidiaries, including current officers of the company named in the Summary Compensation Table, are entitled to receive severance benefits if their employment is terminated under certain circumstances within three years after a "change of control." A "change of control" occurs, in general, if (i) any individual, entity or group acquires 20% or more of the outstanding Common Stock of Ameren or of the combined voting power of the 16 outstanding voting securities of Ameren; (ii) individuals who, as of the effective date of the Plan, constitute the Board of Directors of Ameren, or who have been approved

[32] This implication assumes that that there are externalities in production (i.e., $x_i' \neq 0$).

[33] "Since all agents cannot be penalized sufficiently for a deviation in the outcome, some agent always has an incentive to capitalize on this control deficiency" (Holmstrom, 1982, p. 327).

[34] Source: Ameren's 1998 proxy statement filed with the SEC and available at , http://www.sec.gov.

by a majority of the Board, cease for any reason to constitute a majority of the Board; or (iii) Ameren enters into certain business combinations, unless certain requirements are met regarding continuing ownership of the outstanding Common Stock and voting securities of Ameren and the membership of its Board of Directors.

Severance benefits are based upon a severance period of two or three years, depending on the officer's position. An officer entitled to severance will receive the following: (a) salary and unpaid vacation pay through the date of termination, (b) a pro rata bonus for the year of termination, and base salary and bonus for the severance period; (c) continued employee welfare benefits for the severance period; (d) a cash payment equal to the actuarial value of the additional benefits the officer would have received under Ameren's qualified and supplemental retirement plans if employed for the severance period; (e) up to US$30,000 for the cost of outplacement services; and (f) reimbursement for any excise tax imposed on such benefits as excess payments under the Internal Revenue Code.

References

Agrawal, A., Knoeber, C.R., 1996. Firm performance and mechanisms to control agency problems between managers and shareholders. Journal of Financial and Quantitative Analysis 31, 377–397.

Alchian, A., Demsetz, H., 1996. Production, information costs, and economic organization. In: Putterman, L., Kroszner, R.S. (Eds.), The Economic Nature of the Firm: A Reader. Cambridge Univ. Press, Cambridge, pp. 193–216; (reprinted from) Alchian, A., Demsetz, H., 1972. Production, information costs, and economic organization. American Economic Review 62, 777–795.

Blair, M., Stout, L., 1999. A team production theory of corporate law. Virginia Law Review 85, 248–328.

Blanchard, O.J., Fischer, S., 1989. Lectures on Macroeconomics. MIT Press, Cambridge.

Demsetz, H., Lehn, K., 1988. The structure of corporate ownership: causes and consequences. In: Demsetz, H. (Ed.), Ownership, Control, and the Firm: The Organization of Economic Activity, vol. 1. Basil Blackwell, Cambridge, pp. 202–222.

EViews 3 User's Guide, 1998 (Quantitative Micro Software, Irvine).

Falaschetti, D., Miller, G., 2001. Constraining leviathan: moral hazard and credible commitment in constitutional design. Journal of Theoretical Politics 13, 389–411.

Garvey, G., Gaston, N., 1991. Delegation, the role of managerial discretion as a bonding device, and the enforcement of implicit contracts. In: Rhodes, G.F. (Ed.), Econometric Methods and Models for Industrial Organizations, Advances in Econometrics, vol. 9. JAI Press, Greenwich, pp. 87–119.

Guth, W., Kliemt, H., 1997. Reinhard Selten meets the classics. In: Albers, W., Guth, W., Moldvanu, B., van Damme, E. (Eds.), Understanding Strategic Interaction: Essays in Honor of Reinhard Selten. Springer, Berlin, pp. 243–256.

Harris, R.S., 1982. Characteristics of acquired firms: fixed and random coefficient probit analysis. Southern Economics Journal 49, 164–184.

Holmstrom, B., 1982. Moral hazard in teams. Bell Journal of Economics 13, 324–340.

Holmstrom, B., 1999. The firm as a subeconomy. Journal of Law, Economics, and Organization 15, 74–102.

Kamma, S., Weintrop, J., Wier, P., 1988. Investors' perceptions of the Delaware supreme court decision in Unocal v. Mesa. Journal of Financial Economics 20, 419–430.

Kennedy, P., 1992. A Guide to Econometrics. 3rd edn. MIT Press, Cambridge.

Knoeber, C.R., 1986. Golden parachutes, shark repellants, and hostile tender offers. American Economic Review 76, 155–167.

Kreps, D.M., 1990. A Course in Microeconomic Theory. Princeton Univ. Press, Princeton.

Netter, J., Poulsen, A., 1989. State corporation laws and shareholders: the recent experience. Financial Management 18, 29–40.

Olson, M., 1971. The Logic of Collective Action: Public Goods and the Theory of Groups. Harvard Univ. Press, Cambridge.

Schwartz, S., 1982. Factors affecting the probability of being acquired: evidence for the United States. Economic Journal 92, 391–398.

Shleifer, A., Summers, L.H., 1988. Breach of trust in hostile takeovers. In: Auerbach, A.J. (Ed.), Corporate Takeovers: Causes and Consequences. The University of Chicago Press, Chicago, pp. 33–56.