

Agency-Theory Implications for the Insurance Industry: A Review of the Theoretical and Empirical Research

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Abstract

This paper explores the resolution of incentive conflicts in the insurance industry from an agency-theoretic perspective. It concentrates on the role of organizational forms in mitigating conflict. The paper reviews the concept of agency conflicts and resolution, examines agency conflicts and the use of organizational form in insurance, reviews empirical work that examines the structure of incentive/conflict resolution in insurance, and synthesizes the implications of the theory and empirical findings.

Introduction

The diversity of organizational forms in the insurance industry has been a subject of much inquiry and curiosity. Agency theory has tied many aspects of the industry's diversity into a unified framework and has provided a common ground for analysis. This paper reviews the major tenets of the agency theory literature, focusing on the resolution of agency problems in the insurance sector. This research concentrates on recent empirical work concerning the resolution of conflict through the various organizational forms in the insurance sector.

Four issues are examined. First, what is the rationale for the existence of the wide variety of organizational structures in this industry? Hansmann (1985) observes that stock and mutual insurance companies differ in a number of respects, such as size and growth patterns. Mutual insurance companies, a successful part of the industry for more than a century, differ from other financial mutuals. Reciprocal associations and Lloyd's associations also operate in this industry, but they are generally small in size and appeal to specific niches.¹

Second, insurers exhibit complex contractual relationships in an attempt to control incentive problems between contractors. Mayers and Smith (1986) focus on contracting from an agency-theoretic view, demonstrating how organizational structure is a function of interactions and contracts among participants. Mayers

¹British Lloyd's is the obvious exception.

and Smith argue that survival of organizational structures depends on the amount of managerial discretion required and the cost of monitoring managers.

Third, mutual firms have tended to be most successful in the financial sectors, such as insurance, banking, and mutual funds. Fama and Jensen (1983b) argue that the survival of the mutual form is due to the characteristics of financial intermediation. A recent concern is the effect of demutualization on financial intermediaries. Heller (1986) notes that there have been many conversions from mutual to stock structure among financial firms. Many major insurers are still mutual organizations, and they are a major force in the marketplace.

Finally, the nature of the claims settlement process provides a complex set of incentives for customers, insurers, and agents. Claims settlement procedures differ according to the incentives associated with the various types of policies. Mayers and Smith (1981) argue that insurers, like other firms, are driven by profit maximization--firms handle claims settlement in a fashion that minimizes costs. Incentives for claims settlement procedures are examined in the various organizational forms.

Conflict and Resolution of Incentive Problems

Jensen and Meckling (1976) provide a framework for the analysis of principal/agent relationships in organizations where there is a separation of ownership and control. They argue that if principals and agents are utility maximizers with divergent objectives, then agents have incentives to deviate from the maximization of their principals' utility. Managers take actions to maximize their own utility that may be inconsistent with the best interests of the principals.² Principals incur costs to monitor agents to ensure that their welfare is considered. Agents incur costs to signal their compliance with the principals' objectives. These costs arise as a result of internal and external audits of activity and of communication of results. The costs of managers' collecting and transmitting data to owners are referred to as *bonding costs*.

In addition to monitoring and bonding costs, there are other costs incurred in separating ownership and management that are referred to as *residual loss*. These costs arise because both parties optimize with respect to monitoring and bonding costs. Principals find it inefficient to monitor agents to the point where agents' actions maximize the welfare of the principals. The difference between the

²This issue is examined by Williamson (1963) under the name of the *expense preference hypothesis*. This hypothesis posits that managers will express a preference for expending funds on goods and services that increase their power, prestige, and income rather than maximizing shareholders' wealth.

realized and optimal value of the welfare of principals represents the residual loss.

Fama and Jensen (1983a) divide the decision making process of organizations into four steps: initiation; ratification; implementation; and monitoring.

Initiation and implementation are the decision management phase for which agents usually have authority, while ratification and monitoring are part of the decision control phase. Agency problems arise as a result of conflicts between decision management and control. Fama and Jensen examine the conditions under which it is optimal either to combine decision management with decision control or to separate these two decision phases. An important concept in this setting is residual risk, defined as "the risk of difference between stochastic inflows of resources and promised payments to agents" (1983a, p. 302.) Payments to agents include salaries, wages, and fringe benefits. Residual claimants bear the residual risk and are involved in the decision control phase.

Some ownership structures combine decision management and control as a device to minimize agency costs. Proprietorships, small partnerships, and closed corporations control agency problems between residual claimants and decision makers through joint appointments of claimants and agents. Wealthy principals who are willing to assume risk and have skills can act both as principals and agents. Agency problems are minimized when principals also act as decision agents. This resolution is not costless, however, as the ability to diffuse risk is restricted. This leads the principals/agents to exhibit risk aversion, which can cause lost opportunities. Unrealized opportunities due to risk aversion and underinvestment cause loss in firm value (Fama and Jensen, 1983a, 1983b).

Large open corporations, large professional partnerships, financial mutuals, and nonprofit organizations separate decision management from decision control to minimize agency problems. The size of these organizations causes them to seek agents with specialized knowledge and skills. Agents use delegated authority to increase the owners' wealth.

Residual claims are rewards for bearing the residual risk of an organization. Common stock, for example, is a residual claim from bearing the residual risk of a corporation. Large firms typically have many owners and are able to diffuse their residual claims broadly. Decision control becomes costly if all the claimants are involved in the control process. The transaction costs involved in such a process are more than the benefits from monitoring and controlling.

The need for funds to finance large scale projects also leads organizations to separate ownership and control. Large projects can require the purchase of organization-specific assets. The acquisition of productive assets can be risky because of illiquidity. This necessitates that capital be obtained from many sources to diffuse risk.

Three factors (specialized knowledge of agents, diffused ownership, and extensive wealth requirement) render it difficult to combine decision management and control in a few agents. Separation of ownership and control becomes efficient under these circumstances. Some common internal mechanisms to control agency problems under separation include decision hierarchies, mutual monitoring systems, and boards of directors.³

Fama and Jensen (1983b) examine the use of alternative ownership structures to control specific agency problems. A major point in Fama and Jensen (1983a, 1983b) and Jensen and Meckling (1976) is the concern for survival of the firm. Fama and Jensen emphasize that "the form of organization that delivers the output demanded by customers at the lowest price, while covering costs, survives" (1983a, p. 302). Fama and Jensen's analysis explains that different forms of organizations can be efficient avenues for survival and control of agency problems. The residual claims of these organizations also differ. The special features of residual claims reflect circumstances in which specific types of organizations can survive.

The residual claims of open corporations are represented by common stock. Some special features of common stock are alienability, nonactive ownership, and permanence. This enables separation of decision management and control. Open corporations are more likely to be successful under circumstances where there is greater need to diffuse risk, to separate risk bearing from decision making, to finance purchases of organization-specific assets, to have a specialized professional management team, and to deliver products at a lower cost based on the market value rule of investment decisions.

The possibility of a takeover is an external method to control agency problems in open corporations. Capital markets develop as a result of the unrestricted nature of the common stock residual claims. These markets function to price residual claims, enable stockholders to transfer these claims at a low cost, and provide the potential for takeovers. Thus, capital markets can act as a mechanism to discipline management. Managers try to minimize agency costs to foster a favorable performance evaluation of themselves and their organizations in the capital markets.

The residual claims of financial mutuals, such as mutual funds and money market mutual funds, are redeemable on demand. The survival of these mutuals

³These issues recently have attracted many researchers. For example, see *Journal of Financial Economics* (1988) for a symposium on the distribution of power among corporate managers, shareholders, and directors. Mayers and Smith (1988b) examine the executive compensation as a control mechanism in the life insurance industry. They investigate, with many other variables, the impact of mutual versus stock ownership on the compensation of executives of the insurance companies.

depends on their liquidity. Therefore, the assets of financial mutuals consist almost entirely of marketable securities. This enables financial mutuals to avoid organization-specific investments that do not have value to other organizations and are difficult to liquidate. Financial mutuals meet the demand of redeemability by liquidating their assets. Easy liquidation at market value and availability of accurate asset indices explain why financial mutuals survive.⁴

Redeemability helps control the agency problems for these organizations. The holders of residual claims can sell their claims at a predetermined price at any time. Residual claimants of financial mutuals may combine their residual claims as a weapon against the management. Thus, the managers of financial mutuals are subject to a threat of takeover action.⁵ Managers are aware of potential takeovers and, therefore, reduce suboptimization.⁶

Agency Costs and Ownership Structure in the Insurance Industry

The Types of Structures

Mayers and Smith (1986) hypothesize that ownership structure in insurance is a function of the nature of principal/agent relationships and the amount of managerial discretion.⁷ Managerial, ownership/risk-bearing, and customer/policyholder functions are common to all ownership structures. Different combinations of these functions can lead to the variety of ownership and cost structures.

⁴Fama and Jensen (1985) also provide casual evidence about the survival of mutuals in specific activities. It is, however, beyond the scope of this paper.

⁵Fama and Jensen (1983a, 1983b, 1985) identify this possibility as a *partial takeover*.

⁶Mayers and Smith (1981, 1988a) analyze this issue in the insurance sector. Their view on the possibility of a partial takeover as a discipline device differs from Fama and Jensen's view. Mayers and Smith argue that partial takeover is almost impossible because there are many more owners/policyholders holding a relatively small portion of residual claims per person in this sector.

⁷The use of organizational form to control agency costs is just one of many interesting agency problems found in the insurance industry. Other agency problems that are addressed in the literature include stockholder/bondholder conflicts (MacMinn, 1987 and Mayers and Smith, 1987) and the effect of multiple layers of coverage on claims settlement (Smith and Witt, 1985 and Venezian and Fields, 1987). Here, however, discussion is limited to conflicts that are addressed commonly through differing organizational forms.

Mayers and Smith (1981, pp. 410 and 425) also emphasize the control function of alternative ownership structures. Ownership structures frequently found in the insurance sector include:

- Common Stock Insurers--This is the most widely observed structure in the insurance industry. In this ownership structure, managerial, ownership/risk-bearing, and customer/policyholder functions are separate, leading to increased efficiency from specialization and increased costs from the separation of management and ownership. Managers can find it in their interest to behave in a way inconsistent with the objectives of the stockholders. The difference in objectives and the fact that managers do not bear the full wealth effects of their decisions bring monitoring problems.⁸ Boards of directors and the threat of a takeover act as control measures to minimize the divergence of managers' decisions from the maximization of the owners wealth.

A second monitoring problem with stock firms is the incentive to transfer wealth from policyholders to stockholders after the policies are sold.⁹ Transactions costs limit the ability of the policyholders to eliminate all wealth transfers, but the practice of policy replacement can control for some of the wealth transfers (Sheel and VanDerhei, 1978).

- Lloyd's Associations--Insurance underwriters organize in associations where each member bears a portion of the risk underwritten. The concept behind such associations is to combine managerial and ownership functions. This can eliminate many of the agency problems stemming from separation of ownership and control.¹⁰ Combining these two functions can result in a reduced ability to specialize and diversify risk. The amount of managerial discretion is highest for members who are manager-owners. A control mechanism for incentive conflicts is monitoring by the members. Membership provisions, relationships with brokers, and legal liability of owners can impact control in these associations.

- Mutual Insurance Companies--Mutuals are examples of consumer cooperatives. Mutual insurers have substantial market power compared to

⁸Fama and Jensen (1983a) identify this as the controversy between decision management and decision control.

⁹This is known as the *asset substitution problem* which is similar in nature to the problems of bondholders in the credit markets. Cummins (1988) provides a discussion of the incentive problems faced by managers after the sale of policies. He argues that flat premium insurance guarantee funds provides further incentive for managers to adopt high risk strategies.

¹⁰The only major insurer organized as a Lloyd's is Lloyd's of London. A few American Lloyd's have been founded, but none has made substantial impact on the market. The failure of American Lloyd's has been blamed on an unwillingness to organize in unlimited liability form.

mutuals in other industries. For example, in 1987 only 2.5 percent of banks were organized as mutuals (*Polk's Bank Directory*, 1989, p. 8). In insurance, the impact of mutuals was much more substantive--property and liability insurance mutuals wrote 31 percent of the premium nationally (*Best's Aggregates and Averages*, 1988, pp. 112 and 114), while mutual life insurers wrote 38.5 percent of the premium nationally (*Life Insurance Fact Book*, 1987, p. 19). Market failure in the insurance industry during the late 1800s and early 1900s was common.¹¹ Given the relatively low level of equity in insurance firms and the amount of investable funds generated by the insurance process, it was relatively easy for the customer/owners to assume control of the troubled insurance firms at the turn of the century.

Customership is an important aspect, as it enables mutuals to produce services and products for a group of long-term customers. This provides a sound basis for firms to cover their costs. If customer/owners do not demand the firm's products, the firm encounters difficulty. This is a way to control insurance firms by affecting their market shares.

In the mutual form, the policyholder function is merged with the ownership function. This structure eliminates the incentive conflicts between owners and policyholders. Policyholders are entitled to the rights and responsibilities of stockholders. The rights of mutual owners, however, usually are restricted more than the rights of common stock owners. (The voting rights of owners can not be accumulated.) This provides managers with substantial discretion in controlling the firm (this point is a major deviation from the Fama and Jensen framework of financial mutuals), as takeover attempts require collective effort, which is difficult to implement under diffused ownership. The inability of mutual insurer policyholders to access contributed capital, unlike mutual funds, is another barrier to takeover attempts. Upon cancellation of a policy, the policyholder usually has no rights to capital (except for cash value in life insurance products).

If the management of a mutual imposes too many costs, realizing the lack of a takeover threat, the value of the firm will not be maximized. Managers could consume perks at the expense of the owner/policyholders and increase the residual loss. (This is contingent upon the product market being less than perfectly competitive).

- Reciprocal Insurance Associations--Reciprocal have many characteristics common to those of mutuals. The owner/risk-bearing function is merged with the customer/policyholder function. There are some differences

¹¹Hansmann (1985) discusses different aspects of market failure, including the impact of governmental investigations of managerial self-dealings, such as New York's Armstrong Commission in 1905, and cartelization.

between the two forms. A mutual is incorporated with a stated amount of capital, while a reciprocal generally is unincorporated with no capital. While mutual policyholders elect a board to manage the entity, reciprocal policyholders appoint an individual or a corporation called an attorney-in-fact to manage operations. There are some reciprocals that initially are organized and financed by corporate attorneys-in-fact. Therefore, the ownership structure of a reciprocal may resemble either a mutual, if appointment occurs, or a stock insurer, if it is initiated by a corporate attorney-in-fact. Agency problems of reciprocals may be similar to those of mutuals or, alternatively, of stocks, depending on the reciprocal's ownership structure. Inability of policyholders to access their reserve funds held by the association causes agency problems in these firms.

Three mechanisms can provide control of agency problems in reciprocals. One is the advisory committee of policyholders. Committee members advise and monitor the attorney-in-fact on behalf of all the members of the association. Second is the policyholders' option to withdraw capital and membership. This creates allocation and resource problems for the attorney-in-fact. The last mechanism is a dissolution of the association by the courts. Recently, it has been much easier for reciprocals to dissolve than for mutuals (Mayers and Smith, 1988a, pp. 28-29).

Recently many reciprocals have modified the form of operation, making them similar in form to mutuals, as the firms accumulate surplus and have limits on assessments. If a reciprocal is organized in this fashion, it behaves, in effect, as a mutual.

Changing Forms: Demutualization

Recently a number of insurers have decided to change their organizational form from mutual to stock.¹² Ernst and Whinney (1984) indicate the primary advantages of demutualization:

- Improved access to capital markets
- Ease of diversification into noninsurance products
- Improved performance incentives to managers
- More favorable tax treatment.

With the exception of tax treatment, these rationales increase managerial discretion.

¹²The authors are not aware of any source that has kept track of changes in organizational form in the insurance industry.

Green and Johnson (1980) surveyed a number of mutual and stock companies to determine the advantages attributed to each form. The results suggest "differences in the patterns of control by the legal owners of stock and mutual insurers" (Greene and Johnson, 1980, p. 170). Advantages of stock companies include ease of operation, greater control by management, and the ability to diversify. Managers of mutuals report that regulatory protection, favorable public opinion, and protection from takeovers are advantages of the mutual form.

Conflicts with Policyholders: The Claims Settlement Process

An important aspect of principal/agent problems in the insurance industry is incentive in the claims settlement process. Moral hazard and adverse selection help explain many claims settlement provisions.¹³ Insurers expect that insureds will misinform them concerning the nature of the loss exposure. Thus, insurers have incentives to monitor policyholders' statements. Deductibles, minimums, and the opinions of third parties are common monitoring devices. In liability insurance, the provision of legal services and upper limits on coverage are common monitoring devices.

Health insurance has additional agency problems due to the role of the physician. The physician is an agent of both the policyholder and the insurer. Physicians may take advantage of their dual role, because their opinion is an important variable in determining the cost of care. One monitoring device used to limit a physician's power is the second opinion. The extra expense of second opinions can be justified in cases where large expenses are likely to be incurred (Mayers and Smith, 1981). Copayments that require the insured to pay a percentage of the claim induce policyholders to monitor the physician. Another monitoring device is a prespecified formula for payment based on observable medical expenses. Group insurance with mandatory participation minimizes the problems due to adverse selection. Some other solutions include frequent contract negotiations to adjust for experience, expenditures to reduce information asymmetry, and waiting periods.

¹³For a discussion of the importance of moral hazard and adverse selection in the insurance markets, see Rothschild and Stiglitz (1976).

Empirical Evidence on Agency Problems and Organizational Form in the Insurance Industry

Several authors have empirically examined agency problems and organizational forms in the insurance industry.¹⁴ Mayers and Smith (1986) inquire whether the managerial discretion hypothesis (MDH) is consistent with geographic concentration, specialization, and lines of business for alternative organizational structures. Fields (1988) examines the expense preference behavior in stock and mutual life insurers. Datta and Garven (1988) investigate the interrelationships of agency costs and ownership structure on the financial structure, marketing channels, and group affiliation in property liability insurance. Lamm-Tennant and Starks (1988) test for the presence of the MDH in property liability insurance by organizational type. Lee (1988) examines the structure of control mechanisms of agency problems in a comparative framework for the mutual and stock insurance companies in the property liability insurance sector.

Mayers and Smith (1981) hypothesize that mutuals and reciprocals should be more geographically concentrated than stock insurers, as greater geographical coverage requires more managerial discretion in setting rates and is more expensive to monitor. Lloyd's associations should be more dispersed geographically depending on managerial discretion, the amount of available resources and regulatory provisions. They posit that mutuals and reciprocals should be more specialized, with fewer lines of insurance than stock companies. This restricts the amount of managerial discretion in these firms and lowers monitoring costs. The limited resources of American Lloyd's render it difficult to weigh the degree of specialization vis-a-vis stock companies. They also hypothesize that mutuals will dominate in lines where management exercises little discretion in setting rates. Lloyd's are at the other end of the spectrum, as a high level of managerial discretion is necessary for managers of these associations in setting rates, depending on changing risks. Reciprocals are similar to mutuals and stock companies and fall between mutuals and Lloyd's associations.

Mayers and Smith conclude that the geographic distribution of mutuals and reciprocals is consistent with MDH, and that these organizations are more

¹⁴Empirical studies of agency problems and organizational structure generally have examined the life and property and liability industries separately. There are numerous interesting issues on the differences across these sectors that have not yet been addressed that would provide interesting opportunities for future study.

concentrated than stock companies.¹⁵ Lloyd's associations also are more concentrated than the stock firms; the difference from stock companies, however, is not significant. Mutuals and stock companies are indistinguishable on the basis of specialization.¹⁶ Reciprocal exhibit more specialization than stock companies, and Lloyd's associations are less specialized than stock companies. Finally, Mayers and Smith provide evidence that mutual and stock companies dominate different lines. The lines of business results for reciprocals support the MDH if these associations are classified between stock and mutual companies with respect to managerial discretion. Thus, reciprocals also dominate certain lines of insurance. The evidence for Lloyd's associations does not support the MDH. Mayers and Smith attribute this to the small number of observations for Lloyd's.

Fields (1988) examines the expense preference hypothesis for stock and mutual life insurers. He argues that in order for this hypothesis to hold, there must be "less than perfectly competitive product markets, stockholder diffusion, and the preferences of management." The model used to represent the relationship between cost and output is a flexible translog function. (See Appendix A for the model specifications.)

Fields concludes that although there are small differences in the type of products sold by organizational form, there is no significant difference in the costs incurred between stock and mutual insurers. The policy implication is that, in the aggregate, the costs incurred (basically monitoring and bonding) due to separation under the stock ownership and the costs incurred (basically residual loss) due to lack of monitoring of manager's behavior under the mutual ownership are not significantly different. For those considering demutualization, it does not appear worthwhile to undertake the costs of conversion from mutual to stock ownership from a cost perspective. This does not imply that there is no reason for demutualization, as cost would affect only one of the four rationales developed by Ernst and Whinney.

Datta and Garven (1988) demonstrate the importance of agency problems and ownership structure by identifying the impact of differences in ownership form on the financial structure of property liability insurers. They examine the

¹⁵Care must be used in the interpretation of Mayers and Smith's results, as the sample used is operating companies rather than fleets. As the legal organization of fleets is often dependent on regulation and lines of business, some conclusions may be a result of the sample.

¹⁶Mayers and Smith (1986) use a Herfindahl index to examine specialization by type of ownership structure. This index obtains a value of one if all business of an insurer is concentrated in one line of insurance. Smaller (higher) values indicate less (more) concentration.

implications of marketing channels (direct writer versus independent agent) and group affiliation on capital structure. They hypothesize that mutuals will be less highly levered than stock insurers; Lloyd's associations will be less highly levered than stock insurers; and the capital structure policies of reciprocal associations will not differ materially from the capital structure of stock insurers (Datta and Garven, 1988, p. 11).

The primary argument Datta and Garven make in favor of variations in leverage by organizational form is the type of compensation contracts offered to executives. Stock firms often provide executives some compensation in the form of stock options providing incentives for increased risk bearing. Datta and Garven argue that the distributional form also affects risk bearing, as the employees of direct writers have exclusive contracts with one firm. This provides an incentive for agents to contract only with a low risk firm, given the contractual requirement that they produce business for one firm.

A multivariate regression model (see Appendix B for model specifications) with firm premium-to-surplus ratio as the dependent variable and with independent variables that measure organizational and control variables as the independent variables is the tool of analysis. The results indicate that although capital structure policies do not differ between mutuals and stocks for direct writers, they do differ in independent agency systems; affiliated mutuals have significantly more leverage than stock companies; the capital structure policies of Lloyd's associations do not appear to be significantly different than the capital structure policies of stock insurers; no significant difference was found between the capital structure policies of reciprocal associations and the capital structure policies of stock companies under independent agency channels; and direct writer reciprocals are more highly levered than stock insurers.

Datta and Garven conclude that "the results generally support the notions that 1) agency costs play an important role in the determination of the capital structure and organizational form of firms, and 2) capital structure policy is best understood in the context of the overall organizational structure of the firm" (Datta and Garven, 1988).

Lamm-Tennant and Starks examine the ownership structure of property liability insurers. They test whether "those lines of business in the property casualty insurance industry which have the most risk are dominated by stock insurance companies." Lamm-Tennant and Starks argue that an appropriate measure of risk for stock and mutual firms is dispersion of the loss ratio.¹⁷

¹⁷Care must be used in interpreting Lamm-Tennant and Starks's paper, as there is no widely accepted measure of risk for all applications. The variability in combined ratios can differ across lines due to movements in interest rates if some lines (long tailed lines) are more sensitive to changes in rates than others.

They point out that, "the distribution of this ratio is an ex-post measure of the underwriting risk by line of business. Further, the risk of a line's loss ratio can be related to the firms as a measure of the systematic or undiversifiable risk of underwriting" (Lamm-Tennant and Starks, 1988).

There are two types of analysis in this research. First, Lamm-Tennant and Starks focus on risk across lines of business. Second, they examine risk behavior across firms in the sample. The examination across lines is based on the standard deviations of loss ratios. The results indicate that surety, credit, other liability, medical malpractice, glass, and international are the riskiest lines. Lamm-Tennant and Starks find that stock insurers generally write more premiums than mutual insurers and have much higher systematic risk in allied lines, homeowners' multiple peril, credit accident and health, other accident and health, and miscellaneous lines.¹⁸ Mutuals have higher systematic risk in farmowners' multiple peril, group accident and health, automobile physical damage, surety, and boiler and machinery lines. Stock firms write more business in lines that have the larger total risk than mutuals. Finally, Lamm-Tennant and Starks find that although stock companies have more concentration in inland marine, medical malpractice, earthquake, workers' compensation, other liability, fidelity, and surety; mutual companies have more concentration in farmowners' multiple peril, homeowners' multiple peril, auto liability, and auto physical damage. Lamm-Tennant and Starks conclude that the evidence across lines of business with regard to risk bearing by stocks or mutuals is mixed. As a result, they do not obtain conclusive evidence about the existence of MDH.

Lamm-Tennant and Starks's analysis across firms in the sample employs risk measures that are firm-specific. The major finding is that there is a significant relationship between total risk and organization type. Lamm-Tennant and Starks state that this relationship indicates that stock insurers assume more total risk than mutual insurers. Lamm-Tennant and Starks employ a variance ratio¹⁹ that indicates how much risk is diversified away by investing across different lines of business to test the relationship between risk and organization type. The regression results indicate that stock firms diversify away more risk and have more total risk than do mutual firms. (See Appendix C for model specification.) Lamm-Tennant and Starks conclude that although their evidence with respect to total risk supports the MDH, the evidence about systematic risk is inconclusive.

¹⁸Systematic risk across lines of insurance is the risk that a line has in common with all other lines.

¹⁹Variance ratio is the sum of the variances of the individual line loss ratios divided by the variance of the firm's total ratio.

Lee (1988) identifies sources of conflict and control mechanisms for stock and mutual property liability insurers. There are three relevant hypotheses in this research. The role of the board of directors in mutuals is examined as a device to monitor the behavior of the managers. The board can occupy a significant role, as the diffused ownership of mutuals makes a takeover almost impossible. Thus, his first hypothesis states that mutual insurers will have more outside board members to monitor and control managerial discretion.²⁰ The second hypothesis posits that where board members of mutuals are more responsible in decision making rather than monitoring, the managers of mutuals will consume more perquisites. The final hypothesis examines managerial compensation and manipulation of loss reserves. Lee states that stock insurer managers' compensation package usually include stock incentives. Thus, stock firms' managers have incentives to underreserve in the short run. Mutual managers are not compensated in the form of stock options. Thus, managers have incentives to keep loss reserves high as a protection against unanticipated events. Lee (1988) posits that "the mutual insurer is likely to show less income smoothing through the manipulation of loss reserves than the stock insurer."

A difference in means test reveals that there are significantly more outside board members for mutual firms. Expense preference behavior of stock and mutual insurers is compared using a modified version of the econometric model developed by Edwards (1977). This indicates that mutual managers exhibit more expense-preference behavior than stock managers. (See Appendix D for the details of the model.) The evidence supports the view that although outside members dominate the boards of mutuals, they do not monitor managerial discretion. This contradicts Lee's (1988) first finding that "if the board of directors is indeed a substitute for the market for corporate control in checking managerial discretion, then less expense-preference behavior should be observed as the board becomes more independent."

In his final hypothesis, Lee extends the work of Weiss (1985). He points out that exogenous factors, such as interest rates and unanticipated inflation, and the endogenous factor of income smoothing activity by insurers impact firms' loss-reserving errors.²¹ The findings indicate that manipulation of loss reserves stabilizes underwriting results; stock insurers have more tendency to underreserve than mutuals; higher interest rates and inflation rates lead both stock and mutual

²⁰This also is known as the *substitute hypothesis*. See Brickley and James (1987).

²¹Loss reserve error is defined as $\{[(\text{originally reported incurred losses at the end of year } t) - (\text{losses as actually developed at the end of year } (t + 4))]\} / [(\text{originally reported incurred losses at the end of year } t)] * 100$. This measure is a proxy to approximate the loss-reserving pattern.

insurers to underreserve; and regulation has little impact on the valuation of loss reserves of sample insurers.

Summary and Discussion

The literature on contracting and agency costs as developed by Jensen and Meckling (1976), Fama and Jensen (1983a, 1983b, 1985), and Mayers and Smith (1986) is useful in understanding the number of organizational forms and other devices used to control agency costs in the insurance industry. The insurance industry is a good laboratory for examining the existence and resolution of agency conflicts because of the long-term nature of contracts, the possibility of moral hazard between insurers, insureds, and insurance representatives (brokers/agents), as well as the incentives that agents have to maximize their own utility at the expense of principals. Because of numerous incentive conflicts that exist in insurance, many different types of organizations have been formed to minimize the costs associated with contracting. Organizational forms commonly found in the insurance industry include common stock, mutual, reciprocals, and Lloyd's as well as combinations of the four basic forms. The variety in organizational types across the industry is a reflection of the wide variety of agency problems and the attempt to minimize the costs of dealing with the problems.

Several empirical pieces have focused on various aspects of the agency costs and conflict resolution in insurance; areas that have been investigated include:

- Expense preference behavior of managers across mutual and stock insurers;
- Survival of different organizational forms and their concentration in specific lines of insurance;
- Specialization by line of insurance;
- Effect of organizational form on the capital structure policy;
- Geographic concentration by organizational form;
- Internal monitoring mechanisms.

Fields (1988) and Lee (1988) test for expense preference behavior by managers of mutual and stock firms. The findings from these studies are contradictory. Fields finds no evidence of significant cost differences between stock and mutual life insurers. Lee examines the property liability insurers and reports that mutual managers tend to exhibit expense preference behavior. It is interesting to note the difference in perspective between these two works. Fields studies the effect of organizational form on the total cost. Lee investigates jointly the effect of board composition and organizational form on executive wages. Thus, although both authors purport to examine the same issue, the

nature of the investigations differs substantially. Thus it is unclear whether any strong statement concerning expense control and organizational form can be made based upon the current literature.

The findings in Fields' work is consistent with Fama and Jensen (1983a, 1983b, 1985), who point out that organizational forms survive if they can minimize costs to deliver the output demanded efficiently. Given that stock and mutual companies survive and compete in the same markets, it is not unexpected that one would find no significant difference in total costs for mutual and stock life insurance companies.

Mayers and Smith (1988b), examining the differences in discretion required for individual lines, hypothesize that mutuals should be more prevalent in lines of insurance where management exercises little discretion in setting and adjusting rates while stock firms should dominate lines where managers exercise more discretion on risk bearing. Mayers and Smith test this proposition and provide evidence consistent with their MDH for mutual and stock insurers in property and liability lines. Lamm-Tennant and Starks (1988) also examine this issue and find that stock insurers accept more total risk and diversify it away more than mutual insurers. Thus it appears that these studies are consistent with regard to the domination of stock companies in activities that require substantial risk bearing.

Mayers and Smith (1986) argue that the managerial discretion hypothesis suggests that mutual insurers should be more specialized than stock insurers. Studies by Mayers and Smith (1986), Lamm-Tennant and Starks (1988), and Fields (1988) do not support this hypothesis. Mayers and Smith and Lamm-Tennant and Starks directly test this hypothesis using specialization as their maintained hypothesis. Fields observes the same evidence to demonstrate that the product mix of stock and the product mix of mutual insurers were similar for his sample period. It is interesting to note that the same conclusion is found across different insurance markets. This indicates that mutuals survive and compete with stock insurers across many lines. Thus, it can be concluded that both types of firms can exist in the same markets as long as they can control costs incurred efficiently and there is some prevalence by organizational type and lines, depending on the ability of the different organizational forms to diversify risk.

Jensen and Meckling (1976) point out that agency problems affect the bankruptcy costs and, therefore, may lead to a U-shaped cost of capital curve for firms. This agency-theoretic explanation provides a reconciliation to the Modigliani and Miller (1958) irrelevancy proposition. Datta and Garven (1988) employ an agency-theoretic approach to examine capital structure policies across organizational types in property liability insurance. They obtain empirical findings that agency problems and organizational form have an important

influence on the capital structure policies of the insurance firms. This research is an important step to motivate further research on capital structure and cost of capital issues in the insurance sector.

Mayers and Smith (1986) test the relationship between geographical concentration and organizational form. The MDH predicts that mutual and reciprocal insurers should be more concentrated than stock insurers, while Lloyd's associations may have more geographical concentration than stock insurers depending on their resource level. Mayers and Smith obtain evidence consistent with their hypothesis for mutual and reciprocal firms. Evidence for Lloyd's associations is not consistent with the hypothesis, but the sample size is small for Lloyd's associations.

Lee (1988) examines the importance of internal monitoring mechanisms. He tests the hypotheses that the mutual insurers will have more outside board members than the stock insurers and that the managers of stock firms tend to understate loss reserves to increase their compensation through stock ownership. Lee finds evidence consistent with each of these hypotheses, making it clear that the differences in the types of monitoring devices and incentives are substantial across organizational forms.

Most of these studies examine a specific insurance subsector, usually dividing the insurance industry into the property and liability lines and the life and health insurance field. It appears that the results are not always consistent across subsectors. Perhaps product and market-specific factors in each subsector contribute to different attitudes in expense behavior, managerial discretion, and risk taking. Currently no literature exists that compares incentives across the life and health and property and casualty dichotomy. This is an area that requires further research, as many major financial service companies do business in both sectors.

The empirical research basically confirms the theoretical work of Jensen and Meckling, Fama and Jensen, and Mayers and Smith. Although some of the tests of individual hypotheses may not agree with the theory, the existing evidence is that the incentives and control devices used by firms are complex and require substantially different organizational forms to deal with their environments. This evidence is of substantial importance to managers who must determine the most efficient method for meeting their goals. Given the new interest in changing organizational forms and using subsidiaries of different forms for specific purposes, it is clear that the choice of organizational form is more than a historical footnote.

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Appendix A

Fields (1988) employs a semilog form of the flexible translog function of the following form:

$$\ln C = \alpha_0 + \sum_i \beta_{1i} P_i(\lambda) + \sum_i \beta_{2i} I_i(\lambda) + 1/2 \sum_i \sum_j \beta_{3ij} P_i(\lambda) P_j(\lambda) + 1/2 \sum_i \sum_j \beta_{4ij} I_i(\lambda) I_j(\lambda) + \sum_i \beta_{5i} P_i(\lambda) I_i(\lambda) + \sum_i \beta_{6i} Z_i(\lambda) + \beta_7 M$$

where the data for these variables are scaled by the sample means except for M which is a dummy variable. The variables are defined as follows:

- C = cost;
- P = number of policies written in a line;
- I = number of policies in force in a line;
- Z = product mix variables; and
- M = stock/mutual dummy.

Appendix B

Datta and Garven (1988) regress premium-to-surplus ratio for firm k on five different classes of independent variables. These are variables for 1) dividend policy, 2) investment policy, 3) underwriting policy, 4) organizational form (dummy), and 5) interaction (dummy). The regression equation has the following form:

$$(P/S)_k = \beta_0 + \sum_i \beta_i X_{ik} + \sum_j \alpha_j Y_{jk} + e_k$$

where

- (P/S) = premium-to-surplus ratio for firm k;
- X = independent variables of classes 1, 2, and 3;
- Y = independent variables of classes 4 and 5.

Appendix C

Lamm-Tennant and Starks (1988) develop a set of logistic regressions of the form:

$$\log [p_i/(1-p_i)] = \delta_0 + \delta_1 \text{ Size} + \delta_2 \text{ Risk} + e_i$$

where

- p_i = probability that the organizational form is the mutual form;
- size = relative size of the company in relation to all companies in the sample;
- risk = the firm's risk measure, either variance ratio or total risk; and
- e_i = an error term.

This is a qualitative choice model. The dependent variable is organizational type and the independent variables are size and the risk measures.

Appendix D

Lee (1988) identifies two equations to test the impact of i) ownership structure and ii) the board composition on expense preference behavior:

$$(1) \ln \text{Wage} = b_0 + b_1 \ln \text{ASSET} + b_2 \text{AFF} + b_3 \text{MS} + b_4 \text{MKTG}$$

$$(2) \ln \text{Wage} = b_0 + b_1 \ln \text{ASSET} + b_2 \text{AFF} + b_3 \text{MS} + b_4 \text{DR} \cdot \text{MS} + b_5 \text{MKTG}$$

where

- $\ln \text{Wage}$ = natural logarithm of the salary
- AFF = a dummy variable to indicate whether an insurer is independent (if yes, 1; if no, 0)
- $\ln \text{ASSET}$ = natural log of asset size
- MS = a dummy variable; 1 for mutuals, 0 for stock firms
- MKTG = a dummy variable; 1 if an insurer is direct writer, 0 otherwise
- DR = a dummy variable, 1 if the ratio of outsiders to total number of directors is greater than or equal to 2/3, 0 otherwise.