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Contractual Provisions, Organizational Structure, and Conflict Control in Insurance Markets

I. Introduction and Summary

Insurance contracts separate asset control from risk bearing, with payoffs contingent on designated events. When the probability of events depends on the behavior of the insured, incentive conflicts arise. Insurance contracts contain complex provisions specifying exclusions, insurability requirements, and settlement procedures to handle these problems. The structure of the insurance industry is also complex. Standard health insurance plans and prepaid group practices coexist, as do Lloyd's Associations, stock and mutual insurance firms. Furthermore, for many risks both group and individual policies are available. There is no theory of insurance contracting which simultaneously explains the forms of existing contracts and the structure of the industry.

In this paper, we analyze the control of incentive conflicts provided by various contractual provisions and organizational structures; we provide a foundation for a positive theory of in-

We provide a foundation for a positive theory of insurance contracting with examples of its testable predictions. We argue that incentive conflicts arise when discretionary action is authorized and that contractual provisions and organizational structures control sources of conflict within the insurance market. Our emphasis differs from much of the previous insurance analysis. We focus on the implications of cost differences across insurance lines in the contracting/control technology. Our analysis yields testable implications about the distribution and contractual provisions (such as upper limits, deductibles, and co-insurance) and organizational structures (such as Lloyd's Associations, mutuals, and stocks) across lines of insurance.

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surance contracting.¹ The approach, based on price theory, assumes that people interact in open, competitive markets,² form rational expectations, seek to increase their own expected utilities, and are innovative in doing so. Our analysis yields testable implications. We focus on how contracting incentives vary systematically across lines of insurance and how observed institutions vary in response.

Contractual Control of Incentive Conflicts

Whenever cooperative action is required and utility-maximizing individuals are faced with alternative activity choices, incentive conflicts exist. For example, in the insurance market, individual policyholders must decide such things as how fast to drive and whether to have surgery in the outpatient clinic, while the insurance firm must decide on investment and dividend policies.

While there is little disagreement that incentive conflicts exist, there is disagreement about the effectiveness of the technology for conflict control. With frictionless markets (e.g., Coase 1960), incentive conflicts are assumed costlessly controlled: Contracts can be costlessly negotiated, administered, and enforced to control the incentive conflict by restricting individuals' and firms' opportunity sets to a single point. Furthermore, with no transaction costs the set of available securities spans the relevant state space. Hence the packaging of securities is irrelevant; individuals can always achieve their desired consumption patterns by purchasing the appropriate combination of securities. Thus there is no demand that provides for a resource-consuming insurance industry, even though uncertain future consumption opportunities and risk-averse consumers are explicitly assumed.³

1. A *positive theory* is an internally consistent, interrelated set of hypotheses. These hypotheses must be subject to refutation through formal tests. The confirmation of the theory in the case of insurance would allow prediction of the effects on the industry of any substantive change.

2. We maintain our assumption of effective competition within the insurance industry throughout our analysis. There are some who would disagree with this assumption; e.g., Rothschild and Stiglitz (1976, p. 648) state, "The market on which we focused most of our analysis, that for insurance, is probably not competitive. . . ." Rothschild and Stiglitz offer no basis for their assertion. Although a large number of firms within an industry is not necessarily synonymous with competition, nevertheless, according to the Institute of Life Insurance (1976), in 1974 in the United States there were 1,780 life insurance firms alone. However, if we couple this with evidence of low barriers to entry (e.g., there were 74 new entrants in 1974 with the annual number of new life insurance firms over the previous 20 years ranging between 50 and 216) and a lack of evidence of marginal firms earning rents (e.g., in 1974, 73 firms exited the industry with the annual number of exiting firms over the previous 20 years ranging between 26 and 86) the case for effective competition becomes somewhat stronger.

3. See Benston and Smith (1976) and Barzel (1977). With zero contracting costs, pricing is the only aspect of the contract that is determined: The price must offer an expected return equal to that of other assets of the same risk (see Fama and Miller 1972; Fairly 1979; and Hill 1979).

We assume that incentive conflicts are not costlessly controlled.⁴ In general, positive negotiation, information, administration, and litigation costs imply that optimal contracts will provide less than complete control of real activity choices. With competitive and informationally efficient financial markets, unbiased estimates of the total contracting costs (both out-of-pocket and opportunity costs) will be reflected in the prices of securities when sold.⁵ Thus incentives exist to structure contracts and institutions to reduce these costs: Insurance contracts and the structure of insurance institutions are the result of a costly contracting process.

Ultimately, the insurance market exists because it facilitates the reduction in variability of consumption opportunities. One cost of maintaining this market is that of contractually controlling the conflict between insurer and policyholder. As long as the contracting technology does not allow for control of this conflict at zero cost, the contracting costs must be incurred in order to make insurance feasible.

Moral hazard and adverse selection. The alteration of activities in response to changed incentives after the purchase of insurance is referred to as the *moral hazard problem*. Moral hazard occurs as long as contractual guarantees of an individual's future actions are expensive.⁶ Thus even with zero information costs (in the sense that the

4. In the finance literature, several mechanisms have been discussed which could provide complete control of the activities of the firm with no real resource expenditure (see Smith and Warner [1979] for a summary of the suggested mechanisms). Fama (1980) and Telser (1980) indicate that in a multiperiod setting, incentive conflicts are generally controlled at lower cost. At each point, the parties compare the benefits of opportunistic behavior with the present value of the expected costs. With a longer horizon, contracting costs are smaller because of (1) higher opportunity cost from loss of future rents if the existing contract is cancelled and (2) potential penalties imposed through adjustment of contractual provisions in subsequent contracts. We do not question the fact that these are important mechanisms for controlling incentive conflicts. However, that they are sufficient to provide complete control has yet to be demonstrated.

5. Jensen and Meckling (1976) in analyzing the contracting process define an *agency relationship* as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent." They decompose the contracting (or agency) costs into three components: (1) monitoring expenditures by the principal, (2) bonding expenditures by the agent, and (3) the residual loss. Monitoring is the principal's attempt to control and assess the agent's behavior. Bonding is a form of guarantee made by the agent that he will not harm the principal's interest, or that he will indemnify the principal. The residual loss is the opportunity cost to the principal from the agent's actions which differ from the decisions which would have been made by the principal in the absence of contracting costs. For a number of contractual relationships within the insurance market, there is no clear-cut principal-agent distinction. With loss of distinction between principal and agent, the distinction between monitoring and bonding costs is also lost. Thus total contracting costs are out-of-pocket costs plus the opportunity costs or residual loss.

6. In this framework, the moral hazard problem is just a special case of a positive residual loss.

insurer can perfectly anticipate the policyholder's action, given his contractually restricted opportunity set), moral hazard occurs. Adverse selection refers to the tendency for those who are the worst risks to purchase insurance.

Insurance firms recognize that policyholders' incentives change when insurance is purchased; premiums reflect rational forecasts of the contracting costs. The insured recognizes that the insurance company anticipates that he will act in his own self-interest given his contractually restricted opportunity set. Hence the insured has incentives to negotiate for policy provisions that provide for the acquisition of additional information, restrict coverage, permit monitoring, or require bonding. Therefore, given the contracting technology and effective competition among insurance firms, private incentives exist for the equilibrium insurance contract to maximize the policyholders' expected utility while providing the insurance services at minimum cost.

On Methodology

Examining observed institutional arrangements within the insurance industry leads us to suggest that they are predictable mechanisms to control conflicts arising from various relationships within the contracting process. It seems reasonable to assume that the observed institutions have not arisen merely by chance or by arbitrary forces; rather, they have survived and take their current form because they represent a contractual solution which is efficient from the standpoint of all contracting parties.⁷ As Alchian (1950) indicates, "Success (survival) accompanies relative superiority" (p. 213), and "Wherever successful enterprises are observed, the elements common to those observed successes will be associated with success and copied by others in their pursuit of profits or success" (p. 218). That the provisions we discuss are widely observed suggests that they represent efficient solutions to the contractual problems in this market.⁸

Miller (1977, p. 273) indicates an important constraint on our acceptance of the potential evidence: "The most that we can safely assert about the evolutionary process underlying market equilibrium is that harmful heuristics, like harmful mutations in nature, will die out. Neutral mutations that serve no function, but do no harm, can persist indefinitely." Thus, in addition to observing widespread use of particular contractual arrangements, we must also demonstrate that they are costly. Costly contractual forms that are successfully employed

7. See Alchian (1950) and Stigler (1958) for a discussion of the survivorship principle.

8. Klein, Crawford, and Alchian (1978) call this "suggestive evidence." They indicate that it is impossible to demonstrate *explicitly* that observed provisions are minimum-cost solutions to conflict problems. All possible alternative contractual forms cannot be enumerated, nor can the costs of each be reliably quantified. Nevertheless the survivorship principal suggests that these observed contracts represent important data.

cannot be neutral mutations; they must confer benefits to justify their use. We go further, indicating how observed institutions vary across lines of insurance in response to systematic variation in costs.

On regulation. Our analysis assumes an unregulated market. Although regulation of the insurance industry is a pervasive fact, for the economy regulation is endogenous.⁹ An observation of favorable regulation cannot "explain" an institution but simply raises the next logical question: Why does the regulation favor that institutional form? Parties to the contract in the absence of regulation are still relevant parties when regulation is included. Understanding the incentive problems faced by agents in an unregulated market offers insights into the form of regulation that will be demanded when politicians and regulators are added. Though we do not provide a theory of insurance regulation, we believe that the issues presented are an important first step in its development.

But without a theory of regulation we are faced with potential identification problems in testing the implications of our analysis. To the extent that regulation (especially in the form of tax provisions) favors a particular institutional form, observed use represents correspondingly weaker evidence for incentive contracting hypotheses. Alternatively, to the extent that unfavorable regulation discourages the use of a particular form, observed use provides stronger evidence for the hypothesis. We footnote important regulatory/tax provisions which affect the observed use of particular forms as each is analyzed.

Overview of the Paper

In Section II we identify predictable contractual responses to various incentive conflict problems. Various procedures for monitoring and settling claims including deductibles, minimums, upper limits on coverage, and coinsurance provisions are interpreted as contractual provisions to control the incentives faced by the insured.

In Section III we examine differences in the contracting costs among various lines of insurance and generate hypotheses explaining the observed incidence of group versus individual policies. We indicate that adverse selection is neither a necessary nor a sufficient condition for grouping.

In Section IV the structure of the firms in the insurance industry is examined. We first investigate the determinants of the distribution of ownership structures across insurance firms. We find that conflicts of interest between policyholders and stockholders as well as between

9. See Stigler (1971), Posner (1974), and Peltzman (1976). Within this framework, the only exogenous parameters are individual's preferences and opportunity sets (including contracting technology and the cost of forming coalitions). The structure of contracts and the forms of institutions, both public and private, are endogenous.

owners and managers can be controlled through the choice of ownership structure. The sources of cost advantages for stock firms, mutual firms, and direct underwriters (such as Lloyd's) are suggested. We then examine the asset structure of insurance firms, noting that incentive conflicts provide a motivation for matching maturities of assets and liabilities as well as a motivation to use reinsurance mechanisms.

In Section V we present our conclusions and indicate areas for further development of a positive theory of insurance.

II. An Analysis of Claim Settlement Provisions

Policyholders have incentives to "cheat" in submitting claims under an insurance policy, and the insurer has an associated incentive to monitor. Monitoring a claim involves verifying the incidence as well as the amount of the loss and determining the payment to the policyholder. Various ways of verifying the incidence and loss amount are available. Effective competition among insurance firms assures that the monitoring procedures employed will be provided in the least costly form.

The Structure of Contracts and Premiums

Effective competition within the insurance industry limits the divergence between the premium and the capital market's valuation of the liability incurred by the firm in the sale of policies. The difference must be such that the marginal firm in the industry earns a normal rate of return on the resources employed.

If the insurance market operated like the corporate bond market in that individual demanders of insurance wrote contracts specifying coverage, brought them to the market, and paid a firm to provide that coverage, it would not matter to the insurance firm what provisions the contracts contained. The required premium would adjust to yield a normal competitive return. The owners of the insurance firm would be compensated for any market risk and for the costs borne in negotiating the contract, monitoring the behavior of the insured, and settling any claims. The implications are significant: If, given the set of policies, firms earn a normal rate of return on insurance written, then the specific provisions which are included in the contracts must be for the benefit of the insured. Premiums charged for insurance policies with less effective monitoring devices will reflect the anticipated overstatement of loss, giving policyholders incentives to negotiate for more accurate, though more expensive, claims monitoring procedures. Thus provisions such as deductibles and exclusion clauses are included in the insurance contract at the demand of the policyholders. But since the insurance firms supply the contracts, they are not indifferent to the

provisions included. Effective competition in the insurance market places a maximum on the cost (both premium cost and cost of contract compliance) which can be imposed on the policyholder.

Standard contracts. Insurance is generally sold with standard provisions. This standardization reduces litigation costs; since standardized provisions are likely to have been interpreted by the courts, interpretation will be less apt to involve expensive court procedures. Within the set of standard insurance contracts not every risk is covered. However, competition among insurers implies that given the existing set of standard policies, no new policy type can be offered for which the premium the policyholders would be willing to pay is enough to cover the costs of writing, administering, and enforcing the contract.¹⁰

Claims Settlement for Property Insurance

Deductibles and minimums. Property-related adverse events are often characterized by heterogeneity in the size of losses with a preponderance of small losses. The administrative costs of monitoring and processing claims could make the required premium greater than the value of the insurance if all losses were covered. Deductibles and minimums¹¹ are effective devices to reduce these monitoring costs. They will be used more frequently the higher the fixed component of administrative costs to monitor and process a claim and the more heterogeneous the size of potential claims under a given policy.¹²

Low deductibles/minimums allow more claims of smaller average size. Thus a higher premium is required to compensate for both the greater total value of claims and the larger expected administrative costs. Typically an insurance firm offers a schedule of deductibles with associated premiums. Competition among insurance companies will insure that the insurance firm earns only a normal rate of return on the marginal policy of each type.

Arrow (1963, p. 969) demonstrates that the demand price for a policy with a given expected payoff is higher with a deductible than for any other schedule of payments. Arrow restricts his analysis of the cost structure on the supply side to the case where the premium depends

10. Our argument does not imply that customized contracts cannot be purchased, only that their premium will reflect their additional costs. Some insurance companies specialize in nonstandard insurance contracts; e.g., Lloyd's of London negotiates customized contracts.

11. Deductibles pay zero for losses below the deductible and the loss minus the deductible above. Minimums pay zero for losses below the minimum and the full loss above. Disappearing deductibles pay zero for losses below the deductible and the lesser of a specified multiple of the loss minus deductible or the full loss.

12. Provisions in the tax code provide incentives for individuals to choose high deductibles/minimums. Although property insurance premiums are not tax deductible, uninsured casualty losses in excess of \$100 are. Thus an individual's expected tax liability is lower with deductibles/minimums above \$100.

only on the expected payoff to the policy.¹³ But with positive administrative costs the only case where the premium will be a function of the expected payoff alone is where administrative expenses are proportional to the payoffs. If administrative expenses exhibit economies of scale, then for a value-maximizing insurance firm, the supply price for a policy containing a minimum is lower than for any other schedule of payments (see Huberman, Mayers, and Smith 1980). The choice of deductibles versus minimums also establishes incentives to misrepresent claims; stating a deductible amount rather than specifying a minimum claim lowers the incentive to represent the magnitude of a claim fraudulently.¹⁴ Furthermore, a deductible provides a stronger incentive for hazard reduction since losses above a minimum are fully compensated.¹⁵

Thus our analysis implies that deductibles rather than minimums are more likely (1) the smaller the fixed cost and the smaller the economies of scale in claims administration, (2) the greater the expense in claim verification, and (3) the greater the opportunity for hazard reduction.¹⁶

Ex post versus ex ante valuation. A possible mechanism for loss determination in property insurance is for the insured and the insurer to agree to accept a third party's opinion of the loss. If close substitutes for the insured property are regularly traded, a third-party opinion will be relatively inexpensive to obtain. For example, automobile insurance fits this category. If an insured automobile is "totaled" in an accident, the loss is readily determinable;¹⁷ claims for less than a complete loss

13. Raviv (1979) extends Arrow's analysis but focuses on convex cost structures.

14. E.g., with a \$50 deductible the potential gain from misrepresenting a \$45 claim as \$55 is \$5.00, while the gain is \$55 in the case of the minimum. The expected gain would be less since both figures would have to be adjusted for the probability of detection. This probability would be larger with the minimum because of the higher payoff to the insurance firm from increased monitoring expenditures.

15. Pashigan, Schkade, and Menefee (1966) and Gould (1969) examine the observed schedule of deductibles and associated premiums for consistency with the expected utility hypothesis. They report that the observed reduction in premium for a given increase in deductible is greater than would be expected for some classes of utility functions (quadratic and logarithmic). Both papers take the distribution of losses to be exogenous. Since with larger deductibles, the incentives for hazard reduction are greater (see also Holmstrom 1979), the premium falls both because (1) conditional on the loss, the insurance company's indemnity is less, and (2) the probability of a given loss is less because of increased hazard reduction.

16. The only widespread use of minimums occurs in marine insurance (where they are referred to as "franchise deductibles"). In this case, the monitoring costs appear low because the product valuation is included in the bill of lading and the ability of the policyholder to undertake loss prevention measures is small.

17. Insurance policies specify that an individual cannot collect more than his actual loss. A policyholder who overinsures is to be indemnified only for the actual amount of the loss even if the loss is total. Furthermore, clauses are included specifying that all policies covering the same risk share pro rata in the loss. These provisions control the incentive to overinsure an asset, either with one insurer or through multiple policies with different insurers. In the absence of such provisions, the incentive to produce insured losses is obvious.

are monitored by requiring multiple estimates of the repair cost or by the use of a claims adjuster who negotiates the cost of repairs. (These procedures appear to be designed to raise the cost of bribery to the insured; the claims adjuster, e.g., is frequently employed by the insurer.)

With unique property, such as art, jewelry, and antiques, the third-party valuation often occurs *ex ante* through appraisal by independent appraisers with premiums based on the established value. Even though these appraisal fees are sometimes dramatically lower than *ex post* value determination, *ex post* settlement procedures still can be efficient for insurance against low-probability events. *Ex post* loss determination is only required for those cases in which the insured event occurs, whereas *ex ante* appraisal is required for all cases.

Claims Settlement Procedures for Liability Insurance

The provision of legal services. Liability insurance contracts specify payments related to the *ex post* value of the loss, limited to a prescribed amount. Consequently, the policyholder typically has little incentive to engage quality legal services as long as the suit is less than the maximum payment under the policy, while the insurer does have such incentive. If the insurer directly retains the attorney, the conflict between insurer and policyholder concerning the correct investment in legal services is reduced.¹⁸ Thus monitoring takes the form of providing legal representation in a suit.¹⁹

Upper limits on coverage. Contrary to Arrow's (1963) demonstration that optimal insurance policies written by risk-neutral insurers will provide 100% coverage for all claims in excess of a fixed dollar limit, liability insurance contracts regularly specify an upper limit on coverage. Arrow's proof implicitly assumes unlimited liability for all claims by the insured. In fact, bankruptcy statutes explicitly provide limited liability to individuals. Thus, when considering an increase in the maximum coverage, the insured must weigh the value of the increased premium against the reduction in the probability of a claim in excess of the higher policy limit and the associated reduction in the probability of bankruptcy.²⁰ If liability claims are not independent of the individual's

18. This is similar to the reduction in conflict between insurer and physician in prepaid group health practice plans (see below).

19. In general, the insurer has the final say whether an out-of-court settlement is made or the case is defended in court. However, in cases where the professional competency of the insured is involved, the contract provisions are different; e.g., medical malpractice liability insurance contracts provide that out-of-court settlements cannot be made without the consent of the insured. This reduces the conflict between insurer and insured on the appropriate investment in legal services, since the future income of the insured is a function of the outcome of the case.

20. Thus more liberal provisions in the bankruptcy statutes should reduce the demand for insurance (see Huberman et al. 1980).

insurance coverage, the problem is exacerbated. For example, if an individual with a \$1 million limitation on his liability insurance coverage is more likely to be successfully sued for \$1 million than an individual with a \$500,000 limit, then the equilibrium premium necessary to compensate the insurance firm is higher.²¹

Claims Settlement Provisions for Health and Life Insurance

Prespecified formula of observable expenses. Medical expenses, lost wages, pain and other inconveniences (e.g., cancellation of a golf game) are often associated with insured events. Incurred medical expenses and lost wages are relatively cheap to monitor, whereas pain and suffering and lost leisure are not. Health insurance policies typically specify a formula for payment based on observable expenses. They do not compensate for pain and suffering and lost leisure; these losses are too costly to value.

A very simple formula is employed when the loss of a life or limb is insured: the contract prespecifies an agreed award. Although the value of a life is not directly observable, estimates can be obtained, but they are costly. (The cost of estimating values for these assets can be assessed by considering the expense involved in litigating liability claims involving bodily injury or death.) The premiums for contracts relating payment to ex post valuation would reflect the anticipated costly litigation process. Thus contracting costs are lowered by prespecified awards for indicated losses when the insured asset is a life or limb.

Note that writing contracts with prespecified awards does not remove the requirement that the insurer estimate the value of the non-marketable asset. If the insured value of the asset is greater than the value of the asset to the insured, the incentive problem becomes crucial. For example, the *Wall Street Journal* reports "the macabre case of 'Nub City,' a small Florida town that insurance investigators decline to identify by its real name because of continuing disputes over claims." It explains that "over 50 people in the town have suffered 'accidents' involving the loss of various organs and appendages, and claims of up to \$300,000 have been paid out by insurers. Their investigators are positive that the maimings are self-inflicted; many witnesses

21. Contrast our explanation of upper limits on coverage with that of Raviv (1979, p. 91). Raviv argues that "insurance companies are frequently regulated and therefore operate subject to a regulatory constraint. . . . The insurer is required to sell a policy with a prescribed actuarial value, for any given premium. This actuarial value might be smaller than the expected monetary loss, and then the policy cannot fully cover all potential losses. Being risk averse, the insurer prefers to allocate this given policy actuarial value to full coverage of small losses and limited coverage of large losses, rather than any other feasible form of this coverage." Rather than explain these provisions in terms of "preferences" of insurers, our explanation depends on demand-side alternatives of policyholders. Note also that while our explanation of upper limits on coverage predicts variability in coverage limits across policies, Raviv's does not.

to the 'accidents' are prior claimants or relatives of victims, and one investigator notes that 'somehow they always shoot off the parts they seem to need least' (Lancaster 1974). But with prior negotiation of the payment, the estimate need only determine if the asset is overinsured so that the individual would then be better off by "accidental" dismemberment. These estimates of value are very difficult to make since the appropriate valuation for such decisions is that by the insured individual. A suicide exclusion clause, for example, is one device whereby the insured's assessment of the value of life is bonded to be greater than the insured value.

Monitoring the physician. Health care insurance involves an obvious conflict of interest for the physician. The physician, as an agent of the policyholder/patient, diagnoses ailments and provides services as demanded by the policyholder, while as an agent of the insurer, he reports the diagnosis and the determined loss. Thus the physician's payment and the loss reported to the insurer are highly correlated.

One mechanism to control the physician is to include coinsurance in the prespecified formula for payments in health insurance contracts. Coinsurance details classes of claims for which some fraction of expenses will be reimbursed to the policyholder. By including a coinsurance provision, the policyholder/patient is induced to monitor the physician.²² We suggest that this procedure involves lower costs than ex post review by the insurance company with disallowance of certain claims.

The comparative advantage of the policyholder/patient as a monitor of physician-generated expenses is perhaps least when surgery is the prescribed remedy. We find that the prespecified formula often establishes maximum amounts payable for stated routine operations, with payment for nonroutine surgical procedures determined on an individual basis. These payments can be negotiated beforehand. This formula thus provides the incentive for the policyholder/patient to monitor the physician, and a cost benchmark is provided to assist in the

22. Contrast our explanation of coinsurance with that of Arrow (1963, p. 971) and Raviv (1979, p. 91). Arrow's explanation depends on risk aversion on the part of the insurer. But as we indicate above, since the typical insurer is a corporation, market (systematic) risk alone is important, and thus Arrow's rationale cannot explain coinsurance. Raviv shows that coinsurance arises with administrative costs which are an increasing convex function of the payoffs of the policy. Although it is an empirical question, our intuition suggests that administrative costs are a concave function of the payoffs, that there are fixed costs and economies of scale. Note that if risk aversion by insurers or convex cost structures were the motivation for coinsurance, then we should also see coinsurance in other lines of insurance such as casualty or liability. Our explanation of coinsurance is consistent with that of the risk-sharing literature. With costly contracting, a risk-neutral principal will shift risk to a risk-averse agent to control his actions. (See Harris and Raviv [1978], Holmstrom [1979], and Shavell [1979]. However, none of their analyses examines the relationship between the two nonindependent agents, the insured policyholder, and the physician.)

monitoring process. This formula is more costly to administer than the coinsurance formula. The maximum amounts payable for different procedures require periodic revision, and the potential for expensive negotiation or litigation for payment of nonroutine procedures is obvious. We suggest that the reason for incurring these additional costs is that the incentive problem is more severe when surgical procedures are involved.

Group practice prepayment plans. Another observed solution to the claim settlement problem in health insurance is a group practice prepayment plan, such as the Kaiser Foundation health plan. These plans bundle the provision of health insurance and medical services.

Physicians are employees of the medical group providing the insurance and services. In this way, the insurer-physician agency relationship is internalized. However, the physician is not a direct employee of the patient; his compensation is provided by the health plan. Consequently the incentive conflict between the physician and patient is larger than with the coinsurance solution. Thus group practice prepayment plans are characterized by low insurer-physician contracting costs and relatively high physician-patient contracting costs, compared with standard third-party reimbursement plans. This implies that group practice prepayment plans would specialize in providing lower quality health services.²³ These offsetting costs seem to allow both group practice prepayment plans and standard health insurance to coexist as viable insurance mechanisms.

Our analysis suggests that facilities servicing group practice prepayment plans will have lower operating costs per patient day as well as lower costs per illness than facilities which serve patients with standard third-party reimbursement plans. Furthermore, if coinsurance/exclusion provisions and group practice prepayment plans are alternate mechanisms to control physician-insurer incentive conflicts, then our analysis suggests that coinsurance/exclusion provisions will be less frequently observed in group practice prepayment plans than in standard third-party reimbursement plans.²⁴

23. Establishing group practices and establishing group practice prepayment plans are two separable issues. Complementarity in production, gains from specialization, certification, and joint monitoring all provide incentives to form groups. However, we expect to observe groups tying the provision of health care with the provision of insurance only where the group provides low-quality, low-price care. An individual who demands low-quality health care will find insurance relatively expensive; the insurance firm will presume that with insurance, the individual will demand higher-quality care. By tying the two services, the policyholder contractually agrees *ex ante* to the quality of health care he receives. A group providing high-quality, high-price health care does not have this incentive to tie the sale of insurance; the independent insurance firm will presume that the policyholder/patient will demand high-quality care.

24. Note that this provides another way to discriminate between the Arrow risk-averse insurer and the Raviv convex cost structure hypotheses to explain coinsurance

III. Analysis of Group versus Individual Policies

Adverse selection is the purchase of insurance by individuals who, from the insurer's standpoint, are least desirable. The existing literature has emphasized adverse selection as the motivation for group rather than individual insurance. However, adverse selection alone is insufficient to explain both the incidence of grouping across lines of insurance and the nature of the group (employment, fraternal, etc.).

Adverse Selection and Grouping

Adverse selection in insurance is a variant of the "lemons" problem discussed by Akerlof (1970). It occurs when an asymmetry in information costs exists between the insurer and the insured. For example, if histories for different classes of policyholders are combined to assess probabilities, an estimate of the probability and magnitude of loss for each classification will be obtained. If the insurance policy were priced according to this probability, the price would be too low for those individuals within the classification who estimate their own probability of loss to be above that of the group and too high for those whose estimate is below it. The "bad" risks (those for whom the estimate is an understatement) will tend to purchase insurance while the "good" risks will not. Raising the insurance premium can exacerbate the problem.²⁵

How grouping can solve adverse selection. In some situations, group insurance is an effective response to adverse selection. The most obvious restriction (and one cited repeatedly in the insurance literature) is that the group be formed for purposes other than that of obtaining insurance (e.g., an employment group). Even within a group formed for other purposes, adverse selection can occur if the insurance is voluntary or if the policy allows individual selection of benefits and coverage. Mandatory participation within a group insures that the average risk insured is equal to the average risk of the group and thus solves the within-group adverse selection problem.²⁶ If the group is formed for other than insurance purposes, the average risk for the

and our incentive control hypothesis. Given their hypotheses, we should still observe coinsurance in group practice prepayment plans. The Kaiser Foundation health plan contains coinsurance only for certain specified items such as private duty nurses and local ambulance service. Since Kaiser does not directly provide these ancillary health care services, it should be expected that it employs contractual control devices like those used by third-party reimbursement plans for those items.

25. This situation does not necessarily imply that only the worse risks will remain insured at correspondingly high prices. A mutual advantage of trade will exist with risk-averse individuals. Thus some of the better risks will voluntarily purchase insurance, even at high prices (see Zeckhauser 1968).

26. Note that individual perceptions of the value of the insurance (demand prices) will differ within the group. This can cause problems which will be considered explicitly below.

group is less likely to deviate from the relevant population average, which solves any between-group adverse selection.

When grouping fails to solve the between-group selection problem. Grouping per se is not sufficient to solve the between-group adverse selection problem. Group insurance coverage is one aspect of an employee's pay package. If close substitutes exist for a given job in all dimensions except the insurance coverage, adverse selection will occur as new employees join the plan. In the extreme, if there were no costs to changing jobs and if the set of jobs spanned the relevant space of job attributes, then grouping would be totally ineffective in solving adverse selection problems. For example, firms which offer group insurance policies as parts of their pay package would attract "high-risk" employees, and firms which do not offer insurance policies would attract "low-risk" employees. Because of this possibility of adverse selection, we expect to see premiums in group plans experience rated.²⁷

Alternative solutions to adverse selection. A nongrouping solution to the adverse selection problem is frequent contract renegotiation allowing the insurer to adjust the premium as individual histories develop. If individuals choose among insurance policies on the basis of the anticipated stream of future premiums, "good" risks, knowing how the system operates, would rationally forecast the lower value for the future premiums and elect to purchase even though the initial premiums were higher. The "bad" risks would forecast higher future premiums but also purchase. This system establishes incentives for hazard reduction; in considering an action, the change in the present value of expected premiums must be included. This solution is feasible as long as information is revealed over time and the insurer is able to monitor the information. Thus for some types of risk, frequent contract renegotiation controls adverse selection at low cost.

Automobile insurance policies appear to correspond to this description. Typically the premium is negotiated annually and is adjusted to reflect information about driving skills revealed during the previous contract period. (The term of the contract is endogenous; risk specialty companies adjust premiums quarterly or even monthly.) Thus, for automobile insurance, we expect that a measure of premium variability (dispersion) within a cohort²⁸ would generally increase with the age of the cohort.²⁹

27. Bickelhaupt (1974) reports that over 97% of employer group life insurance is written on a yearly group term basis so that premiums can be adjusted annually for changes in the average age and mortality experience of the group.

28. A *cohort* might be defined, e.g., as consisting of the population of males of a given age who have had a drivers' training course.

29. As time passes, the insurer adjusts the premiums to account for individual differences in the monitored driving histories. If the information (the individual's driving

Premium adjustments to reflect new information about the probability of losses are restricted in individual health and life insurance contracts. In fact, many policies contain explicit insurability guarantees (in essence, an option providing insurance on being able to purchase insurance). With significant serial dependence in one's state of health over time, periodic premium adjustments would reduce the effective amount of insurance provided under the anticipated sequence of contrasts. Moreover, if "becoming sickly" is an event with a relatively large exogenous component, the incentive effects associated with premium adjustment would be small. Thus, for these reasons, we expect to observe other contractual responses to control adverse selection. For example, direct expenditure to gather information (such as a required physical examination or required fire insurance inspections) reduces any informational asymmetry which may exist. In other cases, a waiting period during which certain events are excluded from coverage (such as preexisting conditions, maternity, or suicide) also effectively reduces any informational advantage which the insured may possess. The differential ability of the insured to predict the incidence of these events after the lapse of a waiting period is reduced.

An Alternate Hypothesis of the Demand for Grouping

Various types of groups have been accepted as appropriate for group insurance.³⁰ We suggest that incentives exist for both the insurer and the firm that make the employment group especially well suited as a vehicle for the provision of health and life insurance.³¹ The provision of health and life insurance through this group reduces contracting costs in several dimensions.

There are three important agency relationships when considering the employee group: (1) the insurer-policyholder relationship discussed

record) is available to other insurers, competition would insure the adjustment in the premium. The variability might eventually decrease, e.g., if all of the bad risks were self-selected out by automobile accidents or if bad risks tended to become good risks. We would also expect that time-series measures of premium variability for individuals would be larger among the young than among more mature drivers who have revealed more information (abstracting from the deterioration that might accompany very old age which could confound this implication). With this solution to the adverse selection problem, there is the incentive for policyholders to make it difficult for the insurer to monitor. When "bad driving" is observed, people who are tagged as bad risks would have an incentive to switch to a new insurer. Since the insurer has less information on younger drivers than on older drivers, the incentives to switch carriers will be greater for younger drivers. However, if switchers can be identified apart from new drivers (who have no previous driving records), their premiums should be above the mean for their age cohort.

30. Appropriateness is apparently a matter for regulation by the states. Usually acceptable are employer, union, creditor, and trustee groups for group life insurance (e.g., see Gregg 1962).

31. The 1956 individual employer groups accounted for more than 93.8% of the policies and 87.4% of the amount of group life insurance written (Eilers and Crowe 1965, p. 512). More than 90% of the persons covered by major medical insurance are covered under group contracts (Mehr and Cammack 1966, p. 565).

above, (2) the employer-employee relationship, and (3) the insurer-employer relationship with the employer administering the policy.

Contracting costs in the employer-insurer relationship are low for health and life insurance because of a mutuality of interests. The insurer benefits from being able to sell more insurance.³² If the employees have much firm-specific human capital, then the employer benefits from having a "healthier" group of employees because of the reduced requirements for less efficient temporary help and reduced turnover due to illness or death.³³ It is in the interest of both employer and insurer to do such things as: (1) screen applicants based on physical health, (2) discourage unsafe work practices, and (3) discourage shirking by feigning illness. With health and life insurance offered through an employment group, the employer becomes an agent who administers the policy and monitors and screens the employees for the insurer.³⁴ Furthermore, to ensure that the objectives of the employer and the insurer are coincident, the experience of the insured group is used to adjust the group premiums.

In addition to the low monitoring costs, there are other efficiencies associated with the employment group. The employer's established payroll system reduces administrative costs associated with premium collection. With limited choice about participation in the plan, selling costs to the insurance firm are reduced.

Alternative solutions to the adverse selection problem and the potential for group insurance plans to economize on contracting costs other than information costs lead us to conclude that adverse selection is neither necessary nor sufficient for the existence of group insurance.

32. One might hypothesize that the insurer as well as the employer would benefit from a "healthier" group of employees. However, the insurer should be indifferent to the "health level" of any individual or group of employees as long as the insurance premium is correct and the health level is maintained over the contract period. The insurer benefits from selling more insurance through the group method than he could by individual policy. In the absence of transactions costs the insurer would be indifferent between selling N policies at the average price (group scheme) or N individual correctly priced policies. Thus, e.g., the notion of "creaming" (just insuring the "better" risks by some selection scheme) does not make sense unless there are restrictions on the premiums that can be charged by insurance companies or creaming really means insuring those individuals that are most efficiently categorized. There is confusion about this issue: "Group life insurance also extends protection to a number of persons who cannot qualify for individual life insurance because they are physically substandard or because of their hazardous occupations" (Gregg 1962, p. 21). Gregg's statement could be interpreted as correct if there are pricing restrictions on individual policies. Thus it would be the pricing restriction and not the physical category or occupation that precludes insurance. So an additional rationale for group insurance may be that it allows the insurer to circumvent regulatory pricing restrictions.

33. Our analysis thus suggests the hypothesis that group health insurance should be more prevalent in firms that invest heavily in specific human capital.

34. See Alchian and Demsetz (1972) for a discussion of monitoring and its role in the theory of the firm. Monitoring implies the ability to correct as well as detect. The firm can impose costs on an employee suspected of shirking, perhaps by feigning illness. The insurance firm or the professional agent are limited in the sanctions that can be imposed to threats and to legal action which may be expensive.

*Costs Associated with Grouping:
Contributory versus Noncontributory Policies*

Employment group health or life insurance premiums are paid either by the employer (noncontributory) or jointly by the employer and employee (contributory).³⁵ If participation in the plan is rejected, the employee is typically unable to receive the employer's contribution in any other form. This establishes the incentive for even the better-risk employees to participate in the group plan by lowering the direct private cost of the insurance through either full or partial payment by the employer. But group insurance payments by employers introduce a cost when demands differ across employees. Individuals who find themselves at the margin in their decision to purchase insurance in a contributory plan would be better off if they directly received the employer's contribution to the insurance premium. Similarly, "adverse selectors" appear to be overcompensated. This is a basic cost associated with the use of group plans. The more heterogeneous is the demand for a particular type of insurance within a group, the larger the cost.³⁶

For a given group there is an optimum portion of the group premium that should be contributory. Of course, this portion can range from zero to 100% of the premium. However, the more heterogeneous the demand for a particular line of insurance, the smaller the employer's contribution to the premium.³⁷ This is because the costs associated with heterogeneous demands are reduced by increasing the fraction of the premium paid by the employee. Of course, as the employees' portion of the premium becomes larger and the direct private cost of the insurance rises, the within-group adverse selection problem increases as a smaller portion of the group will elect to be insured. In general, the employees who are the better risks elect not to be insured. Hence, the average risk of the insured group will be larger and so will the group premium. As the plan becomes more contributory, benefits that accrue to the firm from having a healthier work force are reduced;³⁸ any scale economies that exist will also be reduced.

35. Some states set a minimum percentage of the premium that must be paid by the employer if the plan is contributory (Gregg 1962).

36. One factor which acts to reduce the costs of within-group heterogeneity of demand for insurance is the differing compensation plans across employers. Differences in compensation plans allow clienteles to develop. Individuals with strong preferences for certain provisions are attracted to work for firms which offer those provisions in their compensation package.

37. This proposition is in principle testable. Heterogeneity of demand for a particular group would be difficult to measure directly. However, two proxies come to mind. For example, we suspect heterogeneity of demand would be related to the variance of the age distribution of the group for life and health insurance. For life insurance, a measure of whether the group members were predominantly married or nonmarried (with maximum heterogeneity being a 50-50 split) might suffice.

38. There is a tax advantage of making group plans contributory in that the employer's portion of the premium is a tax deductible expense (as are wages), but the portion of the

The employer will expend resources to screen, monitor, and otherwise administer a group insurance plan as long as the expected return to the investment is greater than the expected return on investments of similar risk available in the market. In other words, the firm's decision to undertake group insurance is a decision that should be arrived at as should any other investment decision. The benefits that accrue to the firm are savings arising from a more efficient work force caused by improved health, and net reductions in the aggregate wage bill occurring because the employees value the insurance at greater than its cost. Hence, as long as these benefits outweigh the cost associated with heterogeneous demand sufficiently to compensate the resources employed, the firm will undertake group insurance.

Lines of Insurance: Group versus Individual Policies

Field (1967, p. 2) considers as "perplexing" the question of "why group property and liability insurance has not developed to the same extent as group life and health insurance." Our analysis suggests that the observed distribution of group versus individual policies across lines of insurance can be explained by three general considerations: Grouping will be more likely (1) when information asymmetry is greater, (2) when employers' incentive to monitor the employees' purchase of insurance is greater, and (3) when the heterogeneity of demand for insurance within the group is less.

We suggest that information asymmetry is more pronounced in life and health insurance than in property and liability insurance. The employer has the incentive to monitor certain of the employee's actions which affect his demand for health and life insurance, giving the employer a comparative advantage over the insurer in monitoring the policies. (Conversely, the employer has little incentive to monitor the employee in the case of property insurance.) Finally, the demands for health and life insurance are relatively more homogeneous within

insurance premium paid for by the employer is not considered taxable income for the employee. Under §79 of the Internal Revenue Code of 1954, the cost for up to \$50,000 of coverage for group insurance on an employee's life paid by his employer is not included in his gross income; §106 excludes from an employee's gross income amounts contributed by his employer for health and accident insurance. If all employees have identical demand curves for a particular line of insurance, then as long as the employees face a positive marginal tax rate, the firm and workers will be better off with a noncontributory plan. The firm can reduce the wage payment by an amount equal to the premium paid plus the smallest reduction in an employee's tax liability, reducing its total employee compensation expense. The employees should prefer a wage package allowing purchase of a larger consumption bundle. However, since the first group health and life insurance contracts were written prior to arrival of an effective income tax on workers, we conclude that the tax advantage is not a necessary condition for the existence of group insurance (although it may be sufficient). The first group life insurance contract was written in the United States in 1911 (Gregg 1962). The first group health insurance appeared in 1927 (Field 1967).

the group.³⁹ Thus the major advantage of group policies in property areas would seem to be reduced administrative costs.⁴⁰ Group contracts dominate the health insurance line (Health Insurance Institute 1975-76, pp. 21-38), and group contracts accounted for 42% of all life insurance in force at the end of 1975 (Institute of Life Insurance 1976, p. 28). But property and liability group contracts account for less than 10% of those lines of insurance (Field 1967).

IV. The Structure of Firms in the Insurance Industry

The Ownership Structure of Insurance Firms

The ownership structure of the firms in the insurance industry is complex; stock firms, mutual firms, and direct underwriters coexist. An implication of Coase's (1960) analysis is that with zero contracting/transactions costs, the ownership structure (the assignment of property rights within the firm) will be a matter of indifference. However, with costly contracting, conflicts of interest arise whenever discretionary behavior is authorized with costs related to the amount of discretion and the effectiveness of the mechanisms chosen to control the conflict. The ownership structure is one control mechanism. We identify incentive problems between owners and managers as well as between policyholders and stockholders. Examination of relative cost advantages of various ownership structures leads to hypotheses concerning the distribution of ownership structures across lines of insurance.

Common stock insurance firms. We examine the incentives faced by the stockholders of an insurance firm operated so as to maximize stockholder wealth. We assume initially that the conflict between the stockholders and manager has been costlessly controlled.

Policyholders face incentive problems in the insurance market which are similar to those faced by lenders in bond markets.⁴¹ The policyhold-

39. Although there may be large variability in the demand for life insurance within some groups, if a significant amount of the variability is related to income, specifying the insurance coverage as a multiple of salary can reduce the costs imposed by demand heterogeneity while still controlling the adverse selection problem.

40. Given the heterogeneity of demand, these advantages can be small for property and liability insurance. Furthermore, it is unlikely that the IRS would allow the employer to pay the premium for fire insurance on a house and treat that payment as nontaxable income to the employee.

41. We concentrate largely on similarities between debt contracts and insurance contracts. However, the sales of insurance contracts and debt receive differential treatment under the tax code. The proceeds of the sale of an insurance contract (the premium) represent taxable income to the firm, whereas the proceeds of the sale of a debt contract do not. (The tax law is not this simple. The specific provisions have the effect of smoothing the numbers by using a moving average of realized receipts and disbursements.) Similarly, the payment under an insurance contract is a business expense for tax purposes, whereas only the interest portion of the payment under a debt contract is. This tax treatment has the effect of increasing the present value of the tax liability over what it

ers pay premiums in return for a promise to receive a contractually agreed amount from the assets of the insurance firm upon the occurrence of a specified event. The stockholders of the insurance corporation have the incentive to increase the value of the stock at the expense of the policyholder after the policy is issued. If a firm sold insurance policies and the policies were priced with the assumption that the firm would maintain its dividend policy, the value of the policies would fall (the value of the shareholder's equity would rise) if the firm raised the dividend by liquidating assets. In the limit, if the firm sold all its assets and paid a liquidating dividend, the policyholders would be left with worthless claims.⁴²

Of course, policyholders recognize the incentives faced by stockholders: After the policies are outstanding any available action which will increase the wealth of the stockholders will be taken. Thus rationally priced insurance contracts reflect unbiased estimates of the expected behavior of the stockholders.

If the stockholders contractually limit their opportunity set, the value of the insurance will reflect the revised estimate of stockholder behavior. In an unregulated insurance industry, we would expect stockholders to contractually limit their dividend and investment policy, as is done, for example, in the bond market where stockholders include covenants in bond contracts.⁴³

Alternative structures: mutuals and direct underwriters. Another way the conflict between policyholders and stockholders can be con-

would be if the tax treatment applied to debt were used. This reduces the amount of insurance written by increasing the supply price.

42. See Black 1976. Policyholder-stockholder incentive conflicts arise over any variable which can be changed after the sale of the policy, benefiting shareholders at the expense of policyholders. Other examples would be (1) reducing the quality (e.g., speed) of claims administration services provided and (2) selling additional policies without increasing the equity of the corporation, thus reducing the coverage on the policyholder's claim.

43. DuBois (1938) reports that an English company, the Phoenix Fire Office (later the Phoenix Assurance Co.), was started in 1781 to provide fire insurance. The company's deed of settlement (equivalent to a corporate charter) restricted the investment of company funds to government securities and land which could be leased and specified maximum dividend payments to stockholders. An alternative way to control the policyholder-stockholder conflict is to issue participating policies. A participating policy gives the policyholder a claim on a fraction of the insurance firm's accounting earnings. This acts somewhat like a convertibility provision in a corporate bond contract, except that the policyholder has a claim to only current accounting earnings whereas the convertible bondholder has a claim to the capitalized value of the economic cash flows (see Mikkelsen [1979] and Smith and Warner [1979] for an analysis of convertible debt). Thus to the extent that the firm's capitalized cash flows and accounting earnings are positively related, the stockholders' gain from transferring resources to themselves after the sale of the policy is reduced by issuing participating policies. In 1836 the Girard Life Insurance Annuity and Trust Co. issued the first participating policy in the United States. A circular issued that year says, "The income of the company will be apportioned between the stockholders and the assured for life, an advantage given in America by this Company alone" (Stalson 1942, p. 94).

trolled is with an alternative ownership structure, mutual ownership. In a mutual insurance company, the policyholders are also the owners of the firm. In this way contracting costs arising from differential incentives between policyholders (as principals) and equityholders (as agents) are reduced by making the members of these two groups coincident.

To this point, we have assumed that the owner-manager incentive problem has been costlessly controlled. We now relax that assumption. Fama (1978) suggests that a significant factor in controlling the costs imposed by management on the owners of the firm is the mechanism of takeovers. If management imposes too many costs, someone can purchase control of the firm and replace management, thus realizing the capitalized value of the cost reduction.⁴⁴ In a mutual this control mechanism is weaker since the owners would have to remove the existing management through a proxy fight and thus fail to capture the gains.⁴⁵ We suggest that the advantage mutuals have from the elimination of contracting costs imposed on policyholders by stockholders is thus offset by increased contracting costs between the owners and managers of the firm.

In the insurance industry today we observe both stock and mutual insurance firms. Competition between mutual and stock firms suggests that for common lines of insurance there should be little difference in the types of insurance coverage offered or in the net premiums. Thus we do not think that the major differences in mutuals and stocks will involve differences in contracts within a given line of insurance but, rather, in which lines of insurance particular ownership structures will dominate. Our analysis suggests that (1) if the cost of controlling management in mutual insurance companies is higher than in stock firms, then mutuals should be more prevalent in lines of insurance where management exercises little discretion in setting rates (i.e., in lines of insurance for which there are "good" actuarial tables).⁴⁶ (2) Mutuals should be more specialized than stocks, mutuals should offer insurance across fewer different lines. (3) Managerial compensation (salary plus bonus) should be higher in stock companies than in mutuals both because the opportunities for consumption of job-related perquisites is lower and because managerial compensation should be related to decision-making authority.⁴⁷ (4) If it is less expensive to

44. This motivation for takeovers was originally suggested by Manne (1965). See Bradley (1980) for a discussion of some problems with the specific mechanism Manne suggests for capturing the gains.

45. Furthermore, proxy fights are expensive. For a colorful (almost funny) description of the costs of waging a proxy fight for control of mutual insurance firms, see the report of the Temporary National Economic Committee (1940, pp. 14-27).

46. Mutuals should also be more prevalent in states where premiums for particular lines of insurance are regulated (see Bicklehaupt 1974, p. 209).

47. Note that since decision-making authority should also be related to other factors such as firm size, these other factors must be controlled.

concentrate voting/control rights in small than large corporations, then the potential for stockholders to expropriate policyholder wealth is greater in small stock insurance firms.⁴⁸ This implies that in a given line of insurance, the smallest firms (e.g., measured by total assets) should be mutuals.⁴⁹

Where discretion in setting rates is great and owner monitoring of managers is very expensive, the owner-manager conflict can be controlled through internalizing the conflict by merging the parties. Thus direct underwriting by individuals (e.g., Lloyd's of London) will be more frequently observed where discretion in adjusting rates to changing risks is important.⁵⁰

Independent Insurance Agents versus Direct Writers

Policyholders typically deal only indirectly with insurance companies: they deal through insurance agents. There are two general classes of agents, independent agents and direct writers.⁵¹ The independent insurance agent generally represents many insurance companies; in effect, he is an intermediary between the insurance firm and the policyholder. The direct writer is an exclusive company agent; he represents and is employed by one insurance firm (e.g., State Farm, Allstate).

There are agency problems between the insurance firm and the insurance agent, as well as between the insurance agent and policyholder. We expect the agent-policyholder conflict to be relatively smaller and the firm-agent conflict to be relatively greater with an independent insurance agent. Thus we expect to observe firms which use independent insurance agents to specialize in high-service, high-price policies,

48. For stock firms, the stockholder-policyholder conflict should be related to potential (as opposed to actual) voting/control concentration. This concentration can be achieved either by purchase of stock or by formulation of a coalition among stockholders.

49. Blue Cross/Blue Shield, the major health insurer, is a not-for-profit association. It differs from most non-for-profit organizations (such as charities, universities, churches, etc.) in that there is virtually no associated philanthropic activity. Thus we believe that the only important implication of their not-for-profit status has to do with taxes. (Note that the first Blue Cross plan was founded in 1932, after the inception of corporate taxes.)

50. A good example of a case where changing risks was frequent is marine insurance in the early nineteenth century. Wright and Fayle (1928, p. 188) report the adjustment of rates by an underwriter at Lloyd's: "Take, for example, the year of Trafalgar, and the routes specially affected by the movements of hostile fleets. For homeward voyages from the West Indies, the average rate on 76 risks accepted by Mr. Janson during the first quarter of the year was 8½ per cent. The arrival of Villeneuve's fleet in the West Indies, sent it up to 13½ per cent., and thence to 15 per cent. and over. It touched 16 per cent. when he was making for the Channel, but fell to 11 per cent. after his indecisive action with Calder and his return to Cadiz."

51. Individuals, but especially corporations, deal also through brokers. They are differentiated from insurance agents in that (1) brokers are directly employed by the policyholder and (2) a broker cannot bind a risk (i.e., cannot contractually commit an insurance company). Brokers primarily provide advice and search services.

while firms which employ direct writers specialize in low-service, low-price policies.⁵²

The Asset Structure of Insurance Firms

The policyholder-stockholder incentive conflict is affected by the firm's investment policy and asset structure. Insurance firms which specialize in selling policies in different lines of insurance will have incentives to choose systematically different asset portfolios.

Asset maturity structure. The effective duration of a life insurance policy is much longer than that of casualty, health, or liability insurance policies. As Myers (1977) indicates, future investment decisions of the firm can be viewed as options. He shows that with longer-lived fixed liability claims in a firm's capital structure, the conflict between the fixed claimholders and stockholders over the exercise of the investment options is greater, creating a lower demand price for the fixed claim. Myers concludes that firms can control these incentive problems by matching maturities of assets and liabilities.

Firms which specialize in selling long-lived fixed liability claims like life insurance should be expected to invest more heavily in direct (private placement) loans. First, they have relatively long maturities; and, second, because there is no ready secondary market, the cost of changing the characteristics of the firm's cash flow distribution after the policy's sale is increased.⁵³

Reinsurance. A reinsurance contract is essentially an insurance policy issued by one insurance company, the reinsurer, to another insurance company, the ceding company or the direct underwriter. We suggest that reinsurance is simply an institutional response to avoid bankruptcy which a large policy would impose on the insurance firm. Potential policyholders can be expected to assess the probability of bankruptcy and default in the payment of claims and impound these factors in the demand price for the policy.⁵⁴

Any insurance firm might be unable to diversify away an insurable

52. This argument is the same as between group practice prepayment plans and third-party reimbursement plans; see the section above entitled Claims Settlement Provisions for Health and Life Insurance.

53. Matching maturities of assets and liabilities also hedges interest rate risk, but that motivation for matching maturities cannot explain the specialization in private placement loans as opposed to publically traded claims. Diamond (1980) suggests another benefit to private placement lending in reducing monitoring expense.

54. For a regulated industry such as insurance, actions to avoid bankruptcy embrace a range of factors. If the company's reserves fall below a specified level, regulatory agencies can restrict the company's actions; e.g., the company can be restricted from writing new policies without the permission of the authority. For more extreme problems, regulatory authorities take direct control of the company's activities. Finally, the regulatory authority can impose a merger or other form of reorganization.

risk of great magnitude. If reinsurance were precluded, the insurance purchaser would have to compensate the insurer for an increase in expected bankruptcy costs. The purchaser would thus have an incentive to purchase several smaller policies instead. We suggest that it is less costly for the policyholder to negotiate with one insurance firm and have the insurer reinsure through established channels.

Finally, reinsurance firms provide a set of services to the ceding companies. First, the transaction itself can be viewed as a specialized form of financing.⁵⁵ Second, the reinsurer frequently provides information useful in setting rates; the reinsurer has broader experience with some low probability events. Third, for geographically specialized insurers, reinsurance companies can provide information about claims adjustment services in other areas.

Our analysis suggests the probability of use of reinsurance increases: (1) the smaller the insurance company, (2) the larger the maximum claim under the policy, (3) the higher the covariance of policy payoffs with the existing set of company policies, and (4) if the insurance company is a mutual.

V. Conclusions

We have provided a foundation for a positive theory of insurance contracting with examples of some of its testable predictions. Our primary objective has been the development of a unified theory which can explain the distribution of institutional forms across lines of insurance. We argue that incentive conflicts arise when discretionary action is contractually authorized. Efficient contracts provide minimum cost control of the incentive problems. We interpret observed contractual provisions and institutions within the insurance market as efficient control mechanisms.

Our analysis differs from much of the extant analysis of insurance. In the existing literature, little attention has been given to developing a positive theory of observed contractual forms.⁵⁶ Exceptions include Arrow (1963) and Raviv (1979), but they ignore incentive problems which we argue are important determinants of observed contractual forms. The developing risk-sharing literature (e.g., Harris and Raviv

55. This is especially important for mutuals subject to regulation on the ratio of capital to insurance in force. By reinsuring, capital rises, and insurance in force falls, thus reducing regulatory constraints to growth, etc.

56. Most economists have analyzed the insurance market within a partial equilibrium, usually demand-side, framework (e.g., Mossin 1968, Pauly 1968, Smith 1968, Zeckhauser 1970, Ehrlich and Becker 1972, Razin 1976 and Spence 1978). The insurance literature is mostly a descriptive investigation of institutional arrangements (e.g., Pickrell 1961; Gregg 1962; Field 1967, and Bickelhaupt 1974). Much of the analysis reduces to a taxonomy of types of risk (e.g., speculative, pure, static, economic, personal, property, liability, etc.) Questions of what the world is like, rather than why it is the way it is, have dominated.

1978, Holmstrom 1979, Shavell 1979) analyzes some of the incentive problems on which we focus but is restricted in analyses to single principal-agent problems and focuses more on preferences, less on the contracting/control technology. We argue that many of the observed institutions are designed to control incentive problems in multiple dimensions. Furthermore, we believe that focusing on implications which derive from differences in costs rather than differences in preferences will yield more testable implications; cost differences across lines of insurance are likely to be measurable, differences in the degree of risk aversion are not.

Some Conjectures on Regulation

Thus far we have analyzed the incentives facing policyholders, stockholders, and managers in the context of an unregulated market. The next logical step in the development of the theory is the incorporation of regulation. A complete theory would allow the endogenous determination of the form of regulation. While a comprehensive analysis of the impact of regulation on this industry is beyond the scope of this study, under special assumptions about the nature of regulation, the implications of our analysis are largely unaltered.

Should the effective regulatory measures erect barriers to entry by imposing minimum capitalization requirements and so forth at the announcement of the regulation, the owners of existing firms will realize a capital gain equal to the capitalized rents.⁵⁷ From that point on, the owners earn a normal rate of return, and the owners of any new firms which enter the industry will expect to earn normal rates of return on their investment. This view of the impact of regulation does not preclude the existence of efficient contractual forms; the incentives of the contracting parties are unchanged.

Alternatively, if politicians choose to implement regulation by establishing an agency or commission to develop a specific code, we see incentives for the regulators to codify existing practice. This procedure rapidly generates a lot of code, thereby satisfying the political body which can offer the code as evidence that effective regulation is being accomplished. Furthermore, the procedure produces a code which is generally workable. If this approach is followed, observed contractual forms will approximate those of an unregulated market at the inception of the regulation. Thus we would expect regulation to be different for mutuals and stock firms. This follows from our hypothesis that the dominant agency problem for mutuals is between owners and man-

57. Stalson (1942, p. 298) reports that in 1810, Pennsylvania passed an act which "prohibited all out-of-state insurers from doing business in Pennsylvania; this act declared such contracts, if made or entered into, null and void, imposed a \$5,000 fine on the agent or other persons who renewed such contracts and a \$500 fine on the insured citizen of Pennsylvania." Similar laws restricting entry were passed by other states.

agers, whereas for the stock insurance firm the policyholder/stockholder relationship is more important.⁵⁸

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58. Bickelhaupt (1974, pp. 207–8) offers the following statement: "Standards also vary by legal type of insurer, with mutual insurance requirements being somewhat different from those for stock insurers. For example, the financial requirements for mutual companies are stated in terms of surplus rather than capital plus surplus, and additional requirements are set for the minimum number of policyholders with which to start a mutual company." This statement should be considered merely suggestive; we plan to develop this hypothesis more fully in future work.

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