Agency Theory and Life Insurer Ownership Structure

Steven W. Pottier
David W. Sommer

ABSTRACT

This article uses the insights of agency theory to analyze ownership structures in the life-health insurance industry. We examine operational, financial, and institutional determinants of ownership structure. We simultaneously test hypotheses regarding the owner-manager incentive conflict and the owner-policyholder incentive conflict. Our results demonstrate systematic differences between the activity choices of stock life insurers and mutual life insurers, consistent with the managerial discretion hypothesis. We also find that mutuals are more likely to be licensed in New York, stock firms are more likely to be organized as groups, mutuals are more likely to have high A. M. Best ratings, and older insurers are more likely to be mutuals.

INTRODUCTION

The issue of ownership structure in the insurance industry has been the subject of extensive discussion and analysis in academic research (Mayers and Smith, 1981, 1986, 1988, 1994; Fama and Jensen, 1983a, 1983b; Hansmann, 1985; Lamm-Tennant and Starks, 1993). A primary reason for interest in this subject is the fact that the insurance industry is characterized by a number of distinct ownership structures. Life-health insurers are organized primarily as either stock companies or mutuals. Agency theory hypothesizes that certain ownership structures have advantages in engaging in particular activities due to the efficiency with which each ownership structure can control the incentive conflicts inherent in the relationships among owners, managers, and policyholders (Mayers and Smith, 1981; Fama and Jensen, 1983a, 1983b).

This article uses the insights of agency theory to analyze stock versus mutual ownership structure in the life-health insurance industry. The article makes important contributions to the literature. Most significantly, this is the first study that specifically investigates the determinants of life insurer ownership structure, something which has previously been done only for property-liability insurers

(Mayers and Smith, 1988, 1994; Lamm-Tennant and Starks, 1993). The magnitude of the life-health insurance industry, as well as the significant differences between it and the property-liability industry, make it important to separately investigate the issue of life insurer ownership structures.[1] In this article, we simultaneously test hypotheses regarding the owner-manager incentive conflict and the owner-policyholder incentive conflict, and control for potential effects of state regulation and taxes, age, insurer size, financial quality, and the grouping structure of insurers. Our analysis is similar to the Mayers and Smith (1994) study of ownership structure in the property-liability industry.

AGENCY THEORY AND THE INSURANCE INDUSTRY

The operation of the insurance industry involves three primary parties: the company owners, the company managers, and the policyholders. Agency theory as applied to insurance focuses on the incentive conflicts among these three parties and the manner in which these conflicts can be controlled. The stock ownership form is more effective at controlling the owner-manager conflict, while the mutual form is more effective at controlling the owner-policyholder conflict. The differing abilities of stocks and mutuals to efficiently control owner-policyholder and owner-manger conflicts have significant implications for the comparative advantage of the two ownership structures in various insurance activities. For example, Mayers and Smith (1981, 1988, 1994) suggest that stock firms should be more prevalent in activities that involve significant managerial discretion, since it is with these activities that potential owner-manager conflicts are most severe. By contrast, mutuals might be expected to be more prevalent in lines of business involving long-term contracting, since long-term contracts increase potential owner-policyholder conflicts (Hansmann, 1985; Mayers and Smith, 1988).

Previous research has empirically examined the relationship between insurer ownership structure and activity choices in the property-liability insurance industry. Mayers and Smith (1988) provide evidence on the impact of property-liability insurer ownership structure on line-of-business activity, geographic concentration, and line-of-business specialization, while Mayers and Smith (1994) add additional controls for taxes and regulation. Lamm-Tennant and Starks (1993) find support for the hypothesis that stock insurers are associated with riskier activities.

Our analysis applies agency theory to the determinants of ownership structure in the life-health insurance industry. Although certain issues related to life insurer ownership structure have been investigated, the perspective of the present analysis is different from and broader than such earlier work. Previous articles in this area have dealt with the specific issues of mutualization (Mayers and Smith, 1986), expenses (Boose, 1990), demutualization (McNamara and Rhee, 1992), executive

---

[1] The differences between the property-liability business and the life-health business are innumerable and well known. Some particularly relevant differences for our purposes include the following: the principal market segments for life insurers are individual and group insurance rather than personal and commercial; the largest life insurers are mutuals, whereas the largest property-liability insurers are stocks; unlike property-liability insurers, life insurers generally are not subject to rate regulation (Black and Skipper, 1994).

compensation (Mayers and Smith, 1992), free cash flow (Wells, Cox, and Gaver, 1995), participating policies (Garven and Pottier, 1995), and efficiency (Gardner and Grace, 1996, and Cummins and Zi, 1998). By contrast, the present article looks broadly at the operational, financial, and institutional determinants of ownership structure. The work of this article is most similar to Mayers and Smith's (1994) and Lamm-Tennant and Starks's (1993) analyses of property-liability ownership structure.[2]

HYPOTHESES REGARDING LIFE INSURER OWNERSHIP STRUCTURE

Following Mayers and Smith (1981, 1988, 1994) and Lamm-Tennant and Starks (1993), we test the proposition that activity choices differ by ownership structure. However, we offer potential reasons why particular lines of business might differ in the level of managerial discretion required. These reasons are only suggestive, and we do not contend that any of them fully explain the level of managerial discretion involved in a line of business.

Activities Across Lines of Business

In the life insurance industry, lines of business can be broken down in a number of ways. We first look at the three primary products sold by life insurers: life insurance, health insurance, and annuities.[3]

Mayers and Smith (1981) argue that, because significant managerial discretion in an activity favors stock company involvement in that activity over mutual involvement, mutuals should be more prevalent in lines of insurance that are characterized by good actuarial tables. In life insurance and annuities, reliable actuarial tables are available, making mortality predictions quite accurate (Black and Skipper, 1994). In health insurance, by contrast, benefit payouts usually are not known in advance, and rapid and unpredictable increases in health care costs have made accurately anticipating health insurance claims costs difficult. Based purely on underwriting risk, then, the managerial discretion hypothesis would seem to imply that mutuals should be more prevalent in life insurance and annuities, and stock companies in health insurance. However, more so than in most lines of property-liability insurance, many types of long-term life insurance contracts involve significant risk other than the underwriting risk discussed above, as well as significant managerial decisions besides the initial premium. For example, life insurance involves significant interest rate risk, which has increased the importance of asset-liability management (Wright, 1991; Santomero and Babbel, 1997). In addition,

---

[2] Besides the fact that we are looking at a different industry, the most significant difference between the Mayers and Smith (1994) analysis and ours relates to the treatment of line-of-business choices. Mayers and Smith (1994) make no attempt to interpret their results on specific rebundled lines of insurance. By contrast, since the number of lines in the life-health insurance business is more manageable, we provide potential explanations for particular line-of-business results. In addition, the Mayers and Smith (1994) logistic regression focuses only on stock firms, using the ownership structure categories of closely held, widely held, and mutual owned.

[3] For our year of study (1991), these three product categories accounted for 99.8 percent of total premium income for life insurers (A. M. Best Company, 1992).

life insurer managers must regularly make important decisions for certain policies regarding such things as policyholder dividends and interest crediting rates. This managerial discretion might imply that stock insurers should be more associated with life insurance than should mutual insurers. We test for associations between ownership form and these lines of business by including variables in our analysis that reflect the proportion of direct premiums written in life insurance, in annuities, and in health insurance.

Activities Within Life Insurance Line

Within the category of life insurance, policies can be broken down between term policies and whole life policies. According to Hansmann (1985) and Mayers and Smith (1988) the stockholder-policyholder incentive conflict is more severe with long-term policies, because long-term contracts carry greater opportunities to change dividend, investment, and financing policies to the detriment of the policyholders. As a result, mutuals should have an advantage in long-term contracts, since mutuals minimize owner-policyholder conflicts. Since whole life insurance is longer in duration than term insurance, mutuals should be more prevalent in whole life insurance. However, because of the need to make decisions regarding such things as asset-liability management and policy dividends and interest crediting rates, long-term life insurance (i.e., whole life) may involve more managerial discretion, implying a comparative advantage for stock insurers in whole life. Whether long-term life insurance is associated more with stocks or mutuals is an empirical question which will be tested by including a variable defined as the amount of permanent life insurance in force divided by total life insurance in force.

Individual Versus Group Insurance

One aspect of the life insurance industry that distinguishes it from the property-liability industry is the importance of group insurance. The group insurance business is made up primarily of group contracts for life insurance, annuities, and health insurance sold to employers for coverage of their employees. Group business is highly significant in life-health insurance, whereas it is of very minor importance in the property-liability business.[4]

Individual lines of life-health insurance are likely to be more standardized than group lines and require less discretion in setting rates than group lines. The reason for this is that, unlike individuals, group insurance buyers have the bargaining power to negotiate contract provisions and prices with insurers. Industry publications confirm that group insurance buyers do indeed negotiate vigorously with insurers over rates and coverage (Kazel, 1995). Such negotiation is not prevalent with individual insurance. Thus, we suggest that group insurance involves significantly more managerial discretion than individual insurance, and so

---

[4] In 1991, group life, annuity, and health insurance net premiums written were approximately 50 percent of total net premiums written (American Council of Life Insurance, 1992). By contrast, Beam and McFadden (1996, p. 319) estimate that no more than 1 percent of personal property-liability insurance is provided through employer group plans.

agency theory leads to an expectation that stock insurers should be more prevalent than mutuals in group insurance. The variable used to test this hypothesis is direct premiums written for group insurance divided by total direct premiums written.

Separate Accounts

Another aspect of the life insurance business is separate accounts business.[5] Because many of the investment decisions related to separate accounts are made by the customer, separate accounts should involve little managerial discretion. Also, separate account investments tend to include a substantially higher proportion of financial assets than do general accounts.[6] Fama and Jensen (1983b) predict that mutual financial organizations should be more involved in the management of financial assets, while stock financial organizations should be more prevalent in activities requiring assets that are more costly to trade, generate more uncertain cash flows, and are more difficult to value. Considering the composition of separate account investments, the Fama-Jensen hypothesis suggests that mutuals should be more dominant in separate accounts business. The separate accounts variable in the regression analysis is defined as the percent of total assets held in separate accounts.

In addition to the line-of-business choices described above, insurers make other activity choices and organizational choices that impact or may be related to the agency conflicts between insurance company owners, managers, and policyholders. Some of these issues are addressed below.

Geographic Concentration

Mayers and Smith (1988, 1994) argue that selling business across a wider geographic area requires more managerial discretion in setting rates and underwriting, and that the costs of monitoring managers increase with geographic dispersion. This implies that stock companies would tend to have their business more geographically dispersed than mutuals. A Herfindahl index based on direct premiums written by state is used to measure geographic concentration.

Line-of-Business Concentration

As with geographic dispersion, Mayers and Smith (1988, 1994) posit that line-of-business diversification also requires greater managerial discretion, so we would

---

[5] Separate account assets are used to support the liabilities associated with investment risk pass-through products, such as variable annuities, variable life insurance, and pension products. They are held separately from the general account assets of the insurer and are not subject to the usual investment restrictions on life insurers. The owner of the separate account product often directs the insurer on how to invest the owner's funds. Gains or losses on the funds are borne by the customer.

[6] In 1991, life insurer total assets were $1,551 billion, of which $205 billion were held in separate accounts. The difference of $1,346 billion is referred to as general account assets. Cash, corporate securities, and government securities were approximately 66 percent of general account assets and 80 percent of separate account assets. Mortgages, real estate, policy loans, and other assets accounted for the remaining 34 and 20 percent of general and separate account investments, respectively (American Council of Life Insurance, 1994).

expect mutuals to be less diversified across lines of business than stock insurers. We measure line-of-business concentration, as in Mayers and Smith (1994), with a Herfindahl index based on direct premiums written across lines of business.[7]

Control Variables

Firm size in large part determines economies of scale and scope (Cummins and Zi, 1997), and may influence many other variables, including activity choices. Thus, a variable defined as the natural logarithm of total assets is included to control for size.[8]

Some life insurers are organized as single firms, while others are organized as a group of companies. To control for any systematic relationship between the probability of being a group member and the probability of being a stock or a mutual, a dummy variable is included which equals one for group-affiliated insurers and zero for unaffiliated firms.

Insurance companies are regulated primarily by the states, and therefore regulation and taxation of insurers varies from state to state. For example, states differ in their regulations regarding life insurer investments and minimum capital and surplus requirements and in their rules of taxation for life insurance companies. Because regulation and taxation might influence the preferred ownership structure of a life insurer, an analysis of ownership structure should control for the variations in regulation and taxes across states.[9] As in Mayers and Smith (1994), we do so by including a dummy variable for each regulatory jurisdiction which equals one if the company is licensed in that jurisdiction and zero if not.

Two final control variables are insurer age and Best's rating. The age variable is defined as the number of years the firm has been in business. The rating variable is a dummy which equals one if an insurer is rated A or higher by the A. M. Best Company and zero otherwise. These variables are included to control for any possible differences in the age or financial quality of stock firms versus mutuals.

DATA, METHODOLOGY, AND RESULTS

Our data come from the National Association of Insurance Commissioners' (NAIC) life-health tapes containing data from the 1991 statement year. Since we are primarily concerned with the mutual versus stock differences, we use a subset of all life insurers by including only stock and mutual life insurers on the NAIC tapes that were rated by A. M. Best in 1991 and have positive direct and net premiums written. This subset accounts for over 93 percent of total life insurance in-

---

[7] The lines used to create this variable are industrial life, ordinary life, individual annuities, credit life, group life, group annuities, group accident and health, credit accident and health, individual accident and health, and other.

[8] It is common in the insurance literature to use the natural logarithm of assets as the measure for size rather than simply total assets in order to normalize the highly skewed distribution of total assets in the insurance industry.

[9] On the federal level, tax law has historically treated stock and mutual insurers differently. However, the Deficit Reduction Act of 1984 has eliminated the major differences in tax treatment of stocks and mutuals (see Black and Skipper, 1994).

dustry assets. Our final sample consists of 989 insurers, of which 829 are stock insurers and 160 are mutuals.[10] Summary statistics for our sample are shown in Table 1, and a correlation matrix for the variables in the model is shown in Table 2.[11]

Logistic regression analysis is used to test our hypotheses regarding insurer ownership structure, as in Mayers and Smith (1994) and Lamm-Tennant and Starks (1993). The dependent variable is a dummy variable equaling one if the life insurer is a mutual company and zero if it is a stock company. A positive coefficient on a right-hand side variable indicates a positive association between that variable and the probability of being a mutual.

The results of the logistic regression are presented in Table 3. The results provide mixed support for the hypotheses discussed above. This is not surprising, since some of the variables have competing hypotheses regarding their association with the stock versus mutual ownership form. Of the variables dealing with lines of business, three are significant at better than the ten percent level. The coefficient on the variable for the proportion of premiums from group business is significantly negative, implying that stocks are more prevalent in group insurance than mutuals, as predicted if group business involves more managerial discretion than individual business. The coefficient on the variable for the proportion of premiums in life insurance is significantly negative as well. Finally, the coefficient on the separate accounts variable is positive and significant, indicating a positive association between separate accounts and the mutual ownership form. As discussed earlier, this is consistent with both the managerial discretion hypothesis and the Fama-Jensen (1983b) hypothesis. The variables representing the proportion of premiums in annuities and the proportion of life insurance in force that is of a permanent type are both insignificant.[12]

---

[10] Mutual-owned stock companies are designated as mutuals. Mayers and Smith (1994, p. 641) note that the activity choices of mutuals and mutual-owned stocks should be similar because "the owner/risk-bearers of a stock insurer owned by a mutual are ultimately the policyholders of the parent mutual." Wells, Cox, and Gaver (1995) also classify mutual-owned stocks as mutuals.

[11] To test for multicollinearity problems, we calculate variance inflation factors (VIFs) for the variables in our model. Kennedy (1992, p. 183) suggests that a VIF greater than ten indicates harmful collinearity. In our model, the highest VIFs are for geographic concentration (VIF = 3.4) and size (VIF = 3.3). All other VIFs are two or less. To further ensure that multicollinearity was not a problem, we tried alternately omitting the two variables above with the highest VIFs. Omitting either or both of these variables did not substantively affect the results for any of the remaining variables.

[12] The premium proportions for life, health, and annuities cannot all be included in the same equation, since they sum to one for all but three insurers in the sample. If the health proportion is substituted for the life proportion, its coefficient is positive with a p-value of 0.1146, and the other results are not meaningfully altered. If both the life and health proportions are included in the same model, both are insignificant. This is not surprising given that these two variables are highly correlated (the coefficient of correlation is −0.72).

Table 1: Summary Statistics for 989 Life-Health Insurers Using 1991 Data

Variable	Mutual	Stock
Line-of-Business Specialization		
Mean	0.66	0.68
Median	0.65	0.67
Standard Deviation	0.23	0.24
Geographic Concentration		
Mean	0.31	0.46
Median	0.13	0.32
Standard Deviation	0.33	0.37
Group Direct Premiums Written, %		
Mean	20.85	23.93
Median	1.80	0.73
Standard Deviation	32.20	36.03
Life Direct Premiums Written, %		
Mean	49.61	53.32
Median	53.03	57.37
Standard Deviation	35.91	36.74
Annuity Direct Premiums Written, %		
Mean	13.88	14.69
Median	0.37	0.15
Standard Deviation	26.56	27.51
Accident and Health Direct Premiums Written, %		
Mean	36.04	31.87
Median	19.80	13.53
Standard Deviation	37.75	36.98
Separate Account Assets, %		
Mean	5.37	2.13
Median	0.00	0.00
Standard Deviation	13.64	9.05
Permanent Life in Force, %		
Mean	50.06	49.04
Median	58.05	57.84
Standard Deviation	38.60	39.78
Total Admitted Assets (in thousands of dollars)		
Mean	$4,018,649	$980,903
Median	$286,837	$62,937
Standard Deviation	$15,755,529	$4,238,482
Age		
Mean	67.49	33.56
Median	64.50	28.00
Standard Deviation	44.04	24.10
Number of States Licensed		
Mean	34.66	24.39
Median	45.00	22.00
Standard Deviation	18.95	20.12
Licensed in New York, %	34.38	11.70
A. M. Best Rating of A or Higher, %	63.13	35.95
Member of an Insurer Group, %	69.38	74.79
Number of Firms	160	829

Table 2
Spearman's Correlation Coefficients Across 989 Firms

	HERFDPW	HERFGEO	GRPDPW	LIFEDPW	ANNDPW	SEPACCT	PERMLIFE	RATING	SIZE	AGE	GROUP	NEWYORK	MUTUAL
HERFDPW	1.00000	0.06767	-0.06054	0.03962	-0.05027	0.01205	-0.02357	-0.09368	-0.14452	-0.10917	-0.02597	-0.03990	-0.04204
HERFGEO		1.00000	0.05387	0.03628	-0.02240	-0.15385	-0.09560	-0.38210	-0.59938	-0.36297	-0.20115	-0.00626	-0.14793
GRPDPW			1.00000	-0.41904	-0.15098	-0.00330	0.01183	0.06163	0.02292	0.01075	0.00313	0.04817	-0.03198
LIFEDPW				1.00000	-0.35353	0.02371	0.00423	-0.06467	-0.04920	-0.02592	-0.01709	0.00004	-0.03725
ANNDPW					1.00000	-0.04022	-0.01976	0.02859	0.02167	-0.02713	0.02825	-0.05102	-0.01100
SEPACCT						1.00000	0.00522	0.13835	0.28457	0.08210	0.12702	0.24606	0.11938
PERMLIFE							1.00000	0.06063	0.07055	0.11343	0.03847	0.03118	0.00948
RATING								1.00000	0.62139	0.29402	0.28672	0.27818	0.20401
SIZE									1.00000	0.47076	0.34224	0.31119	0.21447
AGE										1.00000	0.02951	0.18594	0.40457
GROUP											1.00000	0.14463	-0.04540
NEWYORK												1.00000	0.23152
MUTUAL													1.00000

Note: HERFDPW = Herfindahl line-of-business concentration index; HERFGEO = Herfindahl geographic concentration index; GRPDPW = group direct premiums written/total direct premiums written; LIFEDPW = life direct premiums written/total direct premiums written; ANNDPW = annuity direct premiums written/total direct premiums written; SEPACCT = separate account assets/total admitted assets; PERMLIFE = whole life insurance in force/total life insurance in force; RATING = one if A. M. Best rating is A or higher, zero otherwise; SIZE = natural logarithm of total admitted assets; AGE = years in business; GROUP = one if insurer a group member, zero otherwise; NEWYORK = one if insurer licensed in New York, zero otherwise; MUTUAL = one if mutual insurer, zero if stock insurer.

Table 3
Logistic Regression Analysis
(Dependent Variable, Organization Type, Mutual = 1)

Variable	Parameter Estimate	P-Value
Intercept	−1.3457	0.3990
Line-of-Business Specialization	−0.1785	0.7067
Geographic Concentration	0.6677	0.2175
Group Direct Premiums Written, %	−0.00718	0.0559
Life Direct Premiums Written, %	−0.00673	0.0704
Annuity Direct Premiums Written, %	−0.00432	0.3427
Separate Account Assets, %	0.0194	0.0338
Permanent Life Insurance in Force, %	−0.00116	0.6854
Best's Rating	0.7897	0.0099
Logarithm of Total Admitted Assets	−0.1148	0.1797
Age	0.0304	0.0001
Group Affiliation Dummy Variable	−0.9924	0.0006
New York Licensed	1.3695	0.0001
States		0.0001

Note: Line-of-business specialization is a Herfindahl index based on the percent of direct business written in each of 10 lines of business. Geographic concentration is a Herfindahl index based on the percent of business written in each state. Group, life, and annuity direct premiums written are the percent of total direct premiums written in the respective lines. Separate account assets are expressed as a percent of total assets. Permanent life insurance in force is expressed as a percent of total life insurance in force. Best's rating is a dummy variable equaling one if the firm is rated A or higher, zero otherwise. Age is the number of years the firm has been in business. Group affiliation dummy variable equals one if the firm is affiliated with a group and zero if it is a single company. New York licensed is a dummy variable which equals one if the firm is licensed in New York and zero otherwise. States is a vector of 56 dummy variables indicating the jurisdictions in which the firm is licensed. The logistic R^2 for the model is 0.32. The χ^2 statistic is 277 (67 degrees of freedom) and is significant at the 0.0001 level. Organizational form is correctly predicted for 86.1 percent of insurers using the criteria that a firm with a greater than 50 percent estimated probability of being a mutual is classified as a mutual.

The Herfindahl index reflecting line-of-business concentration is insignificant. The coefficient on the Herfindahl index reflecting geographic concentration, while of the expected sign, also is insignificant. Thus, despite the predictions of the managerial discretion hypothesis, we are unable to find evidence of a link between ownership structure and either line-of-business concentration or geographic concentration. Mayers and Smith (1994) also find these variables to be insignificant.

The coefficient on the size variable is negative and has a p-value of 0.1797. Although this is not significant at conventional levels, the sign of the coefficient,

implying a positive association between size and the probability of being a stock company, is consistent with the argument of Mayers and Smith (1981). Mayers and Smith (1981) contend that small stock firms have the greatest susceptibility to expropriation of wealth from policyholders by stockholders, since stockholders have the greatest control in these firms, and therefore size should be positively associated with the probability of being a stock firm, all else being equal.[13] This is still a somewhat surprising result, given the casual observation that most of the very large life insurers are mutuals. Indeed, univariate analysis indicates a positive relationship between size and probability of being a mutual.[14] The multivariate results reveal, however, that once controlling for other things (particularly age) large size does not favor being a mutual.

The company age variable is positive and highly significant, indicating that older life insurers are more likely to be mutuals than younger firms. Hansmann (1985), McNamara and Rhee (1992), and Ferling (1993) have argued that regulation and tax policies have historically favored mutuals, but that these advantages have lessened over time. Thus, the value of the mutual ownership structure may have declined over time.[15] This is a possible explanation for our result. Another likely explanation is that it is much easier to capitalize a new stock company than a new mutual so that new entrants tend to be stock firms. The A. M. Best rating variable has a positive and highly significant coefficient, implying that mutuals tend to have higher Best's ratings than stock companies.

The coefficient on the dummy variable indicating whether the insurer is a group member or an unaffiliated firm is significantly negative, implying that grouping is more predominant in stock companies than in mutuals. One possible explanation for this is the "portfolio of options" argument. In an insurer organized as a single firm, the equity represents a call option on the insurer's asset portfolio. However, in an insurer organized as a group, equity represents a portfolio of call options. Since the investor in a portfolio of call options has the additional right of separate exercise, the equity payoff of an insurer organized on a group basis is greater than or equal to the equity payoff of an insurer organized on a single company basis, provided the underlying asset values and exercise prices are equal in

---

[13] This hypothesis seems very counterintuitive for the life insurance industry, which is dominated by some very large mutuals. However, a casual look at aggregate data does not control for other factors. In our empirical analysis, we are able to control for other important factors, most importantly company age.

[14] The means and medians of total assets for mutuals, shown in Table 1, are significantly greater than they are for stocks. In a univariate logistic regression, the probability of being a mutual is positively related to total assets and significant at the 0.0001 level.

[15] If true, one might wonder why there have not been more demutualizations. However, the decline or even the elimination of the regulatory and tax advantages of being a mutual would not necessarily lead to a large number of demutualizations. First, agency theory tells us that there are some inherent advantages to being a mutual firm (i.e., control of owner-policyholder conflicts). Second, there are significant costs involved in the demutualization process (Ferling, 1993). It does appear that, for new firms not already tied to a particular ownership structure, there is a strong trend toward the stock form. In 1950, there were 133 mutual life insurers and 478 stocks, and in 1993 there were 109 mutuals and 1,835 stocks (American Council of Life Insurers, 1995).

total (Cummins and Sommer, 1996; Huang and Litzenberger, 1988). This argument would imply that stock firms are more likely than mutuals to organize as groups because of this limited liability effect of equity.[16] However, it is also possible that insurers choose to operate as a group rather than a single firm for other reasons. For example, it has been argued that geographically diverse firms might organize as groups in order to minimize the costs of compliance with state regulations (Petroni and Shackelford, 1995). Although we control for size and geographic dispersion in our analysis, our results cannot distinguish between these competing theories of grouping motives.

The final set of variables to be discussed are the state regulation/taxation variables.[17] If regulation/taxation is irrelevant to the choice of ownership structure, we would expect the dummy variables indicating the states in which a firm is licensed to be insignificant. In fact, however, we find that the hypothesis that the dummy variables as a group are not associated with the dependent variable is rejected at the 0.0001 level. In addition, 13 of the individual dummy variables are significant at the 10 percent level, of which 7 are significant at the 5 percent level.

It is also interesting that by far the most significant of the regulation dummy variables is that for New York licensing, with a positive coefficient and a p-value of 0.0001. Because of the stringency of New York insurance regulation, coupled with the extraterritorial dimension of that regulation, it has long been assumed that New York regulation has a particularly important influence on insurance company operations.[18] Much academic research using life insurance company data to look at a variety of issues includes a dummy variable in the empirical models signifying whether the insurer is licensed in New York and thus subject to New York regulation (see, e.g., Wells, Cox, and Gaver, 1995, and Boose, 1990). In terms of agency theory arguments, the stringent extraterritorial regulation would seem to imply lower managerial discretion, and thus we would expect our result that mutuals are more likely than stocks to be licensed in New York.[19]

---

[16] This assumes that the impact of the "portfolio of options" effect is not completely recognized by potential policyholders and fully reflected in the prices they are willing to pay. Whether this is the case is an empirical question.

[17] To conserve space, only the result for the New York dummy variable and the vector of state variables are included in Table 3.

[18] From 1941 to 1969, New York was the only state with a life-health guaranty association (Black and Skipper, 1994). For life insurer investments, the most important state laws are those of New York. The extraterritorial dimension of New York law requires all New York licensed insurers to comply in substance with New York investment law, even for insurers domiciled outside New York (Black and Skipper, 1994). For an empirical investigation of the characteristics of New York licensed life insurers, see Pottier and Sommer (1997).

[19] In the empirical results of Mayers and Smith (1994), although the dummy variables for 12 states are significant, the New York dummy variable is not. Thus, New York regulation does not seem to significantly influence property-liability insurer ownership structure.

CONCLUSION

Variations in ownership structure have not been investigated in the life insurance industry to nearly the same degree as in the property-liability industry. This article uses agency theory arguments to develop hypotheses regarding the determinants of stock versus mutual ownership structure in the life insurance industry. The theoretical analysis focuses on the relative abilities of alternative ownership structures to control incentive conflicts among owners, managers, and policyholders. Empirical results are presented to test the resulting hypotheses. The empirical analysis addresses the relationship between ownership structure and insurer activity choices, institutional factors, and state regulation and taxes.

Regarding support for the managerial discretion hypothesis, our results are mixed. We do find some differences in activity choices between stocks and mutuals. For example, ownership form is significantly related to the percent of premiums written in life insurance, the percent of business in group versus individual insurance, and the percent of assets held in separate accounts. Moreover, the signs on these variables are generally consistent with our hypotheses regarding the relative levels of managerial discretion involved in various business activities. However, we find no statistically significant relationship between ownership form and the proportion of permanent life insurance or the amount of annuity business. We also find no evidence of a link between ownership structure and either line-of-business concentration or geographic concentration, despite theoretical predictions that these concentration variables should be significant.

Interestingly, the strongest results of the analysis are related to the control variables. Age, group affiliation, Best's rating, and states licensed are all highly significant in the logistic regression. Clearly, factors other than agency costs play an important role in the ownership structure issue in the life insurance industry. This does not necessarily imply, however, that managerial discretion is unimportant. First, as just mentioned, some of the line-of-business results are consistent with the managerial discretion hypothesis. Second, it is possible that agency theory issues are influencing some of the control variable results. For example, as discussed earlier, stringent extraterritorial New York regulation can be seen as a restriction on managerial discretion, so the significant association between the probability of being a mutual and the probability of being licensed in New York may be explained in part by the managerial discretion hypothesis. Unfortunately, we are unable to distinguish between this interpretation and other possible interpretations for our results.

In sum, our results add to the body of literature investigating the implications of agency theory for ownership structures in the insurance industry. The results partially support the managerial discretion hypothesis, but the support is not overwhelming. Managerial discretion is clearly not the sole factor in explaining ownership structures in the life insurance industry. Overall, the results of this article provide an important advance in understanding the determinants of ownership structure in the life insurance industry.

REFERENCES

A. M. Best Company, 1992, *Best's Aggregates & Averages: Life/Health* (Oldwick, N.J.: A. M. Best).

American Council of Life Insurance, 1992, 1994, and 1995, *Life Insurance Fact Book* (Washington, D.C.: ACLI).

Barnea, Amir, Robert A. Haugen, and Lemma W. Senbet, 1985, *Agency Problems and Financial Contracting* (Englewood Cliffs, N.J.: Prentice-Hall).

Beam, Burton T. and John J. McFadden, 1996, *Employee Benefits*, Fourth Edition (Chicago: Dearborn Financial Publishing).

Black, Kenneth and Harold D. Skipper, 1994, *Life Insurance*, Twelfth Edition (Englewood Cliffs, N.J.: Simon and Schuster).

Boose, Mary Ann, 1990, Agency Theory and Alternative Predictions for Life Insurers: An Empirical Test, *Journal of Risk and Insurance*, 57: 499–518.

Cummins, J. David and David W. Sommer, 1996, Capital and Risk in Property-Liability Insurance Markets, *Journal of Banking and Finance*, 20: 1069–1092.

Cummins, J. David and Hongmin Zi, 1998, Comparison of Frontier Efficiency Methods: An Application to the U.S. Life Insurance Industry, *Journal of Productivity Analysis*, forthcoming.

Fama, Eugene F. and Michael C. Jensen, 1983a, Separation of Ownership and Control, *Journal of Law and Economics*, 26: 301–325.

Fama, Eugene F. and Michael C. Jensen, 1983b, Agency Problems and Residual Claims, *Journal of Law and Economics*, 26: 327–349.

Ferling, Rhona L., 1993, Heading for Conversion? *Best's Review—Life/Health Insurance Edition*, 93: 26–29, 95–98.

Gardner, Lisa A. and Martin F. Grace, 1996, Efficiency Comparisons between Mutual and Stock Life Insurance Companies, Working Paper, Georgia State University, Atlanta.

Garven, James R. and Steven W. Pottier, 1995, Incentive Contracting and the Role of Participation Rights in Stock Insurers, *Journal of Risk and Insurance*, 62: 253–270.

Hansmann, Henry, 1985, The Organization of Insurance Companies: Mutual versus Stock, *Journal of Law, Economics, and Organization*, 1:125–153.

Huang, Chi-fu and Robert H. Litzenberger, 1988, *Foundations for Financial Economics,* First Edition (New York: North-Holland).

Jensen, Michael C. and William H. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics*, 3: 305–360.

Kazel, Robert, 1995, Managed Care or Indemnity Health Plans? *Business Insurance*, 11: 3–6.

Kennedy, Peter, 1992, *A Guide to Econometrics*, Third Edition (Cambridge, Mass.: MIT Press).

Kopcke, Richard W., 1985, The Federal Income Taxation of Life Insurance Companies, *New England Economic Review*, March/April: 5–19.

Lamm-Tennant, Joan and Laura T. Starks, 1993, Stock versus Mutual Ownership Structures: The Risk Implications, *Journal of Business*, 66: 29–46.

Mayers, David and Clifford W. Smith, 1981, Contractual Provisions, Organizational Structure, and Conflict Control in Insurance Markets, *Journal of Business*, 54: 407–434.

Mayers, David and Clifford W. Smith, 1986, Ownership Structure and Control: The Mutualization of Stock Life Insurance Companies, *Journal of Financial Economics*, 16: 73–98.

Mayers, David and Clifford W. Smith, 1988, Ownership Structure Across Lines of Property-Casualty Insurance, *Journal of Law and Economics*, 31: 351–378.

Mayers, David and Clifford W. Smith, 1992, Executive Compensation in the Life Insurance Industry, *Journal of Business*, 65: 51–74.

Mayers, David and Clifford W. Smith, 1994, Managerial Discretion and Stock Insurance Company Ownership Structure, *Journal of Risk and Insurance*, 61: 638–655.

McNamara, Michael J. and S. Ghon Rhee, 1992, Ownership Structure and Performance: The Demutualization of Life Insurers, *Journal of Risk and Insurance*, 59: 221–238.

Petroni, Kathy R. and Douglas A. Shackelford, 1995, Taxation, Regulation, and the Organizational Structure of Property-Casualty Insurers, *Journal of Accounting and Economics*, 20: 229–253.

Pottier, Steven W. and David W. Sommer, 1997, Regulatory Stringency and New York Licensed Life Insurers, Working Paper, University of Georgia, Athens.

Santomero, Anthony M. and David F. Babbel, 1997, Financial Risk Management by Insurers: An Analysis of the Process, *Journal of Risk and Insurance*, 64: 231–270.

Smith, Michael L., 1982, The Life Insurance Policy as an Options Package, *Journal of Risk and Insurance*, 49: 583–601.

Vaughan, Emmett J. and Therese M. Vaughan, 1995, *Essentials of Insurance: A Risk Management Perspective* (New York: John Wiley).

Wells, Brenda P., Larry A. Cox, and Kenneth M. Gaver, 1995, Free Cash Flow in the Life Insurance Industry, *Journal of Risk and Insurance*, 62: 50–66.

Wright, Kenneth M., 1991, The Structure, Conduct, and Regulation of the Life Insurance Industry, in: R. W. Kopcke and R. E. Randall, eds., *The Financial Condition and Regulation of Insurance Companies* (Boston: Federal Reserve Bank of Boston).