

CONTRACTING INCENTIVES AND COMPENSATION FOR PROPERTY-LIABILITY INSURER EXECUTIVES

Elizabeth Grace

ABSTRACT

This article examines several hypotheses about the structure and level of compensation for 103 property-liability chief executive officers (CEOs) from 1995 through 1997. The greater the level of firm risk and the larger the firm, the greater the use of incentive compensation. Insurers subject to more regulatory attention and those whose CEOs have greater stock ownership make less use of incentive compensation. There is some evidence that option grants and restricted stock awards provide CEOs with differing incentives. This article finds that corporate governance structures, managers' stock ownership, and regulatory attention are not adequate to prevent CEOs from receiving compensation levels in excess of what economic factors predict. Contrary to findings in prior studies, there is little evidence that use of incentive compensation or level of total compensation paid increases with insurer investment opportunities, as traditionally measured.

INTRODUCTION

Levels of executive compensation, the effectiveness of compensation in providing incentives, and efficacy of corporate governance mechanisms have been of academic interest since Jensen and Meckling's (1976) seminal work on agency theory. Numerous studies on various aspects of executive compensation for industrial firms have been published, with three addressing the structure or level of compensation paid to executives of regulated firms, particularly property-liability insurers.¹

Smith and Watts (1992) examine 16 industries to determine whether tax, signaling, or contracting theories best explain financing, dividend, and compensation policies. They use industry-level proxies for performance, investment opportunities, size, and regulation to examine whether empirical associations exist among corporate policy decisions and various industry characteristics. They find that salaries for utility, banking, and insurance chief executive officers (CEOs) are lower than average salaries in

Elizabeth Grace is Professor in the Department of Accounting and Finance at San Jose State University. The author wishes to thank Richard MacMinn and three anonymous referees for their many useful insights and comments.

¹ Most academic studies examine compensation for industrial firms (Mehran, 1995; Core, Holthausen, and Larcker, 1999), while two explore compensation in life insurance firms (Mayers and Smith, 1992; Mayers, Shivdasani, and Smith, 1997).

other industries and that the percentage of firms using bonus and option plans is lower for regulated industries. Smith and Watts attribute lower usage of incentive compensation and lower salaries in some industries to regulation and/or fewer investment opportunities.

Wilson and Higgins (2001) use firm-level data to examine pay-for-performance sensitivities of various types of compensation for insurance brokers and life-health, multi-line, and property-casualty insurers. They also compare insurer compensation levels with compensation levels for a control group of noninsurance service firms. Wilson and Higgins anticipate that regulation will lead to lower levels of compensation for insurance CEOs, but conclude that compensation levels at insurance firms are similar to those at unregulated, noninsurance service firms.

Ke, Petroni, and Safieddine (1999) use a sample of private and publicly held insurance companies to examine whether accounting-based incentive contracts are less prevalent in companies without diffuse ownership. They find a positive association between the sum of salary, bonus, and other compensation and return on assets (ROA) for publicly held insurers, but not for privately held insurers. The authors use state of domicile as a proxy for regulatory strictness, but find no significant association with compensation.

The studies cited employ different methodologies, use different samples, have differing definitions of compensation, and present conflicting evidence on the association between regulation and insurer compensation. Smith and Watts use industry data and find a negative association between regulation and salaries. Wilson and Higgins use firm-level data and find similar total compensation levels for insurers and unregulated, noninsurance service firms. Ke et al. find no significant association between regulatory strictness and compensation levels for property-liability insurers.

The three existing studies use different sets of variables to explain variation in compensation levels either by industry or by firm. All include accounting returns, size, and some measure of regulation to explain compensation variation. Smith and Watts add investment opportunities; Wilson and Higgins add market returns; and, Ke et al. add a test for ownership concentration. None of the articles combine all factors for a comprehensive view of CEO compensation. All of the articles examine whether the compensation levels are associated with firm performance; only Smith and Watts examine the cross-sectional variance in the use of bonus and option plans as incentives; and, only Ke et al. discuss ownership structure as a possible determinant of compensation.

This article examines both the structure and level of executive compensation for a sample of property-liability insurers. It examines the associations between incentive compensation and insurer investment opportunities, risk, and controls on managerial discretion. This article also explores the association between compensation levels and insurer performance, investment opportunities, executive characteristics, ownership structure, corporate governance, and regulation. It tests on insurers the findings by Core, Holthausen, and Larcker (1999) that corporate governance structures are ineffective in monitoring industrial CEOs.

The article expands on previous research in several ways. Tests of hypotheses are made on a sample of property-liability insurers, allowing the use of underwriting

and regulatory data to explain cross-sectional variation in compensation levels and structures. For instance, a solvency regulation variable based on IRIS ratios and a business complexity variable based on underwriting data are used. Tests performed by Core, Holthausen, and Larcker (1999) on a sample of industrial firms are performed on a sample of property-liability insurers using an expanded set of variables measuring demand for a quality executive and regulatory attention. In examining compensation practices for a sample of 103 insurers, four types of compensation are measured, and the Black–Scholes pricing model is used to measure option compensation.

This article finds that incentive compensation as a percentage of total compensation decreases in solvency regulatory attention and CEO stock ownership and increases in insurer size and risk. There is little association between the structure of compensation packages and insurer investment opportunities, as traditionally measured. The results for risk and investment opportunity are contrary to findings by Smith and Watts. This article also finds some evidence that restricted stock awards and option grants may not be similar in their incentive effects for CEOs of sample firms.

The level of CEO compensation for sample property-liability insurers is increasing significantly with ROA, insurer size, the number of subsidiaries managed, commercial lines of business, CEO tenure, the dual role of chairman/CEO, and the percentage of board members who are outside members. CEO compensation has a significant inverse association with CEO stock ownership. Regulatory attention is significantly associated with the level of bonus compensation only. Again, contrary to the findings in the Smith and Watts industry study, there is no evidence that investment opportunities, as traditionally measured in the literature, are associated with levels of compensation. The article finds evidence to support Core, Holthausen, and Larcker (1999) in their conclusion that corporate governance structures are weak.

Several conclusions are drawn from these results: (1) Increased regulatory attention is associated with a decreasing use of incentive compensation, suggesting regulation makes CEO actions more observable or limits CEO choice. (2) Firm risk and size, rather than investment opportunities, are positively associated with the structure of compensation packages. (3) Individual components of incentive compensation may provide CEOs with differing incentives. (4) Individual components of insurer compensation plans combine for a total level of compensation that is increasing significantly with firm performance and other economic determinants; and (5) for property-liability insurers, the significance of corporate governance variables in explaining compensation levels is an indication that corporate governance structures may be weak.

This article provides an overview of contracting theory and offers hypotheses about the structure and level of compensation in the following section. The variables are defined and the sample is described in “Methodology, Sample, and Variable Specification.” The sections “Results” and “Conclusions” present tests of hypotheses and conclusions, respectively.

CONTRACTING THEORY AND COMPENSATION HYPOTHESES

Incentive Compensation

The classic agency problem identified by Jensen and Meckling (1976) and others is that of providing incentives for risk averse managers to make decisions favored by

risk neutral shareholders. Since a manager's human capital and compensation are related to firm survival, managers should prefer compensation packages structured in ways that reduce individual risk.

Harris and Raviv (1979) suggest that managers should prefer fixed cash compensation over incentive compensation, particularly if the incentive compensation is tied to firm returns not completely controllable by managers. Shareholders should also prefer a compensation structure based on fixed cash compensation when they can observe firm investment opportunities and managers' actions. Agency problems are smaller, and shareholders can penalize managers for suboptimal decisions.

High levels of controllable firm risk, unobserved investment opportunities, or large and complex operations make a manager's performance difficult to assess. In attempts to diversify their own compensation risk, managers may make decisions that reduce firm risk and shareholder wealth. In these situations, optimal contracts should compensate managers based on the contribution of their actions to firm value, allowing managers to share in the outcome of their decisions.²

Evidence of an association between the use of incentive compensation and firm risk has not been well established empirically. Mehran (1995) finds no significant association between the percentage of total compensation that is equity-based and firm risk. Smith and Watts (1992) find no significant association between the percentage of firms using bonus or stock option plans and firm risk; but, they do suggest that their proxy for investment opportunities may also be a proxy for firm risk.

Empirical studies generally find a positive association between the use of incentive compensation and firm investment opportunities. Smith and Watts (1992) and Kole (1997) demonstrate a strong association between investment opportunities and the use of incentive compensation plans; however, Yermack (1995) finds no evidence that firms with valuable growth opportunities use stock options to provide CEO incentives. Bryan, Hwang, and Lilien (2000) present mixed results for the association between equity-based compensation and firm investment opportunities. They find that option compensation increases with investment opportunities, while restricted stock grants decrease with a firm's investment opportunities.

Incentive compensation may be less necessary if managerial incentives arise from the manager's stock ownership. Benston (1985) hypothesizes that self-serving management decisions are less likely and fewer equity-based incentives are needed when manager shareholdings are significant relative to individual wealth.³ Mehran (1995) finds that equity-based compensation as a percentage of total compensation decreases in CEO stock ownership.

² When actions and opportunities are not observable, fixed cash compensation still may be effective if contracts are renegotiated periodically. The possibility of future wage adjustments may give managers sufficient incentives to maximize firm value. Smith and Watts (1992) suggest that formal compensation plans may not be necessary to provide incentives, but high turnover and horizon problems encourage their use.

³ There is a point at which stock ownership makes managers act as undiversified shareholders. Wright et al. (1996) hypothesize that at high levels of stock ownership, equity compensation induces executive decisions that are inconsistent with risk-taking. Chang and Mayers (1992) provide support for this hypothesis in their study of employee stock ownership plans (ESOPs).

Incentive compensation also may be less necessary if regulation limits managers' discretion or makes managers' decisions more observable. Insurance solvency regulation monitors insurer revenue growth, investment risk and return, leverage, and other choice variables to provide an early warning for solvency problems. Smith and Watts (1992) find that a lower percentage of firms in regulated industries use bonus and option plans than unregulated firms.

The literature on compensation frequently suggests that different types of compensation give managers differing incentives. Benston (1985) and Jensen and Murphy (1990) hypothesize that equity-based compensation gives managers greater incentives to make value-maximizing decisions than does cash-based compensation. There is some evidence that differing types of equity-based compensation give CEOs different incentives. Bryan, Hwang, and Lilien (2000) hypothesize that stock options provide better incentives for managers to make the decisions preferred by risk neutral shareholders than do restricted stock awards. Because of restrictions on a manager's ability to transfer restricted stock, the manager bears all of the downside risk associated with stock ownership. Managers are unable to diversify their compensation risk and are less likely to select value-maximizing, risky projects. Bryan et al. suggest that restricted stock plans may serve more to attract and retain managers rather than to provide incentives. Finally, Smith and Watts (1992) present evidence that cash bonus plans give managers valuable incentives. MacMinn (1992) demonstrates that bonus payouts do not affect a manager's value-maximizing decisions; rather, managers make decisions that are an increasing function of targeted payouts specified in the bonus scheme.

This article hypothesizes that insurers with greater levels of firm risk, more complex operations, and larger investment opportunities make greater use of incentive compensation. It hypothesizes that insurers subject to greater regulatory scrutiny make less use of incentive compensation. It examines whether shareholders consider the entire set of incentives when structuring compensation packages, and hypothesizes that managers receive compensation packages more heavily weighted with incentive compensation when their stockholdings are smaller. This article also examines whether stock ownership gives board members incentives to monitor actions of CEOs. It hypothesizes that compensation packages are less heavily weighted with incentive compensation when board members have larger levels of stock ownership. All hypotheses are tested for several different types of compensation: total incentive compensation, stock option grants, restricted stock awards, bonus payouts, and long-term incentive payouts.

Compensation Levels

The equilibrium level of compensation paid to a manager should be determined both by the manager's ability and by a firm's demand for a quality manager. In general, managers with greater ability and more invested human capital expect to receive higher levels of compensation, assuming that managers with greater ability are scarcer than managers with less. Core, Holthausen, and Larcker (1999), Chung and Pruitt (1996), and others find a positive association between managerial experience and compensation levels.

The demand for a quality manager and resulting compensation levels may be determined by many firm characteristics, including performance, risk, investment

opportunities, size, and regulation. The link between compensation and firm performance is widely examined, and Murphy (1985), Smith and Watts (1992), Core, Holthausen, and Larcker (1999), and others document a strong association between the level of compensation and prior-year performance.

Managerial risk aversion suggests that managers of high-risk firms receive greater levels of pay to compensate for the uncertainty of future employment, but the empirical evidence is mixed. Core, Holthausen, and Larcker (1999) find compensation levels decreasing in firm risk. Smith and Watts (1992) find no significant association between salary paid and firm risk.

The level of compensation required to attract a manager of a given quality is expected to increase when the firm is large or when the manager's decisions are more complex. Smith and Watts (1992) explain that larger firms are more likely to decentralize; the span of control increases with firm size; and, monitoring of managers and their subordinates becomes more difficult as size increases. They find that average industry salaries increase with size and investment opportunity. Mayers and Smith (1994) demonstrate that managerial discretion is more important for insurers with more complex lines of business.

If regulation limits firm opportunities or managerial decisions, a lower level of compensation may be required to attract a manager of a given quality. Smith and Watts (1992) report lower average salary levels for regulated industries; however, Wilson and Higgins (2001) conclude that compensation levels for insurers and unregulated service firms are similar.

Individual shareholders do not have complete information about a firm's investment opportunities, are not able to observe managers' actions, and do not negotiate with managers directly. Shareholders commonly rely on corporate governance mechanisms, including corporate oversight by the board of directors and managerial ownership interests, to minimize managers' incentive problems. It is assumed in the preceding discussion of compensation levels that the observed board and ownership structures induce optimal compensation contracts and firm performance. The manager's level of compensation is set in order to maximize firm value, given the prevailing wage for the quality of manager required and predetermined corporate governance mechanisms. If optimal compensation contracts are designed, cross-sectional variation in the levels of CEO compensation should be described by the economic determinants of compensation, including firm performance, the required level of managerial discretion, and human capital invested.

The academic literature assesses the effectiveness of corporate governance mechanisms by examining the association between compensation and alternative ownership and board structures. It often concludes that corporate governance structures are ineffective in monitoring managers.⁴ Yermack (1996) and Core, Holthausen, and Larcker (1999) present evidence that a CEO acting as a board chairman creates agency problems. Jensen (1993) suggests that larger boards are often captured by senior managers and are less effective in monitoring management.

⁴ John and Senbet (1998) provide a review of studies focusing on the optimum board structure.

The associations and conclusions often are inconsistent. For instance, Core, Holthausen, and Larcker (1999) find levels of cash compensation increasing in outside directors and whether the CEO also is board chair, among other board factors. They conclude that board and ownership structures are ineffective in monitoring firm managers. Mayers, Shivdasani, and Smith (1997) find mutual life insurer wages decreasing in the number of outside directors.⁵ Mehran (1995) finds that cash compensation as a percentage of total compensation decreases with more outside directors.

This article hypothesizes that executives with greater ability receive greater levels of compensation. It hypothesizes that insurers with more complex operations, larger investment opportunities, and greater levels of firm risk pay their managers greater levels of compensation. It examines the association between regulatory attention and levels of compensation paid. It also examines whether the hypothesized associations extend across the entire set of compensation components. This article hypothesizes that levels of compensation paid by insurers are determined by economic determinants. It examines associations between compensation levels and board of director composition and ownership structure to determine whether the associations are the result of omitted variable bias or whether the associations indicate ineffective corporate governance of insurance executives.

In reality, executive compensation, stock ownership, and the composition of the board of directors are determined by each other and by the characteristics of a firm's business. These characteristics include, among others, business risk, size, investment opportunities, and regulatory attention received. Various aspects of this complicated set of relationships have been investigated, but with the exception of Smith and Watts (1992) and Marx, Mayers, and Smith (2001), little attention has been given to associations between compensation and other endogenous variables for regulated insurers. As previous papers have done, this article treats endogenous variables as predetermined and reported estimates are in reduced form.

METHODOLOGY, SAMPLE, AND VARIABLE SPECIFICATION

Methodology

The hypotheses developed in "Contracting Theory and Compensation Hypothesis" are tested using ordinary least squares analysis on a cross-section of property-liability insurers. Equation (1) tests the associations between compensation structure and variables for ownership structure, investment opportunities, firm risk, and regulation.

$$\begin{aligned} \text{Compensation structure} = f(\text{investment opportunities, complexity of} \\ \text{business, firm size, firm risk, regulatory} \\ \text{attention, equity held by CEOs, equity held} \\ \text{by board members}). \end{aligned} \quad (1)$$

⁵ Mayers, Shivdasani, and Smith noted that the mutual form precludes many corporate governance mechanisms. They find that mutuals employ more outside directors than do stock life insurers and make lower expenditures on salaries and wages as the number of outside directors increases.

Equation (2) tests the associations between level of compensation and the determinants of compensation.

$$\begin{aligned} \text{Compensation level} = f(\text{firm performance, risk, investment opportunities,} \\ \text{complexity of business, size, human capital invested,} \\ \text{equity held by managers, corporate governance,} \\ \text{ownership structure, regulation}). \end{aligned} \quad (2)$$

The hypothesis that corporate governance and ownership structures are effective in monitoring insurance managers is tested in the same method as Core, Holthausen, and Larcker (1999). Using coefficients from OLS regressions performed for Equation (2), predicted excess compensation is determined. The portion of compensation in excess of what economic variables would suggest is used in Equation (3) to explain subsequent years' firm performance.

$$\text{Subsequent ROA} = f(\text{predicted excess compensation, control variables}). \quad (3)$$

Sample

The sample consists of observations over a 2-year period for 103 publicly traded US property-liability insurers. Insurers are identified by standard industrial classification code, and cross-referenced against *Best's Insurance Reports: Property-Casualty* for firm data. CEO compensation data are from proxy statements filed with the Securities and Exchange Commission during 1996–1998.⁶

Variable Measurement

Compensation. Several forms of compensation may be used to attract and motivate managers in a given year. For example, the board of directors in 1997 may consider a compensation package including: salary set and paid during 1997; stock options awarded in 1997; bonus set in 1997 and paid in 1998; and long-term incentive compensation set in 1997 and paid in later years. There may be problems with using bonus and long-term incentive compensation, because both are reported by the SEC in the year paid to managers rather than during the year awarded. Both forms of compensation focus on *ex post* realizations and impose policy decisions from different years.

Although there may be problems with combining bonus and long-term incentive payments with other forms of compensation, this article tests all hypotheses on total compensation paid to CEOs to maintain consistency with prior literature (see Core, Holthausen, and Larcker, 1999). Total compensation in 1997 includes: 1997 salary determined at the beginning of 1997, bonus paid in 1997 for 1996 results, cash incentives

⁶ Of 103 sample firms, 92 report data for 1996 and 1997. The other 11 firms are tested using data from the 1995 and 1996 proxy statements. Statistical results are not sensitive to the inclusion of the 1995 data. Fifty-four firms are classified as fire, marine, and casualty insurers only; five are diversified into noninsurance activities; the remainder are fire, marine, and casualty insurers who also sell life insurance.

earned in earlier years but paid in 1997, other compensation paid in 1997, and option grants and restricted stock awards made in 1997.⁷

The hypotheses are tested for several components of compensation as well. Salary and bonus are used as reported in proxy statements. In many prior studies, equity-based compensation is omitted, represented by a dummy variable, or valued at a constant percentage of exercise price.⁸ In this study, option grants made during a year are valued by a variation of the Black–Scholes pricing model with continuous dividend payments, detailed in an appendix. When stock appreciation rights (SARs) are granted along with options and the executive can choose to exercise either the SAR or the option, the valuation is the same as for a stock option and the SAR is assumed to provide no additional value. Restricted stock is the number of shares granted $\times$ the stock price at date of grant.⁹

Table 1 presents descriptive statistics for various components of compensation. Median total compensation for sample CEOs is \$1,097,084 across the 2-year period. The number of sample firms making option grants to CEOs in 1997 and 1996 total 61 and 54, respectively, and the median option grant is valued at \$136,474 on the date of grant. Equity-based compensation makes up approximately 30 percent of total compensation.

Firm Performance. The proxy for firm performance is ROA, measured as net income to total assets, where both are determined by generally accepted accounting principles (GAAP). ROA is measured for the year preceding the sample year. Whether ROA is the best measure for performance is subject to debate. Lambert and Larcker (1987) suggest using both ROA and market returns because of noise in performance measures. They explain that market returns may be better signals of firm performance if a firm has investment opportunities not captured by accounting information. Similarly, compensation may be more strongly related to accounting measures when managerial decisions focus on the maintenance of existing assets or if the manager's decisions have little effect on firm value.¹⁰ To be consistent with several of the studies discussed in this article (see Smith and Watts, 1992 and Mehran, 1995) ROA is used to measure performance.

⁷ Other compensation may include: contributions to a pension plan, grossed-up taxes, payments made for corporate cars or airplanes, membership fees, and other cash payments.

⁸ For example, Core et al. (1999) value options at 25% of their exercise price, while Chung and Pruitt (1996) and Mayers and Smith (1992) omit incentive compensation. Kole (1997) and Smith and Watts (1992) use dummy variables to indicate the existence of incentive plans.

⁹ Option valuations are restricted to new grants in sample periods and reloads for options previously exercised. Adjustments to existing options through repricing features are omitted; however, this is not a major limitation as options were repriced for fewer than 2 percent of sample executives in 1997 and 1996. Additionally, incentive effects of accumulated options are not measured.

¹⁰ Jensen and Murphy (1990), Antle and Smith (1985), and others maintain that accounting returns are important in determining executive compensation. Executives have incentives to make decisions and report income in ways that affect accounting returns and executive compensation.

TABLE 1

Summary Statistics for Compensation and Its Determinants (Based on 206 Observations)

	Mean	Median	Standard Deviation
Total compensation	\$3,002,161	\$1,097,084	\$5,810,775
Ln(total compensation)	14.0818	13.9082	1.2074
Salary	\$577,677	\$478,117	\$398,941
Ln(salary)	13.0835	13.0776	0.6054
Bonus	\$422,105	\$196,844	\$659,069
Ln(bonus)	9.9523	12.1900	5.1694
Option grants	\$1,672,456	\$136,474	\$4,888,145
Ln(option grants)	7.6322	11.8239	6.9795
Grants as a percent of total compensation	0.2694	0.1860	0.2963
Restricted stock awards	\$175,668	0	\$956,414
Ln(restricted stock awards)	2.2620	0	4.8956
Awards as a percent of total compensation	0.0293	0	0.0931
Long-term incentive payouts	\$151,234	0	\$827,220
Ln(long-term incentive payouts)	12.6251	0	5.9726
Payouts as a percent of total compensation	0.0670	0	0.1471
Failure	2.3301	2.0000	1.4841
Years in position	10.39	8.00	9.8854
Return on assets (ROA)	0.0436	0.0445	0.0793
Standard deviation of ROA	0.0329	0.0208	0.0482
Assets	20.4891	20.4476	1.7646
Market-to-book ratio	4.5621	1.7460	12.0172
Subsidiaries	9.1845	5.0000	12.0274
Commercial	0.5414	0.5080	0.3405
CEO/Chairman	0.6699	1.0000	0.4714
Outside directors	0.7434	0.7778	0.1427
CEO	0.1008	0.0232	0.1647
Outside board members	0.1030	0.0380	0.1533

Notes: Compensation: Total compensation is the sum of salary, bonus, other current cash compensation, options, long-term cash incentive payouts, and restricted stock grants. Option grants are the Black–Scholes valuation with continuous dividend payments. Restricted stock awards are the stock valued at date of award. Long-term incentive payouts are cash paid under long-term performance plans. Regulation: Failure is the number, out of 10 calculated, of IRIS tests falling outside normal ranges. Human Capital: Years in position is the number of years as CEO for the sample. Performance: Return on assets is before tax income divided by total admitted assets for the prior year. Standard deviation of ROA is the standard deviation of annual ROA for the prior 5 years. Discretion: Assets is the natural logarithm of GAAP assets for the year before compensation is paid. The market-to-book ratio is an average over the prior 5 years. Subsidiaries is the number of subsidiaries the CEO controls. Commercial is net premiums written in commercial lines of business to total premiums. Board Composition: CEO/Chairman is a dummy variable equal to 1 if the CEO is also chairman of the board and zero otherwise. Outside directors is the number of outside directors as a percentage of board size. Ownership structure: CEO ownership is the percentage of total shares outstanding beneficially owned by the CEO (owned or controlled by the CEO or an immediate family member). Outside board members' ownership is the number of shares beneficially owned by all outside board members as a percentage of total shares outstanding.

Firm Risk. This article uses the standard deviation of ROA, computed over the 5 years preceding the sample year, as a measure of firm risk.

Investment in Human Capital. Years of service with the sample insurer is used as a proxy for investment in human capital.¹¹ Table 1 indicates that in 1997, sample CEOs average 10 years of experience in that position with the sample insurer.

Level of Managerial Discretion Required. Several proxies are used in the literature to measure investment opportunities.¹² Smith and Watts (1992) and Core, Holthausen, and Larcker (1999) use the ratio of market-to-book value of assets as a proxy for investment opportunity. There may be measurement problems with using this proxy for property-liability insurers. Large ratios are interpreted in the literature to mean that firms have valuable investment opportunities unmeasured by accounting valuation rules. A large market-to-book ratio for an insurer may indicate simply that book assets are undervalued relative to market valuations because of interest rate fluctuations and accounting valuation rules.¹³ To be consistent with prior studies, the proxy used for investment opportunity is the average ratio of market-to-book value (GAAP) of net assets for the five preceding years. The market value of net assets is the year-end stock price $\times$ the number of outstanding shares.

The ratio of premiums written in commercial lines of business to total premiums written is one proxy for business complexity.¹⁴ Commercial lines, compared with personal lines of business, rely less on standard forms and rates in underwriting. A second proxy for business complexity is insurer size, represented as the natural logarithm of total GAAP assets.¹⁵ A third measure of business complexity is the number of subsidiaries for which the CEO is responsible, either directly or through a holding company structure.¹⁶

¹¹ Age and years of service are often used as proxies for human capital. Chung and Pruitt (1996) suggest education may make a manager more productive and able to earn higher levels of compensation. They regress compensation on years as CEO, age, college degree, and graduate degrees, and find a significant association only for years as CEO. Mayers and Smith (1992) report similar results.

¹² Mehran (1995) uses research and development expenditures as a percentage of sales as a proxy of investment opportunities, while others argue that Tobin's Q is a measure of investment opportunities. Insurers rarely report research and development expenditures, and there is disagreement over whether Q measures investment opportunities or performance.

¹³ Insurers hold large investment portfolios of debt instruments. Since 1993, Financial Accounting Standard 115 has required that when management intends to hold debt investments to maturity, the debt must be valued at historical cost, adjusted for premium and discount amortization. Insurer stock prices should adjust for market interest rate fluctuations, but GAAP book valuations would not change.

¹⁴ The commercial lines of business proxy includes: workers' compensation, medical malpractice, commercial multiperil, ocean marine, inland marine, and fidelity and surety.

¹⁵ The natural logarithm of net premiums written also is tested as a measure of size. Its inclusion does not significantly change results reported in this article.

¹⁶ Other proxies for complexity were tested, including a dummy variable taking the value 1 if the insurer has life subsidiaries and a variable for the number of life insurance subsidiaries

Regulation. A proxy is constructed to measure regulatory attention received by sample insurers. Ten of the twelve solvency regulatory ratios used by state insurance commissions are either reported by *Best's Property-Liability Insurance Reports* or may be constructed using reported data.¹⁷ Ratios are calculated for each insurer year and are compared with acceptable levels. The number of ratios lying outside normal ranges is the proxy for degree of regulatory attention received by an insurer. The variable is lagged for 1 year; thus, the degree of regulatory attention received in 1997 is based on regulatory ratios calculated at the end of 1996.¹⁸

Corporate Governance. CEO/Chair is a dummy variable taking the value 1 when the CEO is also chairman and zero otherwise. Outside directors is the ratio of outside board members to total board size.

Stock Ownership. Two variables represent insurer stock ownership. CEO ownership is the percentage of stock beneficially owned by the CEO as a percentage of total shares outstanding. Board ownership is the percentage of stock beneficially owned by nonmanagement board members as a percentage of total shares outstanding.

Ownership and board of director data are reported in insurer proxy statements filed with the SEC. Table 1 presents the summary information related to the board of director composition. Two-thirds of sample boards are chaired by the CEO, and 74 percent of board members are outside directors. Median CEO beneficial stock ownership is 2.3 percent, while the median total beneficial ownership of outside board members is 3.8 percent.

RESULTS

Structure of Compensation Contracts

Reduced form estimates of the associations between compensation structure and variables representing ownership structure, investment opportunities, firm risk, and regulation are presented for CEOs in Table 2. To control for the presence of diversified insurers, the dummy variable, SIC 6331, takes the value 1 when the insurer is classified only as a property-liability insurer and 0 if the insurer has more than one standard industrial classification.

managed. Neither variable was significant in any specification. It is possible that the complexity of organizational structures is not captured by the complexity variables specified, lowering the power of tests in this article.

¹⁷ The regulatory ratios calculated are: gross premiums written to surplus, net premiums written to surplus, change in net premiums written, 2-year overall operating ratio, investment yield, change in surplus, liabilities to liquid assets, gross agents' balances to surplus, one-year reserve development to surplus, and 2-year reserve development to surplus. Data needed to calculate surplus aid-to-surplus and the estimated current reserve deficiency-to-surplus are not available.

¹⁸ The number of ratios falling outside accepted boundaries may be a proxy for poor firm performance instead of degree of regulatory attention. If so, incentive pay as a percentage of total compensation should have a positive association with FAILURE as contracts are adjusted to give executives greater future incentives. A negative association would indicate that FAILURE more likely measures regulatory attention.

TABLE 2

Reduced Form Estimates of Incentive Compensation as a Percentage of Total Compensation for CEOs (Panel A) and SIC 6331 CEOs (Panel B)

	Total Incentive	Options	RSA	Bonus	LTIP
Panel A					
Constant	0.068 (0.346)	-0.297 (-1.664)*	-0.045 (-0.731)	0.406 (3.926)***	-0.042 (-0.414)
Standard deviation of ROA	0.826 (1.901)*	1.017 (2.374)**	0.117 (0.784)	-0.308 (-1.244)	-0.168 (-0.698)
Asset size	0.061 (4.962)***	0.058 (4.761)***	0.010 (2.347)**	-0.007 (-0.950)	0.015 (2.182)**
Market-to-book	0.002 (1.271)	0.002 (1.008)	0 (0.566)	0 (0.143)	0.001 (1.307)
Commercial lines of business	0.053 (0.883)	0.023 (0.393)	0.016 (0.769)	0.014 (0.405)	-0.009 (-0.273)
CEO stock ownership	-0.455 (-3.420)***	-0.412 (-3.139)***	-0.040 (-0.874)	-0.003 (-0.039)	-0.152 (-2.056)**
Outside board stock ownership	0.064 (0.397)	0.259 (1.641)*	-0.033 (-0.596)	-0.163 (-1.786)*	0.019 (0.209)
Regulatory attention	-0.030 (-2.101)**	-0.022 (-1.574)	0.007 (1.484)	-0.015 (-1.850)**	0.004 (0.560)
SIC 6331	-0.001 (-0.019)	0.039 (0.901)	0.010 (0.696)	-0.051 (-2.011)**	0.008 (0.318)
R ²	0.218	0.204	0.012	0.024	0.025
F-statistic	7.542***	7.023***	1.274	1.583	1.612
Observations	206	206	206	206	206

(continued)

Results indicate that large insurers and insurers with greater levels of firm risk make greater use of incentive compensation. There is no evidence that insurer investment opportunities, as traditionally specified, are significantly associated with total incentive compensation. The variable measuring job complexity also is insignificant in explaining variation in observed incentive compensation structures. CEOs receive compensation packages more heavily weighted with incentives when their stockholdings are smaller, and packages less weighted with incentive compensation when the firm is subject to greater regulatory scrutiny. The coefficients for board stock ownership and property-liability industry classification are insignificant.¹⁹

¹⁹ Additional variables are included to measure other dimensions of board of director effectiveness, including: outside board members as a percentage of total board size, board size, old directors, busy directors, directors with potential conflicts of interest, the presence of a founder on the board, and the CEO/chair dual role. None of these variables, included singly or together, is significantly associated with the percentage of equity-based compensation received by CEOs. The model reported is closest to that presented in prior research.

TABLE 2
(Continued)

	Total Incentive	Options	RSA	Bonus	LTIP
	Panel B				
Constant	0.355 (1.406)	0.210 (0.917)	-0.095 (-1.120)	0.334 (2.428)**	-0.094 (-0.819)
Standard deviation of ROA	1.017 (1.815)*	1.016 (1.990)**	0.242 (1.282)	-0.330 (-1.095)	0.090 (-0.367)
Asset size	0.088 (4.466)***	0.047 (2.647)***	0.019 (2.864)***	-0.004 (-0.393)	0.026 (2.862)***
Market to book	0.009 (2.043)**	0.006 (1.558)	-0.001 (-0.752)	0.003 (1.829)*	-0.001 (-0.260)
Commercial lines of business	0.027 (0.313)	-0.024 (-0.308)	0.049 (1.683)*	-0.031 (-0.666)	0.033 (0.854)
CEO stock ownership	-0.806 (-4.540)***	-0.587 (-3.636)***	-0.039 (-0.659)	-0.051 (-0.525)	-0.128 (-1.581)
Outside board stock ownership	-0.480 (-2.025)**	-0.269 (-1.247)*	-0.071 (-0.891)	-0.115 (-0.895)	-0.024 (-0.224)
Regulatory attention	-0.021 (-0.964)	-0.021 (-1.040)	0.014 (1.902)*	-0.018 (-1.522)	0.004 (0.376)
R ²	0.316	0.204	0.074	0.024	0.063
F-statistic	8.065***	7.023***	2.219**	1.583	2.033*
Observations	108	108	108	108	108

*Significant at 0.10 level.

**Significant at 0.05 level.

***Significant at 0.01 level.

Dependent variables are expressed as a percentage of total compensation. Total incentive is the sum of option grants, restricted stock awards, bonus payouts, and long-term cash incentive payouts. Options is the Black-Scholes valuation of option grants with continuous dividend payments. RSA is the value of restricted stock awards on the date of grant. Bonus is the amount of bonus paid for prior year performance. LTIP is long-term incentive payouts. Standard deviation of ROA is the standard deviation of annual ROA for the prior five years. Asset size is the natural logarithm of GAAP assets for the year before compensation is paid. The market-to-book ratio is an average over the prior five years. Commercial lines of business is the percentage of total net premiums written in commercial lines. CEO ownership is the number of shares owned or controlled by the CEO as a percentage of total shares outstanding. Outside board ownership is the number of shares beneficially owned by all outside board members as a percentage of total shares outstanding. Regulatory attention is the number of IRIS ratios falling outside normal ranges. SIC 6331 is a dummy variable equal to 1 if the firm is classified only as a property-casualty insurer.

Table 2 also presents tests of the hypothesis that different types of compensation give CEOs differing incentives. Associations between four types of incentive compensation (option grants, bonus payouts, restricted stock awards, and long-term incentive payouts) as a percentage of total compensation and variables representing ownership structure, investment opportunities, firm risk, regulation, and industry classification vary in sign and significance. Option compensation is used more heavily by large insurers and those with greater levels of firm risk. Option compensation is decreasing

with CEO stock ownership, and increasing with outside directors' stock ownership. There is no significant association between regulatory attention and stock option grants. In contrast, restricted stock awards are significantly associated only with firm size.

The incentive effects of bonus and long-term incentive payouts are more difficult to interpret. MacMinn (1992) suggests that bonus targets provide information about bonus incentives. Bonus and long-term incentive variables, as reported by the SEC and used in this article, represent actual payouts to the CEO after performance has been evaluated; thus, regression results are more likely to shed light on pay-for-performance considerations than on CEO incentives. The overall regressions for bonus and long-term incentive payouts are insignificant. CEOs employed by undiversified property-liability insurers, by insurers with greater ownership by outside board members, and by insurers subject to greater regulatory attention receive lower bonus payouts. There is no significant association between bonus payments and firm risk, size, or investment opportunities. CEOs at larger insurers receive greater long-term incentive payouts, while CEOs with greater stock holdings receive less in long-term incentive payouts.

Sensitivity Results. The significance of risk and the general insignificance of investment opportunities are the opposite of results reported by Mehran (1995) and Smith and Watts (1992), and may be caused by use of different samples, differing variable specifications, or correlation between risk and investment opportunities. Smith and Watts (1992) use the percentage of firms in each industry having an option plan as a measure of incentive compensation. In this study, all but two sample insurers have option plans in place for CEOs.²⁰ Mehran (1995) uses research and development expense as a percentage of sales as a proxy for investment opportunities. Both studies have samples more heavily weighted with industrial firms than with insurers.

Smith and Watts suggest that firm risk may increase with investment opportunities and that the significance of investment opportunities in their study could be due to risk. The associations reported in Table 2 are reestimated omitting the risk variable. Market-to-book ratios are still insignificant and the sign remains the same. Additional tests replicate the Smith and Watts study, regressing various types of incentive compensation as a percentage of total compensation on the logarithm of net premiums written, market-to-book ratios, and regulatory attention.²¹ In no specification does the market-to-book ratio have a positive, significant association with incentive compensation as a percentage of total compensation.

The dummy variable for the property-liability industry may not fully capture differences due to corporate structure. To control for diversification effects, the hypothesized associations presented in Table 2 are reestimated separately for insurers classified only as property-liability firms (SIC 6331). Results appear in Table 2 (panel B) and are similar to those for the full sample. One exception is that incentive compensation paid to CEOs of undiversified property-liability insurers is less sensitive to regulatory

²⁰ CEOs of the two firms not granting options own 34 and 82 percent of their firms' outstanding stock.

²¹ This is the closest model to that specified by Smith and Watts. Omitting the regulatory attention variable does not alter the sign or significance of the market-to-book ratio. The market-to-book ratio is insignificant in all regressions.

attention and decreases with outside director stock ownership. A second exception finds total incentive compensation increasing with investment opportunities for undiversified property-liability insurers. This suggests that CEOs at undiversified insurers with greater investment opportunities receive greater proportional incentive compensation.

When the components of incentive compensation are tested separately, only bonus payouts have a positive, significant association with investment opportunities. Since these payouts are *ex post*, the significant results may suggest that CEOs at undiversified insurers receive greater bonus payouts as pay for performance, i.e., they receive bonus payments in 1997 as a reward for increasing the firm's market value relative to its book value in prior years.

Most results for individual components of incentive compensation are similar for the total and restricted samples. The findings for restricted stock awards are interesting for the restricted sample. There are no significant associations between restricted stock grants and variables representing firm risk, CEO ownership, or board ownership, in contrast to the significant associations found for option grants. Most forms of incentive compensation have a negative association with regulatory attention both in the total and restricted samples. For undiversified property-liability insurers, restricted stock awards increase significantly with regulatory attention. This result is consistent with findings of Bryan, Hwang, and Lilien (2000), who suggest that restricted stock may be used more to attract and retain CEOs than to provide incentives. Greater proportional restricted stock awards are required for CEOs managing insurers facing increased regulatory attention.²²

Level of Compensation

Associations between the level of executive compensation and predetermined variables are tested and reduced form and ordinary least squares results appear in Table 3. Four measures of compensation are regressed on proxies for firm performance and risk, the demand for quality executives, human capital invested, ownership, board composition, and regulation. A dummy variable is included to control for the year in which compensation is paid. It is insignificant in all regressions, and is omitted from the results presented.²³

²² The report of the compensation committee of the board of directors, contained in proxy statements filed with the SEC, is examined for all sample insurers. All 24 insurers granting restricted stock indicate that the awards are made to attract and retain key executives.

²³ Several assumptions must be satisfied for ordinary least squares to be an appropriate estimation procedure. It is assumed that regression coefficients are the same across firms and across time. Compensation and total assets vary with sample insurer size, and coefficients cannot be presumed to be constant. Also, the literature suggests that compensation is logarithmically related to firm characteristics such as sales and assets (see Core et al., 1999, for a discussion). Compensation data, assets and net premiums written are transformed by the natural logarithm. A control variable having the value 1 in 1996 and zero otherwise is included in all regressions. The variable is insignificant in all regressions and is not reported. It is also assumed that the error terms are independent. In this study, there are two observations for each firm, and the *t*-statistics could be overstated. Data are averaged for each firm over the 2-year period, and regressions run on average statistics. Results are different from those presented only in significance levels.

TABLE 3

Regressions of CEO Compensation on Performance, Demand for a Quality Executive, Human Capital, Corporate Governance, and Ownership Variables

	Predicted Sign	CEO Compensation Variable			
		Total	Salary	Bonus	Options
Constant		10.509 (17.027)***	11.084 (35.859)***	5.731 (1.641)*	−5.878 (−1.364)
Return on assets (ROA)	+	2.061 (2.020)**	0.260 (0.509)	7.117 (1.232)	10.049 (1.410)
Standard deviation of ROA	?	1.619 (1.073)	0.335 (0.444)	−3.872 (−0.453)	17.895 (1.698)*
Asset size	+	0.254 (4.474)***	0.135 (4.747)***	0.123 (0.384)	1.117 (2.822)***
Market to book	+	0.007 (1.177)	0.004 (1.284)	0.011 (0.308)	0.019 (0.453)
Commercial lines of business	+	0.474 (2.427)***	0.248 (2.534)***	2.445 (2.212)**	0.303 (0.222)
Subsidiaries managed	+	0.018 (2.208)**	−0.001 (−0.185)	0.060 (1.274)	0.034 (0.589)
Years of service as CEO	+	0.022 (2.676)***	0.020 (5.027)***	−0.001 (−0.014)	−0.030 (−0.531)
CEO is chairman		0.564 (3.629)***	0.314 (4.035)***	2.066 (2.349)**	2.227 (2.052)**
Outside directors		1.417 (2.546)***	0.727 (2.610)	2.453 (0.779)	7.419 (1.910)*
CEO stock ownership		−2.535 (−5.323)***	−1.251 (−5.243)***	−5.695 (−2.113)**	−10.265 (−3.086)***
Regulatory attention		−0.061 (−1.130)	−0.03 (−1.267)	−0.590 (−1.938)**	−0.557 (−1.483)
Adjusted R^2		0.493	0.439	0.109	0.247
F-statistic		17.648***	14.375***	3.101***	6.617***
N		206	206	206	206

*Significant at 0.10.

**Significant at 0.05.

***Significant at 0.01.

Total compensation sums salary, bonus, other cash compensation, option grants, long-term cash payouts, and restricted stock grants. Option grants are a Black–Scholes valuation with continuous dividends. Return on assets is pre-tax income divided by total assets for the prior year. Standard deviation of ROA is the standard deviation of annual ROA for the prior five years. Asset size is the natural logarithm of GAAP assets for the year before compensation is paid. The market-to-book ratio is an average over the prior five years. Commercial lines of business is the percentage of net premiums written in commercial lines. Subsidiaries managed is the number of subsidiaries under CEO control. Years in position is the number of years as CEO for the sample firm. CEO/Chairman is equal to one if the CEO is board chairman and zero otherwise. Outside directors is the number of outside directors divided by board size. CEO ownership is the number of shares owned or controlled by the CEO or an immediate family member as a percentage of total shares outstanding. Regulatory attention is the number of IRIS ratios falling outside normal ranges.

CEOs with greater experience receive greater levels of total compensation, and total compensation increases with firm ROA.²⁴ Larger insurers and those with more complex operations pay their managers greater levels of compensation. Levels of total compensation are greater when the CEO is chairman of the board and when outside board members are a greater percentage of board size. Total compensation levels decrease when the CEO owns more of the outstanding stock of the firm.²⁵ Total compensation increases with firm risk and the market-to-book ratio and decreases with regulatory attention, but not significantly.

While total compensation increases significantly with prior period ROA, individual components of compensation are not sensitive to ROA. Total compensation and most individual compensation components are not significantly associated with risk, but the level of option compensation increases significantly with insurer risk. Regulatory attention has no significant association with total compensation levels, but levels of bonus compensation decrease with increasing regulatory attention.

Sensitivity Results. There is some inconsistency between significance levels reported for total compensation and those reported for salary, bonus, and option grants, perhaps because total compensation includes long-term incentive payouts and other cash compensation.²⁶ Insignificant results for some of the hypothesized variables reported in Table 3 could indicate a power problem caused by the large number of explanatory variables relative to the sample size. All equations in Table 3 are reestimated, omitting governance variables. For total compensation, the only difference in results is that the coefficient for ROA is significant at a 10 percent level. For option compensation, the only change is that FAILURE becomes slightly less significant. The equations are estimated using backwards elimination of insignificant variables, leading only to increased significance for the already significant variables.

Tests of Competing Explanations for Corporate Governance Variables

When optimum compensation contracts are designed, compensation should be related to firm performance, the demand for managerial discretion, the manager's accumulated human capital, and regulatory attention. Regression results for CEO compensation indicate that corporate governance variables, which encompass board composition and ownership variables, are significantly associated with compensation. The positive associations between board composition variables and compensation may indicate that boards are ineffective in controlling incentive conflicts, paying

²⁴ Additional regressions, not reported here, include age to measure the executive's preference for cash compensation as retirement nears. Age is insignificant for all types of compensation tested.

²⁵ There may be a tax motive that has an opposite effect for closely held corporations. The Internal Revenue Service reserves the right to classify compensation as a constructive dividend, which is not tax deductible for the insurer. If payments to CEOs can be classified as compensation, rather than as dividends, the joint tax liability of the insurer and its owner/managers is reduced.

²⁶ Long-term cash incentive payouts during the sample period average \$151,234. The mean is skewed by the award of \$10,850,000 to one executive. Omitting this outlier, average cash incentive payouts are \$98,564.

TABLE 4

Regression of Return on Assets on Predicted Excess CEO Compensation

Variable	Total Excess	Excess Salary	Excess Bonus	Excess Option
Constant	0.037/(2.979)***	0.037/(2.994)***	0.029/(2.469)***	0.035/(2.480)***
Excess compensation	-0.013/(-1.886)*	-0.025/(-1.885)*	-0.001/(-0.546)	-0.002/(-1.485)
ROA deviation	0.101/(1.565)	0.100/(1.554)	0.098/(1.503)	0.099/(1.534)
Net premiums written	0.001/(0.299)	0.001/(0.317)	0.000/(0.018)	0.000/(0.211)
Adjusted R ²	0.016	0.016	0.000	0.009
F-ratio	2.041	2.039	0.940	1.584

*Significant at 0.10 level.

***Significant at 0.01 level.

Values in parentheses are *t*-statistics.

The measurement year is the first year after the CEO receives excess compensation. Return on assets is an average of before tax income divided by total assets for the year after excess compensation is awarded. Excess compensation is the sum of OLS coefficients multiplied by board composition and ownership variables. Standard deviation of ROA is the standard deviation of annual ROA for the five years prior to the measurement year. Net premiums written is the natural logarithm of net premiums written in the measurement year.

managers in excess of what economic variables would suggest. Alternatively, the positive association may be the result of omitted variables. For example, the dual CEO/board chair variable may be less an indication that boards are captured by the CEO than an indication that no other variable adequately measures the dual role.

Core, Holthausen, and Larcker (1999) test the competing interpretations by regressing subsequent years' ROA and market returns on the predicted excess component of compensation. They reason that when CEO compensation levels are greater than economic variables would suggest, future returns may be compromised. A significant negative association between excess compensation and subsequent years' performance is interpreted as evidence of ineffective corporate control. A positive association indicates that corporate governance variables serve as proxies for omitted variables. In their study, Core et al. find that excess compensation is significantly, inversely associated with subsequent year performance, and conclude that corporate governance mechanisms are ineffective in resolving incentive conflicts.

To determine whether the results in this study support these findings, similar regressions are performed for sample insurers. ROA, calculated over 1-, 2-, and 3-year periods following compensation awards, is regressed on predicted excess compensation, ROA deviation over the 5 years prior to the measurement year, and the natural logarithm of net premiums written.²⁷ Results are reported in Table 4.

²⁷ Predicted excess compensation is the sum of OLS coefficients multiplied by board composition and ownership variables. In the 1-year regression, ROA in 1998 is regressed on excess 1997 compensation. Tests of excess salary, bonus, options, long-term incentive payouts, and other compensation provide similar results. For all types of compensation, predicted excess compensation is negatively associated with subsequent year accounting returns.

There is some support for the finding by Core et al. that predicted excess compensation paid to CEOs is inversely associated with subsequent year ROA, but overall explanatory power is weak for all specifications. Excess total compensation and salary are inversely associated with subsequent ROA, but only in the year following payment of compensation. There is no significant association between any form of excess compensation and 2 or 3 year ROA; neither is there a significant association between excess bonus or option compensation and subsequent year ROA.

The significant association between corporate governance variables and CEO compensation in Table 3 provides weak evidence that corporate governance of property-liability insurers is ineffective. Insurers with CEOs who also are chairman of the board and with greater percentages of outside directors may grant salary and total compensation levels in excess of what economic determinants suggest.

CONCLUSIONS

This study examines the structure of compensation packages for a sample of property-liability insurance executives, and finds evidence to support several hypotheses related to incentive pay. As sample insurers increase in size and risk, managers receive greater incentive compensation as a percentage of total compensation. As CEO stockholdings increase, there is less need to align CEO and shareholder incentives, and the percentage of pay received in incentives decreases. The percentage of total compensation paid as incentives decreases as regulatory attention increases, suggesting that regulation either makes CEO actions more observable or restricts CEO choices, reducing the need for incentive compensation. Contrary to findings by Smith and Watts (1992), there is limited evidence that incentive compensation increases significantly with an insurer's investment opportunities, as traditionally measured. These conclusions generally hold for option grants as well as total incentive compensation.

This study also examines the incentive effects of restricted stock awards, bonus payouts and long-term incentive payouts. There is some evidence indicating that restricted stock awards provide different incentives for CEOs than do options. For undiversified property-liability insurers, regression results suggest that restricted stock awards may be given to attract and retain CEOs rather than to give the incentives hypothesized in this article. Evidence from the report of compensation committees confirm this interpretation; however, less than a quarter of sample insurers awarded restricted stock to CEOs and additional study is needed on the incentive effects of restricted stock.

Bonus payouts are lower for undiversified property-liability insurer CEOs and for insurers receiving greater regulatory attention. For undiversified insurers, bonus payments are higher after the CEO increases insurer market value relative to book value. CEOs of large firms receive greater payouts from long-term incentive plans, but payouts decrease as the CEOs' stock ownership increases. Any discussion of the incentive effects of bonus and long-term incentive compensation is necessarily limited, for data reported to the SEC are payout rather than target compensation.

This study also provides an overall specification of executive compensation levels. CEOs receive total compensation that increases with firm performance, the percent

of business that is written in commercial lines, the number of subsidiaries managed, and firm size. CEOs receive compensation increasing in tenure with the firm.

Total compensation decreases as the CEO owns a greater percent of the insurer's outstanding stock and as regulatory attention increases, although the association between regulation and total compensation is not significant at conventional levels. These findings suggest that the CEO stock ownership and regulation restrict self-serving behavior; however, additional tests indicate that the findings by Core, Holthausen, and Larcker (1999) for industrial firms may apply to insurers. Compensation levels increasing with outside representation on the board of directors and with the CEO/chairman role indicate that regulatory attention, CEO stock holdings, and board governance may not be adequate to prevent insurance managers from receiving compensation in excess of the levels economic variables suggest. A fuller testing of the hypotheses of Core et al. requires more data to adequately measure the effects of various characteristics of board composition on CEO compensation levels.

APPENDIX

Stock option grants made during a year are valued by a variation of the Black–Scholes pricing model with continuous dividend payments:

$$C = Se^{-dT} \phi(Z) - Xe^{-rT} \phi(Z - \sigma\sqrt{T}).$$

Estimates of Black–Scholes parameters use the following assumptions:

C = price of option at date of award.

S = common stock price on date of grant, reported in proxy statements.

X = exercise price, reported in proxy statements.

$\phi(\cdot)$ = cumulative standard normal distribution function.

T = time to expiration, usually 3, 5, or 10 years, reported in proxy statements.

r = continuous risk-free interest rate, measured as $\ln(1 + R)$, where R is the annual three, 5- or 10-year average market yield on US government securities, reported in the Federal Reserve Bulletin.

d = continuous dividend yield defined as $\ln[1 + (\text{dividend rate}/\text{closing stock price})]$, where the dividend rate is the last dividend paid during the year multiplied by 4. When insurers do not pay dividends quarterly, the rate is the sum of dividends paid in the year.

σ = annualized volatility, estimated as the square root of the sample variance of daily logarithmic stock returns during the last 120 days of the fiscal year, multiplied by 254, the number of trading days in a typical year.²⁸

$Z = [\ln(S/X) + (r - d + \sigma^2/2)](T/\sigma\sqrt{T})$.

²⁸ Yermack (1995) tests the sensitivity of a 120-day trading period, and finds little difference between a 120-day variance estimate and a 10-year variance estimate.

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