

The relation between CEO control and the risk of CEO compensation

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Abstract

Optimal ownership structure is an important issue in corporate governance debates. This study uses piece-wise regression analysis to examine the impact of ownership structure on the risk of CEO compensation. We show that when the CEO and the board of directors control low levels of voting stock (i.e., below 13% of total shares) increases in ownership are positively related to CEO compensation risk. For ownership levels above 13% but below 22%, increases in ownership are negatively related to CEO compensation risk. This evidence provides a partial explanation for the non-monotonic relationship between Tobin's Q and management ownership observed by Morck et al. (1988) [Morck, R., Shleifer, A., Vishny, R., 1988. Management ownership and market valuation: an empirical analysis, *Journal of Financial Economics* 20 (1988) 293–316.]. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

This study extends the research in corporate control by examining the effect of ownership structure on the risk of CEO compensation. Morck et al. (1988) provide an important insight into the corporate control aspects of ownership structure by

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demonstrating that the relationship between top management control and firm value is non-monotonic. Their analysis shows that equity values increase as top management stock ownership increases from low levels, but then decrease as top management stock ownership increases across some middle ownership range. The authors interpret their finding as evidence of management entrenchment in the middle ownership range.

Subsequent studies have shown that, regardless of ownership level, higher management stock ownership shields managers from corporate takeovers and reduces the likelihood of management turnover (Song and Walkling, 1993; Denis et al., 1997). In addition, entrenched managers are not likely to be removed from their jobs for poor performance (Denis et al., 1997) and can more easily dictate the terms of a change of control (Martin, 1996; Ghosh and Ruland, 1998). Berger et al. (1997) find evidence that entrenched managers avoid risk by limiting debt in company capital structures.

In a study of the characteristics of firm's with dominant stockholders (i.e., more than 50% ownership), Holderness and Sheehan (1988) find a positive market reaction to block trades that create a dominant stockholder. They also find evidence that firms with dominant stockholders tend to maintain such structures.

Our study provides further evidence on the association between management entrenchment and declines in equity values by examining the influence of CEO control (hereafter the term "control" will be used to mean "CEO control") on the risk of CEO compensation. More specifically, we use stock owned by the CEO, other officers, and the Board of Directors as our measure of control and study its relationship with our measure of compensation risk — the proportion of CEO compensation based on stock price performance.

Most executive compensation studies have focused mainly on the expected amount of pay received by CEOs. However, since CEO compensation is open to public scrutiny, CEOs may choose to increase the value of their compensation contracts in more subtle ways like receiving compensation from less risky sources such as salary and bonus payments based on earnings performance measures (see Sloan, 1993). The degree of control at which CEOs affect compensation risk has not been explicitly examined.

We find that the relation between control and CEO compensation based on stock price performance is non-monotonic. Consistent with the results of Morck et al. (1988), the proportion of risky compensation increases and then decreases as the combined stock ownership of the CEO and Board increases. Our results are important since reduction of stock-based compensation can reduce the alignment of manager and owner interests leading to reduced equity values.

We discuss the determinants of compensation risk and CEO control in Section 2 and present our hypotheses in Section 3. Section 4 contains characteristics of the firms in our sample, variable descriptions, and a discussion of our empirical methods. Test results are presented and discussed in Section 5 and summarized in Section 6.

2. Determinants of compensation risk and CEO control

2.1. Compensation risk

CEO compensation contracts typically contain salary, a benefits package, and incentive bonus programs. The greater the portion of compensation paid through salary, the lower the expected risk of compensation streams. For purposes of this study, compensation risk results from uncertainty in incentive bonus payments based on earnings and stock price performance. The risk of incentive bonus programs is, therefore, directly affected by the risk of performance measures used to determine bonus payments. Sloan (1993) demonstrates that performance measures based on stock price are noisier and hence more risky than earnings-based performance measures. Therefore, for a given expected payment, risk averse CEOs should prefer to have their bonus payments based on earnings performance measures which should reduce the sensitivity of their compensation to stock price performance.

It has been suggested that firm-specific human capital, compensation based on stock price, and direct holdings of company stock can result in CEO personal portfolios that are less diversified than portfolios of non-management stockholders (Lambert and Larcker, 1985). Assuming this is the case, at some level of stock ownership, additional increments of stock-based compensation lessen diversification and increase the risk that CEOs bear relative to non-management stockholders. The perceived value of additional increments of stock-based compensation would also decline relative to prior increments (Lambert et al., 1991). The lack of personal diversification combined with a decline in the perceived value of stock-based compensation provides an incentive to reduce compensation risk. If CEOs can manage their compensation contracts, then they can reduce compensation risk by reducing the portion of their compensation that is based on stock price performance. Consistent with this notion, Aggarwal and Samwick (1999) find that the sensitivity of top management compensation to firm performance declines as stock return variability increases.

2.2. Ownership structure and CEO control

Ownership of stock by management promotes two potentially conflicting incentives. On one hand it provides an incentive to reduce excessive consumption of pecuniary benefits because costs born by management are proportional to their stock ownership (Jensen and Meckling, 1976). Based on this notion, increased management stock ownership should promote increased equity values. On the other hand, the control associated with increased stock ownership can insulate management from both internal and external discipline mechanisms, potentially reducing equity values (Jensen and Ruback, 1983). Further, Core et al. (1999) find that increased stock ownership by top management not only reduces the sensitivity

of CEO compensation to firm performance, but also increases overall CEO compensation.

Prior studies of the net effects of increasing management stock ownership have established a piece-wise linear relationship between management stock ownership and (1) firm value (Morck et al., 1988) and (2) the amount of compensation paid to officers and employees (Carter and Stover, 1991). These studies and others support the theory that over low and high ranges of management stock ownership, manager and stockholder interests are aligned, causing firm values to rise with increased control. However, across a middle ownership range, managers exhibit entrenchment characteristics causing equity values to decline with increases in their stock ownership. Specifically, Morck et al. (1988) find that as the percent of outstanding common stock owned by board members increases from 5% to 25%, firm value (measured by Tobin's *q*) decreases. They conclude that as little as 5% ownership can facilitate management entrenchment and reduce equity values. Conversely, as board stock ownership increases from zero up to 5% and above 25%, equity values increase, a finding that is consistent with alignment of management and stockholder interests.

3. Hypotheses

Prior research has established that entrenched CEOs have both an incentive and sufficient control to manage various forms of risk in their firms. Because CEOs are influential in assembling members of top management and the Board of Directors, it is possible that they influence compensation policy. We use the stock ownership of the CEO, other officers and members of the Board of Directors as our measure of CEO Control. We examine the relationship between CEO control and the proportion of compensation paid through stock-based compensation (i.e., a source of compensation risk) to detect if it is non-monotonic.

Our priors are that, across a low control range, outside stockholders and capital markets influence board compensation committees, who in turn, design CEO compensation contracts that increase the alignment of CEO and stockholder interests. Over this control range, increases in the value of compensation contracts are likely to depend on incentive bonus plans designed to increase both CEO stock ownership and the sensitivity of compensation level to stock price performance. Thus, the proportion of stock-based compensation should rise with increases in CEO control over a low control range.

At higher control levels, some CEOs are likely to perceive additional increments of stock-based compensation as providing decreased marginal monetary value because of increased firm-specific risk exposure (e.g., Lambert et al., 1991). At some threshold control level, these CEOs may choose actions that increase the value of their future compensation streams by reducing compensation risk. CEOs that have sufficient influence over their boards and compensation committees, may

lower the risk of their compensation by reducing the portion which is paid in the form of stock-based bonuses.

In addition to reducing direct compensation variability, CEOs can also potentially avoid employment risk due to public criticism of high levels of compensation. The value derived from increased job security and a less risky compensation contract may offset lower expected compensation streams. Finding that control and the proportion of stock-based compensation are negatively related over a middle range of control would support compensation risk management.

Very high levels of stock ownership should make improved stock price performance more valuable than direct compensation payments. If so, compensation risk reduction may not be preferred relative to improving equity values at high ownership levels. In addition, high control CEOs are likely to be either dominant stockholders or members of dominant stockholder groups. Firms with dominant stockholders have been shown to exhibit characteristics consistent with aligned management and stockholder interests (Holderness and Sheehan, 1988). Therefore, our priors are that, at very high levels of control, the relationship between compensation risk and control is nonnegative.

As suggested in Smith and Watts (1992) and Gaver and Gaver (1993), simultaneity is a valid concern because other variables may be determining both control and compensation. Such jointness would make estimation by least squares inappropriate. We discuss this issue in a later section.

4. Sample selection, variable descriptions and empirical methods

4.1. Sample selection

Our sample consists of annual observations on the CEO compensation contracts of 50 publicly traded firms over the 6-year period from 1984 through 1989. Firms were selected from those publicly traded members of either the *Fortune 500* or the *Fortune Service 500* in 1990 that had the same CEO throughout the study period. This latter requirement reduces problems of varying risk preferences due to changes in CEOs. Appendix A contains a list of the firms and their CEOs.

4.2. Dependent variable: compensation risk

We base our measure of compensation risk on studies by Sloan (1993) and Lambert et al. (1991) which demonstrate that compensation payments based on stock price performance are likely to be perceived as riskier forms of compensation than salary and bonus payments based on earnings performance. Accordingly, we separate stock-based compensation from salary, benefits, and earnings-based bonus for each annual observation in the sample. We then use the proportion of total compensation paid to CEOs through stock-based compensation (PSCOMP) to

measure compensation risk. Stock-based compensation includes stock options and bonus payments where stock price performance determines either the size of the pool of funds available or the portion of the pool paid to the CEO. We assume that if any component of a bonus is dependent on stock price performance, the ex ante perception of the risk of payouts is higher relative to the risk of payouts from salary and bonus plans based solely on earnings performance. Since it is possible to have an observation with zero stock-based compensation, we add 1 to PSCOMP to enable the use of the natural log form to adjust for skewness (e.g., Murphy, 1985).

The estimation of total CEO compensation is based on Lewellen (1968) and includes salary, current and deferred bonus payments, the current income equivalent of pension plans, the value of stock options when granted, and other forms of identifiable compensation disclosed in annual proxy statements. Stock options are valued using a form of the Black and Scholes' (1973) option pricing model similar to that used by Murphy (1985).¹

4.3. Independent variables

We use the percent of outstanding common stock owned or controlled by the CEO, other officers, and board members as a proxy for control (CONTROL). Our data source is annual proxy statements. Included in our measure of stock holdings are stock options exercisable within 60 days and stock that is held in trusts controlled by officers, board members, or the CEO. This source differs from the 1980 CDE data used by Morck et al. (1988). The 1980 CDE data include only individuals owning at least 0.2% of outstanding stock while annual proxy statements provide stock ownership of all officers and board members regardless of ownership level. However, Kole (1995) demonstrates that the CDE data and data obtained from annual proxy statements are sufficiently comparable to serve as substitutes.

Certain firm characteristics have been shown to be associated with the presence of stock-based bonus programs in CEO compensation contracts and may also affect the proportion of compensation based on stock price performance. Smith and Watts (1992) and Gaver and Gaver (1993) provide evidence that the use of stock-based incentive plans increases with a firm's investment opportunities. Smith and Watts (1992) also demonstrate that stock-based bonus plans are less likely to be used in regulated industries. In addition, total compensation and compensation risk are potentially related (Antle and Smith, 1985). Since the

¹ Lambert et al. (1991) show that CEO perceptions of the true value of compensation components are dependent of the composition of their personal portfolios. We are, however, unable to observe CEO personal portfolios and must assume that those portfolios are sufficiently homogeneous to render unbiased results.

proportion of compensation paid through stock-based compensation could also be affected by these characteristics, we include them in our model of compensation risk.

We use the ratio of the book value of assets to the market value of the firm ($A_{i,t}/V_{i,t}$) to measure a firm's investment opportunity set at year t . Using year-end numbers, $A_{i,t}$ is the book value of the i th firm's assets and $V_{i,t}$ is the market value of the i th firm's equity plus the book value of its assets minus the book value of its equity. Lower levels of this ratio would be associated with higher growth opportunities.

Since regulated firms are less likely to have stock-based bonus plans (Smith and Watts, 1992), it is possible that when a regulated firm includes a stock-based bonus plan as part of its CEO compensation, the proportion would be lower than for non-regulated firms. Thus, we include a binary variable in our model with 1 indicating that the firm's industry is regulated. We consider the banking, insurance, and public utilities industries to be regulated. Our sample contains 13 regulated firms. We also include total annual CEO compensation (TCOMP) in our model to control for the relationship between total compensation and compensation risk observed by Antle and Smith (1985). *Ceteris paribus*, we expect that increased compensation risk should be associated with higher compensation levels.

As noted earlier, it is possible that both the control and stock-based compensation variables are determined by exogenous factors. By including industry regulation, the firm's investment opportunity set, and compensation level in the model, we seek to eliminate the potential for a spurious relationship that might arise between CONTROL and PSCOMP. If the relationship is spurious, the significance of control should vanish with the inclusion of these explanatory variables.

4.4. Empirical method

We test whether the relationship between compensation risk and control is linear throughout all ranges of control by performing piece-wise linear regression analysis. In this procedure we conduct multiple iterations using different demarcations of three separate control ranges: low, middle, and high, until the lowest sum of squared errors is obtained.

Two regression methods were considered in our examination of compensation policy. One uses pooled cross-sectional and time series (CSTS) data (e.g. Smith and Watts, 1992). The other method examines variable means across the study period. CSTS data are desirable because of their ability to utilize period-to-period variation as well as variation across firms. However, their use in this study is problematic due to lumpiness in the annual measures of compensation. Lumpiness results when a firm determines the value of stock-based incentives over performance periods which include several years. Bonuses are then paid in a lump sum at the end of a specified performance period. While annual proxy statements disclose the amounts paid at the end of each performance period, they seldom

indicate the amounts earned in each year of the performance period. As a result, some CEOs receive zero or low proportions of stock-based compensation in some years followed by abnormally large stock-based proportions in bonus plan payout years. This problem would likely increase the standard errors of estimates if CSTS data were used.

The lumpiness in our data is not unique to our sample. Smith and Watts (1992) averaged observations over 4 years and used these averages in their CSTS sample. We resolve the lumpiness problem by using 6-year means for the dependent and independent variables, making the sample solely a cross-section.

Our model is

$$\begin{aligned} \ln(\text{PSCOMP} + 1) = & \beta_0 + \beta_1(\text{CONTROL}_{\text{LOW}}) + \beta_2(\text{CONTROL}_{\text{MID}}) \\ & + \beta_3(\text{CONTROL}_{\text{HIGH}}) + \beta_4 \ln(A/V) + \beta_5(\text{REG}) \\ & + \beta_6 \ln(\text{TCOMP}) + \end{aligned} \quad (1)$$

where PSCOMP is the 6-year mean of the stock-based portion of annual compensation paid to the CEO; CONTROL is the mean percent of outstanding common stock owned by the CEO, other officers, and board members separated into low, middle, and high ranges; A/V is the mean assets to value ratio, which measures the market's perception of a firm's investment opportunity set; REG is a binary variable where 1 indicates that the firm is in a regulated industry, else zero; TCOMP is the mean total annual CEO compensation; and e is the normally distributed error term with zero mean and constant variance.

The three ranges of CONTROL are defined as in Kole (1995) such that:

$$\text{CONTROL}_{\text{LOW}} = \text{CONTROL}, \text{ if } \text{CONTROL} < t_1, \quad (2a)$$

$$= t_1, \text{ if } \text{CONTROL} \geq t_1;$$

$$\text{CONTROL}_{\text{MID}} = 0, \text{ if } \text{CONTROL} \leq t_1, \quad (2b)$$

$$= (\text{CONTROL} - t_1), \text{ if } t_1 \leq \text{CONTROL} < t_2,$$

$$= (t_2 - t_1), \text{ if } \text{CONTROL} \geq t_2;$$

$$\text{CONTROL}_{\text{HIGH}} = 0, \text{ if } \text{CONTROL} < t_2, \quad (2c)$$

$$= (\text{CONTROL} - t_2) \text{ if } \text{CONTROL} \geq t_2,$$

where t_1 is the break point between the low and middle control ranges and t_2 is the break point between the middle and high control ranges. Thus the coefficients of the three control variables give the change in the dependent variable for a unit change in CONTROL within each of the defined intervals.

In determining the break points between low, medium, and high CONTROL, a grid search method was used. Models for all possible integer combinations of break points using a range of 4% to 17% for the break point between low and medium CONTROL and 5% to 30% for the break point between medium and high CONTROL were estimated. The break point between low and medium CON-

TROL was required to be at least one unit below the break point between medium and high CONTROL throughout the iteration process. The final break points were those values that minimized the error sum of squares.

An issue of concern is whether TCOMP is jointly determined with the dependent variable, $\ln(\text{PSCOMP} + 1)$. Clearly, TCOMP is the denominator in defining the variable PSCOMP. However, if TCOMP is considered to be an independent variable, then dividing stock-based compensation by TCOMP does not make TCOMP a dependent (jointly determined) variable. The exogeneity of TCOMP hinges on whether given TCOMP and all the other independent variables in the regression model, the deviation of observed $\ln(\text{PSCOMP} + 1)$ from what the regression model would predict for $\ln(\text{PSCOMP} + 1)$ is correlated with $\ln(\text{TCOMP})$. This would arise, for example, if positive deviations from the regression line were correlated with larger values of TCOMP. While competing theories could likely be constructed in support of non-zero correlation or no correlation, we simply test the null hypothesis of zero correlation with a statistical test. The RESET test (Ramsey, 1969) is a test for simultaneity bias and failure to reject the null hypothesis of no simultaneity bias indicates that the assumption of $\ln(\text{TCOMP})$ not being jointly determined with $\ln(\text{PSCOMP} + 1)$ cannot be rejected.

5. Empirical results

5.1. Descriptive statistics

Table 1 contains variable means and medians in 1982 dollars. The mean of CEO compensation for the study period is US\$1,315,592 and the median is US\$1,120,452. On average, CEOs in the sample received 74.80% (median 76.50%) of their compensation from salary and earnings-based bonus and 19.31% (median 17.02%) from stock-based bonus. The remaining 5.89% (median 6.48%) was received in the form of pensions and other miscellaneous compensation.

Table 1

Means and medians of characteristics associated with the mean annual compensation of 50 CEOs for the 6 years (1984–1989)

	Mean	Median
Stock-based compensation (%)	19.31	17.02
Earnings-based compensation (%)	74.80	76.50
Miscellaneous compensation (thousands)	5.89	6.48
Total annual compensation (thousands)	1315	1120
Board stock holdings (%)	12.24	6.00
Asset to value ratio	0.739	0.716
Total sales (millions)	3818	1681

Table 2

Piece-wise linear regression estimates of the proportion of CEO stock-based compensation as a function of control, investment opportunities, regulation, and total compensation (50 observations, *t*-statistics in parentheses)

Variable	Parameter estimate
Intercept	−1.5553 (−4.208) * *
Low control range	0.01116 (2.685) * *
Middle control range	−0.0210 (−3.082) * *
High control range	0.00193 (0.998)
Asset to value ratio	−0.27971 (−3.050) * *
Regulated industry	0.07858 (1.665)
Total compensation	0.13453 (5.208) * *
<i>F</i> -value = 32.712	
<i>R</i> ² = 0.4896; Adj. <i>R</i> ² = 0.4184	

The variables are defined as follows: LOW CONTROL indicates board ownership of less than 13% of outstanding voting stock; MIDDLE CONTROL indicates board ownership equal to or greater than 13% but less than 22% of outstanding voting stock; HIGH CONTROL indicates board ownership of 22% or more of outstanding voting stock.

* * Significance at the 1% level.

The CEO, other officers, and Board members collectively controlled an average of 12.24% (median 6.00%) of their company's outstanding voting stock. This is slightly higher than mean holdings of 10.6% observed by Morck et al. (1988). A potential reason is that, unlike their study, our sample is constrained to firms with CEOs that have a minimum of 6 years of tenure as CEO. In addition, increased use of stock and stock option awards in top management compensation contracts may have increased top management stock ownership since 1980 (Hall and Liebman, 1998).

5.2. Regression results

Table 2 contains the results of the piece-wise regression analysis.² The statistical fit of this model is very good in several respects. The *R*-square of 0.4896 is reasonable for cross-sectional models and the Breusch–Pagan–Godfrey (Judge et al., 1984) test for homoscedasticity and Jarque and Bera (1987) test for normality fail to reject at the 0.05 level. In addition, the RESET test (Ramsey (1969)) for omitted variables and simultaneity bias ($F = 0.373$, $n = 3$, 40 *df*) does not indicate model mis-specification in the sense of omitted relevant explanatory variables or simultaneity bias between the control variables and the dependent variable.

² A marginal estimation consideration is the fact that four of the 50 observations on the dependent variable have values of zero. In such cases a Tobit (Tobin, 1958) estimator is a possible alternative. In estimating the model using a Tobit approach, the parameter estimates did not vary substantially from the least squares estimates.

The coefficient for the assets to value ratio is negative and significant at the 0.01 level. Thus, the proportion of total compensation received through those bonus plans increases with firm investment opportunities. As in Antle and Smith (1985), we also find that total compensation is positively related to our measure of compensation risk. The coefficient for the binary indicator of a regulated firm, however, is not significant.

The central question of our study involves the relationship between compensation risk and control, which is not uniform across control ranges. Instead, it is positive across the low control range and negative across the middle range. Both coefficients are significant at the 0.01 level. While the coefficient for high control is not significantly different from zero, it bears a positive sign and is significantly different from the middle control range at the 0.01 level. The break point between the low and middle control ranges (t_1) occurs at the 13% level of stock holdings. Between the middle and high control ranges, the break point (t_2) occurs at 22%. Thirty-three of the fifty observations are in the low control range, eight are in the middle range, and nine are in the high range.

The coefficient of 0.01116 for the low control variable and -0.0210 for the middle control variable indicates that additional management stock ownership results in increases and decreases, respectively, in the proportion of stock-based compensation. More specifically, a one percentage point increase in top management stock ownership for firms in the low control range would be accompanied by slightly more than a 1.1 percentage point increase in the proportion of stock-based compensation. The same ownership increase for middle range firms would result in a decrease of slightly more than 2.1 percentage points in the proportion of stock-based compensation.³ Above a 22% control level, changes in control do not significantly effect the proportion of stock-based compensation.

These results are consistent with the non-monotonic relationship found by Morck et al. (1988) in that (1) the presence of compensation contracts that align CEO and stockholder interests in the low control range is congruous with increases in equity values across that range, and (2) evidence of compensation risk management across a middle control range may provide some explanation for the declines in equity values across this range as observed by Morck et al. (1988). Their study also found that Tobin's q reached a local maximum just below the break point between the low and middle ranges of management ownership. Based on our analysis, local maximum alignment of CEO and stockholder interests should occur at the 13% ownership level.

³ For example, assume that a CEO at a control level of 8% receives 20% of his compensation from stock-based sources (i.e., $PSCOMP = 0.20$). Adjusting for the log transformations in our model, if he increased his control by 1 percentage point to 9%, his proportion of stock-based compensation would be expected to increase to 21.35%.

5.3. Persistence of sub-optimal ownership structures

If increases in management stockholdings across a middle control range are detrimental to equity values, then 1) why do we find firms with management ownership between 13 and 22%, and 2) can value decreasing ownership structures persist? A potential answer is that middle control ownership is transitory rather than an equilibrium condition. If so, we would expect middle control range firms to migrate to higher or lower control ranges via changes in management stock ownership. We would also expect to observe more frequent CEO turnover in middle control firms if no transition is made. We provide preliminary evidence on both possibilities for our sample.

For companies in each control range we calculate the average annual growth rate in management stock ownership for the 6-year study period by control range. We use a fixed effects regression model that allows each firm to have its own intercept or base level of stock and then calculates the average growth rate over all firms in a given control range. These results are presented in Table 3. While the average annual growth rates are not statistically significant at the 0.05 level for any control range, the growth rate sign changes from positive to negative as control moves from the low to middle range. The difference between growth rates for these two ranges is significantly different in a one sided test at the 0.05 level. One possible explanation for the slope sign change is that this point represents an equilibrium ownership condition. *Ceteris paribus*, we would expect that the risky compensation proportion is a local maximum near 13% management ownership, declining as ownership diverges from this point. The average management stock ownership of 12.24% for our sample provides some support for a convergence towards this point.

Mikkelsen and Partch (1997) and Denis et al. (1997) examine the relationship between ownership structure and top executive turnover. Both studies find the likelihood of top executive turnover is negatively related to the stock holdings of officers and board members. Furthermore, Denis et al. (1997) find that the likelihood of top management turnover is lowest and least sensitive to stock price performance when officers and directors control between 5% and 25% of the firm's common stock. They also find evidence that entrenched managers are

Table 3

The average annual growth rate in stock holdings of the CEO, other officers, and Board members for the 6-year study period by control range

	Low range, <i>n</i> = 33	Middle range, <i>n</i> = 8	High range, <i>n</i> = 9
Average annual growth in stock holdings (%) ^a	1.27	− 2.92	− 1.41

^a None of the growth rates are statistically different from zero at the 0.05 level.

Table 4

Status of the sampled CEOs at the end of 1998 by control range

Disposition of CEO	Low range, <i>n</i> = 33	Middle range, <i>n</i> = 8	High range, <i>n</i> = 9
Still CEO	10	5	3
Chairman, but no longer CEO	1	—	1
Retired Voluntarily	10	3	1
Resigned Voluntarily	3	—	1
Helped take the firm private	—	—	1
Still runs firm, but as a subsidiary	—	—	2
Forced to resign by the Board	4	—	—
Forced to resign after a takeover	5	—	—
Percent of CEOs forced to resign	27.3	0	0

occasionally removed, regardless of the level of management ownership. Morck et al. (1989) and Martin and McConnell (1991) show that, even if top management is entrenched, boards may remove them when their firms perform poorly at a time when their industry group is doing well.

We tracked the CEO of each of the firms in our sample for the 9-year period from the last year of our study period (1989) through the end of 1998 to observe their current status. The results of this examination are found in Table 4. In general, the evidence is consistent with the results of prior studies of management entrenchment which concluded that entrenched CEOs are difficult to remove. Of the 33 CEOs in the low ownership range, 11 are still with their firms, 10 of these are still CEO and one other is Chairman, but no longer CEO. Of the 22 that are no longer with their firms, 13 left voluntarily, through either retirement (10) or unforced resignation (3). The other nine (27.3%) were forced out of their positions either by their boards (4), or as the result of a merger or takeover (5).

Of the eight CEOs in the middle ownership range, five are still in their positions. The other three retired voluntarily. Of the nine CEOs of the high ownership range, three are still CEO and one is still Chairman, but not CEO. One resigned voluntarily and one other retired voluntarily. One of the remaining CEOs orchestrated the acquisition of his firm by a private investor group after his firm defaulted on debt payments. The other two firms were acquired, but the CEOs are still members of top management. In summary, while 27.3% of the CEOs in the low control range were forced out of their positions, none of the CEOs above the cut off for the middle control have experienced forced turnover. Thus, our data does not indicate greater turnover for CEOs in the middle range.

6. Summary and conclusions

By estimating the relationship between compensation risk and control, this study advances the literature on corporate ownership structure. The results are

consistent with Morck et al. (1988). Our evidence indicates that across a middle control range, increases in board stock ownership are associated with decreases in stock-based compensation. We interpret this evidence to mean that entrenched CEOs may influence the construction of their compensation contracts in a way that reduces their personal risk exposure but may reduce alignment of the objectives of CEOs and stockholders. This outcome may partially explain the decline in equity values associated with increased stock ownership across a middle ownership range reported in Morck et al. (1988).

We also track the CEOs in our sample for the 9 years following the study period. While 27% of the CEOs in the low control range were forced to resign from their positions during this time period, none of the CEOs above the entrenched threshold suffered a similar fate. Thus, our evidence supports the existence of an ownership structure within which CEOs can become entrenched, make value decreasing decisions, and be difficult to remove. However, we also provide some evidence that, over time, entrenched levels of stock ownership may be transitory and that stock ownership in such firms reverts towards a range where management and stockholder interests are aligned.

Appendix A. Sampled companies and chief executive officers used in the study

Company name	Chief Executive Officer
1. American Express	J.D. Robinson III
2. American International Group	M.R. Greenberg
3. AMETEK	J.H. Lux
4. Archer Daniels Midland	D.O. Andreas
5. Balfour Maclaine	A.C. Van Ekris
6. Bank of N Y	J.C. Bacot
7. Bristol Myers	R.L. Gelb
8. Capital Cities/ABC	T.F. Murphy
9. Chase Manhattan	W.C. Butcher
10. Chem. Banking	W.V. Shipley
11. Citicorp	J.S. Reed
12. Colgate Palmolive	R.J. Mark
13. ConAgra	C.F. Knight
14. Consolidated Edison	A. Hauspurg
15. Continental	J.P. Mascotte
16. Crane	R.S. Evans
17. Culbro	E.M. Cullman
18. Dover	G.L. Roubos
19. Dow Jones	W.H. Phillips

20. Grace (W.R.)	J.P. Grace
21. Grow Group	R.M. Banks
22. ITT	R.V. Araskog
23. Interpublic Group	P.H. Geier
24. Jostens	H.W. Lurton
25. Loral	B.L. Schwartz
26. Louisiana-Pacific	H.A. Merlow
27. Lubrizol	L.E. Coleman
28. Manufacturers Hanover	J.F. McGillicuddy
29. McGraw Hill	J.L. Dionne
30. Merrill Lynch	W.A. Schreyer
31. Nalco Chemical	W.H. Clark
32. New York Times	A.O. Sulzberge
33. Nucor	F.K. Iverson
34. Ogden	R.E. Ablon
35. Paine Weber	D.B. Marron
36. Pfizer	E.T. Pratt
37. Philip Morris	H. Maxwell
38. Phillips Van Heusen	L.S. Phillips
39. Pitney Bowes	G.P. Harvey
40. Potlatch	R.B. Madden
41. Ralston Purina	W.P. Stiritz
42. Republic N Y	W.H. Weiner
43. Schering Plough	R.P. Luciano
44. Shaw Industries	R.E. Shaw
45. Sherwin Williams	J.G. Breen
46. Time	J.R. Munro
47. Times Mirror	R.F. Erburu
48. Trinity Industries	W.R. Wallace
49. VF	L.R. Pugh
50. Witco	W. Wishnick

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