



NEW YORK UNIVERSITY
STERN SCHOOL OF BUSINESS
FINANCE DEPARTMENT

Working Paper Series, 1996

Stock-Based Compensation and Top Management Turnover

Mehran, Hamid and David Yermack

FIN-96-35

Stock-Based Compensation and Top Management Turnover

Hamid Mehran^a and David Yermack^b

^a *Kellogg Graduate School of Management, Department of Finance, Leverone Hall,
Northwestern University, Evanston, IL 60208-2001*

^b *Stern School of Business, Department of Finance, Management Education Center,
44 West Fourth Street, Suite 9-10, New York University, New York, NY 10012-1126*

May 1996

Abstract

We test the hypothesis that corporate managers leave their jobs less often when they receive stock-based compensation. In a sample of CEOs from 452 large U.S. companies between 1984 and 1991, we find inverse associations between the probability of CEO turnover and the amount of stock option compensation in relation to cash pay. The association is even stronger when we exclude apparently involuntary CEO turnover. Our results suggest that stock-based compensation plays a significant role in helping firms retain the services of top managers.

Key words: Incentives; Compensation; Ownership; Turnover

JEL Classification: G31, G32, G35, J63

Stock-Based Compensation and Top Management Turnover

1. Introduction

Because superior human resources give a firm a competitive advantage over its rivals, retaining good managers is a high priority for nearly all corporations (Wall Street Journal, 1991). Anecdotal evidence suggests that retaining key employees has become more difficult for large companies in recent years (see e.g., Miller, 1992), partly because of the growing allure of the economy's entrepreneurial high-tech and small-business sectors (Bushnell, 1987).

One common strategy for retaining managers is to reward them with stock-based incentive compensation (Weber, 1991), which often takes several years to vest and provides rewards linked to the long-term performance of the firm. Little empirical evidence has surfaced to support the hypothesis that corporations whose top managers receive more equity-based pay experience lower managerial turnover. This paper seeks to fill this gap in the literature, examining the relation between CEOs' stock-based compensation plans and their frequency of departure.

Using compensation data for CEOs of 452 large U.S. companies between 1984 and 1991, and controlling for performance, age, and other variables, we find that the probability

of CEO turnover is smaller for firms whose CEO compensation packages contain a higher ratio of value of stock option compensation to cash. The results, which are significant across the entire sample of CEOs, strengthen markedly when we exclude CEO departures that appear to have been involuntary. In line with other theories and past studies of CEO turnover, we also find that CEOs are less likely to lose their jobs if they own large amounts of stock, or if they founded the company or belong to the founding family. Company performance has a pronounced negative association with CEO turnover. CEOs are more likely to leave if the company has an unstable operating environment, as indicated by the standard deviation of annual changes in ROA. This may reflect a tendency by boards to punish CEOs for delivering inconsistent results, and may also reflect CEOs' preferences to work in more stable environments.

The remaining sections of the paper are organized as follows: Section 2 reviews the relevant literature and presents hypotheses. Section 3 describes the sample selection and variables used. Empirical results and their interpretation are presented in Section 4. Section 5 summarizes the key findings.

2. Stock-based compensation and retention of executives

The importance of using stock-based compensation to reduce managerial turnover hinges on whether high levels of turnover are costly to a firm. This issue has been debated among labor economists for many years (see Osterman, 1988). Some theorists view high rates of labor mobility as important for matching employees' skills with the jobs to which they are best suited, a conjecture that suggests that all firms might perform better if

employees move freely among companies. However, each episode of employee turnover results in costs specific to the firm that the worker is leaving, such as the company's loss of value from previous investments in recruiting and training. High turnover may also affect the morale of workers who remain with the company.

The costs of management turnover are especially high in companies that earn monopoly rents, such as firms in high-tech industries. Top executives in these companies have access to valuable inside information about technology and corporate strategy, and this value could be dissipated if key managers were hired away by competitors. Also, in a research-intensive environment, a manager could develop a valuable new idea and choose to leave the firm and set up his own business, rather than share the idea with his employer. This problem arises because the manager does not capture the full monopoly rent if he stays with his original firm (Jackson and Lazear, 1991).

Some firms attempt to limit these costs of managerial turnover through the inclusion of "noncompete" agreements in employment contracts (Kitch, 1980), a strategy that appears to be on the rise (Waldman, 1992). However, U.S. courts have typically construed these agreements quite narrowly, generally enforcing noncompete agreements only if an employee leaves with existing trade secrets. While some successful court cases have barred lower-ranked employees from working for competitors,¹ the enforcement of non-compete agreements against top executives is rare (see Siler and Zellner, 1991, for an exception).

¹ For example, the noncompete agreement has been an important issue in the brokerage industry. Recently, a federal judge ruled that Wall Street firms "own" their brokers' clients for up to four months after a broker leaves the firm (Wall Street Journal, 1992). See Himelstein, Schiller, and Zinn (1993) for an application of a noncompete agreement to retail industry.

Compensation incentives represent an alternative to the threat of legal sanctions for mitigating problems of managerial turnover. An employer can design compensation contracts to induce employees with inside information to remain with the firm.² Nitzan and Pakes (1983) and Jackson and Lazear (1991) suggest that stock options can play an important role in such contracts, since they provide rewards for long-term company performance while usually requiring employees to remain with the firm for a relatively long period before the options may be exercised. Other stock-based compensation plans have similar structures that should reduce employee turnover. For example, restricted stock provides shares of stock to managers, requiring them to remain with the firm over some specified period (usually five to ten years) before the stock may be sold.³ Performance shares are bonus plans that provide cash payouts tied long-term changes in a company's share price.

Stock-based pay helps firms retain managers for at least three reasons. First, the long-term vesting requirements of stock options and similar instruments provide direct financial incentives for executives not to leave. Second, by giving managers a share of the company's long-term price appreciation, stock-based compensation provides incentives for managers with valuable ideas to share these plans with their employers rather than starting their own firms. Third, stock-based compensation makes executives more expensive for competitors to

² An alternative solution may be to pay an "efficiency wage," that is, compensation higher than an employee could receive in the open market. The efficiency wage theory, which focuses on the level of pay rather than the structure of pay, may be a more appropriate incentive mechanism for lower-ranked employees. See Katz (1986) for a survey of efficiency wage models.

³ Although restricted stock and stock options may be substitute methods for reducing labor turnover, their incentive effects are not the same, since an executive who stays with the firm will always realize value from a restricted stock award but will profit from stock options only if the company's shares rise in price.

recruit, since rivals have to compensate managers for the value of non-vested long-term compensation they surrender when changing jobs.⁴ For these and perhaps other reasons, we expect to observe lower levels of executive turnover among firms with more stock-based compensation for their top executives.

3. Sample selection and data description

To estimate the impact of stock-based compensation on managerial turnover, we study CEOs in a panel of 452 large U.S. industrial companies, using the executive compensation data set assembled by Yermack (1995). To qualify for inclusion in the sample, a firm is required to rank among *Forbes* magazine's largest 500 U.S. companies in any of the categories of sales, net income, total assets, or market capitalization. Our sample includes all firms meeting this criterion at least four times during the eight-year 1984-1991 period except for financial institutions and utilities, which were dropped because Compustat's thin coverage of firms in these industries. Observations are included in the data set for every full fiscal year between 1984 and 1991 for which a company's stock was publicly traded, whether or not the firm qualified for the *Forbes* rankings in every year. This sample selection rule yields 3,438 CEO-year observations. For each observation, we use corporate proxy statements to obtain data about the CEO's compensation and ownership of stock and stock options. When a company has more than one CEO during a fiscal year, we collect data for the executive

⁴ In two widely noted recent cases, IBM paid \$7.8 million in cash to its Chairman, Louis Gerstner, Jr. to cover the value of stock options at his former employer, RJR Nabisco Holdings (Hays, 1995), while General Dynamics paid \$3.3 million to William Anders to replace deferred compensation he would have received had he remained with his former employer, Textron (Dial and Murphy, 1995).

serving for the majority of the year. Ownership variables are measured as of the date of the proxy statement, usually three to four months after the start of the fiscal year. We match this data with financial statement data obtained from Compustat, as well as stock return data from the Center for Research in Security Prices (CRSP) database.

3.1. CEO turnover data

We use our data to estimate binary (0, 1) probit models of CEO turnover, assessing the importance of a range of explanatory variables upon the probability of whether the CEO leaves office in a given year. Our dependent variable is set equal to one if a CEO leaves office during the last six months of the current fiscal year or the first six months of the subsequent period. Summary statistics displayed in table 1 indicate that CEO turnover events occur for 10.8% of the observations in our sample, a frequency similar to those in related studies such as Coughlan and Schmidt (1985) (12.7%, 1978-80 data) and Weisbach (1988) (7.8%, 1974-83 data).

Our analysis of the role of compensation in the CEO turnover process would be enhanced considerably if we could identify whether individual CEOs left office voluntarily or were removed by their boards of directors. This data is nearly impossible to obtain from public sources, as news releases by companies rarely mention performance as the reason for an executive's departure.⁵ However, we believe that the fate of the CEO at the time of departure is highly correlated with the probability of whether the transition is friendly or

⁵ Weisbach (1988) read *Wall Street Journal* news announcements for his sample of 286 exiting CEOs and found that poor performance was cited in only nine cases, with scandals mentioned in an additional four.

unfriendly. In particular, CEO retirements are increasingly likely to have been voluntary if CEO is older, and if the CEO remains connected to the company in a position such as Chairman of the Board of Directors.

Table 1 provides further information about the fate of CEOs at the time of departure. By reading proxy statements and, where necessary, news reports, we find that 34.8% of exiting CEOs remain in office at least temporarily as Chairman of the Board, apparently following the "relay" model of CEO succession described by Vancil (1988). An additional 26.1% of exiting CEOs remain on the board but not as Chairman. Among the remaining subsample of departing CEOs, 10.0% lose their jobs because their firms are delisted due to acquisition or insolvency, and a small handful either die in office (2.7%) or are demoted to a lower position in the company (2.2%, usually cases in which an acting CEO returns to his former post). The remaining cohort, 24.3% of exiting CEOs, sever all ties with their former companies and do not retain a place on the board of directors.

We find a sharp dichotomy in the fate of younger and older CEOs at the time of departure. We divide our sample into two groups, CEOs with ages of 62 or less and 63 or more. We choose age 63 as the cutoff since it is reasonably close to the most common retirement age of 65. The younger cohort of CEOs are far more likely to sever all ties with their employers (35% vs. 16%), while the older cohort has a three times greater probability of remaining as non-executive Chairman of the Board (36% vs. 12%). Younger CEOs who leave are also far more likely to have their successors chosen from outside the firm (16% vs. 9%).

We use this data to define two proxy variables for cases of CEO turnover that are likely to be involuntary. Our first variable is set equal to one if the CEO is aged 62 or less and severs all ties with his firm, not remaining on the board of directors. This group includes 56 CEOs. However, it is possible that some of these CEOs leave their firms for more attractive positions with other companies, and we research this possibility by reading the biography of each exiting CEO in *Who's Who in Finance and Industry*. The vast majority of outgoing CEOs are no longer covered by *Who's Who* after leaving their posts, suggesting that they did not receive better offers, but we do identify two of the 56 exiting CEOs who appear to have taken similar positions with other firms. We drop these two CEOs from the subsample of departures classified as involuntary. Our second proxy for involuntary turnover is based upon whether the successor CEO comes from outside the company, since the board is more likely to hire an external CEO if recent performance has been poor, or if it wants to prevent the outgoing CEO from anointing a successor from inside the firm.

3.2. *Explanatory variables*

Descriptive statistics for our turnover variables are listed in the top section of table 2. Table 2 also provides descriptive statistics for the explanatory variables in our probit models of CEO turnover.

To test our hypotheses about the link between CEO turnover and stock-based compensation, we use as key explanatory variables the stock options received and held by each CEO. While CEOs receive stock-based compensation in other forms, such as restricted stock and phantom stock, options account for the lion's share of this type of pay (Yermack,

1995). Moreover, complete data about other stock-based compensation instruments is far more difficult, and sometimes impossible, to obtain from corporate proxy statements, especially those filed before expansion of the SEC's disclosure requirements in 1992.

Our measure of stock-based compensation is the ratio of the value of each CEO's annual stock option award, divided by the cash salary and bonus payments received during the fiscal year. Approximately 60% of the CEOs in our sample receive nonzero stock option awards during the sample period, and we value these awards as of the date of grant using Black-Scholes (1973) methodology, assumptions for which are detailed in Yermack (1995). Salary and bonus payments are normalized to annual equivalents for the small group of CEOs not employed by their firms for twelve-month fiscal years. We measure a CEO's inventory of stock options awarded in prior years by collecting data on the exercisable options held near the start of the fiscal year, expressing this value as a percentage of the firm's common shares.

Data in table 2, indicate that stock option compensation has a significant role in overall remuneration of CEOs. The mean ratio of stock option pay over cash salaries and bonuses is 0.535; if one ignores other types of compensation, this statistic implies that the typical CEO in our sample receive more than one-third of his pay from stock options, although the median value is far smaller. Over time, these option awards accumulate so that the typical CEO holds a mean of 0.18% of his firm's common shares in exercisable options (median 0.06%).

The other explanatory variables in our analysis include CEO and company characteristics that should influence the likelihood of turnover. Among CEO characteristics, age is widely recognized as a critical factor in the turnover process, with a majority of

departures occurring around age 65. To capture this effect, we include in our models (0, 1) indicator variables for each CEO age between 55 and 70, and an additional indicator variable for CEOs aged 71 and higher. CEOs should be less likely to leave their jobs if they have direct or indirect control over the firm's board of directors. We include the CEO's direct stock ownership in our models as one measure of CEO power, and we also include a (0, 1) indicator variable for whether the CEO is the company's founder or belongs to the founding family.

Numerous studies, such as Warner, Watts, and Wruck (1988), find inverse connections between company performance and the probability of CEO turnover. We include the firm's current year, net-of-market stock return in the model as the performance variable, and we also include one year's lag of this variable. For the market return we use CRSP's value-weighted, dividend inclusive index for either the NYSE/AMEX or NASDAQ file, as appropriate.

Further control variables include proxies for growth opportunities, leverage, firm size, and the riskiness of a firm's operating environment. These characteristics are expected to influence both the mechanisms by which boards of directors evaluate CEO performance, and the incidence of stock-based compensation awarded to CEOs. We measure growth opportunities with two variables, research and development expenditures over sales, and an estimate of Tobin's Q. The Q-ratio is measured at the start of the year and calculated from recursive methods described in Yermack (1996), based upon the q_{PW} estimator of Perfect and Wiles (1994). Leverage is defined as the ratio of long-term debt over total assets. Firm size is the natural log of total assets in constant 1991 dollars. The volatility of the operating

environment is calculated as the standard deviation of annual changes in return on assets over the 1984-91 period. ROA is based upon operating income before interest and taxes and is compounded continuously.

4. Results

Table 3 presents coefficient estimates for our basic model of CEO turnover. We estimate four specifications of the model, with and without two sets of (0, 1) indicator variables for individual years and two-digit SIC industries. Results appear insensitive to the inclusion of these additional variables, and we use them in the remaining models discussed in the paper. We drop from our analysis 55 observations involving extraordinary cases of CEO turnover: deaths in office, demotions of acting CEOs to lower positions in their firms, and departures of CEOs due to delisting of their companies.

4.1. Stock-based compensation and CEO turnover

Consistent with our main hypothesis, stock-based compensation appears to have a negative association with the probability that a CEO leaves his position. The coefficient on our main explanatory variable, the ratio of stock option pay over cash salary plus bonus, is negative and significant in every specification of our model. The inventory of previously awarded options is also negatively associated with CEO turnover, as expected, but the relation is not statistically significant. In the right column of table 3, the most general version of our model, the t-statistic for our option holdings variable has a p-value of 0.14.

Other variables appear to influence CEO turnover in expected patterns. CEOs are less likely to lose their jobs if they own large amounts of stock, or if they founded the company or belong to the founding family. Company performance has a marked negative association with CEO turnover. CEOs are more likely to leave their firms if the company has an unstable operating environment, as indicated by the standard deviation of annual changes in ROA. This may reflect a tendency by boards to punish CEOs for delivering inconsistent results, and may also reflect CEOs' disutilities for working in unpredictable environments.

4.2. Voluntary and involuntary turnover

We analyze our findings more closely by disaggregating CEO turnover events into two classes: voluntary and involuntary. If a connection exists between stock-based compensation and CEO turnover, by definition we expect it to influence only voluntary CEO departures. As discussed in section 3, we use two indicator variables as proxies for involuntary turnover. The first variable equals one if the exiting CEO is 62 years old or younger and does not remain on the board of directors. The second variable equals one if the successor CEO is chosen from outside the firm.

Table 4 presents estimates using our first proxy for involuntary CEO turnover. To save space, the table shows only estimates for the two key explanatory variables related to stock option compensation and stock option holdings. For comparison purposes, the first column of the table shows estimates for a probit model where the dependent variable equals one for all episodes of CEO turnover. Estimates in the middle column are produced by setting the dependent variable to one only for involuntary CEO turnover. The final column

shows estimates with the dependent variable equal to one only for all other CEO departures, e.g., voluntary resignations and retirements. All models include the same specification as the model in the right column of table 3. Because our dependent variable depends on segmenting the sample at age 62, we conduct a robustness check by re-estimating our models over the subsample of CEOs aged 62 and younger, reporting these results in the bottom half of table 4.

Results in table 4 appear to offer strong support for our main hypothesis. As expected, the link between stock-based compensation and CEO turnover holds especially strongly for voluntary turnover episodes, and has no statistical significance when turnover is involuntary. For both the entire sample and the subgroup of CEOs aged 62 and younger, the coefficient on the stock-based compensation variable becomes far more negative after involuntary turnover episodes are excluded. Further, this coefficient moves close to zero and loses its statistical significance when only involuntary CEO turnover is analyzed. We also find a significantly negative association between voluntary CEO turnover and holdings of exercisable stock options, although this pattern does not hold for the 62-and-under subsample.

The findings in table 4 also appear to rule out a possible alternative explanation for the observed inverse connection between stock-based pay and CEO turnover. Outgoing CEOs might receive less stock-based pay for "life cycle" reasons, since boards of directors may not perceive a need for long-term incentives when the CEO is expected to leave. If this phenomenon occurred, it should be most pronounced in cases of involuntary CEO turnover, since the board of directors has at least as much knowledge and control over CEO departures for these episodes than for voluntary turnover. The pattern of coefficients shown in table 4

belies this interpretation, however, as the negative association between stock-based pay and turnover weakens, rather than strengthens, when the analysis is confined to involuntary turnover.

We further analyze voluntary and involuntary CEO turnover using a second proxy, an indicator variable for forced turnover that equals one if the successor CEO is selected from outside the firm. Table 5 presents probit estimations based upon this variable, in a format identical to table 4. Again, the results appear to provide considerable support for our main hypothesis. When the dependent variable equals one for involuntary turnover only, no significant connection is found between CEO turnover and either stock option compensation or a CEO's holdings of previously awarded options. The opposite is true for voluntary CEO turnover, which is negatively and significantly related to both option-based compensation and option holdings. As before, both of these coefficients are more negative for the subsample of voluntary turnover events than for the entire sample.

4.3. Relevance of results to other levels of management

Our results about the effect of stock-based compensation on voluntary turnover are based on a sample of chief executive officers, those managers who have already reached the top position in their respective firms. Although we do not have data about the turnover patterns of lower-ranked managers, we believe the negative effects of stock-based compensation on turnover would be at least as strong or even stronger among this group.

Companies may face a greater probability of turnover for managers just below the CEO level than for the CEO himself, for several reasons. A large number of incumbent

CEOs will always be unattractive to other firms, either because of advancing age, high compensation, or because their position is derived from membership in the company's founding family. Our data discussed in section 3.1 above seems to support this conjecture, as nearly one-fourth of our CEOs are members of the founding family, and very few CEOs (only two in our entire sample) leave their firms to take CEO posts elsewhere. In firms with successful or entrenched CEOs, other managers may feel they have no realistic chance for further promotion and therefore look outside for other opportunities.⁶ Also, managers below the CEO level may have more specific knowledge about the firm's products or technology than the CEO, making them potentially more valuable for competitors to hire. Therefore, firms in which top executives have significant inside information may use stock-based compensation more extensively to reduce turnover. Mehran (1992) documents a positive correlation between the ratio of the firm's R&D to sales (as a proxy for inside information) and the ratio of top executives' value of new stock options to their total compensation. He also shows a higher ratio of value of new stock options to total compensation for other top executives relative to that for CEOs. Finally, one can argue that the control issue is more applicable to the CEOs than for top executives, as we documented that the probability of the CEO's turnovers decreases with the percentage holding of the company's stock.

⁶ For example, General Electric has seen many of its high-ranked executives leave to become CEOs of other firms during the successful tenure of John Welch.

5. Conclusions

Retention of employees is an important issue in human resource management, and many firms use stock-based compensation to provide incentives for key managers to remain with their firms. We test the hypothesis that corporate managers leave their jobs less often when they receive stock-based compensation. We find the probability of CEO turnover is smaller for firms whose CEOs compensation packages contain a higher ratio of value of stock option compensation to cash pay. The results strengthen when we exclude CEO departures that appear to have been involuntary. Our findings suggest that stock-based compensation plays a significant role in helping firms retain the services of top managers.

Moreover, we find that CEOs are less likely to lose their jobs if they own large amounts of stock, or if they founded the company or belong to the founding family. Company performance has a marked negative association with CEO turnover. CEOs are more likely to leave if the company has an unstable operating environment, as indicated by the standard deviation of annual changes in ROA. This may reflect a tendency by boards to punish CEOs for delivering inconsistent results, and may also reflect CEOs' preference for predictable environments.

References

Black, Fischer and Myron Scholes, 1973, The pricing of options and corporate liabilities, *Journal of Political Economy* 81, 637-659.

Bushnell, Davis, 1987, Escaping the corporation, *Boston Globe*, June 27, 13.

Coughlan, Anne T. and Ronald M. Schmidt, 1985, Executive compensation, management turnover, and firm performance: An empirical investigation, *Journal of Accounting and Economics* 7, 43-66.

Hays, Laurie, 1995, IBM's boss paid \$12.4 million, stock options, *The Wall Street Journal*, March 14, B7.

Himelstein, Linda, Zachary Schiller, and Laura Zinn, 1993, Are trade-secret police patrolling your company? *Business Week*, August 23, 25.

Jackson, Matthew O. and Edward P. Lazear, 1991, Stocks, options, and deferred compensation, *Research in Labor Economics* 12, 41-62.

Katz, Lawrence, 1986, Efficiency wage theories: A partial review, in Stanley Fischer, ed, *NBER Macroeconomics Annual 1986* (MIT Press, Cambridge, MA).

Kitch, E., 1980, The law and economics of rights in valuable information, *Journal of Legal Studies* 9, 683-726.

Mehran, Hamid, 1992, Executive incentive plans, corporate control, and capital structure, *Journal of Financial and Quantitative Analysis* 27, 539-560.

Miller, Michael W., 1992, IBM sues to silence former employee, *The Wall Street Journal*, October 15, B1.

Dial, Jay and Kevin J. Murphy, 1995, Incentives, downsizing, and value creation at General Dynamics, *Journal of Financial Economics* 37, 261-314.

Nitzan, Shmuel and Ariel Pakes, 1983, Optimum contracts for research personnel, research employment and the establishment of rival enterprises, *Journal of Labor Economics* 1, 345-365.

Osterman, Paul, 1988, Turnover, employment security, and the performance of the firm, in: Eugene Smolensky, Richard Burkhauser, Peter Gottschalk, Robert Moffitt, Barbara Wolf, eds., *Human Resources and Firm Performance* (University of Wisconsin Press, Madison, WI), 275-317.

Perfect, Steven B., and Kenneth W. Wiles, 1994, Alternative constructions of Tobin's Q: An empirical comparison, *Journal of Empirical Finance* 1, 313-341.

Siler, Julia F. and Wendy Zellner, 1991, You'll never eat lunch in this industry again, *Business Week*, November 11, 44.

Vancil, Richard F., 1987, *Passing the Baton: Managing the Process of CEO Succession* (Harvard Business School Press, Boston, MA).

Waldman, Meredith K., 1992, More firms restrict departing workers, *The Wall Street Journal*, June 26, B1.

Wall Street Journal, 1991, Keeping key workers has high priority for many corporations, November 12, A1.

Wall Street Journal, 1992, October 5, A1.

Warner, Jerold B., Ross L. Watts, and Karen H. Wruck, 1988, Stock prices and top management changes, *Journal of Financial Economics* 20, 461-492.

Weber, Joseph, 1991, Offering employees stock options they can't refuse, *Business Week*, October 7, 34.

Weisbach, Michael, 1988, Outside directors and CEO turnover, *Journal of Financial Economics* 20, 431-460.

Yermack, David, 1995, Do corporations award CEO stock options effectively? *Journal of Financial Economics* 39, 237-269.

Yermack, David, 1996, Higher market valuation of companies with a small board of directors, *Journal of Financial Economics* 40, 185-212.

Table 1
CEO turnover statistics

Descriptive statistics about the frequency of turnover for CEOs of 452 large U.S. industrial companies between 1984 and 1991. A CEO turnover event occurs if the CEO leaves his position during the last half of the current fiscal year or the first half of the subsequent fiscal year.

The sample includes all firms qualifying at least four times between 1984 and 1991 for Forbes magazine's annual list of the 500 largest U.S. public corporations in any of the categories of sales, assets, net income, or market capitalization. Data about CEO turnover events and the fate of the departing CEO was gathered mainly from annual corporate proxy statements, supplemented when necessary by news reports.

| Summary statistics | All CEOs | CEOs aged 62 or less | CEOs aged 63 or more |
|---|-----------------|---------------------------------|---------------------------------|
| CEO-year observations in sample | 3,438 | 2,605 | 833 |
| Turnover events (Frequency among all CEOs) | 371 10.8% | 160 6.1% | 211 25.3% |
| <u>Nature of CEO turnover events</u> | | | |
| CEO remains as Chairman of the Board (Frequency among exiting CEOs) | 129 34.8% | 41 25.6% | 88 41.7% |
| CEO remains on board of directors, but not as Chairman | 97 26.1% | 20 12.5% | 77 36.5% |
| CEO demoted to lower position in firm | 8 2.2% | 7 4.4% | 1 0.5% |
| CEO severs all ties with company | 90 24.3% | 56 35.0% | 34 16.1% |
| CEO dies in office | 10 2.7% | 5 3.1% | 5 2.4% |
| Company delisted due to acquisition or insolvency | 37 10.0% | 31 19.4% | 6 2.8% |
| <u>Successor CEO</u> | | | |
| Chosen from outside the company (Frequency among non-delisted firms) | 40 12.0% | 21 16.3% | 19 9.3% |

Table 5**Probit coefficient estimates: Voluntary vs. involuntary turnover**

Coefficient estimates for (0, 1) probit models of CEO turnover. The sample consists of 3,187 CEO-year observations drawn from 452 firms in the 1984-91 period. Estimates are displayed only for selected explanatory variables; the entire specification is identical to that in the right column of Table 3. Standard errors are displayed below each estimate. More complete variable definitions appear in Table 2.

The first column of the table presents estimates for models with the dependent variable equal to 1 in all cases in which a CEO leaves his position during the last half of the current fiscal year or the first half of the subsequent fiscal year. In the second column, the dependent variable equals one only for CEO turnover events in which the CEO is replaced by an executive from outside the company. The third column presents estimates with the dependent variable equal to one for all other CEO turnover.

| | All CEO turnover | Involuntary turnover | Voluntary turnover |
|--|-----------------------------|-----------------------------------|-------------------------------|
| Definition of dependent variable: | All cases | CEO replaced by outside executive | All other cases |
| <u>Explanatory variable</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> |
| Options owned / shares outstanding | -16.57 11.12 | 10.32 13.55 | -37.94 *** 14.40 |
| Option compensation / (salary + bonus) | -0.18 *** 0.06 | -0.08 0.09 | -0.25 *** 0.08 |

Significant at 1% (***) level.

Table 4**Probit coefficient estimates: Voluntary vs. involuntary turnover**

Coefficient estimates for (0, 1) probit models of CEO turnover. The top section of the table presents estimates for the entire sample of 3,187 CEO-year observations drawn from 452 firms in the 1984-91 period. The lower half of the table contains estimates for the subset of 2,408 CEOs aged 62 or less. Estimates are displayed only for selected explanatory variables; the entire specification is identical to that in the right column of Table 3. Standard errors are displayed below each coefficient estimate. More complete variable definitions appear in Table 2.

The first column of the table presents estimates for models with the dependent variable equal to 1 in all cases in which a CEO leaves his position during the last half of the current fiscal year or the first half of the subsequent fiscal year. In the second column, the dependent variable equals one only for CEO turnover events in which the CEO is aged 62 or less and does not remain a member of the board of directors. The third column presents estimates with the dependent variable equal to one for all other CEO turnover.

| | All CEO turnover | Involuntary turnover | Voluntary turnover |
|--|-----------------------------|--|-------------------------------|
| Definition of dependent variable: | All cases | CEO aged 62 or less, and CEO leaves board | All other cases |
| All CEOs | | | |
| <u>Explanatory variable</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> |
| Options owned / shares outstanding | -16.57 11.12 | 3.63 15.77 | -27.56 ** 13.61 |
| Option compensation / (salary + bonus) | -0.18 *** 0.06 | -0.06 0.08 | -0.31 *** 0.09 |
| CEOs aged 62 or less | | | |
| <u>Explanatory variable</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> |
| Options owned / shares outstanding | 3.88 13.16 | 5.61 16.49 | 4.92 17.84 |
| Option compensation / (salary + bonus) | -0.21 ** 0.09 | -0.07 0.08 | -0.57 *** 0.19 |

Significant at 1% (***) and 5% (**) levels.

Table 3
Probit coefficient estimates: Determinants of CEO turnover

Coefficient estimates for (0, 1) probit models of CEO turnover. The dependent variable equals 1 if the CEO leaves his position during the last six months of the fiscal year or the first six months of the subsequent fiscal year. After deletion of observations with missing values, the sample used in estimations includes 3,187 observations for 452 firms in the 1984-91 period. Table 2 includes more complete variable definitions.

The model includes control variables for growth opportunities (r&d expense over sales and Tobin's Q), leverage (long-term debt over total assets), the volatility of the operating environment (the standard deviation of annual changes in ROA between 1982 and 1991), and performance (stock returns net-of-market for the current and prior years). All models include indicator variables for each CEO age from 55 to 69 and CEO age 70 and over. Industry and year indicator variables appear as indicated in the model shown in each column. Standard errors are displayed below each coefficient estimate.

| <u>Variable</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> | <u>Estimate</u> |
|---|-------------------|-------------------|-------------------|-------------------|
| Stock owned / shares outstanding | -2.58 *** 0.92 | -2.50 *** 0.91 | -2.97 *** 0.97 | -2.94 *** 0.97 |
| Options owned / shares outstanding | -9.69 10.34 | -9.31 10.46 | -16.17 10.97 | -16.57 11.12 |
| Option compensation / (salary + bonus) | -0.18 *** 0.06 | -0.17 *** 0.06 | -0.19 *** 0.06 | -0.18 *** 0.06 |
| CEO is member of founding family | -0.34 *** 0.12 | -0.35 *** 0.12 | -0.39 *** 0.13 | -0.41 *** 0.13 |
| R&D expense / sales | 1.39 1.00 | 1.42 1.02 | 3.36 *** 1.11 | 3.53 *** 1.12 |
| Leverage | 0.51 ** 0.24 | 0.49 ** 0.24 | 0.27 0.27 | 0.21 0.28 |
| Std. Dev. of changes in ROA | 4.10 *** 1.07 | 4.14 *** 1.07 | 5.08 *** 1.23 | 5.17 *** 1.24 |
| Tobin's Q | -0.07 0.06 | -0.08 0.06 | -0.11 0.07 | -0.13 * 0.08 |
| Stock return net-of-market | -0.46 *** 0.12 | -0.48 *** 0.12 | -0.48 *** 0.13 | -0.50 *** 0.13 |
| Stock return net-of-market (lagged one year) | -0.19 0.13 | -0.20 0.13 | -0.19 0.13 | -0.19 0.14 |
| Log (total assets) | -0.004 0.03 | -0.006 0.03 | -0.004 0.04 | -0.010 0.04 |
| CEO age indicator variables | Yes | Yes | Yes | Yes |
| Industry indicator variables (2-digit) | No | No | Yes | Yes |
| Year indicator variables | No | Yes | No | Yes |

Significant at 1% (***), 5% (**), and 10% (*) levels.

Table 2
Descriptive statistics for key variables

Dependent and explanatory variables used in probit models of CEO turnover. The sample consists of 3,438 observations from a panel of 452 industrial companies during the 1984-91 period, but 55 observations are dropped for years in which CEOs left office due to death, delisting of the company, or demotion to a lower position in the firm (usually an acting CEO returning to prior job). Data for CEO turnover, stock ownership, and compensation were obtained mainly from corporate proxy statements. Compustat served as the source for financial statement data, while the CRSP database provided stock return data.

| Dependent variables | Functional form | Missing values | Mean | Median | Std. dev. |
|---|--|-----------------------|-------------|---------------|------------------|
| CEO turnover indicator (0, 1) | =1 if CEO leaves position during last half of current fiscal year or first half of subsequent fiscal year. | 0 | 0.093 | 0 | 0.291 |
| Involuntary CEO turnover indicator (0, 1) | =1 if CEO turnover occurs at age 62 or less, and CEO does not remain as member of board of directors. | 0 | 0.016 | 0 | 0.128 |
| Involuntary CEO turnover indicator (0, 1) | =1 if successor CEO is chosen from outside the company. | 0 | 0.012 | 0 | 0.108 |
| Independent variables | Functional form | Missing values | Mean | Median | Std. dev. |
| CEO age | Years. | 0 | 57.8 | 58 | 7.2 |
| CEO stock ownership | Fraction of equity held by CEO through direct stock ownership. Excludes shares held contingently and those from which CEO derives no economic benefit (e.g., charitable trusteeships). | 90 | 2.93% | 0.16% | 8.49% |
| CEO option ownership | Exercisable options held / (exercisable options + shares outstanding). | 122 | 0.18% | 0.06% | 0.54% |
| Option compensation | Black-Scholes value of options awarded during year / (salary + bonus). | 39 | 0.535 | 0.191 | 1.658 |
| CEO in founding family indicator (0, 1) | =1 if CEO belongs to family that founded company or acquired controlling interest. | 0 | 0.239 | 0 | 0.427 |
| Growth opportunities | Research and development expense / sales. | 0 | 0.019 | 0 | 0.037 |
| Leverage | Long-term debt / total assets. | 0 | 0.199 | 0.178 | 0.156 |
| Riskiness of operating environment | Standard deviation of annual changes in (operating income / total assets) between 1984-91. | 0 | 0.041 | 0.033 | 0.033 |
| Tobin's Q | Market value of equity and debt / book value of assets. See Yermack (1996). | 0 | 1.229 | 1.025 | 0.770 |
| Stock return, net of market | $\log(1 + \text{stock return}) - \log(1 + \text{CRSP value-weighted index return})$. | 0 | -1.76% | -0.42% | 28.40% |
| Company size | $\log(\text{total assets})$ (1991 dollars). | 0 | 7.827 | 7.738 | 1.185 |

Thoughts on Goodyear
Arthur L. Rebell
May-97

The forgoing contains some of my observations on the Goodyear case. You should remember that a key factors in M&A work is the advantage of brainstorming about complicated issues. The nature of the examination process is that you must do this alone. Therefore, few people will recognize or put into prospective all of the issues by themselves the way that they could as part of a group.

Conclusion

While a case can be made for option one i.e. allowing Goldsmith to tender, and several of the papers which received top grades did make this choice, to me the better choice was option three. The second option I find more difficult to justify. A few macro comments might help to put the alternatives into perspective.

The financial Strain

Attached are my working papers on the DCF and Cash Flow Statements.

While one must of course make a decision as to how credible the cash flow numbers are, assuming the numbers given in the case, it is clear that the company has the ability to repay a substantial amount of money over a five year period. In fact, from internally generated sources, approximately \$500 million can be repaid. That means that the company will have debt of \$1.7 in five years with a reasonable stated equity, since the company will have generated book earnings approximating \$1 billion. Perhaps more importantly Goodyear will have the capacity to pay down over \$150 million of debt each of the next few years. Therefore, the problem clearly is an unrealistic amortization schedule rather than an ability to carry the debt load, again assuming one believes the projections.

In point of fact, what the company has is a form of a bridge loan, i.e. they have a certain amount of time to refinance, either with all debt or if they are fortunate with some equity. If things got worse than expected, the prospect of joint ventures or other creative financing could be looked into. A key factor, as many of you pointed out, is their position in a very basic, although cyclical industry.

Company Strategy

It seems clear that the diversification strategy is a failure, and a failure which the market has recognized in pricing Goodyear relative to other tire companies. As many of you recognized, in all likelihood whether in fact Goldsmith takes over the company or the company goes back to the focused tire approach itself, the effect on the company, its employees etc. is substantially the same. The key point to be recognized is that to have a chance at greater market recognition, the company must return its attention to the tire business, which they have run well. Then, whether as some have suggested, they can achieve even greater costs savings, is for the market to consider in its evaluation. If one chooses option 2, the Company is not forced to return to the core business, and in fact it is not clear what assets would be sold. Thus the market would continue to view the company as a conglomerate, presumably with the same skepticism shown to date.

What Actually Happened

The actual case was somewhat different since the repayment terms of the debt wasn't as severe, but in reality one could not assume the quick clean sale of all assets. In fact, the debt level got much higher, and capital expenditures on the pipeline in particular continued at high levels. The company did perform well in 1987, which until October was a very good year for stocks. The highly leveraged nature of the company worked to its advantage. In fact in 1987 the stock hit a high of \$71.63. As an aside very few people raised what struck me as a potential problem, i.e., the prospect that their competitors would see the debt and begin to act in a very predatory manner. This did happen and made life difficult. In fact, by 1988, consolidations, including stronger players coming into the domestic market, i.e. Bridgestone of Japan buying Firestone, lead to increased capital expenditures and eventually weakened profits. By 1988, the stock started to fall. However, it was not until the end of October of 1988 that it fell back to the \$50 level.

With respect to Goldsmith, they did pay him \$49.50 per share. Goldsmith and the company maintained that because he got less than the tender price, it was not greenmail. Others, noting the \$37 million in expenses also paid to Goldsmith, and the lack of pro rationing, insist he did get greenmail. Goodyear tendered for an additional 40 million shares and only 40.4 million shares were tendered.

Legal Issues

While I did not expect exhaustive discussions of legal issues, some mention of either Revlon or UNOCAL was helpful. Revlon was mentioned by some who questioned whether if Goodyear tendered it would put itself in play and not be able to retreat from that position. The Revlon discussion also came from several students who felt that Goldsmith was bluffing, and that they should allow him to go ahead. Both groups questioned whether these decisions would force the company to be sold at the highest short term price, even if Goldsmith withdrew. As we discussed in connection with Time Warner, I doubt that would happen, as these actions could be interpreted as tactical given the circumstances.

Several students who where in favor of alternative 3 noted that if Goldsmith was not bluffing, and would tender to compete with the reorganization, he would not be able to get a court to remove the pill. Citing UNOCAL, these students felt that a court would view the reorganization as a reasonable response to the corporate threat, and particularly given the substantial number of independent directors, the pill would be upheld. At least student one cited the weight of his opinion as an important consideration for the court. At least one noted this as a reason why Goldsmith would in fact tender his stock.

Allow Goldsmith to Tender.

The advantages of this choice included:

- Goldsmith could be bluffing in which case no reorganization would be necessary, and the question of dealing with him made easier or at least postponed
- Treats all shareholders equally and fairly
- Avoids questions about fiduciary responsibilities, and if fact why management hadn't done some of this before
- Avoids the risk of a failed tender i.e. a low stock price after the deal
- Shareholders are spared the risk of the leveraged company failing
- For most non-shareholders, to a great extent their fate will be no different than under the company's aggressive reorganization.
- Management could probably work out reasonable contracts

The disadvantages of this choice included:

- This isn't what management professes to believe is best for the company
- Shareholders who have faith in the focused tire business are not given the chance to capitalize on its potential growth

