OUTSIDE DIRECTORS AND CEO TURNOVER

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This paper examines the relation between the monitoring of CEOs by inside and outside directors and CEO resignations. CEO resignations are predicted using stock returns and earnings changes as measures of prior performance. There is a stronger association between prior performance and the probability of a resignation for companies with outsider-dominated boards than for companies with insider-dominated boards. This result does not appear to be a function of ownership effects, size effects, or industry effects. Unexpected stock returns on days when resignations are announced are consistent with the view that directors increase firm value by removing bad management.

1. Introduction

Boards of directors are widely believed to play an important role in corporate governance, particularly in monitoring top management. Directors are supposed to supervise the actions of management, provide advice, and veto poor decisions. The board is the shareholders' first line of defense against incompetent management; in extreme cases, it will replace an errant chief executive officer (CEO). Discussing boards' effectiveness in this role, Jensen (1986) claims that 'the internal control mechanism of corporations, which operate through the board of directors, generally work well' (p. 9).

Two recent studies, Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988), provide some support for this view by showing that poor performance is associated with CEO turnover. These studies do not explore the differences in monitoring between the managers who serve as directors (inside directors) and directors who are not full-time employees of the company (outside directors). These outside directors are widely believed to play a larger role in monitoring management than inside board members. Fama

(1980, p. 293–294) argues:

> The probability of [top management colluding and expropriating share-
> holder wealth] might be lowered, and the viability of the board as a
> market-induced mechanism for low-cost internal transfer of control might
> be enhanced, by the inclusion of outside directors. The latter might be
> regarded as professional referees whose task is to stimulate and oversee
> the competition among the firm's top management.

This view has led to numerous calls for regulation of board composition to
increase outside representation and hence the level of monitoring of manage-
ment in American corporations [see, for example, the American Law Institute
(1982)].

Economists have criticized such regulatory proposals.[1] Demsetz (1983a, p.
B-6) argues that 'the board of directors can do very little to improve on the
powerful incentives that presently guide management to serve the interests of
shareholders'. He maintains that executive compensation contracts, which are
designed to align shareholders' and managers' interests, and the pressures of
the product and capital markets [Hart (1983)] already provide adequate
monitoring of corporate managers. According to this argument, regulation of
boards cannot improve and could possibly impose a harmful constraint on an
optimizing management.

Understanding the role of the outside director remains an important and
unresolved question. Unfortunately, most of the day-to-day actions of boards
of directors are unobservable. Any attempt to isolate the different effects of
outside and inside directors must either examine their effect on some aspect of
firm performance or concentrate on the directors' observable actions. The
most striking of such actions is the decision to remove a CEO.

This paper tests the hypothesis that inside and outside directors behave
differently in their decisions to remove top management. It exploits the wide
variation across firms in the composition of the board of directors to study
how the relation between poor performance and management turnover varies
with the makeup of the board. The findings suggest that firms with outsider-
dominated boards are significantly more likely than firms with insider-
dominated boards to remove the CEO on the basis of performance, as
measured by such publicly available measures as earnings or stock returns.

The paper consists of seven sections. Section 2 reviews the role of boards of
directors in the CEO succession process. Section 3 describes the data. The
fourth section discusses the empirical specification. Section 5 presents an
econometric model that explains CEO turnover using stock returns and
earnings changes as measures of performance. It then tests to see whether this
relation is the same for firms with different board types. Section 6 analyzes the

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[1]See Andrews (1982), Demsetz (1983a), and MacAvoy, Cantor, Dana, and Peck (1983).

change in firm value associated with the announcement of CEO changes and tests whether the outside monitoring is causally related to the change in firm value. A brief conclusion discusses possible directions for future research.

2. Boards of directors as monitors of management

One important duty of the board of directors is to evaluate management. The board is responsible for evaluating the senior management of the corporation and replacing them if they fail to perform well. This task is likely to fall mainly on the outside directors. Inside directors' careers are tied to the CEO's and hence insiders generally are unable or unwilling to remove incumbent CEOs.[2] Harold Geneen (1984, p. 262), the longtime CEO of ITT, wrote: 'Certainly, none of the inside directors would substantially challenge his boss in the boardroom.'

Outside directors are responsible for removing bad management, but they may not have the incentives to do so. A recent *Business Week* editorial (Sept. 8, 1986) argues that outside directors without a significant stake in the firm have no incentive to cause trouble for management. However, outside directors are generally respected leaders from the business or academic community whose reputations suffer when they are directors of faltering companies. Like Fama (1980), Fama and Jensen (1983, p. 315) argue that

> outside directors will monitor the management that chooses them because outside directors have incentives to develop reputations as experts in decision control.... The value of their human capital depends primarily on their performance as internal decision managers in other organizations. They use their directorships to signal to internal and external markets for decision agents that (1) they are decision experts, (2) they understand the importance of diffuse and separate control, and (3) they can work with such decision control systems.

Outside directors thus will have an incentive to ensure the effective running of the company because being directors of well-run companies signals their competence to the market.

It may not be ideal, however, to have a board composed entirely of outsiders. Although outsiders may be best able to judge when to remove a CEO, inside participation on the board can improve the decision about who the successor should be. Inside board members are often potential future CEOs. Their inclusion on the board serves two purposes. First, it gives them experience that may prove valuable should they become CEO. Second, it gives

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[2] Much of the discussion here and below is taken from Mace (1971). An alternative view is that insiders are much more likely to remove the CEO so they can take his place. This view is not consistent with the evidence in Mace (1971) or Vancil (1987).

the outside board members an opportunity to evaluate potential CEO candidates. Irrespective of the reasons for the CEO change, we might expect that boards combining inside and outside directors do a particularly good job of replacing management because this type board type allows for superior training of the inside directors and better evaluation of them by outside directors.

Most studies of the monitoring functions of boards of directors have used the case method. Perhaps the best attempt in the direction is Mace (1971).[3] He interviewed CEOs and directors to explore their functions and relationships. His results show that directors typically are not involved in important corporate decisions such as long-range planning or selecting other directors. Directors do serve as a valuable source of advice for many CEOs and were responsible for removing the CEO in what Mace called crisis situations. Mace emphasized that outside directors generally took the initiative to remove incumbent CEOs.

In addition to this case approach, there have been several attempts to identify quantitatively the effects of boards of directors on profitability. MacAvoy, Cantor, Dana, and Peck (1983), responding to the proposal by the American Law Institute (1982) for regulation of board composition, collected data on the composition of boards of directors for a cross-section of publicly traded companies. They compare two subsamples: those firms that met the proposed ALI regulations for a majority of outside directors and various other requirements, and all other firms. They tested whether the two subsamples differed in various performance measures: accounting profits, sales, and return on equity. Their results indicated no differences between the two types of firms. A problem with this approach is that the causality of the relation between board composition and firm performance is unclear. For example, if MacAvoy et al. had discovered that more profitable firms tend to have insider-dominated boards, we would not know whether inside directors cause good business decisions to be made or whether CEOs of unprofitable firms tend to invite outsiders onto the board to help solve their problems [Hermalin and Weisbach (1987a)]. This simultaneity problem makes the MacAvoy et al. results difficult to interpet.

A related study by Morck, Shleifer, and Vishny (1988) explores how stockholdings by boards of directors affect performance. They find that profitability, measured by Tobin's Q, is highest at moderate levels of share ownership by the board. In addition, they find that this result applies both to ownership by the firm's top officers and to ownership by the rest of the board.

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[3]Vance (1983) performs a similar study. There also have been a number of studies that document the composition and compensation of boards. Two examples are Bacon (1975) and Mruk and Gardinia (1985).

This result may be due to the tradeoff between the agency costs resulting from misalignment of directors' and shareholders' interests and the costs of managerial entrenchment [Demsetz (1983b)]. Managerial entrenchment occurs when managers gain so much power that they are able to use the firm to further their own interests rather than the interests of shareholders. Demsetz argues that when CEOs are able to control the board, they are able to take on projects that are known to have negative net present values but provide utility for the CEO.

The extent of this entrenchment has been the subject of two recent studies. Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988) estimate resignation equations for CEOs. Each study finds that poor performance by the company's stock increases the probability of a CEO's removal, although Coughlan and Schmidt find a much larger effect than Warner et al. However, neither paper provides any direct evidence that the board of directors is actively monitoring. A nonmonitoring explanation consistent with the evidence presented in these studies is that CEOs resign voluntarily from companies that are doing badly because of the difficulties of running a faltering company, including potential shareholder suits.

Warner, Watts, and Wruck (1988) also examine the residuals from a market model regression on the day the CEO change is announced. They find that the mean excess return is not distinguishable from zero, but that the variance of the excess return increases on the event day. This finding implies that the announcement contains information but that the information is good news for some firms and bad news for others. Warner et al. interpret this result as consistent with the announcement's providing information about both past and future performance.

Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988) provide studies of the CEO succession process. Although both papers claim that the board of directors is responsible for the CEO changes, neither paper attempts to link the work with work on the composition of boards of directors done by MacAvoy, Cantor, Dana, and Peck (1983) and by Morck, Shleifer, and Vishny (1988).

3. Data

The data used in this study are an extension of the data collected by MacAvoy, Cantor, Dana, and Peck (1983). They assembled data on board composition for all corporations listed on the New York Stock Exchange with a proxy statement available on microfiche, a total of 495 publicly held corporations between 1977 and 1980. For each firm, directors were classified as either outside, inside, or grey. MacAvoy et al. classify directors who are

full-time employees of the corporation as inside directors. They designate directors who neither work for the corporation nor have extensive dealings with the company as outside directors. Those directors who are not employees, but who may not be independent of current management because of extensive business dealings with the company or family relationships with management, are classified as grey. In the analysis below, the measure of outside domination of the board is the fraction of board members who are outsiders.[4]

These data on composition are matched with data on CEO succession. Once a year *Forbes Magazine* lists the names, compensations, ages, backgrounds, years with the company, and years as CEOs for the CEOs of all corporations it lists of the 500 largest corporations in several categories (sales, profits, etc.). I followed the identity of the CEO over a ten-year window from 1974 to 1983 for each firm in both the MacAvoy et al. sample and the *Forbes Magazine* surveys. All CEO changes were a cross-checked with the *Wall Street Journal* to get the exact date of the announcement of the change as well as the reason given by the company for the change.[5] Finally, the data were matched with financial data from the Center for Research in Security Prices (CRSP), giving a total of 367 companies.[6]

Table 1 shows the distribution of outsider representation for 1980. Firms are grouped according to the percentage of outsiders on the board. The distribution is centered around 50%, with few firms in the tails of the distribution. The largest concentration of firms – 61 (including 30 with exactly 50% outsiders) – is in the 45–50% range. To distinguish the differences between the firms on the basis of outside representation on the board, I divide the sample into approximate thirds. All firms in which outsiders make up no more than 40% of the directors are considered insider-dominated firms, all firms in which at least 60% of the board are outsiders are designated outsider-dominated firms, and firms with between 40% and 60% outsiders are considered mixed boards. According to this assignment procedure, 146 firms have mixed boards,

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[4]An alternative measure is the fraction of insiders on the board. This alternative measure is highly correlated with the fraction of outsiders on the board, as the correlation coefficient between the two is −0.813 and the rank correlation is −0.823. The fraction of outsiders is used in the empirical work because of the claims in the institutional literature [see Mace (1971)] that grey directors do not monitor management.

[5]For the years 1974–1976 and 1981–1983, for which MacAvoy et al did not collect any data, the board data were taken from the nearest available year (either 1977 or 1980). This approximation does not appear to be too inaccurate because board composition changes extremely slowly over time. For example, between 1977 and 1980, only 6% of the firms in the MacAvoy et al. sample changed the percentage of outsiders on their boards by at least 20% When the equations are estimated on the 1977–80 subsample, the results are similar to those on the entire sample, although the coefficients are not estimated as precisely as with the entire sample.

[6]For some of the analysis, earnings data from the COMPUSTAT Industrial file were used, reducing the total number of firms to 322.

Table 1

The frequency of outsider representation on the boards of 367 NYSE firms in 1980.

Proportion of directors who are outsiders[a]	Number of firms
0–5%	1
5–10%	2
10–15%	6
15–20%	7
20–25%	11
25–30%	9
30–35%	23
35–40%	34
40–45%	37
45–50%	61
50–55%	18
55–60%	40
60–65%	26
65–70%	32
70–75%	28
75–80%	20
80–85%	7
85–90%	5
90–100%	0
Total	367

[a]The ranges are inclusive of the upper bound. For example, the 30 firms with exactly 50% outsiders are included in the 45–50% group rather than the 50–55% group.

compared with 93 insider-dominated boards and 128 outsider-dominated boards.[7]

Table 2 presents the reason given in the *Wall Street Journal* for the CEO resignations. Retirement (138 instances) is the most common. Perhaps the most striking feature of this table is that in only 9 of the 286 resignations was performance given as a reason why the CEO was replaced. In some of these nine cases, it was not the firm that mentioned performance but the *Wall Street Journal* which cited rumors that performance was the true reason.

Yet there is evidence that poor performance does precede CEO resignations. The findings of Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988) both imply that poor stock performance tends to raise the probability

[7]There are many firms with exactly the same percentage of outsiders. Therefore, it was impossible to divide the sample into exact thirds without including two firms with exactly the same fraction of outsiders into different categories. This method of dividing the sample was chosen because of its simplicity. Alternate divisions, such as dividing the sample as equally as possible, yield similar results.

of a resignation. The same effect exists in my data. In the four quarters preceding retirements, market-adjusted returns were on average 4.8% lower than the average annual return from my sample. In the four quarters preceding all other resignations market-adjusted returns were 6.5% lower than average returns. Both differences are significantly different from zero but they are not significantly different from each other.

This suggests that companies do not announce the true reason behind their CEOs' resignations. Therefore, I ignore the stated reasons for resignation in constructing my sample. I do, however, eliminate the resignations for which I am able to corroborate the cause independently. Changes in CEOs caused by death and preceding a takeover are excluded because these 'resignations' are totally verifiable.[8]

One other variable that is highly correlated with the probability of a planned resignation is the age of the CEO. A nontrivial number of the resignations take effect on the CEO's sixty-fifth birthday. These resignations are likely to be actual retirements, unrelated to performance. Since the *Forbes* data on the age of the CEO are accurate only to within a year, all firms with CEOs aged 64, 65, or 66 were excluded.[9] Excluding these observations is likely to increase the signal-to-noise ratio and ultimately the precision of the estimates.[10]

4. Empirical specification

To test whether outside boards monitor management more effectively than inside boards and to compare the sizes of the effects across board types, I relate CEO resignations to performance measures. If a stronger relationship exists between poor performance and the probability of a CEO's being replaced for outsider-dominated than for insider-dominated boards, this would provide evidence that outsiders play a role in monitoring management. Find-

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[8] The four public scandals and the five instances of CEOs taking prestigious positions elsewhere might also be considered verifiable. Excluding these observations from the sample does not change the results in any meaningful way.

[9] Excluding these observations does not meaningfully affect the results when stock returns are used as the explanatory variable. However, in the logits using earnings discussed below, excluding these observations drastically affects the results. This difference is possibly caused by CEOs who have compensation plans based on earnings. These CEOs have an incentive to manipulate the intertemporal structure of earnings to maximize their compensation. This strategy makes sense only if the resignation is anticipated, so it is not likely to be a problem in the case of an unanticipated removal. For a detailed study of how management can manipulate earnings to maximize their compensation, see Healy (1985).

[10] A number of resignations located in *Forbes* were not discussed by the *Wall Street Journal*. These resignations were also eliminated because it is impossible to isolate the date of the resignation accurately enough from the *Forbes* surveys.

Table 2

The principal reason given by the *Wall Street Journal* for CEO resignations; *sample*: 367 NYSE firm between 1974 and 1983.

Reason	Number of resignations
Retirement	138
Personal reasons	17
Death	12
Normal succession procedure	11
Illness	9
Performance mentioned	9
Policy or personality disagreement	8
Take prestigious appointment elsewhere	5
Followed by takeover	4
Scandal	4
Company policy to retire at 60	3
Merger	2
CEO purchased a subsidiary and will run it	1
No reason given	63
Total	286

ing the same relationship across different types of boards would imply that boards do not differ systematically in monitoring management.

I test this hypothesis using logit models to estimate the probability of a CEO change.[11] The logistic approach assumes that

$$\Pr(\text{CEO leaves his job}) = F(x\beta) = \exp(x\beta)/(1 + \exp(x\beta)),$$

where x is a vector of variables (including a constant) that may affect the CEO's probability of losing his job, and β is a parameter vector. The distribution F is known as the logistic distribution. I use maximum likelihood to estimate the parameters. The log of the likelihood function for the logit model is given by

$$\log L = \sum C_i * \log[F(x_i\beta)] + \sum (1 - C_i) * \log[1 - F(x_i\beta)],$$

where C_i is a dummy variable equal to one if there is a resignation in a given firm-year.

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[11] Ordinary least squares is not an appropriate statistical technique for this problem because the dependent variable is dichotomous. For a complete description of logit, see Amemiya (1985). Logit was used instead of probit to be consistent with the previous literature [Coughlan and Schmidt (1985), Warner, Watts, and Wruck (1988)]. The results are similar if probit is used instead of logit.

The first performance measure used is the return on the company's stock minus the return on a value-weighted market portfolio.[12] When stock returns are used as the performance measure, the logit equations are estimated using firm-quarters as the unit of observation and the return for the year prior to the quarter in question as the performance measure. This approach was adopted to minimize the time between the performance period and the potential resignation. The alternative approach of using annual data would have associated a resignation in, say, November 1982 with the performance of the stock in 1981, leaving eleven months between the measured predictive period and the event. If boards of directors do not remove CEOs for poor performance, it is plausible that the time lag would be relatively short. Therefore, annual data will, in general, paint a less accurate picture of the relationship between performance and removals than quarterly data.

5. Results of the prediction equations

5.1. Using stock returns as the performance measure

The removal equations with stock returns as predictors are shown in table 3. The first column indicates the relationship for the entire sample. The coefficient on the return variable is negative and significantly different from zero. This means that a poor stock return increases the probability of a CEO's losing his job. This result replicates the results of Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988) with an effect smaller than the former and larger than the latter. The relationship between stock return and the probability of the CEO's being replaced implied in these equations is illustrated in the first column in table 4. For the median firm in the bottom decile of stock returns, with a return 33% lower than the market, the CEO has a 6% chance of losing his job, while the CEO of the median firm in the top decile that outperformed the market by 70% has a 3% chance of losing his job. Considering that CEOs leave their jobs for many reasons, the size of this difference seems fairly large.

The second column of table 3 examines the effect of stock returns on resignations across different board types. For the inside boards, the returns

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[12]An alternative approach involves estimating market model parameters for each firm by estimating the equation

$$R_{it} = \alpha_i + \beta_i M_t + \varepsilon_{it},$$

where R_{it} is the return on firm i, M_t is the return on market portfolio, and α_i and β_i are the market model parameters. The residuals from this equation could be used as the performance measure. The reason this approach was not used is that if the parameters were estimated using data from several years prior to the resignation, the estimate of the α would likely be biased downward for firms with bad CEOs. For these firms, the residuals from the market model will not reflect true CEO performance.

coefficient is negative, but is small and not significantly different from zero. For mixed boards the coefficient ($-0.20 = -0.46 + 0.26$) is even smaller in absolute value and is also not significantly different from zero. However, there is a larger effect for outside boards. The coefficient ($-1.63 = -0.46 - 1.17$) is significantly different from zero at the 1% level and significantly different from the coefficients on either inside or mixed boards at the 10% level.[13]

The derivative of the probability of resignation with respect to stock returns illustrates the impact of board type. The derivative (evaluated at a return of 0.0) is -0.066 for companies with outside boards, -0.022 for companies with inside boards, and -0.010 for companies with mixed boards. This derivative, a measure of the responsiveness of the removal decision to stock performance, is three times as large for the companies with outside boards as for any other board type. Although the larger effect for inside boards than for mixed boards is unexpected, the difference between the two is not significant. The difference between the outside boards and mixed boards is significant at the 5% level. The difference between outside boards and inside boards is not significant at conventional significance levels.[14]

The probabilities of removal implied from these logit equations for each board type are shown in table 4. For outside boards the probabilities range from 7% for a firm in the bottom decile to 1.3% for a firm in the top decile. The difference between these probabilities is 5.7%, which is significant at the 1% confidence level. For inside boards the probabilities range from 5.7% to 3.6%, a difference of just 2.1%. This difference is not significant at any

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[13] I use one-tailed tests here and below because there are many a priori reasons why outsiders would monitor better than insiders but few why insiders would monitor better than outsiders. The hypothesis is hence a 'one-tailed' hypothesis.

For the whole sample (including CEOs of all ages) the right-hand side of the estimated equation was

$$- \underset{(36.4)}{4.00} - \underset{(1.38)}{0.54} R + \underset{(0.36)}{0.19} R * D_{mixed} - \underset{(1.19)}{0.63} R * D_{outside}$$

$$+ \underset{(0.93)}{0.14} D_{mixed} + \underset{(0.25)}{0.04} D_{outside}.$$

(t-statistics are in parentheses.) The coefficient on outside boards is still significantly different from zero but is no longer significantly different from the coefficient on inside boards.

The equations shown in table 4 and below include dummy variables for each board type. These dummy variables make each of these equations equivalent to estimating separate equations for each board type. The equations are shown in this form to facilitate testing whether various effects differ across board types.

[14] The standard errors used here and below are calculated using the delta method [see Rao (1965)]. If a parameter vector w has a variance–covariance matrix V, and g is a differentiable function, then the variance–covariance matrix of $g(w)$ is approximated asymptotically by $G'VG$, where G is the Jacobian matrix of g. The numbers referred to in the text as t-statistics therefore do not actually have a small-sample t-distribution but are equal to the ratio of the parameter estimate and an asymptotic approximation of the standard error. Under the null hypothesis that the coefficient is equal to zero they have an asymptotic standard normal distribution.

Table 3

Logit equations predicting CEO turnover using stock returns;[a] *sample*: 12,997 firm-quarters between 1974 and 1983 (CEOs must be either younger than 64 or older than 66); asymptotic *t*-statistics in parentheses.

Variable	Coeff.	Coeff.	Coeff.	Coeff.
Constant	−4.39	−4.39	−4.60	−4.60
	(54.9)	(31.4)	(28.8)	(28.8)
D_{mixed} [b]	—	0.13	0.22	0.23
		(0.68)	(1.15)	(1.15)
$D_{outside}$ [c]	—	−0.18	0.03	−0.03
		(0.86)	(0.13)	(0.14)
Return [d]	−0.64	−0.46	−0.44	−0.45
	(2.28)	(0.92)	(0.88)	(0.87)
Return * D_{mixed}	—	0.26	0.19	0.20
		(0.39)	(0.28)	(0.29)
Return * $D_{outside}$	—	−1.17	−1.11	−1.07
		(1.60)	(1.52)	(1.43)
$Return_{-1}$	—	—	—	−0.10
				(0.20)
$Return_{-1}$ * D_{mixed}	—	—	—	−0.08
				(0.11)
$Return_{-1}$ * $D_{outside}$	—	—	—	−0.44
				(0.71)
Dummy if age > 66	—	—	1.28	1.29
			(5.82)	(5.61)
Log likelihood	−846.76	−843.76	−830.88	−830.45

[a]The dependent variable is equal to 1 if there was a CEO change in a given quarter and 0 otherwise.

[b]D_{mixed} is a dummy variable that is 1 if the company's board contains between 40% and 60% outsiders.

[c]$D_{outside}$ is a dummy variables that is 1 if the company's board contains at least 60% outsiders.

[d]The variable *Return* is the return on a company's stock minus the return on a value-weighted market portfolio in the four quarters prior to the period.

conventional significance level. These implied probabilities again illustrate the monitoring effect of the outside directors.

The third column of table 3 includes a dummy variable for whether the CEO was past retirement age. (All CEOs at retirement age were excluded from the sample.) A possible objection to the results described above is that they are just proxies for effects due to age, a variable that seems likely to have an effect on the probability of retirement. Indeed, the coefficient on this age variable is significant and does increase the probability of retirement. It has little effect, however, on the estimates of the other coefficients.

The final column of table 3 includes the returns for two years prior to the resignation as explanatory variables. The variable $Return_{-1}$ is the market-

Table 4

Implied annual probability of resignation by marked-adjusted stock return decile and outsider representation on the board for 367 NYSE firms from 1974 to 1983.[a]

Decile	Return vs. market[c]	Implied probability of resignation (standard error[b])			
			Percentage outsiders on board		
		Entire sample	≤ 40%[e]	> 40%, < 60%[f]	≥ 60%[g]
1	−0.331	0.061 (0.00073)	0.057 (0.0128)	0.052 (0.0105)	0.070 (0.0141)
2	−0.204	0.056 (0.0054)	0.054 (0.0097)	0.051 (0.0082)	0.057 (0.0094)
3	−0.125	0.053 (0.0046)	0.052 (0.0082)	0.051 (0.0071)	0.050 (0.0076)
4	−0.065	0.051 (0.0042)	0.050 (0.0075)	0.050 (0.0065)	0.045 (0.0068)
5	−0.005	0.049 (0.0039)	0.049 (0.0070)	0.049 (0.0061)	0.041 (0.0063)
6	0.057	0.047 (0.0038)	0.048 (0.0068)	0.048 (0.0060)	0.037 (0.0061)
7	0.117	0.045 (0.0039)	0.046 (0.0070)	0.048 (0.0062)	0.034 (0.0060)
8	0.207	0.043 (0.0042)	0.045 (0.0076)	0.047 (0.0068)	0.029 (0.0060)
9	0.371	0.038 (0.0050)	0.041 (0.0094)	0.046 (0.0088)	0.022 (0.0061)
10	0.708	0.031 (0.0064)	0.036 (0.0132)	0.042 (0.0136)	0.013 (0.0056)

[a] Implied probabilities are obtained from logit equations that predict the probability of a CEO resignation in a given quarter using the market-adjusted returns for the four previous quarters as the independent variable. The probabilities are then multiplied by four to approximate annual probabilities.

[b] The standard errors are computed using the delta method [Rao (1965)].

[c] The *Return vs. market* variable is the return on the company's stock for the median stock in a given decile of the firms ranked in terms of stock returns minus a value-weighted market index.

[d] Estimated model: ln(odds of resignation) = −4.39 − 0.64 (market-adjusted return).

[e] Estimated model: ln(odds of resignation) = −4.39 − 0.46 (market-adjusted return).

[f] Estimated model: ln(odds of resignation) = −4.26 − 0.20 (market-adjusted return).

[g] Estimated model: ln(odds of resignation) = −4.57 − 1.63 (market-adjusted return).

adjusted return for the four quarters prior to the period covered in *Return*, i.e., the return between eight and five quarters prior to the quarter of the potential resignation. The estimates indicate that resignations are not sensitive to returns from previous years. This result, together with a similar one from Warner, Watts, and Wruck, suggests that boards react relatively quickly to poor performance in their decision to replace the CEO.

5.2. Using earnings as the performance measure

A second measure of corporate performance is accounting earnings. Despite the many problems with using earnings data as a measure of profitability [see Fisher and McGowan (1983), Solomon (1970), and Stauffer (1971)], earnings data have one large advantage over stock price data for the purposes of measuring the performance of the CEO: earnings data measure short-term profits. The stock price reflects the present discounted value of the expected future cash flows of the company. The stock price incorporates the market's estimate of the probability that a bad CEO will be fired. Therefore, the stock price of firms with bad CEOs is greater than it would be if the CEOs were given a lifetime job guarantee. If a company were known to be likely to replace bad management, e.g., if it had an outsider-dominated board of directors, this difference becomes even larger. This argument implies that using stock price data may underestimate the monitoring effect of outsiders. In addition, if boards of directors base executive turnover decisions on economic profitability, then a finding that accounting earnings data can predict CEO resignations is consistent with a relation between accounting profits and economic profits [Fisher and McGowan (1983)].

As the decisions to change CEOs are likely to be related to unanticipated changes in performance, I would like to use a measure of unexpected earnings. A large literature on the time series behavior of accounting earnings [see Ball and Watts (1972) and Foster (1978)] finds that annual earnings follow approximately a random walk. This implies that changes in earnings are an unbiased estimate of unexpected earnings.[15]

The choice of the appropriate earnings measure presents some difficulties. The measure used below is earnings before interest and taxes ($EBIT$).[16] This measure was used to prevent changes in capital structures or tax treatments from obscuring differences in earnings measures of performance. The change in $EBIT$ is standardized by the book value of the firm's assets in the previous year (A_{-1}) to control for size differences.

Finally, to control for factors affecting earnings changes in the year of CEO turnover caused by industry effects, the average standardized earnings change is computed for all the firms on the COMPUSTAT industrial tape with the same two-digit SIC code as the test firm. This average is subtracted from the standardized earnings change for the test firm. The resulting variable provides

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[15]An earlier version of this paper used earnings levels normalized by asset levels as the measure of performance. The results were all qualitatively identical. Earnings changes are used here because the appropriate benchmark for measuring CEO performance would seem to be the unexpected component of earnings.

[16]This variable is constructed by adding data items 15, 16, 18, and 49 on the annual COMPUSTAT industrial tape.

a measure of unexpected earnings that should not be sensitive to the firm's size, industry, capital structure, or tax treatment.[17]

The results from these logits are shown in table 5. The variable $\Delta EBIT$ reflects the most recent earnings change of which the board of directors has knowledge, and $\Delta EBIT_{-1}$ and $\Delta EBIT_{-2}$ the two prior changes. In the first column, earnings changes for the three years prior are used to predict resignations for the entire sample. The only variable with a significant coefficient is $\Delta EBIT_{-1}$. A possible explanation for this follows from the fact that CEOs can manipulate earnings streams [Healy (1985), DeAngelo (1987)] and have an incentive to report high earnings before their retirement. Since a large fraction of the resignations in my sample is likely to be planned in advance, high earnings changes for these firms might offset poor earnings change for the firms where the board of directors removes the CEO, obscuring the relationship between poor unexpected earnings for the year prior to the resignation and the probability of resignation.

The results broken down by fraction of outsiders are shown in the second column for the two earnings announcements prior to the resignation. The coefficients on the performance variables for inside and mixed are not significantly different from zero. The coefficient for outsiders is negative and significantly different from zero and from the insiders coefficient at the 5% level for $\Delta EBIT$ and at the 1% level for $\Delta EBIT_{-1}$.[18]

The implied probabilities of a CEO change calculated from this equation are similar to those from the returns equations. For the entire sample, the probability of resignation for a CEO with earnings changes in the bottom decile for two subsequent years is 0.071 in the following year. The probability of a CEO resignation in the year following two earnings changes in the top decile is 0.033. The difference between the two is satistically significant (t-statistic $= 2.94$). For the outside boards, the two probabilities are 0.135 and

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[17]Because firms have fiscal years ending in months other than December, the timing of observations presents a problem. The unit of observation is taken to be a fiscal year. Since directors presumably know earnings before they are announced publicly, resignations occurring in the month of the announcement or the month before the announcement are said to have followed the announcement.

[18]For the whole sample (including CEOs of all ages) the right-hand side of the estimated equation is

$$-\ 2.60\ +\ 1.83\ \Delta EBIT\ -\ 3.71\ \Delta EBIT * D_{mixed}\ -\ 3.76\ \Delta EBIT * D_{outside}$$
$$(20.2)\quad\ (0.72)\qquad\qquad (1.02)\qquad\qquad\qquad (1.04)$$

$$-\ 0.79\ \Delta EBIT_{-1}\ +\ 1.94\ \Delta EBIT_{-1} * D_{mixed}\ -\ 7.46\ \Delta EBIT_{-1} * D_{outside}$$
$$(0.37)\qquad\qquad (0.67)\qquad\qquad\qquad (2.11)$$

$$+\ 0.18\ D_{mixed}\ -\ 0.12\ D_{outside}.$$
$$(1.06)\qquad\quad (0.63)$$

Using the entire sample, the coefficient on outsiders is still negative for both $\Delta EBIT$ and $\Delta EBIT_{-1}$. It is significant for $\Delta EBIT_{-1}$ but not for $\Delta EBIT$.

Table 5

Logit equations predicting CEO turnover using earnings changes and stock returns; [a] *sample*: 2,823 firm-years between 1974 and 1983 (CEOs must be either younger than 64 or older than 66); asymptotic t-statistics in parentheses.

Variable	Coeff.	Coeff.	Coeff.	Coeff.
Constant	−3.02	−2.92	−2.91	−2.89
	(31.6)	(18.9)	(18.9)	(18.6)
D_{mixed} [b]	—	−0.05	−0.01	−0.10
		(0.22)	(0.05)	(0.43)
$D_{outside}$ [c]	—	−0.63	−0.16	−0.62
		(2.31)	(0.70)	(2.24)
$\Delta EBIT$ [d]	−0.33	3.04	—	4.18
	(0.17)	(1.03)		(1.39)
$\Delta EBIT *$ D_{mixed}	—	−3.95	—	−5.53
		(0.90)		(1.22)
$\Delta EBIT *$ $D_{outside}$	—	−10.08	—	−9.38
		(2.29)		(2.04)
$\Delta EBIT_{-1}$	−5.23	0.58	—	0.63
	(3.49)	(0.26)		(0.27)
$\Delta EBIT_{-1} *$ D_{mixed}	—	−4.81	—	−4.82
		(1.41)		(1.39)
$\Delta EBIT_{-1} *$ $D_{outside}$	—	−14.52	—	−13.87
		(3.73)		(3.29)
Return [e]	−0.35	—	−0.29	−0.44
	(1.29)		(0.73)	(1.05)
*Return *D_{mixed}	—	—	0.57	0.75
			(0.97)	(1.21)
*Return *$D_{outside}$	—	—	−1.38	−0.72
			(1.91)	(0.86)
Log likelihood	−554.85	−547.17	−555.31	−544.39

[a] The dependent variable is equal to 1 if there was a CEO change in a given year and 0 otherwise.

[b] D_{mixed} is a dummy variables that is 1 if the company's board contains between 40% and 60% outsiders.

[c] $D_{outside}$ is a dummy variables that is 1 if the company's board contains at least 60% outsiders.

[d] The variable $\Delta EBIT$ is the company's change in the earnings before interest and taxes weighted by the book value of assets in the most recent fiscal year prior to the potential resignation. This variable is adjusted for industry effects by subtracting from it the mean for all the firms on COMPUSTAT in the same two-digit SIC code.

[e] The variable *Return* is the return on a company's stock minus the return on a value-weighted market portfolio in the four quarters prior to the period.

0.010. Again the difference between them is statistically significant (*t*-statistic = 3.80). For the inside boards, the poor earnings decrease the change of a resignation, as earnings changes in the bottom decile predict a 6.7% chance of a resignation and earnings changes in the top decile predict a 3.9% chance. However, the difference between these two numbers is not statistically significant (*t*-statistic = 1.45). That the difference is statistically significant for the outside boards but not for the inside boards is evidence that the outsiders engage in some monitoring.

These results show that there is a relation between both stock returns and changes in earnings and the probability that a CEO will be replaced for outsider-dominated firms but not for insider-dominated firms. Yet, the accounting literature has documented a well-known relation between stock returns and earnings [see Watts and Zimmerman (1985)]. A possible explanation for this result for earnings changes is that the significant coefficients on the changes in earnings just act as a proxy for the 'true' relation between stock returns and CEO changes.

To test this explanation I estimate equations including both earnings changes and stock returns as explanatory variables. A significant coefficient on changes in earnings in this equation would suggest that the boards of directors base their decision to retain a CEO in part on the component of changes in earnings not contained in stock returns.[19]

For purposes of comparison, I re-estimate the returns equation using annual data on the 322 firms with earnings data available in the third column. The results are qualitatively identical to the results presented in table 3. The coefficients for companies with outsider-dominated boards are all negative and significantly different from zero and from the coefficient on companies with insider-dominated boards.

In the fourth column, I include both earnings changes and returns. The coefficients on earnings changes for companies with outside boards are both negative and significantly different from both zero and the coefficient for companies with inside boards. Including returns in the equation does little to the coefficients on changes in earnings. However, the coefficient on returns for outsider-dominated companies is noticeably smaller when earnings changes are included. It is still significantly different from zero at almost the 5% level using a one-tailed test (*t*-statistic = −1.65), but is no longer significantly different from the coefficient for insider-dominated companies. Thus this equation provides support for the view that boards of directors look at

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[19] The fact that the returns were computed quarterly and the earnings changes were computed on an annual basis presented a problem. The equations presented here use firm-years as the unit of observation. The returns are the market-adjusted returns for the year prior to the year of the observation and the earnings changes are exactly the same as discussed above. This method is employed instead of quarterly earnings changes because annual data are available for a larger fraction of my sample.

accounting numbers when evaluating a CEO's performance, possibly even more than at stock returns.

5.3. Controlling for shareholdings

A related concern is that shareholdings rather than the number of outside directors determine the board's level of monitoring. To test this hypothesis, I use data gathered by the Corporate Data Exchange (CDE) on the shareholdings of 456 *Fortune* 500 corporations for 1980.[20] Of these 456 firms, 220 are in the sample of firms used for the returns equations and 208 are in the sample used for the earnings equations. The CDE lists the shareholdings of each director with a stake larger than 0.2% of the total shares and identifies the top two officers of the corporation, usually the CEO and the chairman of the board. A deficiency of these data is that they do not distinguish between outsiders and insiders except for the top two officers. Nevertheless, the CDE data do provide some insights into the relations between board shareholdings, board composition, and CEO turnover.

A first pass at the CDE data merged with the composition data yields a strong relation between shareholdings and board composition. An ordinary least squares regression tells the basic story:

$$
\begin{array}{cccc}
Fraction\ of\ outsiders = & 0.515 & - & 0.532 & Stake\ of\ top \\
on\ board & (39.6) & & (4.63) & two\ officers \\
\end{array}
$$

$$
\begin{array}{ccc}
-0.434 & Stake\ of\ rest & + & 0.00007 & Assets, \\
(2.95) & of\ board & & (0.032) \\
\end{array}
$$

$$R^2 = 0.111, \quad Number\ of\ firms = 236.$$

(*t*-statistics are in parentheses.) Even controlling for size, shareholdings by both the top two officers of the firm and the rest of the board decrease the number of outsiders on the board.[21]

The same correlation is illustrated in more detail in table 6. The top panel gives the average stakes of the top two officers and the rest of the board. In insider-dominated companies, the top two officers owned an average of nearly 8% of their company's stock in 1980, whereas in outsider-dominated companies, the top two officers owned an average of only 1.57%. The same effect is

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[21] The stakes here are expressed as fractions, so that the equation would predict that a firm whose CEO holds 10% of the company's stock and whose board outside the CEO has negligible holdings would be predicted to have 47.8% outsiders on the board.

Table 6

The association between board composition and board shareholdings for 208 NYSE corporations in 1980.

(A) Average holdings by board type (%)			
	Board type		Entire sample
	Inside[a]	Mixed[b]	Outside[c]	
Chairman & president	7.98	2.32	1.57	3.71
Rest of board	5.26	2.39	1.75	3.01

(B) The distribution of board stakes by board type					
		Number of firms with stake of board (excluding the stake of chair & president)			
Board type	No. of firms	< 0.2%	≥ 0.2%, < 2%	≥ 2%, < 20%	≥ 20%
Inside	60	12	18	25	5
Mixed	80	31	30	16	3
Outside	68	21	32	14	1
Entire sample	208	64	80	55	9

[a]Inside boards have no more than 40% outsiders.
[b]Mixed boards have between 40% and 60% outsiders.
[c]Outside boards have at least 60% outsiders.

true for the rest of the board. In insider-dominated companies, the board other than the CEO and chairman owned 5.26% of the shares, whereas in outsider-dominated companies, they owned only 1.75%. Board holdings exclusive of the top two officers are broken down in the second panel of table 6. The pattern is the same as in the earlier columns. Insider-dominated firms have much greater ownership by directors than do outsider-dominated firms.

The relation between the CEOs' shareholdings and outsiders on the board is relatively easy to explain. The evidence presented above and in the institutional literature on boards suggests that CEOs have incentives to avoid including outsiders on the board. One explanation for this relation is that CEOs with more shares have more power in the firm and hence can keep outsiders off the board. A second argument follows from the Jensen and Meckling (1976) agency cost story. As a CEO's shareholdings grow as a fraction of his wealth, his interests become more aligned with the shareholders', so agency costs diminish. Thus there may be less need for monitoring by outside directors when the CEO has a large stake in the firm.

There are a number of explanations for the correlation between the holdings of the rest of the board and the composition of the board. One explanation is that when an outsider has a significant stake in the firm, further outside

directors are not deemed necessary, because the first outsider already has significant incentives to monitor management. A second explanation is that ownership by inside directors and monitoring by outside directors are alternative mechanisms used by shareholders to control agency problems. Yet a third explanation is that family-dominated companies are generally both tightly held and insider-dominated. Hermalin and Weisbach (1987a) have shown for a subsample of 142 of the firms from this study that much of the relation between board ownership and composition can be explained by family directors.

Shareholdings might affect the CEO turnover process in several ways. When a CEO has more power in the firm, he is more difficult to remove. Since shareholdings are likely to be one source of a CEO's power, one might expect that a large stake in the firm would decrease the probability that a CEO is replaced. To test this hypothesis, I include the CEO's shareholding in the resignation equations.

The results from these equations are shown in the second column of table 7. In each case, increased shareholdings of the CEO reduce the probability that he resigns, although the reduction is not significantly different from zero. Nonetheless, including this variable in the equation does not affect the other coefficients.

Since board shareholdings are correlated with board composition, a possible objection to these results is that board composition may not be what determines monitoring levels, but that board composition is simply a proxy for shareholdings. Morck, Shleifer, and Vishny (1988) argue that directors will not monitor management without a significant stake in the firm. I test this hypothesis by examining whether the monitoring level depends on the shareholdings of the noncontrolling directors (other than the CEO and the chairman).

I divide the sample of firms into three subsamples based on the holdings of the noncontrolling directors. The first subsample has no noncontrolling directors with enough shares to be listed on the CDE director (i.e., no director has 0.2% of the shares). These 64 firms will be referred to as having negligible holdings. I split the remaining firms into two categories based on whether the noncontrolling directors hold more than 2% of stock. Although 2% is arbitrary, it seems plausible that in the 64 companies in which noncontrolling boards hold less than 2%, they may exercise some significant power over management. In the 80 companies where the noncontrolling directors hold less than 2% of the stock but enough to be listed on the CDE directory, these directors are likely to exercise much less control over management.[22]

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[22] There are several problems with this approach. The most obvious is that I am using 1980 data to measure board control for 1974 to 1983. In doing so, I am implicitly assuming that board shareholdings do not change over this ten-year period. I also am not able to separate the shareholdings of outsiders and insiders. These equations are intended as a first pass at an important question, using the data that are available.

Table 7

Logit equations predicting CEO turnover using stock returns and management shareholdings;[a] *sample*: 8,862 firm-quarters between 1974 and 1983 (CEOs must be either younger than 64 or older than 66); asymptotic *t*-statistics in parentheses.

Variable	Coeff.	Coeff.	Coeff.	Coeff.
Constant	−4.34	−4.25	−4.19	−4.14
	(25.5)	(23.6)	(26.2)	(20.7)
D_{mixed}[b]	0.03	−0.03	—	0.02
	(0.10)	(0.13)		(0.09)
$D_{outside}$[c]	−0.18	−0.24	—	−0.19
	(0.72)	(0.92)		(0.70)
Return[d]	−0.15	−0.15	−0.59	−0.10
	(0.26)	(0.26)	(1.00)	(0.14)
Return * D_{mixed}	−0.48	−0.45	—	−0.53
	(0.59)	(0.55)		(0.64)
Return * $D_{outside}$	−2.09	−2.08	—	−2.10
	(2.32)	(2.28)		(2.19)
Stake of CEO	—	−1.28	—	−1.04
		(1.11)		(0.84)
D_{Shnil}[e]	—	—	−0.22	−0.20
			(0.96)	(0.83)
D_{Sh02}[f]	—	—	−0.32	−0.29
			(1.39)	(1.16)
Return * D_{Shnil}	—	—	0.38	0.78
			(0.45)	(0.88)
Return * D_{Sh02}	—	—	−1.08	−0.68
			(1.27)	(0.75)
Log likelihood	−586.49	−585.84	−587.04	−583.88

[a] The dependent variable is equal to 1 if there was a CEO change in a given year and 0 otherwise.

[b] D_{mixed} is a dummy variable that is 1 if the company's board contains between 40% and 60% outsiders.

[c] $D_{outside}$ is a dummy variable that is 1 if the company's board contains at least 60% outsiders.

[d] The variable *Return* is the return on a company's stock minus the return on a value-weighted market portfolio in the four quarters prior to the period.

[e] D_{Shnil} is a dummy variable that is 1 if the directors collectively own less than 0.2% of the company's stock.

[f] D_{Sh02} is a dummy variable that is 1 if the directors collectively own between 0.2% and 2% of the company's stock.

In the third column of table 7, I estimate the resignation equations separating the samples by ownership level instead of by board composition. The results do not indicate that any one group engages in more monitoring than any other group. The boards with moderate levels of ownership appeared to do the most monitoring, although the difference among the groups is not satistically significant. In the analogous earnings equations (not presented), the

firms whose boards own negligible amounts of stock seem to do the most monitoring, although the effect appears only in the lagged earnings and not in the most recent earnings change. The two equations together do not lead to any clear conclusions about the role of shareholdings in motivating boards to monitor managers.

In the fourth column of table 7, I separate the sample both by composition group and by ownership group. The one result from these equations is that having outsiders on the board seems to have a large effect on its monitoring level. The coefficients are essentially unchanged from the original equations, shown in the first column of table 7.[23] The same result holds for the analogous earnings equation. Thus, the monitoring effect of the outsider-dominated boards does not appear to be a function of the ownership of the board. Rather, it seems that the composition of the board is what drives its level of monitoring.

5.4. Additional tests

One possible objection to the above results is that the CEO replacement relationship might vary systematically depending on a firm's size or industry. Since board composition is correlated with both firm size and industry, it is possible that the relationship discovered above is caused by board composition proxying for size or industry effects. To evaluate this interpretation, I control for size and industry effects in my equations. Since the results are not particularly revealing, they are not reported.

Including a measure of size in the equation has essentially no effect, either by itself or on the other variables. Since one might expect the strength of the monitoring relation to vary depending on the size of the firm, I also include terms interacting size and performance measures in the equation. These variables have no statistically or economically meaningful effect, either by themselves or on the other variables. Finally, I include dummies that are equal to one if the firm is in a certain SIC two-digit industry code. All industries with at least four firms in them are included. Including these dummies does not affect the basic result: the coefficient on outside boards is still significant at the 10% level in each equation.

An independent way of confirming that the results represent boards of directors firing CEOs and not simply that poor stock returns and earnings tend to precede resignations in general is to consider resignations that are caused by exogeneous forces. A finding that prior performance does not predict these resignations would provide support for the view that in the

[23]Because of the restriction that the firm must be included in the CDE directory, these equations are estimated on a smaller sample of firms and hence have slightly different parameter estimates. Therefore, I re-estimate the basic equations in the first columns of table 7. These estimates are the ones against which the ones in the later columns of table 7 should be compared.

previous cases, poor performance does cause the resignations. I therefore estimate the logit equations on the subsample of CEOs who are 64, 65, or 66 and are highly likely to resign because of mandatory retirement. The right side of the removal equation using returns is

$$- \underset{(13.2)}{2.51} - \underset{(1.21)}{0.82} \; Return + \underset{(0.76)}{0.69} \; Return * D_{mixed}$$

$$+ \underset{(0.70)}{0.57} \; Return * D_{outside} + \underset{(1.04)}{0.26} \; D_{mixed} + \underset{(1.16)}{0.29} \; D_{outside}.$$

(*t*-statistics are in parentheses.) The coefficient on returns for each of the groups is negative but the magnitudes are very small and none of the coefficients is significantly different from zero. The coefficient on outside boards is −0.25, which is less than one sixth of −1.63, the coefficient in the equation for the CEOs not of mandatory retirement age.

5.5. Interpretations

The results suggest that outside boards rely more frequently than inside boards on performance, at least as measured by publicly available measures, when making removal decisions. The obvious interpretation of these results is that the outside directors serve a monitoring role. A potential alternative explanation, however, is that some third factor simultaneously determines which companies have outside boards and which companies have CEO turnover after poor performance.

One factor may be the amount of 'power' the CEO has within the firm. Suppose some CEOs are weak, in the sense that they do not command much loyalty or control over their shareholders. Other CEOs are strong, because they do command such loyalty and control. Strong CEOs can impose their will on the director selection process, while weak CEOs cannot. Thus, we would expect that on average strong CEOs would have more insiders on their boards than weak CEOs. Similarly, strong CEOs would be less likely to be replaced following poor performance than would weak CEOs. According to this explanation, the relationship between the composition of the board and the correlation between poor performance and CEO turnover is spurious; both are actually caused by a third factor, the amount of power the CEO has within the firm.

This explanation, though, has an additional prediction that we can test. Suppose that strong CEOs leave office only when they retire voluntarily and weak CEOs leave office both when they are fired and when they resign voluntarily. If there are no systematic differences between the times when strong and weak CEOs choose to resign voluntarily, we would expect to see

strong CEOs remain in office longer than weak CEOs. Thus, this differential power hypothesis predicts that the CEOs who resign with insider-dominated boards will have longer tenures than those who resign with outsider-dominated boards.

The data, however, do not confirm this prediction. The average tenure of CEOs who resign with insider-dominated boards is 11.7 years, while the average tenure of CEOs who resign with outsider-dominated boards is 9.7 years. This difference is not significantly different from zero (t-statistic $= 1.50$). Moreover, it is driven by a few outliers. The median tenure of CEOs who resign from outsider-dominated firms is actually longer than it is for insider-dominated firms; the median tenure is 9 years for outsider-dominated firms and 7.5 years for insider-dominated firms. The fact that there does not appear to be a systematic difference in the tenure of CEOs who resign between the two types of firms casts doubt on the hypothesis that the results are caused by some unobservable factor related to the power of the CEO within the firm.

Nevertheless, the question of how board composition is determined, and whether it is jointly endogenous with CEO removals, remains. The results can be plausibly explained by the following story: following poor performance, firms first respond by adding outsiders to the board. If poor performance continues, these outsiders remove the CEO. If the two stages are approximately contemporaneous and the unobserved forces that determine board composition are correlated with the ones that determine CEO removal, than the coefficient estimates in the CEO removal equations would be biased and inconsistent.

Indeed, results from Hermalin and Weisbach (1987) suggest that firms do add outsiders to their boards following poor performance. However, the effect is small – a firm with earnings changes in the bottom decile is predicted to increase the fraction of outsiders on its board by less than 1%. The effect of poor stock returns is similar. Since the change in board composition following poor performance is relatively small, and board composition changes very slowly over time, it is unlikely that the potential endogeneity of the board composition is a serious problem.

An interesting fact is that there is no significant difference in the overall number of resignations between board types. If anything, inside boards are more likely to remove CEOs than outside boards. The average probability of removal for an insider-dominated firm is about 5% annually; for an outsider-dominated firm it is approximately 4%. This fact, together with the results above, suggests that inside boards have reasons for replacing their CEOs unrelated to publicly available performance measures such as stock returns or earnings. Another explanation is that inside boards have better information about true performance than is reflected in publicly available measures. Yet a third explanation is that outside board members tend to be short-sighted and

remove managers following one bad year, ignoring the fact that the manager may in fact be maximizing the long-term value of the firm. I will now test these various explanations.

6. Analysis of share price movements

6.1. Measuring price responses to announcement of resignations

If CEOs who are removed are in fact poor performers, then firm value should increase when the decision to remove them is made. Event studies are the traditional way to test hypotheses of this type.[24] This event study estimates the market model parameters α_i and β_i for each firm, using daily data occurring both more than 120 trading days before and 60 days following the resignation by running the following regression:

$$R_{ij} = \alpha_i + \beta_i M_j + \varepsilon_{ij},$$

where R_{ij} is the return of firm i's stock on day j and M_j is the return of a value-weighted market index on day j. The residuals from this predicted equation are computed on the days immediately surrounding the announcement of the resignation in the Wall Street Journal.[25] These residuals measure the percentage change in the expected future profits of the firm. A positive residual indicates that there has been good news about the firm's prospects unrelated to market factors. The cumulative abnormal residuals are computed for several 'event windows' and a test is performed to see whether their average across firms is significantly different from zero. This procedure tests whether the news about the sample firms conveyed to the market on the event day is on average good or bad. Through the estimation of the α_i and the β_i it controls for both systematic (market-related) risk and any possible anomalies such as the size effect [Banz (1981)].

The results of the event study are presented in table 8. The excess returns are shown for several event windows and broken down by board type and age

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[24] The event study methodology was developed by Fama, Fisher, Jensen, and Roll (1969). The particular implementation adopted here follows Ruback (1982).

[25] For several of the firms, it was possible to isolate the month of the announcement but not the exact date. Usually, for these firms, there is an article describing the transition of power saying something like: 'Joseph Jones today replaced William Smith, who announced last August he would step down in December as chief executive officer of XYZ Corporation.' However, there was no article discussing the announcement in August. It was therefore possible to include the change in the prediction equations but not in the event study.

Table 8

Excess returns around the date of the announcement of CEO resignations; *sample*: 367 NYSE firms between 1974 and 1983; day 0 is the *Wall Street Journal* announcement date; *t*-statistics in parentheses.

Board types	Age restrictions	Event window					Number of resignations
		0 to 0	−1 to 0	to 1	−1 to 1	−3 to 3	
All	None	0.0016 (1.41)	0.0028 (1.77)	0.0022 (1.39)	0.0035 (1.77)	0.0027 (0.89)	259
All	Age < 64 or > 66	0.0017 (1.30)	0.0034 (1.79)	0.0037 (1.93)	0.0054 (2.29)	0.0039 (1.07)	153
Outside[a]	None	0.0049 (2.11)	0.0037 (1.09)	0.0062 (1.81)	0.0050 (1.19)	0.0060 (0.91)	83
Outside	Age < 64 or > 66	0.0045 (1.55)	0.0006 (0.15)	0.0105 (2.50)	0.0066 (1.28)	0.0080 (1.01)	44
Mixed[b]	None	0.0007 (0.40)	0.0043 (1.77)	−0.0002 (−0.10)	0.0033 (1.13)	0.0011 (0.25)	101
Mixed	Age < 64 or > 66	0.0015 (0.77)	0.0087 (2.82)	0.0002 (0.06)	0.0072 (1.90)	0.0021 (0.35)	62
Inside[c]	None	−0.0009 (−0.50)	−0.0001 (−0.57)	0.0012 (0.55)	0.0019 (0.79)	0.0011 (0.35)	75
Inside	Age < 64 or > 66	−0.0007 (−0.28)	−0.0010 (−0.28)	0.0019 (0.58)	0.0016 (0.41)	0.0022 (0.37)	47

[a]Outside boards have at least 60% outsiders. Of 367 firms in the sample, 128 have outside boards.

[b]Mixed boards have between 40% and 60% outsiders. Of 367 firms in the sample, 146 have outside boards.

[c]Inside boards have no more than 40% outsiders. Of 367 firms in the sample, 93 have inside boards.

of CEO. The excess returns are always positive and sometimes significantly different from zero. This result is different from Warner, Watts, and Wruck's (1988) finding that the mean of the excess returns was very close to zero. The entire sample and the entire sample excluding CEOs at mandatory retirement age are shown in the first two lines. The excess returns are positive and significantly different from zero for the three-day window from the day before the announcement to the day after the announcement. The excess returns are larger for cases where the CEO was not of retirement age. This suggests that more news is revealed by these resignations, which is reasonable, since retirements of 65-year-old CEOs tend to be anticipated.

The residuals are broken down by board composition in rows 3 through 8. Outside boards are shown in lines 3 and 4, mixed boards in lines 5 and 6, and inside boards in lines 7 and 8. The effects are positive for outside and mixed

boards and close to zero for inside boards. The positive residuals for the outside boards are consistent with the hypothesis that outside boards improve firm value by replacing bad management. The positive residuals for the mixed boards are consistent with the argument discussed above that mixed boards allow both better training for future CEOs and better observation by outside directors of future CEO candidates. However, the difference between the residuals of different board types is not significantly different from zero. Thus it is impossible to conclude that outsiders add more to firm value than insiders do through their removal decisions.[26]

The excess returns from the market model provide weak evidence that outside and mixed boards increase their firms' values when they replace a CEO. This increase does not seem to be present for inside boards. These results are consistent with the hypothesis that outside boards engage in monitoring that improves firm value. The improvement for mixed boards is consistent with the argument that a combined board facilitates the evaluation of CEO candidates by the outsiders. The next section provides a test of these explanations.

6.2. Explaining the share price responses

The final test evaluates whether the event day residuals can be explained by the prior performance measures. If boards improve firm value by replacing bad CEOs, there should be a relation between the quality of the CEO and the change in firm value when he is replaced. If the performance measures are correlated with the quality of the CEO and all replacements for the CEO are expected to be of roughly the same quality, then the change in the value of the firm surrounding the event day will be correlated with the performance measure. The test measures whether the cases where the board replaces bad management are those cases where there is an improvement in firm value when the change is announced. A finding that there is a relation between prior performance and the event day residual for outsider-dominated firms but not for insider-dominated firms would provide additional confirmation for the results discussed above.

The test is performed by regressing the cumulative excess returns from the day before the *Wall Street Journal* announcement until the day following it on

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[26] This argument presumes that the market is correctly valuing the firm prior to the resignation. Warner, Watts, and Wruck (1988) argue that if the market has only noisy information about firm value, the resignation of the CEO may signal that the CEO and hence the firm have been performing poorly. This signalling effect may cause a stock price to drop following a resignation even though the resignation increases firm value. Hence, the event study may not be the appropriate way to investigate whether CEO removals increase firm value.

the stock returns for the four quarters prior to the resignation.[27] The estimated equation is

$$Excess = -0.0010 + 0.0343 * Return - 0.0555 \ Return * D_{mixed}$$
$$return \quad (0.13) \quad (1.66) \quad \quad \quad (1.97)$$

$$-0.0924 \ Return * D_{outside} + 0.0099 \ D_{mixed}$$
$$(3.10) \quad \quad \quad \quad (1.24)$$

$$+0.0009 \ D_{outside},$$
$$(0.10)$$

$$R^2 = 0.0776, \quad Number \ of \ observations = 153.$$

(*t*-statistics are in parentheses.) The relation between prior performance and the excess return surrounding the announcement of the CEO resignation is strongest for the companies with outside boards. The coefficient is significantly different from that for the inside boards at the 1% level and from zero at the 5% level. This implies that, for outside boards, it is exactly when the resignation is preceded by poor performance that firm value rises the most around the day the resignation is announced. There is no similar relation between prior performance and event day performance for companies with insider-dominated or mixed boards. The fact that the coefficient on the returns for mixed boards is not significantly different from zero is consistent with the story that the excess returns for the mixed boards are caused by good succession choices and not by throwing out bad CEOs.

7. Conclusions

The main result of this paper is that performance measures are more highly correlated with CEO turnover for firms in which outsiders dominate the boards of directors than for firms in which insiders dominate. Outsider-dominated boards tend to add to firm value through their CEO changes. This addition to firm value is largest when the change is preceded by poor

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[27]An earlier version of this paper also included analogous tests using changes in earnings with similar results.

For this test, it is not appropriate to use the residuals from the estimated market model as the measure of performance. If the market model residuals are used, then those firms with negative returns prior to the resignation will be precisely those firms with low estimated values of the intercept term. Therefore, even though all the firms may perform about the same around the event day, it would seem as if there is a relation between prior performance and event day performance. This relation would be spurious, due to the estimation process and not to any decisions made by the boards of directors. For this reason the measure of excess return used for this test is the return on the stock minus the return on the market portfolio. In fact, the results are stronger if market model residuals are used because of this spurious effect.

performance. No similar results hold for insider-dominated boards. Furthermore, these results do not appear to be caused by differences in the ownership structure of the firm, the size of the firm, or the industry in which the firm participates.

Although the results discussed above are for CEO removals, there are many other ways in which outside directors can control the CEO's actions. One way is the choice of accounting policies. The board of directors has the final decision over the amount of discretion the CEO can take in manipulating accounting numbers, in particular the accruals, to maximize his compensation [Healy (1985)]. An interesting research project would test whether the ability of CEOs to manipulate accruals differs systematically depending on the board type. Similar projects could test agency cost explanations of dividends [Easterbrook (1984)] and capital structure [Myers (1984)].

References

Amemiya, T., 1985, Advanced econometrics (Harvard University Press, Cambridge, MA).
American Law Institute, 1982, Principles of corporate governance and structure: Restatement and recommendations, Tentative draft no. 1 (American Law Institute, Philadelphia, PA).
Andrews, K., 1982, Rigid rules will not make good boards, Harvard Business Review 00 34–46.
Bacon, J., 1975, Corporate directorship practices: Role, selection and legal status of the board (The Conference Board, Inc., New York).
Bali, R. and R. Watts, 1972, Some time series properties of accounting numbers, Journal of Finance 27, 663–82.
Banz, R., 1981, The relationship between return and market value of common stocks, Journal of Financial Economics 9, 3–18.
Coughlan, A.T. and R.M. Schmidt, 1985, Executive compensation, managerial turnover, and firm performance: An empirical investigation, Journal of Accounting and Economics 7, 43–66.
DeAngelo, L., 1987, Managerial competition, information costs, and corporate governance: The use of accounting information in proxy contests, Journal of Accounting and Economics, forthcoming.
Demsetz, H., 1983a, The monitoring of management, in: Statement of the Business Roundtable on the American Law Institute's proposed principles of corporate governance and structure: Restatement and recommendations (Business Roundtable, New York).
Demsetz, H., 1983b, The structure of ownership and the theory of the firm, Journal of Law and Economics 26, 375–393.
Easterbrook, F., 1984, Two agency costs explanations of dividends, American Economic Review 74, 650–659.
Fama, E., 1980, Agency problems and the theory of the firm, Journal of Political Economy 88, 288–307.
Fama, E. and M. Jensen, 1983, Separation of ownership and control, Journal of Law and Economics 26, 301–325.
Fama, E., L. Fisher, M. Jensen, and R. Roll, 1969, The adjustment of stock prices to the new information, International Economic Review 10, 1–21.
Fisher, F.M. and J.J. McGowan, 1983, On the misuse of accounting rates of return to infer monopoly profits, American Economic Review 73, 82–97.
Foster, G., 1978, Financial statement analysis (Prentice-Hall, Englewood Cliffs, NJ).
Geneen, H., 1984, Managing (Avon Books, New York).
Hart, O., 1983, The market mechanism as an incentive scheme, Bell Journal of Economics 14, 366–382.

Healy, P., 1985, The effect of bonus schemes on accounting decisions, Journal of Accounting and Economics 7, 85–108.

Hermalin, B. and M. Weisbach, 1987, The determinants of board composition, Unpublished manuscript (University of Rochester, Rochester, NY).

Jensen, M.C., 1986, The takeover controversy: Analysis and evidence, Midland Corporate Finance Journal 4, 6–32.

Jensen, M.C. and W.H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, Journal of Financial Economics 3, 305–360.

Jensen, M.C. and R. Ruback, 1983, The market for corporate control: The scientific evidence, Journal of Financial Economics 11, 5–50.

MacAvoy, P.W., S. Cantor, J. Dana, and S. Peck, 1983, ALI proposals for increased control of the corporation by the board of directors: An economic analysis, in: Statement of the Business Roundtable on the American Law Institute's proposed principles of corporate governance and structure: Restatement and recommendations (Business Roundtable, New York).

Mace, M.L., 1971, Directors, myth and reality (Harvard Business School Press, Boston, MA).

Morck, R., A. Shleifer, and R. Vishny, 1988, Management ownership and market valuation: An empirical analysis, Journal of Financial Economics, this issue.

Mruk, E. and J. Gardenia, 1985, Organization and compensation of boards of directors (Arthur Young Inc., New York).

Myers, S., 1984, The capital structure puzzle, Journal of Finance 34, 575–592.

Rao, C.R., 1965, Linear statistical inference and its applications (Wiley, New York).

Ruback, R., 1982, The effect of discretionary price control decisions on equity values, Journal of Financial Economics 10, 83–105.

Solomon, E., 1970, Alternative rate of return concepts and their implications for utility regulation, Bell Journal of Economics 1, 65–81.

Stauffer, T., 1971, The measurement of corporate rates of return: A generalized foundation, Bell Journal of Economics 2, 434–469.

Vance, S.C., 1983, Corporate leadership – boards, directors, and strategy (McGraw-Hill, New York).

Vancil, R., 1987, Passing the baton: Managing the process of CEO succession (Harvard Business School Press, Boston, MA).

Warner, J.B., R.L. Watts, and K.H. Wruck, 1988, Stock prices, event prediction, and event studies: An examination of top management restructurings, Journal of Financial Economics, this issue.

Watts, R. and J. Zimmerman, 1985, Positive accounting theory (Prentice-Hall, Englewood Cliffs, NJ).