

The determinants of board composition

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We identify factors that lead to changes among corporate directors. We hypothesize that the CEO succession process and firm performance will affect board composition. Our findings are consistent with both hypotheses. When their CEO nears retirement, firms tend to add inside directors (who may be possible candidates to be the next CEO). Just after a CEO change, inside directors with short tenures appear more likely to leave the board (they, perhaps, being the losing candidates). We also find that inside directors are more likely to leave the board and outside directors more likely to join after a firm performs poorly and when a firm leaves a product market.

1. Introduction

■ Recent attention has focused on what corporate boards of directors do, how their composition affects what they do, and what should be done to improve their effectiveness.¹ What has been ignored, though, is how boards get to be the way they are; the question of what determines who gets added or taken off a board has been left largely unanswered. Our goal here is to establish some empirical regularities about director selection in the hopes of partially answering that question.

Understanding how directors are chosen is crucial to understanding corporate organization and governance: who gets selected will, in turn, affect the roles the board can play and how effectively it can play them. Furthermore, knowing how board membership is currently determined makes it possible to evaluate proposed reforms in the board selection process, such as the ALI's (1982) or Dunn's (1987).

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¹ ALI (1982), Brickley and James (1987), Brickley and Van Drunen (1987), *Business Week* (September 8, 1986), MacAvoy *et al.* (1983), Mace (1971), Morck, Shleifer, and Vishny (1988), Shleifer and Vishny (1986), and Weisbach (1988) are some examples.

In this article we ask whether firm performance, CEO tenure, and changes in market structure lead to changes in board composition. Our results suggest that outside directors are more likely to join and inside directors more likely to leave a board after poor firm performance, when firms leave product markets, and possibly when there is a new CEO.² We also find that as a CEO nears retirement, insiders will be added to the board, possibly to be “groomed” as candidates to be the next CEO (Vancil, 1987).

Section 2 develops the hypotheses to be tested. Section 3 describes our data. Section 4 presents the empirical results. Section 5 contains a discussion and conclusion.

2. Potential factors influencing director choice

■ Evidence from both academic and business sources (Mace, 1971; Vancil, 1987) suggests that the CEO plays a large role in choosing the board of directors. One concern of the CEO, particularly toward the end of his tenure, is the choice of his successor. Both the business press and some academic work (Mace 1971; Vancil, 1987) argue that “grooming” the next CEO is a major motive for adding insiders to the board. That is, insiders are added to give them exposure to a variety of corporate issues, as well as to make them more visible to the other board members. Broad exposure to the work and problems of other divisions is valuable experience for a potential CEO. In addition, greater visibility of potential CEOs will aid the board in evaluating and choosing the next CEO. Thus, the CEO facilitates the succession process through his choice of inside directors. Although some boards have only two insiders, the CEO and his “heir apparent,” many boards include a number of “CEO candidates,” who engage in a rivalry for the top job (or to be anointed heir apparent).³

The link between the board and the CEO succession process generates several testable hypotheses: toward the end of a CEO’s tenure, insiders should be added to the board to facilitate the succession. Also, insiders who come to feel they have little chance to become the next CEO may leave the company.⁴ At the beginning of a new CEO’s tenure a number of insiders, losing candidates to become the new CEO, may leave, since they will not soon have another chance to become CEO. Since the new CEO is not ready or, perhaps, even able to begin his own succession process, he is not likely to wish to replace the departed insiders with other insiders. Also, the new CEO may wish to fill the board vacancies with outsiders who can offer good advice and counsel as he begins his job. Alternatively, a new CEO may have less freedom to choose his board than an established CEO, and hence may have to add outsiders to satisfy shareholders’ desires for greater monitoring. Finally, the former CEO frequently stays on for a few years as chairman of the board, which further limits the new CEO’s control of the board selection process.

A second set of explanations for board changes involves corporate performance: poor corporate performance can lead to an inside director’s being fired, either at the urging of the shareholders and the rest of the board, or by the CEO in an effort to protect himself and the company. Thus, we would expect to see poor corporate performance leading to

² An outside director is a director whose full-time job is not with the firm (often the CEO of another firm), while an inside director is a director whose full-time job is with the firm. An explanation of how we operationalize this sometimes murky distinction appears in Section 3.

³ The horse race among seven candidates, three of whom were added to the board, at General Electric to determine Reginald Jones’ successor is an example of this (Vancil, 1987).

There are, of course, other motives behind the choice of board members. For example, the CEO may choose outside directors who will give good advice and counsel, who can bring valuable experience and expertise to the board, and who offer a contrast to the perspectives and opinions found within the firm. The CEO may use his choice of inside directors to enhance monitoring of subordinates or to reward valuable personnel.

⁴ A possible example is the departure of two of three executive vice presidents of Allied Chemical after John Connor’s rejection of the outgoing CEO’s recommendation to make one of them COO and heir apparent. (Vancil, 1987).

resignations of insiders.⁵ The insider's immediate successor on the board may or may not be an insider. To the extent that poor performance indicates a need for a fresh perspective or greater monitoring, a board vacancy following poor performance is more likely to be filled by an outsider than by an insider.

Finally, if a firm exits a market, the insider who was in charge of that market is likely to lose his job or be demoted from the board. Therefore, there should be a positive correlation between a reduction in the number of markets in which a firm operates and the number of insiders who leave the board. When a firm enters a market, an insider who is already on the board, rather than the person in charge of the market, may be given the additional responsibility of managing that market. Consequently, we expect that entering a market will be less strongly correlated with the addition of insiders to the board.

3. Data

■ **An overview of the variables.** To study board composition we assembled a database on the boards of directors for a sample of NYSE-traded companies. We began with the 322 firms used by Weisbach (1988), all of which had data available on both earnings (from annual *COMPUSTAT*) and stock returns (from *CRSP*).⁶ This data set contains detailed information about CEO tenure and turnover. For each firm in the sample we collected data from corporate proxy statements between 1971 and 1983. Because we were interested in the factors that determine board composition, we eliminated all firms whose board composition was likely to be affected by regulation. This restriction eliminated 23 public utilities, two airlines, and one railroad. Since banks and financial institutions have different board structures than do industrial firms, we eliminated 13 banks and financial institutions from our sample. We also required that each firm have a proxy available in Harvard's Baker Library for each year between 1971 and 1983. A total of 140 firms had missing proxies for at least one of the 13 years. The resulting sample contained 142 firms.⁷

For each of our 142 firms we gathered 13 years of data on their board composition. We classified each director according to his principal occupation. Full-time employees of the corporation were designated as insiders. Directors who did not work full-time for the corporation were classified as outsiders. Directors who were closely associated with the firm, but were not full-time employees, were designated as "greys." Greys either were related to an officer of the company or had extensive business dealings with the company (as reported on the proxy), which made their independence from management questionable. Directors who were classified as grey because of business dealings were often lawyers, bankers, consultants, or investment bankers. Because of the conflict-of-interest problems inherent in having investment bankers on the board (Mace, 1971), investment bankers were always designated as greys.

Our data collection procedure creates some relatively minor problems for determining composition. To economize on data-collection costs, we examined the 1971, 1974, 1977, 1980, and 1983 proxies to determine our set of directors for each firm. We then used the

⁵ It is almost impossible for external observers to distinguish between firings and voluntary resignations. Corporations rarely announce publicly that they are firing top executives. Instead, they typically invent a face-saving explanation for the executive that is indistinguishable from a voluntary resignation. (See Weisbach (1988), Warner *et al.* (1988), or Vancil (1987) for evidence.)

⁶ This data set in turn comes from a sample of 495 firms used by MacAvoy *et al.* (1983). The 495 firms represent all firms for which proxies were available in the Yale Library. 128 firms were excluded because they were not in the *Forbes* compensation surveys, which provide the data on CEO tenure and turnover we use below. Finally, 45 firms were excluded because they were missing earnings data from *COMPUSTAT*.

⁷ In addition, we eliminated Chrysler Corporation because different directors represented different classes of stocks, rather than representing all shareholders. We felt this structure differed too much from the rest of the sample to be included.

other proxies to determine the year in which each of these directors joined and left the board. A problem with this procedure is that it undersamples directors with very short tenures (less than three years). For example, a director who joined the board in 1975 and left in 1976 would not be in our sample. Therefore, we are likely to miscalculate board composition occasionally because we fail to include some directors.⁸ To the extent that this affects our results, it will bias us toward not finding strong relationships between our hypothesized determinants of board composition and actual composition, since it essentially creates errors in our dependent variables.

A second problem created by our collection procedure is that our data on when directors join the board are taken from proxy statements and are on a calendar-year, rather than a proxy-year basis (a proxy year is the year between mailing dates).⁹ As the study of board composition is naturally done on the basis of proxy, rather than calendar years, some procedure was necessary for translating "joins" from a calendar-year to a proxy-year basis. If a company issues its proxies during the first half of the year, we assume that all directors who joined in that calendar year joined following the issuance of the proxy. If a company issues its proxies during the second half of the year, we assume that all directors who joined in that year joined before the issuance of the proxy. For example, if a firm issues its proxies in March, any join in the year 1975 is attributed to the 1975–1976 proxy year, but if it issued proxies in September, such joins would be attributed to the 1974–1975 proxy year.

We used and supplemented data from Weisbach (1988) to determine CEO tenures. This was done because our hypotheses predict that CEO tenure will be an important determinant of board composition. For the years within our sample period, we calculated CEO tenure by locating the exact date of any CEO change in the *Wall Street Journal Index*. We obtained the starting year for CEOs who started before 1971 from the *Forbes* compensation surveys or from *Who's Who in Finance and Industry*.¹⁰

As a measure of firm diversification, we use the number of different industries in which a firm operates, which we estimated by the number of four-digit SIC codes for which the firm was listed by *Standard and Poor's Register of Corporations*. Changes in diversification are measured by the proportional change in the number of four-digit codes.

The company information gathered from the proxies was supplemented by data on stock returns and earnings from *CRSP* and *COMPUSTAT*. The returns used below are the total return on a company's stock for the twelve months before the proxy year in question. If, for example, board changes between 1975 and 1976 are being analyzed for a firm with proxies mailed in April, we would use the returns over the year from April 1974 to March 1975 as an independent variable. These returns are adjusted for industry factors by subtracting from them a measure of the average return in the firm's industry. This measure is constructed by computing the average return of all firms in the given firm's two-digit SIC code on the *CRSP* tape for the relevant twelve-month period.¹¹

The construction of the earnings measure is more complicated. Since our hypotheses suggest that changes in the composition of the board are likely to be related to deviations from average performance, we would like to use a measure of unexpected earnings. A large

⁸ The fraction of directors who leave the board within three years of joining it (calculated by using only directors who joined in 1971, 1974, 1977, and 1980) is .1176 (with a standard error of .3226). The fraction who leave one year after joining is .0455 (.2086), and the fraction leaving after two years is .0468 (.2115). Given our method of calculation, these numbers tend to overstate greatly the probabilities of missing a director. Using these estimates, we calculate the number of directors we missed to be approximately 113, or 3% of the directors serving our 142 firms during the period 1971 to 1983.

⁹ As a rule, proxies list only the (calendar) year in which a director joined.

¹⁰ Occasionally precise starting and finishing dates were reported in the proxies as part of the CEO's biography. For those CEOs beginning before 1971, and for whom we only knew the starting year, we assumed that their tenure began July 1 of that year to minimize bias when carrying out certain calculations.

¹¹ We also have estimated our equations by using market-adjusted returns with similar results.

literature on the time-series behavior of accounting earnings (Ball and Watts, 1972; Foster, 1978) finds that annual earnings can be approximated by a random walk. This implies that changes in earnings are a good proxy for unexpected earnings.

The earnings variable used below is earnings before interest and taxes (*EBIT*).¹² We use this measure 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 at the end of the previous year to control for size differences. Finally, to control for factors affecting earnings changes 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 given firm. This average is subtracted from the standardized earnings change for the test firm. The resulting variable provides a measure of unexpected earnings that should not be sensitive to the firm's size, industry, capital structure, or tax treatment.

□ **Descriptive statistics.** Table 1 provides a description of our data for the year 1977, the midpoint of our sample period. The median firm had 13 directors of whom 45% were outsiders. The percentage of outsiders ranged from 10% for General Instrument to 89% for Western Union. Board size varied between 4 (National Semiconductor) and 21 (Philip Morris).

Causal observation of this table reveals that some of the variables have skewed distributions. For example, the median CEO tenure is only 5.9 years, but one CEO (S. Rabb of Stop & Shop) was in office almost 47 years at the time of the 1977 proxy. Similarly, the inside members of the median board own slightly more than 1% of the stock, but for Campbell's Soup, insiders control almost 65% of the stock. It is important to recognize the importance of such outliers so that a few corporations do not drive the results.

Board composition has changed through time. A striking feature of our data is that between 1971 and 1983 there has been a substantial movement toward replacing insiders with outsiders. The average percentage of outsiders rose from 37.6% to 53.9%, while the average percentage of insiders fell from 49.1% to 34.3%.¹³

Table 2 gives a correlation matrix of some of the important variables in our data set.

TABLE 1 Variables on Firms and Their Boards of Directors Ranked by Percentile (Sample: 142 NYSE Companies in 1977)

Data Item	Percentile						
	1	10	33	50	67	90	99
Percentage Outsiders (%)	10.0	21.4	33.3	45.4	53.8	66.7	88.9
Board Size	4	10	12	13	14	17	21
CEO Tenure (Years)	0	1.5	4.8	5.9	7	19.8	46.8
Shareholdings of Insiders (%)	.00	.12	.39	1.13	2.89	28.59	64.89
Shareholdings of Top Management (%)	.00	.02	.11	.36	1.07	21.88	64.89
Shareholdings of Outsiders (%)	.00	.00	.01	.04	.21	1.83	27.68
Assets (\$ Millions)	134	365	839	1214	1859	3839	93972

¹² This variable is constructed by adding data items 15, 16, 18, and 49 on the annual *COMPUSTAT* industrial tape.

¹³ This trend confirms the results of other studies (Conference Board, 1973; Mruk and Gardinia, 1985). Since 1983, though, the pattern has reversed. Because of increased director-liability insurance costs, firms have begun to move back towards having more insiders on their boards (*Business Week*, September 8, 1986).

TABLE 2 Correlation Matrix of Variables about Firms and Their Boards of Directors
(Sample: 142 NYSE Firms in 1977)*

Variable	CEO Tenure	Median Director Tenure	Stake of Top Management	Number of Industries	Market Value of Equity
Fraction Outsiders on Board	-.104 (1.17)	-.157 (1.72)	-.167 (1.82)	.136 (1.73)	.168 (2.18)
CEO Tenure	—	.242 (3.30)	.204 (2.70)	-.024 (.297)	-.072 (.825)
Median Tenure of Directors	—	—	.043 (.52)	-.090 (1.05)	-.088 (1.00)
Stake of Top Management ^a	—	—	—	-.205 (2.21)	-.094 (1.07)
Number of Industries ^b	—	—	—	—	-.033 (.38)

* *t*-statistics are in parentheses.

^a Stake of top management includes the shareholdings of the present CEO as well as all former CEOs still on the board. It is measured as a fraction of the company's shares.

^b The measure of the number of industries of a firm is the number of different four-digit SIC codes a firm is associated with in *Standard and Poor's Register of Corporations*.

The fraction of outsiders on the board is correlated with several variables: the median tenure of directors, the shareholdings of top management, and the number of industries in which the firm operates. All of these correlations are significant at least at the 10% level. The negative correlation between median board tenure and fraction of outside directors suggests that outside directors turn over more rapidly than do inside directors. This is not surprising: outside directors, because they are frequently CEOs of other firms, distinguished professors, retired politicians, etc., tend to be older than inside directors, who, except for the CEO, tend to be vice presidents. Consequently, the retirement rate for outside directors should be higher. Another explanation is that outside directorships are not the primary occupation of most outside directors. Therefore, they are more prone to resign as directors for reasons, either personal or professional, that would not be sufficient to cause inside directors to resign.

As noted in Weisbach (1988), the fraction of outside directors is negatively correlated with the shareholdings of top management. This fact is consistent with the view that monitoring by outside directors and the direct incentives created by management's stock ownership are substitute methods of control. This fact might be better explained, however, by the tendency of top management with a large stake in its firm to put family members on the board (the correlation coefficient between the fraction of the board related to top management and the shareholdings of top management is .5208, with a *t*-statistic of 8.9013). Since we never count family members as outsiders, this tendency necessarily reduces the fraction of the board who are outsiders. When we examined the correlation between the fraction of nonfamily board members who are outsiders and the shareholdings of top management, we found no significant relation (the correlation coefficient was -.0834, with a *t*-statistic of .9479).

4. Empirical specification and results

■ We expect the forces that determine board composition to affect insiders and outsiders differently. Consequently, we estimate separate equations for each type. Similarly, the forces that cause firms to add directors are different from those that cause firms to remove directors.

For this reason, we estimate separate equations for additions and departures from the board. Finally, we examine direct evidence on our conjecture that it is the succession process that motivates CEOs to add insiders to the board late in their tenure.

□ **Departures from the board.** To predict departures of director type i from the board, we estimate the following equation:

$$Depart_i = f(\text{CEO tenure}, \Delta\text{Earnings}, \text{Stock Returns}, \Delta\text{Industries}, \text{Median Director}, \text{Tenure}_i, \text{Retirement Dummy}, \text{Number}_i, \text{Size of Firm}, \text{Period Dummies}).$$

The dependent variable is the number of departures of directors of a given type from the board from one proxy to the next.¹⁴ The firm-years are pooled, with each firm-year representing a separate observation. Because we do not have data on the number of industries in 1971, we use 11 years of data for each firm. After omitting observations with missing data, we have 1,521 observations.

Because the dependent variable in our equations is the count of different events (departures from the board) rather than a continuous variable, ordinary least squares is biased and inconsistent. Therefore, we use a Poisson model (Hausman *et al.*, 1984) to estimate our equations. If λ is defined by $\log(\lambda) = X\beta$, where X is a vector of independent variables and β is a parameter vector, then a Poisson model assumes that the probability of n directors' leaving the board in a given year equals $(\exp(-\lambda) * \lambda^n) / (n!)$. This specification implies that the log-likelihood function is

$$L(\beta) = \sum_{i=1}^N \sum_{t=1}^T [C_1 - \exp(X_{it}\beta) + n_{it}X_{it}\beta],$$

where C_1 is a constant that does not affect the maximization process, n_{it} is the number of departures for firm i in year t , N is the number of firms, and T is the number of time periods per firm. The log-likelihood function is maximized over β to produce maximum-likelihood estimates.

Every company has its own history, traditions, and culture, which are likely to affect director choice. As these effects are not captured in the specification discussed above, we need to control for them in the estimation process. The logical way to do this is to include firm-specific fixed effects in the specification. A problem with this approach is that it ignores variation among firms and only uses within-firm variation. Since we have only 11 years of data for each firm, including fixed effects substantially lowers the amount of variation in our data. This will be particularly important when investigating the effects of factors that change slowly over time. As a result of this difficulty with fixed-effects estimation, we report each of our equations with and without fixed effects. With fixed effects the log-likelihood takes the form:¹⁵

$$L(\beta) = C_2 - \sum_{i=1}^N \sum_{t=1}^T n_{it} \log \left\{ \sum_{s=1}^T \exp[-(X_{it} - X_{is})\beta] \right\},$$

where C_2 is a constant that does not affect the maximization process.

A remaining specification issue concerns "adding-up constraints." One might think that we should estimate our additions and departures equations jointly, by imposing on the

¹⁴ In a previous version of this article, we also used the percentage change of directors of a given type as the dependent variable. Since the results from these equations are economically identical to the ones reported here, we choose to report only the equations using the number of directors as the dependent variable.

¹⁵ A derivation of this likelihood function can be found in Hausman *et al.* (1984, pp. 917-919).

estimation process the constraint that the total number of additions equal the total number of departures. Such a constraint does not seem to be borne out in our data, however. Of the 1,521 firm-years in our sample, 905 contain at least one departure from the board. In only 244 of these 905 firm-years does the number of additions to the board equal the number of departures. This suggests that board size is not fixed. Therefore, we chose not to impose constraints that are truly not constraints.¹⁶

The first independent variable is CEO tenure. Because our hypotheses focus on the beginning and end of a CEO's regime, we feel our hypotheses are best tested by using dummy variables for the different phases of a CEO's career. We have two dummy variables; the first indicates whether a CEO is in the lowest third of the sample in terms of his tenure (less than 4.5 years), and the second is the middle third (4.5 to 10 years). The omitted variable is for CEOs with at least ten years of experience.¹⁷

The measures of unexpected performance, changes in earnings and stock returns, are included for the two years before the proxy in question. We have experimented with longer lags on these variables, but as their coefficients were never significantly or meaningfully different from zero, we do not report these estimates.

The measure of the change in the numbers of industries in which the firm operates is broken down into its positive and negative components (i.e. $\Delta SIC = \Delta SIC_+ + \Delta SIC_-$, where ΔSIC is the proportional change in the number of industries, ΔSIC_+ (>0) is the positive component and ΔSIC_- (<0) is the negative component). We do this because adding industries and dropping industries are likely to be different types of events and there is no reason to suspect that the effects of the two on board composition are the same.

We include the median tenure of directors of a given type (e.g., median tenure of insiders or median tenure of outsiders) to control for the natural turnover process of the board.¹⁸ As boards get older, there are likely to be more voluntary resignations, because age and professional norms limit the tenure of directors.

As we have suggested that board composition is intimately related to the CEO succession process, we attempt to control for retirements of CEOs. Since a large number CEOs retire at approximately age 65 (Weisbach, 1988), we include a dummy variable that is 1 if the CEO is between 62 and 66. This variable attempts to capture some of the "grooming" motivations for board change before a CEO change.

Because the number of directors of a given type who leave the board is likely to be related to the number of directors of that type on the board, we include the number of directors of the type in question in the equation. We also control for firm size in our equations. To measure size we use the market value of the firm's equity at the start of the proxy year.¹⁹ Finally, to control for time trends, we include three period dummies.

The results are shown in Table 3 for departures of insiders and in Table 4 for departures of outsiders. The equations for insiders departing the board support the hypotheses discussed above. In the equations without fixed effects, the coefficient for a new CEO is positive and significantly different from zero at the 5% level: a new CEO leads to the departure of insiders.

¹⁶ Since additions and departures may be correlated, however, we would have liked to estimate the additions and departures equations jointly and allow for correlations among the errors from the different equations. Unfortunately, that is impossible, given our fixed-effects Poisson specification—there is no consistent system estimator for this specification (unless the number of proxy years approaches infinity). By ignoring cross equation correlations, we admittedly lose efficiency but *not* consistency, so this problem is not serious.

¹⁷ To test the robustness of our specification, we also estimate our equations by using a specification identical to the one reported except that it is linear in CEO tenure. The results (which are available from the authors on request) are consistent with those reported here.

¹⁸ We have also estimated equations by using the median tenure of the entire board with similar results.

¹⁹ We have also used the book value of the firm's assets with practically identical results.

TABLE 3 Poisson Estimates of Departures of Insiders from Boards of Directors
(Sample: 142 NYSE Firms, 1972–1983)*

Independent Variable	Without Fixed Effects	With Fixed Effects
Intercept	−1.922 (10.2)	—
<i>NEWCEO</i> ^a	.257 (2.77)	−.099 (.95)
<i>MIDCEO</i> ^b	.116 (1.16)	−.190 (1.81)
$\Delta EBIT$ ^c	.713 (.85)	.570 (.77)
$\Delta EBIT_{-1}$	−.801 (.97)	−.380 (.50)
<i>Return</i> ^d	−.493 (3.30)	−.359 (2.78)
<i>Return</i> _{−1}	−.287 (1.91)	−.234 (1.87)
ΔSIC_+ ^e	.018 (1.22)	−.005 (.38)
ΔSIC_- ^f	−.054 (3.12)	−.034 (1.57)
<i>MEDIN</i> ^g	.009 (1.13)	.091 (8.24)
<i>RETIRE</i> ^h	.212 (2.20)	.013 (.16)
Number of Insiders on Board	.183 (13.2)	.369 (15.0)
Market Value of Equity	.005 (.54)	−.021 (.50)
Dummy If Year = 1972–1973	−.057 (.51)	−.464 (4.85)
Dummy If Year = 1974–1976	−.114 (1.14)	−.387 (4.40)
Dummy If Year = 1977–1980	−.113 (1.14)	−.219 (2.65)
Number of Observations	1,521	1,521

* *t*-statistics are in parentheses.

^a *NEWCEO* is a dummy variable that takes the value 1 if the CEO has held his job for less than 4.5 years.

^b *MIDCEO* is a dummy variable that takes the value 1 if the CEO has held his job for at least 4.5 years and less than 10 years.

^c 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 before 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.

^d The variable *Return* is the return on the company's stock for the 12 months before the date the proxy was mailed minus the return on an equally weighted portfolio comprising all firms listed as having the same principal two-digit SIC code on *CRSP* for the same period.

^e The variable ΔSIC_+ is the positive component of the change in the number of four-digit SIC codes over the period of the potential board changes weighted by the number of SIC codes at the start of the period.

^f The variable ΔSIC_- is the negative component of the change in the number of four digit SIC codes over the period of the potential board changes weighted by the number of SIC codes at the start of the period.

^g The variable *MEDIN* is the median tenure of the insiders currently on the board as directors.

^h The variable *RETIRE* is dummy variable that takes the value 1 if the CEO is at least 62 and no older than 66 years old.

TABLE 4 Poisson Estimates of Departures of Outsiders from Boards of Directors
(Sample: 142 NYSE Firms, 1972–1983)*

Independent Variable	Without Fixed Effects	With Fixed Effects
Intercept	−2.702 (14.8)	—
<i>NEWCEO</i>	.171 (1.46)	.045 (.35)
<i>MIDCEO</i>	.106 (.95)	−.039 (.33)
$\Delta EBIT$.472 (.53)	−.528 (.65)
$\Delta EBIT_{-1}$.944 (1.03)	.823 (1.08)
<i>Return</i>	−.073 (.57)	−.157 (1.42)
<i>Return</i> _{−1}	−.232 (1.37)	−.308 (1.99)
ΔSIC_+	−.005 (.23)	−.031 (1.34)
ΔSIC_-	.020 (.60)	.033 (1.06)
<i>MEDOUT</i> ^a	.055 (4.59)	.161 (11.6)
<i>RETIRE</i>	.201 (1.78)	.141 (1.34)
Number of Outsiders on Board	.187 (12.3)	.383 (14.2)
Market Value of Equity	−.012 (1.92)	.076 (3.06)
Dummy If Year = 1972–1973	.268 (2.27)	.392 (3.73)
Dummy If Year = 1974–1976	.151 (1.33)	.398 (4.04)
Dummy If Year = 1977–1980	.043 (.39)	.200 (2.17)
Number of Observations	1,521	1,521

* *t*-statistics are in parentheses.

^a The variable *MEDOUT* is the median tenure of outsiders currently on the board as directors.

When the fixed effects are added, however, this effect disappears, possibly because much of the variation in CEO tenure is across firms, rather than within a given firm.²⁰

Stock returns seem to affect the departure of insiders. The coefficient on stock returns for the year before the proxy year is negative (poor returns increase the number of insiders who depart) and significantly different from zero at the 1% level. The coefficient on returns for two years before the proxy is negative and significant at the 10% level. Poor performance, measured by stock returns, leads to the resignations of insiders. There does not appear to be an analogous effect for earnings changes, however. The coefficients on earnings changes are insignificantly different from zero. Nevertheless, a likelihood-ratio test of the hypothesis that the overall effect of the performance measures is zero is rejected at the 1% level ($\chi^2 = 15.79$).

²⁰ The within-firm variation in dummy variables is less than the between-firm variation because the values of the dummy variables stay the same for many years (e.g., a firm can have a “new” CEO or an “about to retire” CEO for 5 of its 12 firm-years).

Decreases in the number of industries in which firms operate appear to increase the departures of insiders from the board. The coefficients on the negative component of the change in SIC codes are negative and significantly different from zero in the specification without fixed effects. Presumably, this is caused by the departure of the insiders who were in charge of the exited industries. Increases in the number of industries had no effect on departures of insiders from the board. The coefficients on the positive component of the change in SIC codes are close to zero and not significant.

The number of insiders who leave the board is significantly and positively related to the CEO approaching retirement for the regression without fixed effects. This is consistent with the idea that as the CEO nears retirement and his replacement is announced, the losing candidates leave the firm for jobs elsewhere. The fact that this effect is not significant for the fixed-effects regressions is likely due to the lack of within-firm variation in the *RETIRE* variable (see footnote 20), although caution should be exercised when interpreting this variable's effect.

Thus, we see that poor stock returns, exiting industries, and possibly new CEOs and imminent CEO succession increase the chances of an insider's leaving the board. From Table 4, it appears that these factors do not play much of a role in the departure of outsiders. Indeed, the only significant variables in predicting the departure of outsiders are the median tenure of outsiders and the number of outsiders on the board. That these two variables are significant is not surprising, as they simply control for exposure to risk.

□ **Additions to the board.** When a new CEO takes office, the company performs poorly, and a company drops out of industries, insiders tend to depart. We argued previously that such departing insiders could potentially be replaced with outsiders. Now we examine additions to the board. We estimate the following equation for additions of directors of a given type:

$$Addition_i = g(\text{CEO tenure, } \Delta \text{Earnings, Stock Returns, } \Delta \text{Industries, Current Composition, Retirement Dummy, Number of Vacancies, Size of Firm, Period Dummies}).$$

Again, we estimate the equations by using a Poisson model with and without fixed effects and use the same 1,521 observations as before.

The variables in the additions equations were, with two exceptions, also included in the departures equations: we include the current composition of the board and a measure of the possible number of vacancies. Current composition will affect who is added to the board, if management is wary of having boards that are extremely inside-dominated or extremely outside-dominated. We use the current proportion of outsiders as our measure of current composition.

Although not every departure is immediately filled, *ceteris paribus* someone is more likely to join the board following a departure than otherwise. Therefore, we would like to control for the number of departures preceding any addition to the board that we seek to explain. Unfortunately, given the information on the proxies, we cannot determine the sequence of departures and additions within a given proxy year (e.g., we cannot determine whether a given addition preceded or followed a given departure). We include in our specification the number of directors who left the board in the previous proxy year as an admittedly rough control for board vacancies.

One reason it is important to control for past departures is the following: imagine that, given a vacancy, top management always chooses, *independent of the circumstances*, to fill the vacancy with an insider with probability p and with an outsider with probability $1 - p$. Suppose further that no one is added to the board where there is not a departure. Then a regression of the number of type i directors added to the board that does not control for the number of vacancies would result in the spurious finding that the addition of type i

directors is related to the variables that determined the vacancies. Such a finding would give the misleading impression that who was being added to the board was *determined* by those variables, when, in fact, who was added was *independent* of those variables. To avoid that mistake, it is important to control for the number of vacancies. If, controlling for the number of vacancies, we find that the addition of type i directors is significantly related to a set of variables, then we can conclude that those variables do determine who gets added to the board, i.e., that the probabilities p and $1 - p$ are *not* independent of the circumstances.

The results from the addition of insiders equations are shown in Table 5. The CEO succession effect, measured by the dummy variable *RETIRE*, is positive and significant at the 5% level. This is consistent with the conjecture that CEOs use the period before their resignation as a grooming period, during which rival candidates to be CEO are added to the board. As hypothesized, the addition of directors is directly related to the previous departure of directors. The positive coefficient indicates that more insiders are added after previous departures of directors.

TABLE 5 Poisson Estimates of Additions of Insiders to Boards of Directors
(Sample: 142 NYSE Firms, 1972–1983)*

Independent Variable	Without Fixed Effects	With Fixed Effects
Intercept	−1.167 (8.42)	—
<i>NEWCEO</i>	−.027 (.27)	−.350 (2.78)
<i>MIDCEO</i>	−.118 (1.17)	−.347 (2.82)
$\Delta EBIT$.698 (.70)	−.358 (.37)
$\Delta EBIT_{-1}$	−.388 (.42)	−.924 (1.01)
<i>Return</i>	−.314 (1.91)	−.307 (1.98)
<i>Return</i> _{−1}	−.064 (.46)	.020 (.14)
ΔSIC_{+}	.017 (1.00)	.008 (.47)
ΔSIC_{-}	.005 (.15)	.003 (.09)
<i>PEROUT</i> ^a	−.850 (4.09)	2.523 (5.55)
<i>RETIRE</i>	.245 (2.48)	.267 (2.40)
Number of Directors Who Left Last Year	.128 (4.35)	.026 (.93)
Market Value of Equity	.021 (3.76)	.036 (.98)
Dummy If Year = 1972–1973	.668 (5.94)	1.056 (9.53)
Dummy If Year = 1974–1976	.240 (2.04)	.541 (4.79)
Dummy If Year = 1977–1980	.285 (2.58)	.453 (4.36)
Number of Observations	1,521	1,521

* t -statistics are in parentheses.

^a The variable *PEROUT* is the fraction of outsiders on the board at the time of the initial proxy.

The effects of current board composition differ between the fixed-effects and the no-fixed effects regressions. But this apparent anomaly is not surprising because one would expect the between-firm variation and the within-firm variation to affect the results in opposite ways. When the fixed effects are included, the coefficient on the fraction of outsiders is positive. This means that when the fraction of outsiders is large *relative to the firm's historical norm*, firms look to reverse the trend and add insiders (i.e., return to their norm). When we exclude the fixed effects from the equation, the coefficient on *PEROUT* becomes negative. What appears to be happening is that the fraction of outsiders is a proxy for the omitted fixed effect. Firms that traditionally hire insiders (and thus have more of them on the board) are more likely to hire them in the future than are firms that traditionally hire outsiders.

Turning to the outsiders equations in Table 6, we see that the coefficients on *NEWCEO* are both positive and significantly different from zero at the 5% level in the equations without fixed effects and at the 10% level in the equations with fixed effects. This result suggests that newer CEOs are more likely to add outside directors than their more experienced counterparts.

TABLE 6 Poisson Estimates of Additions of Outsiders to Boards of Directors
(Sample: 142 NYSE Firms, 1972–1983)*

Independent Variable	Without Fixed Effects	With Fixed Effects
Intercept	−1.01 (8.32)	—
<i>NEWCEO</i>	.225 (2.63)	.175 (1.80)
<i>MIDCEO</i>	.172 (1.99)	.114 (1.24)
$\Delta EBIT$	−1.522 (1.95)	−1.704 (2.51)
$\Delta EBIT_{-1}$	1.052 (1.41)	1.108 (1.80)
<i>Return</i>	−.117 (.97)	−.048 (.47)
<i>Return</i> _{−1}	−.278 (2.16)	−.261 (2.43)
ΔSIC_+	.004 (.28)	−.006 (.43)
ΔSIC_-	−.047 (3.09)	−.053 (4.42)
<i>PEROUT</i>	.217 (1.23)	−2.906 (9.84)
<i>RETIRE</i>	.055 (.63)	−.0002 (.004)
Number of Directors Who Left Last Year	.151 (7.27)	.125 (6.00)
Market Value of Equity	.013 (2.54)	.009 (.54)
Dummy If Year = 1972–1973	.141 (1.55)	−.324 (3.63)
Dummy If Year = 1974–1976	−.010 (.11)	−.343 (4.20)
Dummy If Year = 1977–1980	.053 (.64)	−.108 (1.53)
Number of Observations	1,521	1,521

* *t*-statistics are in parentheses.

The estimates indicate that outsiders are added after poor performance. It seems to take longer for outsiders to be added than for insiders to leave, however. While the returns coefficients are all negative, the coefficient for returns immediately preceding the proxy are smaller than the coefficient on returns in the prior year. The coefficient for returns immediately preceding the proxy is not significantly different from zero in either equation. The coefficient on $Return_{-1}$, the returns between 24 and 12 months before the proxy, is significantly different from zero at the 5% level in both equations. The coefficient on earnings is negative and significantly different from zero in both equations. These results suggest that firms tend to add outsiders to their boards after poor performance, although perhaps with a lag.

There is an effect of exiting industries (decreases in the percentage of SIC codes) on the number of outsiders added to the board. The coefficient is negative and significantly different from zero at the 1% level, which implies that the more industries the firm exits, the more outside directors get added *ceteris paribus*. The coefficient on increases in the number of industries is once again close to and insignificantly different from zero. From this result and the earlier one, it appears that firms replace departing insiders with outsiders as they reduce the number of industries in which they operate, but do not change their board as they increase the number of industries in which they operate.²¹

□ **Director tenure and CEO succession.** In Section 2, we conjectured that the CEO succession process would play a significant role in director choice. The above evidence, that insiders are added toward the end of a CEO's tenure and that insiders leave just before and after a change in CEO, is consistent with our conjecture. In this subsection we consider some additional evidence.

If insiders are brought onto the board toward the end of a CEO's tenure to be groomed as potential successors, then the next CEO should tend to be chosen from these insiders with relatively short tenures. Table 7 gives the frequency with which inside directors become CEO, given their tenure at the time of a change in CEO. At the time of a change, a director with 4 to 6 years on the board was the most likely to become the new CEO. Directors with

TABLE 7 **The Relation between Inside Director Tenure and CEO Succession**
(Sample: 148 CEO Successions from 142 NYSE Companies, 1971–1983^a)

Director ^b Tenure (Years)	Number of Directors	Number Becoming CEO	Proportion ^c Succeeding	Proportion ^d of All CEOs
0–3	261	43	.165	.291
4–6	156	42	.269	.284
7–9	109	26	.239	.176
10–12	75	18	.240	.121
13+	163	19	.117	.128
Total	764	148	.194	—

^a All inside directors on the board at the time of a CEO change are included.

^b Director tenure at time of CEO change.

^c Proportion of directors with given tenure (at the time of the CEO change) who became CEO.

^d Proportion of directors who became CEO with given tenure.

²¹ This last result seems at odds with the positive simple correlation between percentage outsiders and number of SIC codes (Table 2). One explanation is that firms add outsiders only with a lag when they expand into new industries. We have attempted to uncover this process by using longer lags of changes in number of industries, but have been unsuccessful, most likely because there is a very low signal-to-noise ratio in these types of tests.

very short tenures (0–3 years) or very long tenures (greater than 12 years) were the least likely to become the new CEO.

To test the null hypothesis that there is no relation between director tenure and the probability of becoming CEO, we compute a χ^2 -statistic from Table 7. The χ^2 -statistic of 19.038 with 5 degrees of freedom implies that the null hypothesis can be rejected at the 1% level. Note that a director with 4 to 6 years on the board is only slightly more likely to become CEO than a director with a longer tenure (.269 versus .239 (7–9 years) and .240 (10–12 years)). The source of the significant χ^2 -statistic is that directors with either very short or very long tenures are roughly half as likely to become CEOs as are directors with less extreme tenures. Although the probability that an *individual* inside director becomes CEO is approximately invariant with tenure (when we ignore very short or very long tenures), the probability that a new CEO will have a given tenure is *not* invariant with tenure. With probability .575, the new CEO was on the board for less than 7 years when chosen. The results in column 5 of Table 7 are consistent with the conjecture that candidates are brought onto the board before a CEO change, but, from column 4, we see that these newcomers are not the only candidates in the race.

Given that average CEO tenure is ten years, the data in Table 7 suggest that three out of four CEOs are succeeded by someone they put on the board. In addition, almost three out of five CEOs had been on the board less than seven years when they were promoted to CEO, so that the majority of future CEOs appear to be put on the board toward the end, rather than the beginning of the previous CEO's tenure. Finally, if we ignore directors with very short tenures ("too inexperienced") or very long tenures ("too old"), we see that every inside director stands roughly the same chance of becoming CEO. This last observation supports the widely held belief (cf. Mace, 1971) that only members of management who could potentially become CEO are added to the board.

We have argued that the tendency for insiders to leave after a CEO change might be explained by losing candidates for the CEO position leaving.²² If this were true, then, given our findings about the tendencies for insider candidates to be added shortly before a CEO change, we should expect those insiders leaving shortly after a change to have shorter board tenures and to be younger than the average inside director at the time of his resignation.²³

We test these hypotheses in Table 8. The top panel reports statistics on the distribution of tenure for three groups of insiders, none of whom ever became CEO. The mean tenure of those who leave within one year of a CEO change is 10.2 years, which is 2.5 years less than the mean tenure of the average director at retirement. This difference is significantly different from zero at the 5% level (t -statistic = 2.09). The difference between the means of those who leave within 3 years of a CEO change and a randomly chosen insider (1.9 years) is also significant (t -statistic = 2.22).

To be certain that the differences in means are not generated by a few outliers with extremely long tenures, we compute the median tenures upon leaving the board for our groups. The median tenure for the group of directors that left the board in the year after a CEO change is 7 years, 2 years shorter than the median tenure for the entire sample. We also compute the percentage of directors who leave after a short (≤ 5 years) period. In the year after a CEO change, 36.6% of inside directors leaving the board have been there no longer than 5 years. This figure is 6.1% greater than the 30.5% of inside directors in the entire sample who leave within 5 years.

This evidence suggests that the directors who resign after CEO turnover tend to have shorter tenures than typical directors at resignation. This regularity is consistent with the

²² The losers may leave because they see their future prospects diminished, because they find it difficult to work with the winner, or because the new CEO desires to hire his own people.

²³ It is considered desirable for a CEO to be in his midfifties when appointed (Vancil, 1987), and directors do not typically resign until age 65.

TABLE 8 Tenures and Ages of Inside Directors Who Resign after CEO Succession
(Sample: 142 NYSE Companies, 1971–1983)

Variable	Measure	Group		
		Leave within 1 Year ^a	Leave within 3 Years ^b	Entire Sample ^c
Director Tenure at Resignation	Mean	10.2	10.6	12.7
	Median	7	8	9
	Percentage ≤ 5 Years	36.6	— ^d	30.5
	Number of Observations	142	232	747
Director Age at Resignation	Mean	56.7	57.4	60.3
	Number of Observations ^e	54	90	233

^a This group contains all inside directors (excluding the CEO and all former CEOs) who were on the board at the time of a CEO change and resigned within 1 year of the CEO change.

^b This group contains all inside directors (excluding the CEO and all former CEOs) who were on the board at the time of a CEO change and resigned within 3 years of the CEO change.

^c This group contains all inside directors who were never CEO and resigned sometime during our sample period.

^d A criterion for entry into the “Leave within 3 Years” group is that all directors in it must have been directors at the time of the CEO change. Because of this criterion, this group does not include directors who joined and quickly left the board shortly after the CEO change. If we were to include this statistic for this group, it would understate the number of directors who left with very short tenures. For this reason we omit it.

^e The number of observations is smaller because firms were not required to include directors’ ages in the proxy statements until the 1979 statement. All directors in the appropriate groups for which we have data are included.

notion that those directors were put on the board toward the end of the CEO’s tenure as potential candidates to be the next CEO.

The lower part of Table 8 compares the ages of the directors who leave the board after CEO turnover with typical directors who leave the board. On average, those insiders who leave the board within one year of a CEO change were 3.6 years younger than average. This difference is significant at the 1% level (t -statistic = 2.63). The corresponding difference for those who leave within 3 years (2.9 years) is also significant (t -statistic = 2.73). These results indicate that the directors who leave the board following a CEO change are generally younger than typical directors when they leave the board. This supports the losing-candidates hypothesis.

5. Discussion and conclusion

■ We have hypothesized that board composition is determined by, among other things, the internal promotion and CEO succession processes, poor firm performance, and the participation of the firm in various product markets. We have provided some empirical support for each of these hypotheses.

The internal promotion and CEO succession processes have a number of effects on board composition. The years just preceding and following a CEO change see insiders leaving the board, although the sensitivity to model specification should be noted. Before a CEO change, insiders are also brought onto the board, possibly as part of the grooming process. We have found evidence that the new CEO tends to be drawn from these new insiders, though old insiders are also very much in the running. After the CEO is chosen, the evidence indicates that the losing candidates are prone to resign from the board. New CEOs, perhaps not yet ready to begin their own succession process or in need of advice, replace departing insiders with outsiders.

When firms perform poorly, they tend to remove insiders and add outsiders to the board. There are two explanations of these results. We have argued that firms may fire the insiders held responsible for poor performance. Having no sufficiently senior personnel—alternatively no one who might be a potential CEO—within the company to fill the vacancy, they fill it with an outsider. Thus, we see a correlation between poor performance and the removal of insiders and the hiring of outsiders. A similar argument holds when firms exit industries.

An alternative explanation for the performance and market participation results, as well as for the CEO tenure effects, can be derived from agency theory (Jensen and Meckling, 1976; Fama and Jensen, 1983): poor performance is an indication of poor management, and hence of the need for greater monitoring of management. Thus, in response to poor performance, the shareholders put (force the CEO to accept) more outside directors on the board to monitor management. To make room for these new outside directors, some inside directors must leave. Therefore, poor performance will cause insiders to leave the board and outsiders to join the board. Since exiting an industry is frequently the result of poor performance, the market-structure effects can be explained similarly.

An explanation for the CEO-tenure effects can also be derived from agency theory. A new CEO is an unknown quantity with relatively less power than an established CEO. Consequently, shareholders feel that a new CEO requires more scrutiny, so they will put more outsiders on the board to monitor him. In addition, shareholders are better able to put monitors on the board because the new CEO is not yet powerful enough to keep them off. A more established CEO is a known quantity, so less scrutiny is required. Furthermore, an established CEO is more powerful, and hence better able to control who gets a board seat.

We tend to believe the reasons discussed in Section 2, but we emphasize that there is little in the results to distinguish between the two sets of explanations. We have two principal reasons for not favoring the agency explanations. First, the institutional and business literature (Mace, 1971) argues convincingly that top management usually has the most say when it comes to choosing the board. Second, there is little or no direct evidence that outsiders exercise any control except in “crisis” situations (Mace, 1971; Vancil, 1987; Weisbach, 1988).²⁴

To the limited degree that our results can help distinguish between the hypotheses of Section 2 and those of agency theory, we point to one piece of evidence. If shareholders respond to poor performance by adding new monitors, why do they not also replace the current monitors with new monitors, since poor performance could in part be due to a lack of vigilance on the part of the current monitors? Yet from Table 4 we see little evidence that poor performance leads to the resignation of outside directors (of the four measures of performance only one is significant and in only one specification). Nonetheless, the agency explanations are plausible, and future research should be devoted to distinguishing between the two sets of explanations.

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²⁴ Some preliminary work by Hermalin and Weisbach (1987) fails to find any evidence of a relationship between board composition and firm performance (where performance is measured by Tobin's q).

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