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The Effect of CEO Tenure on the Relation between Firm Performance and Turnover

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Abstract

We analyze the effect of CEO tenure on the relation between firm performance and forced turnover. We find that the performance-forced turnover relation is conditional on CEO tenure. Our results suggest a constant negative relation between firm performance and forced turnover throughout an inside CEO's tenure. Founders are entrenched early in their careers but held accountable for firm performance later in their careers. We find evidence that outside hires experience a probationary period, followed by a period of apparent entrenchment during their intermediate years that weakens later in their tenure.

I. Introduction

There is a well-documented negative relation between firm performance and the probability of forced chief executive officer (CEO) turnover (e.g., Parrino (1997), Warner, Watts, and Wruck (1988)). The effectiveness of boards of directors in monitoring CEOs, however, remains controversial. Weisbach (1988), for example, finds that the probability of CEO turnover for firms in the bottom decile of earnings changes for two subsequent years is only 7.1 percent. Several studies argue that the weak relation between performance and turnover is due to a breakdown in corporate governance; in particular, CEOs become entrenched (e.g., Morck, Shleifer, and Vishny (1988), Hill

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and Phan (1991)). An alternative explanation for the low turnover rate is that it takes the board time to learn about the CEOs true ability (e.g., Gibbons and Murphy (1992), Murphy (1986)). Our primary hypothesis is that the empirical predictions implied by the entrenchment and learning hypotheses suggest that the performance-forced turnover relation varies over a CEO's tenure. Our hypothesis is consistent with a low forced turnover rate in a particular year.

An entrenched CEO is not held accountable for contemporaneous, poor firm performance. Entrenched CEOs may dominate the board and consequently pursue costly pet projects and demand compensation packages that benefit them at the expense of stockholders. Hill and Phan (1991) find evidence that tenure provides a CEO time to circumvent monitoring and incentive alignment mechanisms. Morck, Shleifer, and Vishny (1988) argue that some managers can be entrenched with relatively low levels of ownership simply by virtue of their tenure with the firm, status as founder, or their personality. Hermalin and Weisbach (1998) develop a model of the balance of power between the CEO and other directors that predicts board independence declines over the course of a CEO's tenure. If entrenchment is positively related to CEO tenure, the effect of performance on the likelihood of forced turnover will decrease with CEO tenure.

We also argue that learning about a CEO's ability over time may cause the performance-forced turnover sensitivity to vary with CEO tenure. Gibbons and Murphy (1992) maintain that a board of directors may have little information about a new CEO's true ability. As the board learns about the CEO's true ability, the variance of expected performance diminishes. We assert that when there is greater uncertainty about a new CEO's ability, the board will be more lenient regarding poor performance that deviates from the expected level. Thus, a level of performance that is acceptable early in a CEO's tenure may become unacceptable later in his/her tenure. If the variance of expected performance decreases with tenure, the effect of firm performance on the likelihood of forced turnover will increase with CEO tenure.

Our interpretations of the learning and entrenchment hypotheses suggest opposing affects of CEO tenure on the performance-forced turnover relation, but the hypotheses are not necessarily mutually exclusive. We argue that whether the entrenchment or learning effect dominates depends on whether a CEO begins his/her tenure as an outside hire, an inside hire, or a founder.

Outside hires are unlikely to have influenced the composition of the board before their hire, suggesting it may take several years for them to become entrenched. If this is the case, we expect the effect of firm performance on the likelihood of forced turnover to decrease with CEO tenure for an outside hire. An inside hire, however, may already have had time to develop relationships with board members and may thereby enjoy entrenchment at the outset of his/her tenure. If the inside hire's control over the board does not appreciably increase with his/her tenure as CEO, the effect of performance on the likelihood of forced turnover will not vary with his/her tenure. Founders have had a strong influence on the board's initial composition; therefore, it is unlikely founders would be forced from office early in their tenure. Shivdasani and Yermack (1999) find that CEOs are more likely to be involved in director appointments if they are members

of the company's founding family. Also, the probability of an independent board is significantly lower if the CEO is a member of the founding family. This implies founding CEOs are likely to be highly entrenched early in their tenure and the likelihood of forced turnover is independent of firm performance.

The amount of learning a board must do about a CEO's ability also varies with CEO type. According to Gibbons and Murphy (1992), shareholders may have precise information about the ability of a new inside hire, implying the board would have little to learn about an insider. Alternatively, they argue learning may take place for an inside hire because the skills required of a newly appointed CEO differ from the skills required at lower levels in the organization. If the first interpretation is valid, the performance-forced turnover relation does not vary with tenure. If the second interpretation is valid, the effect of performance on the likelihood of forced turnover increases with tenure. For outside hires, the board must learn about their ability because the board does not have the same opportunity to observe past efforts. Therefore, the performance-forced remover relation strengthens with tenure for outside hires. Founders bring a firm into existence and they have already demonstrated the ability to effectively operate a company. Therefore, we argue the learning hypothesis is not applicable to a founder, and we expect the performance-forced turnover relation to remain constant across a founding CEO's tenure.

We estimate multinomial logit models of CEO turnover using two measures of firm performance: return on assets (ROA) and stock return. Using ROA as the performance measure, we find the effect of performance on the likelihood of forced turnover is two to three times greater for new and old CEOs relative to intermediate CEOs.[1] When measuring performance using stock return, however, the effect of performance on the likelihood of forced remover is statistically significant but remains constant across a CEO's tenure. These results provide conflicting evidence for our primary hypothesis that the effect of performance on the likelihood of forced turnover varies with a CEO's tenure. Therefore, we divide our sample based on whether a CEO begins his/her tenure as an inside hire, an outside hire, or a founder. We find the effect of performance on the likelihood of forced turnover for inside hires is independent of tenure. There is no evidence that CEOs hired from inside the firm become more entrenched during their tenure in office. If learning occurs by the board, it takes place before an inside hire becomes CEO. For founders, performance does not affect the likelihood of forced turnover until after the tenth year in office. Thus, it appears founders are initially entrenched, but lose control of their board of directors later in their tenure.

The likelihood of forced turnover for a CEO hired from outside the firm is independent of current firm performance when measured with industry-adjusted stock returns. Using ROA, we find evidence that outside hires have a three-year probationary period during which they are evaluated for firm performance, but they are en-

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[1] We define new as CEO tenure of less than four years, old as CEO tenure greater than ten years, and intermediate as CEO tenure of four through ten years.

trenched during their intermediate years of CEO tenure. Later in their tenure, outside hires begin to lose their control over the board. Overall, we find that both industry-adjusted stock returns and ROA are negatively related to the likelihood of turnover, but the nature of this relation depends on the tenure of the CEO and on the type of CEO in office.

II. Sample

Identifying CEO Turnover

We draw our initial sample of firms from the *Forbes Annual Survey of Executive Compensation* (*Forbes*) and include any firm that appears between 1980 and 1993. For firms that do not appear in *Forbes* every year, we analyze proxy statements when they are available. Firms may be in the sample for the entire fourteen-year sample period or any fraction thereof. This process yields an initial sample of 1,524 firms, with 875 firms experiencing 1,388 turnovers.

Because regulated firms may be systematically different from unregulated firms (Gaver and Gaver (1993)), we eliminate financial institutions and public utilities from the final sample. Firms must be also listed on Compustat with complete performance data available for the applicable period. CEO tenure and age data must be available through *Forbes*, proxy statements, the *Reference Book of Corporate Management*, or the *Million Dollar Directory*. These restrictions result in a sample of 760 unregulated firms with 681 turnovers across 7,592 CEO years. This implies a turnover rate of 9.0 percent per year, which is comparable to the 9.3 percent reported by Denis and Denis (1995), but higher than the 7.8 percent reported by Weisbach (1988).

We use the *Wall Street Journal Index* to determine the reason for CEO turnover. Our scheme for classifying turnovers as forced or voluntary is based on that of Blackwell and Farrell (1999). We exclude turnovers from the voluntary and forced category for which the *Wall Street Journal Index* reports no reason for the turnover. We classify as voluntary all CEO changes arising from retirement, normal management succession, death, or illness, or those involving the CEO's departure for a prestigious position elsewhere. Normal management succession refers to turnovers that are announced in advance of the actual turnover and include language in the announcement suggesting it is part of a planned succession. Prestigious appointment elsewhere relates to nine CEOs leaving one Fortune 500 company for a CEO position at another Fortune 500 company. We further analyze all announced retirements involving CEOs less than sixty-two years of age to determine if the announced retirement is simply a euphemism for a firing. We examine articles in the *Wall Street Journal* or other press releases relating to the company to determine whether any information was released suggesting a reason for the turnover other than retirement. For example, if the firm is experiencing poor performance around the turnover, we reclassify the turnover as forced. We define forced turnover as resignations, pressure from the board of directors, pres-

sure from outside blockholders, pressure from bank lenders, policy or personality disagreements, demotion, being fired, scandal, poor performance, bankruptcy, and reorganization.

Defining the Measure of Firm Performance

The quality of the performance measures available to the board of directors affects the likelihood of CEO turnover (Parrino (1997)). A relative performance measure provides a more precise estimate of the CEO's performance by filtering out shocks that affect all firms in an industry or market. We define one measure of firm performance as ROA, calculated as the ratio of accounting earnings before interest and taxes to total assets. To control for industry factors affecting a firm's earnings, we subtract the median of the corresponding measure for the population of firms listed on Compustat in the same two-digit Standard Industrial Classification (SIC) code. We also define industry-adjusted stock return as a market measure of firm performance. We obtain stock return data by calculating the dividend-adjusted annual return using Compustat and subtracting the median of the corresponding measure for the population of firms listed on Compustat in the same two-digit SIC code.[2]

After eliminating observations with missing data on assets and after eliminating turnovers for which the *Wall Street Journal Index* reports no reason for the turnover, the sample has 7,402 CEO years and 491 turnovers, 162 of which are forced (23.8 percent). When we define performance using stock returns, we lose an additional 311 observations due to missing stock return data, but gain 23 observations that have complete return data but missing asset data. The resulting sample has 7,114 CEO years and 479 turnovers, 157 of which are forced (23.7 percent). Blackwell and Farrell (1999) and Parrino (1997) classify 18.5 percent and 13 percent, respectively, of their CEO turnovers as forced. Denis and Denis (1995) and Warner, Watts, and Wruck (1988) classify more than 18 percent of top executive changes as forced.

Descriptive Statistics

Table 1 describes the average CEO in our sample. All statistics are calculated from the pooled cross-section. If a firm appears in the sample for all fourteen years, the age, firm tenure, and CEO tenure of the individual CEO in office in each year is used in calculating the sample statistic. Based on the sample with 7,402 CEO years, the

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[2] Our accounting performance measure is similar in construction to Parrino (1997) and Weisbach (1988). Parrino also uses an industry-adjusted stock return measure; however, he adjusts using mean rather than median industry performance. We choose median to avoid placing a significant weight on outliers in both the ROA and return distributions. We replicate all the estimated equations discussed throughout the article using current stock returns, market-adjusted stock returns, and a modified capital asset pricing model approach to estimate risk-adjusted abnormal returns. We find our results are not sensitive to the choice of proxy for market measures of performance.

Table 1. Descriptive Statistics for Individual CEOs in the Final Sample.

CEO/Firm Characteristics	Sample Characteristics [a]		
	Mean	Median	Std. Dev.
CEO age (in years)	56.6	57.0	7.9
CEO tenure (in years)	9.6	7.0	8.7
Firm tenure (in years)	23.1	24.0	12.4
Founder [b]	14.0%	0.0%	34.7%
Outside [b]	26.7%	0.0%	44.2%
Sales (in millions)	$3832	$1441	$8989
Median-industry-adjusted ROA	4.4%	3.6%	11.4%
Median-industry-adjusted return [c]	4.0%	0.0%	72.9%

[a] The sample statistics are based on defining performance as industry-adjusted return on assets (ROA), except where noted, which results in a sample of 760 firms with 7,402 CEO years between 1980 and 1993.

[b] These percentages represent the percentage of CEO years associated with founders and outside hires. Approximately 10 percent of the CEOs in the sample are founders and 18 percent are outside hires.

[c] The industry-adjusted return is calculated from the subsample of firms for which complete return data were available. The sample includes 748 firms with 7,114 CEO years.

mean (median) age of the CEO is 56.6 (57) years. On average (at the median), the tenure of the CEO is 9.6 (7) years. The mean (median) firm tenure for a CEO is 23.1 (24) years.

Table 1 also shows the mean (median) industry-adjusted ROA is 4.42 percent (3.6 percent). The mean (median) industry-adjusted stock return is 4.0 percent (0 percent). We control for differences in firm size using firm sales. The average (median) firm has sales of $3.8 billion ($1.4 billion). Founders are associated with 14 percent of the CEO years, and outside hires are associated with 26.7 percent of the CEO years. We define an outside hire to be any CEO who has been with the firm one year or less at the time of succession and who is not a founder. There are 1,294 (1,266) CEOs in the sample when firm performance is defined using ROA (return). Of these CEOs, 232 (223) are outside hires and 129 (124) are founders.

III. Model and Results

We specify a multinomial logit model with three possible outcomes of the dependent variable: no turnover, voluntary turnover, and forced turnover. We maximize a likelihood function based on the cumulative logistic distribution and normalize the model by setting the parameters of the outcome associated with no turnover to zero. The sign and significance of the marginal effects may differ from that of the estimated coefficients; therefore, the reported estimates are the marginal effects evaluated at the means of the explanatory variables.

Defining New and Old CEOs

To test the effect of CEO tenure on the performance-turnover relation, we interact CEO tenure with each performance measure. Using an approach similar to Murphy (1986), we aggregate CEO tenure into three categories and construct dummy variables.[3] We define the variable NEW to equal one if CEO tenure is less than four years, and zero otherwise; OLD equals one for a CEO with tenure that is greater than ten years, and zero otherwise. We define tenure of four through ten years as INTERMEDIATE, and it is the omitted category. No theory specifies how new and old CEOs should be defined. We rely on empirical regularities concerning the terms of board members and the mean of the observed distribution of CEO tenure, respectively. Many boards have three classes of directors with staggered three-year terms (e.g., Shivdasani and Yermack (1999), *Farrell* and Whidbee (2000)). Some boards, however, elect all directors every year. Consequently, within three years the CEO has been involved with the nomination process of every member of the board. Therefore, we define a new CEO as one with CEO tenure of one to three years.

What constitutes an old CEO is less obvious. The average CEO tenure in our sample is 9.7 years; therefore, we define an old CEO as someone with CEO tenure greater than ten years.[4] When we use ROA (return) as our performance measure, new CEOs account for 27 (26) percent of the sample, intermediate CEOs account for another 35 (39) percent, and old CEOs represent the remaining 38 (35) percent. The frequency of forced turnovers for each category of CEO tenure illustrates why we do not specify CEO tenure as a continuous variable. The number of forced turnovers for each year of CEO tenure is similar for both performance measures, so we focus on the ROA distribution. The

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[3] We do not use CEO tenure as a continuous variable because we do not expect, a priori, that the likelihood of forced turnover is a continuous function of the interaction of CEO tenure and firm performance. Interaction terms between continuous CEO tenure and firm performance are not statistically significant in our model.

[4] Murphy (1986) defines his tenure dummy variables to attain three equally sized groups of CEOs. He defines a new CEO as having tenure less than 4.6 years and an old CEO as having tenure greater than 9.9 years. We do not have information regarding the month of CEO appointment to attain fractional measures of CEO tenure.
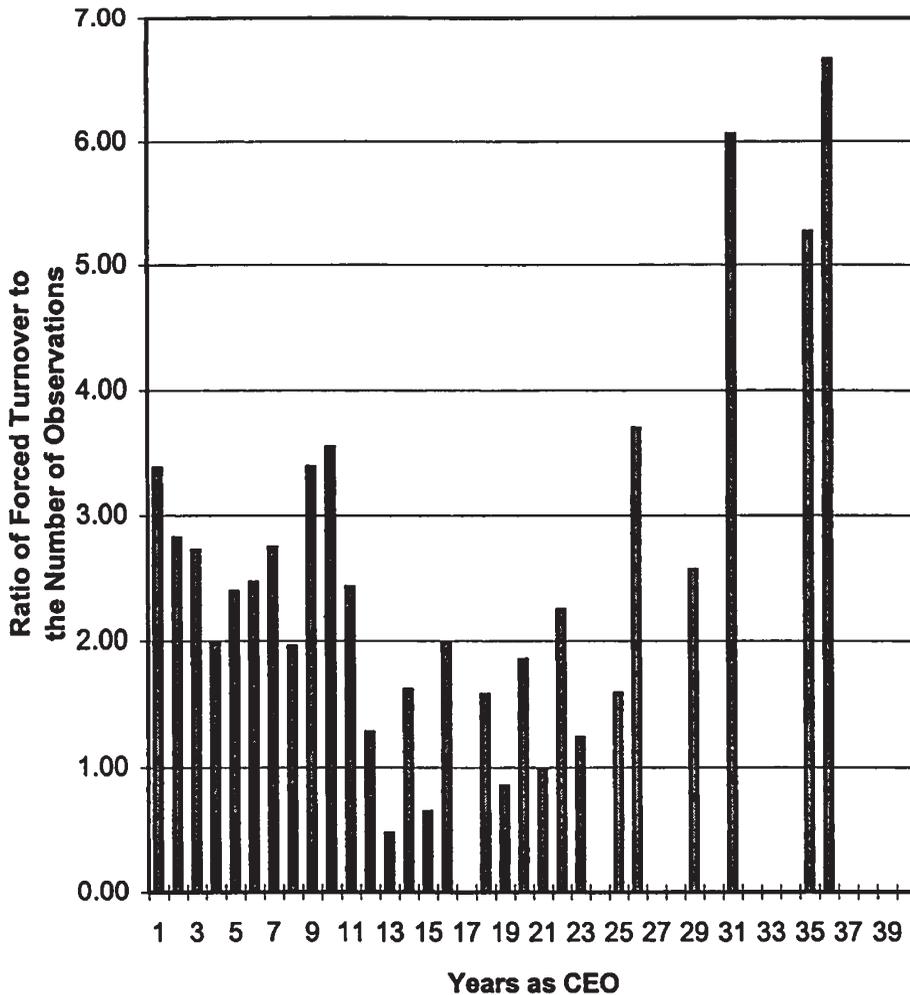
Figure I. The Ratio of Forced CEO Turnover to the Number of Observations by Years of Tenure. *Note:* The unregulated sample consists of 760 firms with 7,402 CEO years between 1980 and 1993 when measuring firm performance using industry-adjusted return on assets (ROA). The vertical axis measures the ratio of forced turnovers to the number of observations for that year of CEO tenure. For example, 709 observations in the sample involve one year of CEO tenure, and 23 involve forced turnover. Thus, ratio for year 1 is 3.24.

three-year tenure interval with the most turnovers is the first three, during which there are sixty forced departures (35.9 percent of the forced turnovers), and the fewest turnovers in a single year is seventeen. During years 4 through 10, there are seventy-three forced turnovers (43.7 percent), and only year 8 has fewer than ten forced turnovers. The pattern of forced departures is different for old CEOs relative to the first ten years. Although old CEOs make up over a third of our sample, only thirty-four old CEOs are forced from office (20.4 percent), and no single year has more than three turnovers. The dummy variables defining CEO tenure capture similar patterns of forced turnover.

Figure I shows the ratio of forced removers to sample CEO years for each year of tenure. Even when accounting for the number of observations, new CEOs are more likely to be removed from office. Intermediate CEOs are less likely to be removed from office than new CEOs in all years except the ninth and tenth, and intermediate CEOs are generally more likely to be removed than old CEOs. After ten years, the likelihood of forced turnover varies substantially from year to year. The years containing a high percentage of forced turnovers beyond twenty-five years of tenure represent few observations, not a large number of removers.

Initial Results Analyzing the Effect of CEO Tenure on the Probability of Turnover

The marginal effects reported in Table 2 establish a relation between both measures of firm performance and the probability of turnover, as well as a statistical relation between CEO tenure and the probability of turnover. This model specification does not, however, allow the performance-turnover sensitivity to change with CEO tenure. Columns 1 and 3 show the marginal effects of the explanatory variables on the probability of forced turnover, and columns 2 and 4 report the marginal effects of the explanatory variables on the probability of voluntary turnover, defining performance as ROA and return, respectively. The marginal effects are calculated at the mean values of the data.

Consistent with Parrino (1997), Warner, Watts, and Wruck (1988), and Weisbach (1988), columns 1 and 3 show that firm performance and the probability of forced remover are negatively related. Conversely, columns 2 and 4 show that firm performance does not have a statistically significant effect on voluntary turnover. The statistically significant effect of performance on forced turnover, but not on voluntary turnover, provides support for our definitions of forced and voluntary turnovers. If we incorrectly classify forced turnover as voluntary, we would expect performance to have a negative effect on both types of turnover. To conserve space, we do not report the results for voluntary turnover in the remaining tables.

Columns 1 and 3 in Table 2 provide evidence that the likelihood of a forced remover is lower for a CEO with more than ten years of tenure than for a CEO with tenure of four to ten years. Kim (1996) also finds that, for a given level of performance, CEOs are less likely to be removed from office beginning with their tenth year in office. Alternatively, there is no significant difference between the likelihood of forced turnover for new CEOs and intermediate CEOs. The results in columns 2 and 4 suggest CEOs are less likely to leave office voluntarily early in their tenure, which is also consistent with Kim (1996).[5]

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[5] We also estimate a model with CEO tenure as a regressor instead of the two dummy variables. In this specification, CEO tenure is negatively related to forced turnover and positively related to voluntary turnover. In both cases it is statistically significant.

Table 2. Multinomial Logit CEO Turnover Models.

Variable [c]	ROA [a]		Return [b]	
	Forced [d]	Voluntary [e]	Forced [d]	Voluntary [e]
Constant	-.0768	-.1844	-.0679	-.1832
	(0.000)	(0.000)	(0.000)	(0.000)
NEW	.0018	-.0367	.0024	-.0364
	(0.610)	(0.000)	(0.513)	(0.000)
OLD	-.0097	.0092	-.0114	.0093
	(0.028)	(0.033)	(0.014)	(0.042)
RELATIVE	-.0583	-.0075	-.0171	-.0013
PERFORMANCE	(0.000)	(0.724)	(0.001)	(0.795)
LOG (SALES)	.0015	.0123	-.0003	.0116
	(0.165)	(0.000)	(0.794)	(0.000)
OUTSIDE	.0025	.0051	.0043	-.0069
	(0.538)	(0.380)	(0.302)	(0.265)
FOUNDER	-.0127	-.0239	-.0095	-.0253
	(0.088)	(0.003)	(0.170)	(0.003)
Log-likelihood	-2016.3		-1980.4	
χ^2	209.89		162.06	
Pseudo R^2	0.05		0.04	
N	7402		7114	

Note: We specify a multinomial logit model with three possible outcomes of the dependent variable for a given observation: no turnover, voluntary turnover, and forced turnover. The partial derivative with respect to each independent variable and the *p*-value for a two-tailed test of the null hypothesis that the marginal effect equals zero (in parentheses) are reported. Marginal effects are evaluated at the means of the data.

[a] The unregulated sample, defining performance as industry-adjusted return on assets (ROA), consists of 760 firms with 7,402 CEO years between 1980 and 1993.

[b] The unregulated sample, defining performance as industry-adjusted return, consists of 748 firms with 7,114 CEO years between 1980 and 1993.

[c] NEW equals one if CEO tenure < four; OLD equals one if CEO tenure > ten; RELATIVE PERFORMANCE is industry-adjusted ROA or stock return; LOG(SALES) is the natural log of sales; OUTSIDE equals one if firm tenure minus CEO tenure < two, and the CEO is not the founder; and FOUNDER equals one if the CEO is the founder.

[d] Forced turnover is defined as resignations, pressure from the board of directors, pressure from outside blockholders, pressure from bank lenders, policy or personality disagreements, demotion, being fired, scandal, poor performance, bankruptcy, and reorganization.

[e] Voluntary turnover is defined as all CEO changes arising from retirement, normal management succession, death, illness, or those involving the CEO's departure for a prestigious position elsewhere.

Our model also includes controls for firm size and CEO type. Consistent with Parrino (1997), we find that firm size, defined as the logarithm of sales, is positively and significantly related to voluntary turnover. In contrast, firm size does not have a statis-

tically significant marginal effect on the probability of forced turnover.[6] Founders are less likely than other CEOs to be removed from office, or to leave office voluntarily, when measuring performance as ROA. However, the founder variable has a statistically insignificant marginal effect on the likelihood of forced remover when return is the performance measure.[7] In all specifications estimated, being an outside replacement does not have a statistically significant effect on the likelihood of either voluntary or forced turnover.[8]

Allowing the Performance-Forced Turnover Sensitivity to Change with CEO Tenure

To allow the performance-forced turnover sensitivity to change with CEO tenure, we interact the performance measure with the dummy variables denoting new and old CEOs. With the two interaction variables included, the relative performance variable measures the effect of performance on the probability of forced turnover for the omitted category, intermediate CEO (new = 0 and old = 0).[9]

Defining performance as ROA in column 1 of Table 3, the marginal effects on all three performance variables are negative and significant. The effect of firm performance on forced turnover for new CEOs is -0.0802, -0.0291 for intermediate CEOs, and -0.1076 for old CEOs. The marginal effect of performance is almost three times as large for new and old CEOs as it is for intermediate CEOs.[10] A test of the hypothesis that the three coefficients on the performance variables are jointly equal to zero is rejected (χ^2 = 55.32; p-value = 0.00). We interpret the results in column 1 of Table 3 as evidence that the effect of performance on the probability of forced CEO turnover varies across CEO

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[6] Alternatively, Denis, Denis, and Sarin (1997) who define firm size using both the log of the book value of total assets and market value of equity plus the book value of debt, find that forced top executive turnover is less likely in larger firms. We find that the significance level of the sales variable is sensitive to whether we report marginal effects or the estimated coefficients of the logit model for forced turnover, and the sign depends on the performance measure. When we use ROA (return) as the performance measure, the coefficient on the log of sales is negative (positive) and statistically significantly (insignificantly) related to the likelihood of forced turnover.

[7] Parrino (1997) and Denis, Denis, and Sarin (1997) find that forced turnover is less likely when the top executive is a member of the founding family. Our results are sensitive to the performance measure used and may differ because we only identify the founder and not a member of the founding family.

[8] We also define an outside replacement as a CEO who has been with the firm two years or less or, alternatively, three years or less before becoming the CEO. Our results are unchanged by using either definition.

[9] We also re-estimate all model specifications in Tables 2 and 3 that use ROA as the performance measure by including the lag value of ROA. The lagged ROA variable was statistically insignificant in all specifications and did not qualitatively change the results for the remaining variables in the model.

[10] Gibbons and Murphy (1992) and Murphy (1986) define "low tenure" as the first 4 years of a CEO's tenure and CEO tenure less than 4.6 years, respectively. When we define low tenure equal to 4 years, the p-value on NEW*RELATIVE PERFORMANCE increases to 0.110. If old is defined as 12 years or more of CEO tenure, our results are unchanged. If old is defined as 10 years or more of CEO tenure, both interaction variables are insignificant, as is the variable OLD.

Table 3. Multinomial Logit CEO Turnover Models with CEO Tenure and Firm Performance.

Variable [a]	ROA [b]	Return [c]
Constant	-.0739	-.0672
	(0.000)	(0.000)
NEW	.0016	.0013
	(0.630)	(0.726)
OLD	-.0087	-.0115
	(0.041)	(0.015)
RELATIVE PERFORMANCE	-.0291	-.0113
	(0.010)	(0.111)
NEW*RELATIVE PERFORMANCE	-.0511	-.0142
	(0.008)	(0.190)
OLD*RELATIVE PERFORMANCE	-.0785	-.0042
	(0.005)	(0.730)
LOG (SALES)	.0015	-.0002
	(0.152)	(0.797)
OUTSIDE	.0014	.0042
	(0.712)	(0.314)
FOUNDER	-.0134	-.0094
	(0.067)	(0.171)
Log-likelihood	-2009.6	-1976.7
χ^2	223.29	162.34
Forced turnovers [d]	167	162
New	60	56
Intermediate	73	71
Old	34	35
Pseudo R^2	0.05	0.04
N	7402	7114

Note: We specify a multinomial logit model with three possible outcomes of the dependent variable for a given observation: no turnover, voluntary turnover, and forced turnover. We report only the forced turnover results. The partial derivative with respect to each independent variable and the *p*-value for a two-tailed test of the null hypothesis that the marginal effect equals zero (in parentheses) are reported. Marginal effects are evaluated at the means of the data.

[a] NEW equals one if CEO tenure < four; OLD equals one if CEO tenure > ten; RELATIVE PERFORMANCE is industry-adjusted return on assets (ROA) or stock return; NEW*RELATIVE PERFORMANCE and OLD*RELATIVE PERFORMANCE are interactive terms between the dummy variables and the industry-adjusted performance measure; LOG(SALES) is the natural log of sales; OUTSIDE equals one if firm tenure minus CEO tenure < two, and the CEO is not the founder; and FOUNDER equals one if the CEO is the founder.

[b] The unregulated sample, defining performance as industry-adjusted ROA, consists of 760 firms with 7,402 CEO years between 1980 and 1993.

[c] The unregulated sample, defining performance as industry-adjusted return, consists of 748 firms with 7,114 CEO years between 1980 and 1993.

[d] Forced turnover is defined as resignations, pressure from the board of directors, pressure from outside blockholders, pressure from bank lenders, policy or personality disagreements, demotion, being fired, scandal, poor performance, bankruptcy, and reorganization.

Table 4. The Marginal Effect of ROA on the Likelihood of Forced Turnover. [a]

	Bottom Decile [b]	Fifth Decile [b]	Top Decile [b]
New CEOs [c]	-0.1492	-0.0903	-0.0364
Intermediate CEOs	-0.0540	-0.0576	-0.0132
Old CEOs	-0.1999	-0.1211	-0.0488
All CEOs [d]	-0.0958	-0.0648	-0.0294

Note: The marginal effects reported above are from the estimation of multinomial logit models for the unregulated sample, consisting of 760 firms with 7,402 CEO years between 1980 and 1993, defining performance as industry-adjusted return on assets (ROA). The marginal effects reported in the first three rows are from the model estimated in the first column of Table 3, and the marginal effects for All CEOs are calculated from the model estimated in the first column of Table 2. The marginal effects are calculated at the mean value of the data for each decile.

[a] Forced turnover is defined as resignations, pressure from the board of directors, pressure from outside blockholders, pressure from bank lenders, policy or personality disagreements, demotion, being fired, scandal, poor performance, bankruptcy, and reorganization.

[b] Deciles are created by sorting the data in ascending order by industry-adjusted ROA.

[c] New CEOs have a tenure < four years; Intermediate CEOs have a tenure between four and ten years; Old CEOs have a tenure > ten years. The marginal effect for New CEOs is the sum of the marginal effects on the variables RELATIVE PERFORMANCE and NEW*RELATIVE PERFORMANCE, the marginal effect for Intermediate CEOs is the marginal effect on RELATIVE PERFORMANCE, and the marginal effect for Old CEOs is the sum of RELATIVE PERFORMANCE and OLD*RELATIVE PERFORMANCE.

[d] The marginal effect for All CEOs is for the variable RELATIVE PERFORMANCE.

tenure.[11] We fail to reject, however, the hypothesis that the coefficients on the new and old interaction variables are statistically different [$\chi^2 = 1.00$; *p*-value = 0.32]. Estimating a model that does not take into account the effect of CEO tenure on the performance-turnover sensitivity yields an underestimate of the probability of forced turnover for both new and old CEOs.

Table 4 illustrates how the marginal effect of ROA on the likelihood of forced turnover varies by the level of ROA and CEO tenure. The marginal effects reported in Table 4 are calculated at the means of the bottom, the fifth, and the top deciles as ranked by ROA, whereas the marginal effects in Tables 2 and 3 are calculated at the overall sample means. The marginal effects in the first three rows are calculated for the estimates reported in the first column of Table 3 and those in the fourth row are calculated for the estimates reported in the first column of Table 2. The results in Table 4 emphasize two relations. First, ignoring the effect of CEO tenure leads to an underestimate of the effect of performance on the likelihood of forced turnover for new and old CEOs. The first column illustrates that the marginal effect of ROA is almost -0.2

[11] One could argue that our results are partially driven by a horizon problem. We re-estimate the specifications presented in Tables 2 and 3 but include a variable for CEO age. The marginal effect on age is positive and significant by itself, but the magnitude and significance level of the other marginal effects is unchanged.

for old CEOs, whereas it is -0.1 for all CEOs. The marginal effect for new CEOs is one-and-a-half that of all CEOs. These relative comparisons are the same across deciles. Second, the marginal effect of ROA varies substantially across deciles. The marginal effects in the bottom decile are over four times the size of those in the top decile for a given CEO tenure.

As shown in column 2 of Table 3, the effect of CEO tenure on the performance-forced remover relation is sensitive to the proxy for firm performance. Neither of the terms interacting CEO tenure with stock return is statistically significant, implying performance-forced turnover sensitivity is constant across a CEO's tenure. Although our results show that both performance measures are negatively related to the likelihood of forced turnover, the nature of this relation differs across measures. When measuring performance using ROA, 53 percent of the forced turnovers in the sample are at firms in the bottom quartile. When using return, only 36 percent of the forced turnovers are in the bottom quartile.

Results from Table 3 provide conflicting evidence for our primary hypothesis that the effect of performance on the likelihood of forced turnover varies with CEO tenure. In the next section, we further disaggregate our sample by type of CEO (e.g., outside hire). The empirical results provide strong evidence in favor of our hypothesis and clarify the role of entrenchment and learning in understanding CEO turnover.

Inside Hires, Founders, and Outside Hires

The control variables included for outside hires and founders in previous specifications of the model do not allow the effect of tenure on the performance-forced turnover probability to vary across the CEO types. We re-estimate our model by separating the data for the three subsamples: inside hires, founders, and outside hires. The control variables denoting CEO type are therefore excluded.

Columns 1 and 2 in Table 5 show the estimates of the marginal effects of the model using data for inside hires and defining firm performance as industry-adjusted ROA and return, respectively. The marginal effects of both performance measures are negative and significantly different from zero. The interaction terms are insignificant, implying the effect of firm performance on the likelihood of forced CEO turnover is negative and significant, but constant across tenure. The marginal effect on OLD is negative and significant. The results suggest that if learning takes place, the board has already learned about the ability of inside hires before they take office.

The marginal effects of firm performance on the likelihood of forced remover for founders (reported in columns 3 and 4) are not statistically significant. The coefficients, however, for the variables that interact old CEOs and performance are negative and significant at the 1 percent and 10 percent levels for ROA and stock returns, respectively. The coefficient estimates suggest founders begin their tenure with a high degree of entrenchment and lose power over time. We do not interpret these results to suggest learning is taking place, because this implies that it takes the board ten years to learn

Table 5. Multinomial Logit CEO Turnover Models for Inside Hires, Founders, and Outside Hires.

Variable [b]	Inside Hires [a]		Founders [a]		Outside Hires [a]	
	ROA [c]	Return [d]	ROA [c]	Return [d]	ROA [c]	Return [d]
Constant	-.0694	-.0736	-.0351	-.0192	-.0967	-.0932
	(0.000)	(0.000)	(0.164)	(0.051)	(0.002)	(0.003)
NEW	.0035	.0036	-.0010	-.0039	-.0090	-.0050
	(0.411)	(0.436)	(0.875)	(0.792)	(0.398)	(0.636)
OLD	-.0104	-.0108	-.0070	-.0072	-.0089	-.0138
	(0.073)	(0.073)	(0.261)	(0.327)	(0.408)	(0.256)
RELATIVE PERFORMANCE	-.0958	-.0205	-.0075	.0019	.0221	-.0064
	(0.002)	(0.046)	(0.306)	(0.699)	(0.618)	(0.669)
NEW*RELATIVE PERFORMANCE	.0092	-.0069	-.0527	-.0328	-.1378	-.0221
	(0.804)	(0.628)	(0.384)	(0.352)	(0.039)	(0.414)
OLD*RELATIVE PERFORMANCE	-.0270	.0151	-.0236	-.0173	-.1689	-.0180
	(0.674)	(0.368)	(0.185)	(0.247)	(0.072)	(0.549)
LOG (SALES)	-.0001	-.0003	.0028	-.0014	.0038	.0024
	(0.957)	(0.830)	(0.265)	(0.182)	(0.131)	(0.383)
Log-likelihood	-1521.6	-1488.8	-148.2	-157.8	-317.6	-312.2
χ^2	158.22	134.32	36.46	21.67	38.91	20.95
Forced removers [e]	124	118	10	11	34	33
New	48	45	1	1	11	10
Intermediate	54	52	4	4	15	15
Old	21	21	5	6	8	8
Pseudo R^2	0.05	0.04	0.11	0.06	0.06	0.03
N	5144	4990	1035	966	1223	1158

Note: We specify a multinomial logit model with three possible outcomes of the dependent variable for a given observation: no turnover, voluntary turnover, and forced turnover. We report only the forced turnover results. The partial derivative with respect to each independent variable and the *p*-value for a two-tailed test of the null hypothesis that the marginal effect equals zero (in parentheses) are reported. Marginal effects are evaluated at the means of the data.

[a] Inside hire is defined as a CEO who is hired from within the firm when he/she originally takes office. An outside hire is defined as a CEO with CEO tenure equal to firm tenure who is not a founder. A founder is defined as a CEO who is responsible for establishing the firm.

[b] NEW equals one if CEO tenure < four; OLD equals one if CEO tenure > ten; RELATIVE PERFORMANCE is industry-adjusted return on assets (ROA) or stock return; NEW*RELATIVE PERFORMANCE and OLD*RELATIVE PERFORMANCE are interactive terms between the dummy variables and the industry-adjusted performance measure; and LOG(SALES) is the natural log of sales.

[c] The unregulated sample, defining performance as industry-adjusted ROA, consists of 760 firms with 7,402 CEO years between 1980 and 1993.

[d] The unregulated sample, defining performance as industry-adjusted return, consists of 748 firms with 7,114 CEO years between 1980 and 1993.

[e] Forced turnover is defined as resignations, pressure from the board of directors, pressure from outside blockholders, pressure from bank lenders, policy or personality disagreements, demotion, being fired, scandal, poor performance, bankruptcy, and reorganization.

about the CEO's ability and that while the board learns it does not hold the CEO accountable for performance. This seems unlikely.[12]

Columns 5 and 6 display the estimates for outside hires. The likelihood of forced turnover is independent of industry-adjusted ROA for intermediate CEOs, but ROA has a negative and significant effect on the probability of forced turnover for new and old CEOs. One interpretation is that outside CEOs initially experience a probationary period, become entrenched during their intermediate years, and again become accountable for firm performance after ten years in office. A test of the hypothesis that the coefficients on the three ROA variables are jointly equal to zero is rejected (χ^2 = 16.41; *p*-value = 0.00). The conclusions regarding the probability of forced turnover of outside hires differ when firm performance is measured using stock return. Stock return performance does not affect the probability of dismissal at any point in a CEO's tenure, implying stock returns have no effect on whether a CEO hired from outside the firm is dismissed.

Our results suggest ROA and stock returns play different roles in the evaluation of outside CEOs. ROA may be seen by the board as a more accurate indicator of CEO performance than stock returns because the firm's assets, and how they are used, are largely under the CEO's control. Weisbach (1988) finds that earnings do a better job of predicting management changes relative to stock returns. Hermalin and Weisbach (1998) contend that earnings are a function of the performance of current management only (and possibly of CEOs in prior years), but stock returns reflect both the performance of current management and the expectation of future performance, conditional on management changes.[13]

Comparing the means and standard deviations of the ROA and return variables provides some explanation of why a board may not view stock returns as a precise measure of an outside CEO's performance. The first row of Table 6 replicates the means and standard deviations for ROA and stock return from Table 1. Stock return (standard deviation = 72.9 percent) is a more volatile measure of firm performance than ROA (standard deviation = 11.4 percent). Although outside hires are associated with a lower mean ROA than mean ROA for all CEOs, the mean stock return for outside hires is more than double that of all CEOs (these differences are statistically significant at the 5 percent level). More important, the standard deviation of return for firms with outside hires increases to 153.4 percent from 72.9 percent for the full sample. With such greater volatility in stock returns for firms with outside hires, it is not surprising there is no observable effect of stock returns on the likelihood of forced CEO turnover for CEO's hired from outside the firm.

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[12] The insignificance of the marginal effects likely arises from the small number of forced turnovers for founders. The small number of turnovers and the fact that most turnovers occur later in the tenure of the CEOs further supports the interpretation that founders begin their tenures highly entrenched, but they lose control of the board over time.

[13] Given the backward-looking nature of an accounting measure of performance, new CEOs may not be held accountable for current accounting performance, because it may reflect decisions of CEOs from the past. We re-estimate the regression shown in Table 5 for outside CEOs including a variable for lagged ROA. The results are qualitatively the same.

Table 6. Descriptive Statistics of Performance for Outside Hires.

	ROA [a]			Return [b]		
	Mean (%)	Std Dev. Dev. (%)	N	Mean (%)	Std Dev. (%)	N
All CEOs	4.4	11.4	7402	4.0	72.9	7114
All Outside Hires [c]	2.8	14.4	1223	10.8	153.4	1158
NEW	-0.1	16.2	368	20.4	264.5	336
INTERMEDIATE	4.7	15.5	474	9.8	65.9	443
OLD	3.1	10.3	381	3.4	69.7	379

[a] The unregulated sample, defining performance as industry-adjusted return on assets (ROA), consists of 760 firms with 7,402 CEO years between 1980 and 1993.

[b] The unregulated sample, defining performance as industry-adjusted return, consists of 748 firms with 7,114 CEO years between 1980 and 1993.

[c] All Outside Hires are CEOs whose CEO tenure equals faro tenure, and the CEO is not the founder; NEW is CEOs whose CEO tenure < four; INTERMEDIATE is CEOs whose CEO tenure is four to ten years; OLD is CEOs whose CEO tenure > ten.

The market may view the hiring of a CEO from outside the firm as risky because it signals to the market that a firm wants to institute fundamental changes in how it operates. Parrino (1997) finds a negative relation between firm performance and the likelihood of outside appointments and he argues that the inverse relation exists because outsiders are more likely to institute change in firm policies. For our data, the mean stock return for firms with new outside CEOs is more than 20 percent. The high mean stock return suggests the market agrees with the decision to hire an outside CEO, but the hiring of a new CEO from outside the firm is a difficult signal for the market to interpret. The variation around this mean is enormous with a standard deviation of 264.5 percent. Both the mean and standard deviation of the stock return diminish with tenure. These data are consistent with the idea that the hiring of an outside CEO is a risky decision with the potential for high returns. When the high variability of stock returns noted in Table 6 is combined with the results from Table 5, it suggests that boards, on average, do not find stock returns a useful benchmark for evaluating the performance of outside CEOs.

IV. Conclusion

Using ROA as the proxy for firm performance, we find the effect of performance on the likelihood of forced turnover varies with CEO tenure. How the performance-forced turnover relation varies depends on whether the CEO is an inside hire, an outside hire, or a founder. One interpretation of our results is that the board of directors learns about inside hires before they take office, but there is no evidence that inside hires become more entrenched over their tenure. Founders appear to be entrenched for at least the first ten years of their tenure, but we find some evidence that performance affects the likelihood of forced turnover after ten years. If ROA is the performance measure, outside CEOs appear to be entrenched during their intermediate years of tenure, but are otherwise held

accountable for firm performance. However, there is no relation between stock returns and the likelihood of forced turnover for CEOs hired from outside the firm.

Recent research suggests that accounting measures are better predictors of management changes than are stock returns. Our results suggest the two performance measures play different roles only in the evaluation of CEOs hired from outside the firm. A closer investigation of the stock return distribution shows that the standard deviation in stock returns is twice as high for outside hires as that of our entire sample of CEOs. It is not surprising that we cannot find a significant relation between stock returns and the likelihood of forced turnover for outside hires given the high variance of the subsample.

Our findings are also consistent with a low probability of forced turnover in a given calendar year. We find that the marginal effect of firm performance on the likelihood of forced turnover increases substantially for firms in the bottom decile of performance, suggesting only poor performance matters. Also, founders and outside hires are not held accountable for firm performance during certain periods of their tenure, which is consistent with entrenchment. If only a small fraction of firms exhibit poor performance and only some of these CEOs are held accountable for poor performance, the result is a low probability of forced turnover in a particular year.

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