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CEO Turnover: More Evidence on the Role of Performance Expectations

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Abstract: Previous research on CEO turnover indicates that a number of factors, including age, firm performance, and expected firm performance affect CEO turnover. Measurement of expected performance in these studies is typically based on investment analysts' forecasts of earnings; these expectations potentially suffer from a number of problems, including the tendency for CEOs to "manage" analysts' expectations. We examine the relationship between performance expectations and CEO turnover using data from NCAA Division I-A college football using a market-determined measure of expected performance, winning percentage against point spreads; this expected performance measure does not suffer from many of the problems that plague analysts' earnings forecasts. We find that performance expectations, actual expectations, and tenure affect CEO turnover in NCAA Division I-A college football, based on performance data from 102 Division I-A football programs over the period 1980-2004.

JEL Codes: D84, J44, J63
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Introduction

Considerable attention has been paid to understanding the factors associated with CEO turnover in the academic literature. Much of this empirical research focuses on identifying observable factors related to firm performance that explain CEO turnover. Important observable factors related to CEO turnover include firm performance in terms of stock prices and accounting-based performance measures, firm size, CEO age, and the presence of viable internal replacements. Brickley (2003) argued that, while actual firm performance appears to be a statistically significant determinant of CEO turnover, firm performance does not appear to be an economically important factor, because the size of the estimated parameters on variables reflecting firm performance tend to be small. Rather than continue to refine and expand measures of actual firm performance, Brickley (2003) suggests future research focus on other factors related to CEO turnover.

Subsequent research focused on factors like CEO pay (Shen, Gentry, and Tosi, 2010), the departure of other top management team members (Barron, Chulkov, and Waddell, 2010), performance risk (Bushman, Dai, and Wang, 2010) and performance expectations. Recent research on the importance of the performance of the firm relative to expectations in CEO turnover includes Holmes (2010), Franck, Nüesch and Pieper (2010), Engle, Hayes and Wang, (2003) and Farell and Whidbee, (2003).

Previous research on the relationship between performance expectations and CEO turnover employs variables like 1-year and 5-year analyst forecasts of firm earnings as proxies for expected performance (Farrell and Whidbee, 2003). While analyst forecasts reflect expected performance of firms, these proxies have limitations. Farrell and Whidbee (2003) point out that analyst forecasts may reflect the ability of CEOs to manage the expectations of industry analysts, since CEOs' jobs often include shaping public perceptions of the firm through influencing media coverage of the firm and the industry. Information asymmetries and biases that affect analysts forecasts of firm performance also may limit the ability of analyst forecasts to capture expected performance. Also, use of analyst forecasts limits the analysis of the relationship between performance expectations and CEO turnover to those firms tracked by analysts, typically large established firms. Finally, 1-year analysts forecasts are available for relatively short periods of

time, but performance expectations may take a relatively long time to form and be acted on by individuals in charge of evaluating, hiring, and firing CEOs.

In this paper, we use a market based measure of performance expectations to analyze the relationship between CEO turnover and performance expectations. We examine turnover in head coaches at NCAA Division I-A football programs, a position analogous to the CEO of a large firm, and the role played by the performance of football teams against point spreads, in order to assess the performance expectation-CEO turnover relationship. The head coach of a Division I-A football program has a job similar to the CEO of a large corporation. The head coach must determine a strategic direction for the football program, devise game plans analogous to making day-to-day operational decision, hire and manage a large number of assistant coaches, recruit players, manage large scale tutoring operations that keep players academically eligible to compete, deal with the media, and preform the role of public face of the football program. The head coach must also interact with alumni and donors and ensure that the football program is both successful and stays within NCAA regulations. Head football coaches at top programs earn salaries commensurate with corporate CEOs; top coaches earn millions of dollars per year in salaries as well as significant performance bonuses and additional compensation from media appearances and camps.

Point spreads set in betting markets are unbiased forecasts of game outcomes and are generated in informationally efficient markets (Sauer, 1998), so the performance of a football team against point spreads can be interpreted as a measure of firm performance relative to a market-based expected performance measure. The results of logistic regressions explaining CEO turnover indicate that both current performance and expected performance affect CEO turnover, and that the relationship between CEO turnover and expected performance is stronger than the relationship between turnover and actual performance. While the result that current performance affects CEO turnover simply confirms the existing results in the literature, a clear link between expected performance and CEO turnover in this setting provides strong support for the growing body of evidence that performance expectations affect CEO turnover, and suggests that analyst-based expectations measures are reasonable proxies for expectations formed by boards of directors who evaluate, hire, and fire CEOs.

Context and Research Approach

Although a large empirical literature analyzing CEO turnover exists, relatively little theoretical research has focused on this issue. Fredrickson, Hambrick and Baumrin (1988) developed a basic descriptive model of the CEO dismissal process. This model identifies performance expectations, the allegiances and values of the individuals in charge of hiring and firing the CEO, the availability of viable alternative CEO candidates, and the power of the incumbent CEO as key factors in the CEO dismissal process. Holmes (2010) proposed a Bayesian learning model of CEO turnover that includes a Bayesian prior distribution over the true ability of CEOs, learning about the true ability of CEOs by observing performance over time, updating posteriors, and, ultimately, a cost-benefit assessment leading to retention or firing of the CEO. Franck et al. (2010) emphasize the risk-taking aspects of CEO turnover, in that firm performance following CEO turnover is uncertain, so evaluating CEOs based on expected performance may reduce incentives for CEOs to take risks. In the context of the Bayesian learning model proposed by Holmes (2010), the risk taking aspects of CEO turnover raised by Franck et al. (2010) imply that, while a prior distribution describing possible alternate CEOs exists, the firm will only learn about the ability of an actual replacement CEO over time, and a poor draw from this distribution is possible. This makes CEO turnover a risky decision.

Franck et al. (2010) also emphasize the importance of expectation setting as an activity involving decisions under uncertainty, and use prospect theory (Kahneman and Tversky, 1979) to shed new light on the decision to change CEOs. From a prospect theoretic perspective, the individuals who evaluate, hire, and fire CEOs --- the board of directors in the case of corporate firms and the athletic director and university president in the case of college football coaches --- must choose between two risky prospects: keeping the current CEO, who is performing below expectations but may return to meeting or exceeding expectations in the future, or hiring a new CEO who will have an uncertain effect on future firm performance. Additional uncertainty is introduced because poor current performance relative to expectations may be attributable to factors outside the CEO's control like general economic conditions. The key insight of prospect theory applied

to this setting is that the presence of uncertainty in evaluating CEO performance implies that both actual firm performance and performance relative to expectation will influence CEO turnover decisions.

Frick, Barros and Prinz (2010) point out that CEO turnover can be viewed in the context of standard principal-agent theory. From this perspective, the individual or individuals responsible for hiring and firing CEOs represent the principal and the head football coach the agent, hired to run the football program. As Frick et al. (2010) point out, information asymmetries, costly monitoring, and moral hazard --- in this setting any behavior on the part of the CEO that maximizes the CEOs net benefits at the expense of the principal --- characterize the principal-agent relationship. Since the output of football teams can easily be observed, the potential for moral hazard problems appears to be mitigated in this setting. In addition, the principal-agent aspects of CEO turnover do not reduce the potential for performance expectations to affect CEO turnover.

The existing theoretical research on CEO turnover supports the idea that performance expectations play an important role in the process. Clearly, identifying observable measures of performance expectations represents a key component of any empirical investigation of factors affecting CEO turnover. In the literature in the corporate setting, researchers typically use industry analysts' forecasts of firm performance as a proxy for expected performance. Farrell and Whidbee (2003) discuss the positives and negatives of using industry analysts' forecasts as a proxy for performance expectations. Industry analysts have detailed information about specific firms, products produced, competitors, and likely future market conditions. They examine all relevant public information about firms and develop forecasts of firm performance that are widely read and used. A one year time frame fits with the typical short term planning and decision making horizon used by most firms, as well as the typical evaluation cycle used by corporate boards to evaluate CEO performance.

However, a growing literature points out that many CEOs are expected to manage expectations, including the expectations of industry analysts, by influencing public perceptions of firms through interaction with the media. Some recent research suggests that CEOs who successfully

manage the expectations of the general public receive larger bonuses and earn more from stock options (Matusanga and Park, 2001; Aboody and Kaznik, 2000). This implies that CEOs have an economic incentive to manage expectations. If CEOs manage earnings expectations by selective release of financial information, "spinning" media accounts and other forms of contact with analysts, and if industry analysts incorporate CEO managed information into their performance forecasts, then industry analysts' forecasts of performance may not be statistically exogenous to the CEO turnover decision, as unobservable factors that affect CEO turnover, for example the ability of a given CEO to manage earnings expectations, could be correlated with industry analysts' forecasts of firm performance, leading to statistical problems. In any event, previous research indicates the performance expectations appear to be an important factor in explaining observed CEO turnover in the corporate setting (Brickley, 2003).

The market-based measure of expected performance used here avoids many of these potential problems. We assume that point spreads set in betting markets can be interpreted as a market based forecast of expected football team performance. Sports betting markets clearly aggregate public information efficiently and point spreads have been shown to be excellent predictors of actual game outcomes. Sauer (1998) thoroughly reviewed the theoretical and empirical literature on the efficiency of sports betting markets, and additional research has generally confirmed the presence of weak form efficiency in sports betting markets. The point spreads set in betting markets should be insensitive to problems related to CEO expectation management that may plague industry analysts' forecasts of firm performance in other settings. Point spreads are set by book makers based on their expectations of game outcomes and the preferences of sports bettors. Sports bettors also form expectations of game outcomes when deciding which games to bet on, although other factors may affect their betting patterns, including behavioral biases (Levitt, 2004) and consumption benefits generated by betting on specific teams (Paul and Weinbach 2008a, 2008b, 2009). It is unlikely that the CEO of a college football team is interested or able to manage the diverse performance expectations of book makers and sports bettors, who interact in a market that CEOs of college football teams do not participate in and are driven primarily by the desire to earn excess returns on bets placed on game outcomes. However, both book makers and sports bettors clearly have incentives to form accurate forecasts of team performance and to take into account all public information that might help them to generate accurate performance

forecasts. A significant amount of public information on college football team performance, in terms of detailed game statistics, extensive television coverage, and in-depth daily media and blog reporting on teams and players, is available to both book makers and bettors, providing a rich setting for detailed analysis and expectation formation. In this sense, sports book makers and sports bettors have incentives that lead them to perform a role similar to industry analysts in the corporate setting, with the advantage that there are many more book makers and bettors forming performance expectations than there are industry analysts, and these book makers and bettors are interacting in markets that aggregate information efficiently.

The performance forecasts set in sports betting markets, in the form of opening and closing point spreads on Division I-A college football games, and actual performance, in the form of game outcomes, are easily observable. Book makers set point spreads on almost all games involving Division I-A football teams, and these point spreads are widely reported in newspapers and sports betting web sites. The ready availability of performance expectations and the immediate availability of exact performance data makes it simple to determine when a team's actual performance differs from expectations by comparing actual game outcomes to the expected outcome based on point spreads. It also makes it easy and costless for the individuals responsible for hiring and firing CEOs to acquire this information, and use it when evaluating the performance of CEOs in this setting.

A substantial amount of previous research has examined CEO turnover in the sports setting. The closest antecedent to this paper in the literature is the recent paper by Holmes (2010), who also examined CEO turnover in NCAA Division I-A football. Holmes (2010) estimated discrete-time hazard models of coaching tenure and retention standards, and found that recent team performance, performance in conference games, and length of tenure at an institution were all important factors for explaining CEO turnover. He also reports evidence that being an alumnus of the institution, race, and violations of NCAA regulations played an important role in CEO turnover. Holmes (2010) assumed that performance expectations were based on a Bayesian learning process, implying that recent actual performance can be interpreted as a proxy for performance expectations. This paper extends the work by Holmes (2010) by relaxing the assumption that recent actual performance proxies for performance expectations and replacing it

with a market-based measure of performance expectations. We also use a different empirical approach, estimating logit models of CEO turnover instead of discrete-time hazard models. These two empirical methods share many similarities and can be thought of as analogous approaches for analyzing duration data (Greene, 2008, page 940.) Also, logit models have been extensively used in research on CEO turnover, facilitating comparisons between these results and others in this literature (Powers, 2005).

Franck, et al. (2010) perform a similar analysis using match level data from the German Bundesliga over the period 1998/99 to 2007/08. Franck et al. (2010) also use betting market data as a proxy for performance expectations. They analyze match level outcomes using a logit model, since intra-season CEO turnover is common in their setting, and use implied outcome probabilities from odds on the three possible outcomes in football games (home win, draw, home loss) to derive a measure of the expected points generated from each match, based on the 3 points for a win, one point for a tie, zero points for a loss point system used in European football leagues. Franck et al. (2010) report evidence based on these logit regressions that performance relative to expectations play an important role in CEO turnover in the Bundesliga in that CEOs who perform poorly relative to expectations, proxied by betting market outcomes, are more likely to be involuntarily dismissed. Other recent research on CEO turnover in sport include Frick, Barros and Prinz (2010) who also analyze outcomes in the Bundesliga, Audas, Goddard, Rowe (2006) who analyze CEO turnover in the National Hockey League, and de Dios Tena and Forrest (2007) who examine within-season CEO turnover in the top division of the Spanish Football League. Earlier research was surveyed by Audas, Goddard and Dobson (2002). These studies generally conclude that recent performance affects the likelihood of CEO turnover in variety of settings. We extend the literature on CEO turnover by examining the role played by performance expectations set in betting markets that use point spreads.

Data Description

We assembled the data set used in this research from a number of sources. Data on the performance of Division I-A football teams and the head coach of these teams were obtained from College Football Data Warehouse (http://www.cfbdatawarehouse.com/). This

comprehensive statistical archive of college football data is a standard source of information on team performance and head coach tenure. We augmented data on team and coach performance with data on point spreads set by Las Vegas sports book makers. Much of the early point spread data were collected from various print sources, including newspapers and gambling publications. In all cases we used data on the closing Las Vegas point spread from the Friday or Saturday of the week the games were played.

The final data set includes data for 102 Division I-A football teams that played in the top NCAA football division continually over the period 1980-2004. The final sample has 2,460 team-season observations. Using the point spread and game outcome variables, we calculated each teams' won-loss record against the spread. For example, if Team A was a 7 point favorite over Team B in the final point spread and Team A won by 6 points, we counted this game as a loss against the spread for Team A, since Team A did not meet or exceed the expectations generated in the betting market. In Las Vegas point spread betting, when a team wins by the exact amount of the point spread, the game is declared a "push" and all wagers on that game are refunded to bettors. In the example above, if Team A would have won by seven points, that game would be a "push" in the betting market. We counted all "pushes" as ties in our calculation of winning percentage against point spreads. Because all wagers are refunded if the game is a "push," many point spreads include half points. For example, if Team A was a 7.5 point favorite over Team B in the final Las Vegas point spread and Team A won by 7 points, the game would be counted as a loss against the spread but if Team A won the game by 8 points, the game would be counted as a win against the point spread.

We focus on CEO turnover, so identifying cases where a CEO (head football coach) leaves his position is a key element for this research. In this setting, a CEO can leave a position for four reasons: to take a head coaching position at another Division I-A university or the position of athletic director at his current university, because he is fired or forced to resign, because he retires, or because he becomes ill or too incapacitated to perform his job. Leaving to take another position at another Division I-A university can be interpreted as a promotion in this context, and we do not include cases where the CEO takes another head coaching position as instances of CEO turnover. Being fired or forced to resign constitutes a case of CEO turnover.

In some cases, the retirement of a head football coach can be viewed as CEO turnover. For example, Florida State head football coach Bobby Bowden retired at the end of the 2009-2010 season, but in subsequent media interviews he made it clear that he did not retire willingly and would have preferred to continue coaching. This is an example of an involuntary separation where the CEO was not fired or forced to resign. Because we cannot easily determine when a retirement was voluntary and when it was involuntary, due to a lack of complete information about many retirements in college football coaching, we treat all retirements as CEO turnovers. While this may introduce some measurement error into the CEO turnover indicator variable, we can control for this statistically if there is no systematic component to voluntary or involuntary retirement in this population.

Table 1: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Wins Last Season	6.0	2.9	0	14
Points Scored Last Season	285	93	81	654
Points Scored by Opponent Last Season	271	77	78	566
Tenure at Current Institution	4.3	5.1	0	38
Cumulative Win %	0.512	0.183		
Cumulative Win % Against the Spread	0.501	0.118		
Coach Separated From Team	0.137	0.343		

Table 1 contains summary statistics for the variables used in the analysis of CEO turnover. Wins in the previous season, points scored in the previous season, and points allowed in the previous season are all measures of actual performance of the football team. We do not use post-season bowl appearances as a measure of team performance because the number of post-season bowl games increased dramatically over the sample period, implying that the value placed on this type of successful performance might have changed from the beginning of the sample to the end of the sample; there were only fifteen Division I-A bowl games in 1980 but 28 in 2004.

The next three variables capture characteristics of the CEOs in the sample. Tenure is the number of years the CEO has spent at his current college or university. Although the tenure spells are relatively short, the average employment spell in Division I-A is roughly four years, the right tail of this distribution is quite long. Eleven individuals in our sample (Bill Yeoman, Bo

Schembechler, Bobby Bowden, Don Nehlen, Fisher DeBerry, Grant Teaff, Joe Paterno, Lavell Edwards, Paul "Bear" Bryant, Tom Osborne, and Vince Dooley) coached twenty or more years at the same institution. The cumulative winning percentage variables are calculated for each season in the sample. Ties and pushes are not counted as wins, but are counted as part of the games played when calculating cumulative winning percentages; the cumulative wins variable is wins divided by total games played.

Nearly 14% of the team-season observations in our sample represent seasons when CEO turnover took place in a Division I-A football program. CEO turnover is distributed relatively evenly throughout the sample. Only six instances of CEO turnover took place in 1987, 8 in 1995, and 9 in 1983. At the other end of the distribution, more than 20 instances of CEO turnover occurred in 1996 and 2000, and seventeen instances occurred in 1982, 1988, 2002 and 2004. In the next section, we describe the results of a conditional analysis of CEO turnover in this sample.

Empirical Analysis

Following the standard practice in the CEO turnover literature, we estimate logit models of the determinants of Division I-A head football coach turnover. The dependent variable, Y, is equal to zero if the CEO remained in his position after that season and equal to one if an instance of CEO turnover occurred. While a Division I-A head football coach may occasionally be fired during the season, almost all CEO turnover in this setting takes place after the regular season has ended.

The logit model we estimate takes the form

$$\text{Prob}(Y=1|x) = (e^{x'\beta})/(1+ e^{x'\beta}) = \Lambda(x'\beta) \qquad (1)$$

Where Y is the dependent variable indicating and incidence of CEO turnover, **x** is a vector of explanatory variables and β a vector of unknown parameters to be estimated. Λ is the logistic cumulative distribution function. The unknown parameters of Equation (1) can be estimated

using maximum likelihood. Like most discrete dependent variable models, the logit model can be interpreted in the context of a latent variable model

$$y^* = x'\beta + e \qquad (2)$$

where y* is an unobservable latent variable that in this context captures the expected net benefit that would be realized by turnover in the head football coach of a Division I-A football team. e is an unobservable mean zero constant variance random variable that affects y*. We cannot observe y*, but instead observe Y=1 when y*>0 and Y=0 otherwise.

We estimate two alternative logit models that contain different measures of current performance. The first model uses the number of wins in the previous season as the measure of current performance. This model assumes that the individuals responsible for the hiring and firing of CEOs care primarily about winning when evaluating performance. The second model uses the number of points scored and allowed in the previous season as measures of current performance. This model assumes that the individuals responsible for the hiring and firing of the CEO care about the offensive (scoring points) and defensive (preventing opponents from scoring points) outputs of the team when evaluating the performance of the CEO and not simply about wins. This is analogous to a corporate board of directors caring about costs and revenues instead of simply focusing on profits. Both models also contain explanatory variables capturing the long term performance of the CEO as reflected in his cumulative winning percentage, and the tenure of the CEO at his current institution. Cumulative winning percentage captures the overall performance of the team under the leadership of the current CEO. We allow the relationship between tenure and CEO turnover to be non-linear.

The key variable in the logit models is the CEOs cumulative record against the point spread. Again, we interpret the point spread as a market-based measure of the expected performance of the football team. It is market based because point spreads are set in betting markets based on the interaction between bookmakers and bettors. A significant body of empirical literature indicates that point spread betting markets are weak form efficient, in that point spreads reflect all public information available to bookmakers and bettors, and are good predictors of actual

game outcomes (Sauer, 1998). Since point spreads reflect performance expectations, the CEO's cumulative winning percentage against the point spread can be interpreted as a measure of performance relative to expectations. We expect that the higher a CEO's cumulative winning percentage against the point spread, the better his performance relative to expectations, and the less likely he is to be fired, other things equal.

Table 2 contains the maximum likelihood regression results for equation (1). The first set of results are for the logit model with wins last season and cumulative wins and measures of actual performance and the second set of results are for the logit model with points scored and allowed last season as measures of actual performance. Table 2 also shows the z-statistics for a two-tailed test of the null hypothesis that the parameter estimate is equal to zero. Stars indicate variables that are statistically different from zero at the one percent significance level. The models explain between 9% and 10% of he observed variation in CEO turnover in this sample.

Table 2: Logistic Regression Results

Variable	Parameter Estimate		Z	Parameter Estimate		Z
Wins Last Season	-0.261	*	-7.63	---		---
Points Scored	---		---	-0.006	*	-5.78
Points Scored by Opponent	---		---	0.004	*	4.12
Cumulative Win %	-0.121		-0.22	-0.661		-1.23
Cumulative Win % Against the Spread	-1.633	*	-2.71	-1.461	*	-2.44
Tenure at Current Institution	0.283	*	7.51	0.286	*	7.61
Tenure at Current Institution Squared	-0.011	*	-5.44	-0.011	*	-5.49
Number of Observations	2460			2460		
Psuedo-R^2	0.098			0.090		

The results indicate that current performance matters for explaining CEO turnover. The more wins a team had in the previous season, the less likely an instance of CEO turnover will take place this season, other things equal. The probability derivative implied by this point estimate indicates that each additional win reduces the probability of a CEO turnover by 2.5%. Interestingly, previous performance, as captured by the CEO's career winning percentage, does not appear to be related to CEO turnover. The parameter on the cumulative winning percentage variable is not statistically significant in either model. This suggests only current performance, and not long-term performance, matters to individuals who make decisions about CEO hiring

and firing. In terms of actual performance, it appears to be a case of "what have you done for me lately?"

Current performance in terms of points scored and opponents points allowed also affect the probability that CEO turnover takes place. Better offensive performance is associated with a reduced probability of CEO turnover; the probability derivative implies that an offense scoring an additional 100 points per season, roughly a 40% increase above average based on the mean reported on Table 1, would reduce the probability of CEO turnover by 5.5%. Better defensive performance, in terms of fewer opponents points allowed in the previous season, is also associated with a reduced probability of CEO turnover. The probability derivative on points allowed implies that giving up 100 fewer points per season, again a change of about 40% from the mean points allowed in the sample, reduced the probability of CEO turnover by about 3.8%. Offensive performance has a larger impact on CEO turnover than defensive performance.

Tenure is related to CEO turnover in a nonlinear fashion. CEOs with shorter tenure at an institution have an increased probability of involuntary dismissal, and this probability increases until the CEO has 13 years of experience at an institution, after which the probability of CEO turnover declines. This is consistent with the fact that the average spell of employment in the sample is just over four seasons. This non-linear relationship can be interpreted as the result of goodwill built up with the individuals responsible for hiring and firing CEOs, or as reputational effects which grow slowly over time. It is also consistent with the discrete-time hazard model results reported by Holmes (2010).

The primary parameter estimate of interest is the parameter on the proxy for performance relative to expectations, the CEO's career winning percentage against the Las Vegas point spread. Again, the larger this winning percentage, the better the CEO has performed relative to expectations. The results on Table 2 indicate that performance relative to expectations has an important effect on CEO turnover. CEOs with better performance relative to expectations are much less likely to be involuntarily dismissed than those who perform worse relative to expectations. The estimated parameters have similar magnitudes in both models; the probability derivative from Model 1 indicates that a 0.1 increase in career winning percentage against the spread, for example an

increase from a 0.500 record against the spread to a 0.600 record, is associated with a 1.5% decrease in the probability of turnover. On average, CEOs in the sample played about 54 games against the spread and won about 27 of them (the average career winning percentage against the spread on Table 1 is just over 0.5). To improve to a 0.600 career record, the CEO would need to outperform the point spread in an additional 5 games. The probability derivative from Model 2 is slightly smaller.

Discussion and Extensions

The results of the logit regressions indicate that both current performance and performance relative to expectations matters in this setting. The probability that CEO turnover occurs increases with both poorer recent performance and poorer performance relative to expectations, as measured by point spreads set in betting markets. This performance expectation measure is unlikely to suffer from the problems associated with the use of analysts forecasts of firm performance used in studies of CEO turnover in the corporate setting. The expectations formed by book makers and sports bettors are unlikely to be influenced by CEOs as part of their job, and CEOs in this setting are prohibited from participating in betting markets so they are unlikely to care about the performance expectations that emerge from these markets. However, the individuals responsible for CEO hiring and firing, athletic directors, university presidents, and university bards of trustees, make CEO turnover decisions in a way systematically related to the CEO's performance against this specific performance expectation. Since betting markets are weak form efficient, and efficiently aggregate all public information related to team performance, we should not be surprised that career performance against the point spread explains CEO turnover decisions in this setting.

The estimated relationship between current performance and CEO turnover, as well as performance relative to expectations and CEO turnover, is robust to alternative specifications. We estimated alternative models that included only current wins and current winning percentage against the spread, and only cumulative winning percentage and cumulative winning percentage against the spread. The results from these alternative specifications were qualitatively identical

to those reported on Table 3. Current performance, current performance relative to expectations, and cumulative long-term performance relative to expectations were all significant factors for explaining CEO turnover. Current performance alone cannot explain CEO dismissals, implying that those responsible for CEO turnover care about both performance and performance relative to expectations.

The results here suggest that other empirical findings of an important relationship between performance expectations and CEO turnover can be viewed as robust. Commonly used measures of performance expectations in other settings, for example 1-year analyst forecasts of firm performance, appear to be reasonable expectations of firm performance, since these expectation measures, like winning percentage against the point spread, both explain observed CEO turnover decisions.

Several fruitful extensions to this research could be explored. First, Brickley (2003) pointed out that the age of CEOs is an important factor explaining turnover, and that the probability of CEO turnover occurring increases as the CEO gets older. The current logit models contain only a coaches tenure at an institution, not age. Tenure reflects factors specific to a coach and an institution, and factors like firm-specific human capital. Age captures factors like human capital and reputation. In future work, we plan to augment this data set with information about the age of the head coach, in order to assess the effects of age on CEO turnover in this setting.

Second, since performance expectations clearly affect CEO turnover in this setting, and betting market based performance expectations data exist for a number of other sports, a similar analysis could be repeated in other settings. Franck et al. (2010) perform a similar analysis in the Bundesliga in Germany, and report similar results to those reported here using match level data. Data aggregated to the season level can be used in this setting, because of the relatively short college football season and the institutional characteristics of the college football CEO market lead to bunching of CEO turnover and hiring in the off season. However, CEO turnover in the National Basketball Association and Major League Baseball occurs throughout the season providing a different setting for examining CEO turnover. Also, the expectations of general managers and team owners in these professional leagues, with different organizational structures

and goals, and different institutional characteristics, may lead to differences in the importance of current performance and performance relative to expectations. Further research in these settings can increase our understanding of the factors affecting CEO turnover.

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