The Quality of Corporate Governance and the Length it Takes to Remove a Poor-performing CEO

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In this paper, we investigate the effects of internal corporate governance on the length it takes to remove a CEO after the initial sign of poor firm performance. We find that firms that have a better quality of internal corporate governance are quicker to remove poor-performing CEOs. This result persists after controlling for other factors that might influence the CEO removal decision.

INTRODUCTION

Why do firms remove CEOs? Three main explanations that have been offered in literature in response to this question are a) information asymmetry between the CEO candidate and the board, b) sociopolitical forces, and c) poor firm performance.

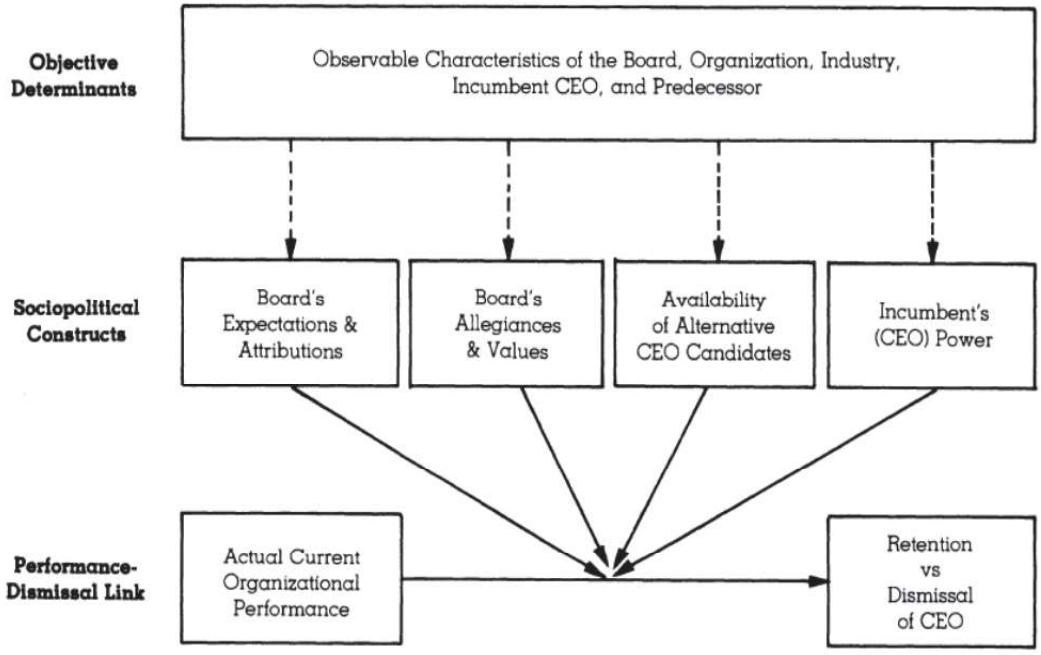
Rijck (2011) suggests information asymmetry that exists at the time of hiring the CEO is a reason for firing CEOs when the asymmetry is subsequently removed. In this construct, the board is the principal, and the potential CEO candidate is the agent. The candidate will do everything to fit the profile for the position and exaggerate his or her personality traits that are positive. The candidate has the incentive to hide information that might hinder the suitability of his candidacy. Such information, which can be highly relevant to the board for the decision-making process, is kept from the board. The resulting information asymmetry leads to the initial hire and, upon removal of information asymmetry, subsequent fire of the CEO.

Fredrickson et al (1988) propose a model (figure 1) suggesting that the board's actions can be explained by several sociopolitical forces, dealing with interpersonal relations, coalitions, and power. Four such forces appear critical-- (a) the board's expectations and attributions, (b) the board's allegiances and values, (c) the availability of alternative candidates for CEO, and (d) the power of the incumbent CEO. Therefore, the event of dismissal can be explained best by using a combination of social and political forces, not simply by considering whether it is rational for the organization to remove or retain executives associated with a given level of organizational performance.

The third group of explanations is the most-researched one and points to the sub-par firm performance when the incumbent CEO is at its helm. This linkage between forced termination of CEOs and their subpar performance has been established in several studies, including McEachern (1975),

Salancik & Pfeffer (1980), James & Soref (1981), Coughlan and Schmidt (1985), Brickley et al. (1988); Weisbach (1988); Warner, Watts, and Wruck (1988), Morck et al. (1988); McConnell and Servaes (1990); Denis, Denis and Sarin (DDS) (1995); Borokhovich et al (1996); Yermack (1996); Denis, Denis and Sarin (1997); Parrino (1997), Huson (2000) ; Perry (2000); Maury (2006); Kato and Long (2006); and Conyon and He (2008))[1].

FIGURE 1
A MODEL OF CEO DISMISSAL



The connection between poor performance and termination is typically pronounced in presence of an efficient corporate governance system. Parrino (1997) documents a negative relation between firm performance and the probability of forced chief executive officer (CEO) turnover. Coughlan and Schmidt (1985) and Warner, Watts, and Wruck (1988) show existence of association between poor performance and CEO turnover. These studies discuss the board's effectiveness in replacing a CEO following poor firm performance; however, they do not explore the differences in monitoring between inside directors (full-time employees of the company) and outside directors. By employing a sample of 485 publicly held corporations between 1977 and 1980, Weisbach (1988) show that firms with outsider dominated boards (firms in which at least 60% of the board are outsiders) are significantly more likely than firms with insider dominated boards (firms in which outsiders make up no more than 40% of the directors) to remove the CEO following poor firm performance. Weisbach (1988) suggests that successors from outside the firm are more willing to break with the failed policies of their predecessors. He also argues that outsider-dominated boards tend to add to firm value through their CEO changes. This value addition is largest when the change is preceded by poor performance. Similar results are reported in Maury (2006), Kato and Long (2006), Canyon and He (2008), Chen (2012).

The relation between a firm's performance and its top executives is driven by other governance factors as well: board size (Yermack (1996)), ownership (Morck et al (1988), Denis et al. (1997), Kato and Long (2006), Conyon and He (2008)), and director compensation (Perry (2000).

In this paper we extend the poor performance-termination literature by examining the time expired between poor performance and forced departure of the CEO. We posit that a well governed firm is not

only better able than its poorly governed counterpart to identify under-performing executive but is also able to remove the executive at a faster speed. Considering that poor executives create value losses, it is reasonable to assume that an efficient governance system will act quicker in order to stop further value deterioration by replacing a less capable executive with a more proficient one. Consequently, we test the following hypothesis:

A firm with a superior governance structure would fire its poor performing CEO faster than its inferior counterpart.

Based on the existing literature on corporate governance, we employ, along with control variables, a group of proxies that reflect the quality of corporate governance system. The proxies include fraction of outside directors on board, board size, ownerships by managers, CEOs, controlling shareholders, and incentive compensations to outside directors. We use three proxies to measure firm performance: ROA (return on assets), ROE (return on equity), and M/B (market-to-book).

Our sample consists of S&P 500 firms in which involuntary CEO turnovers occur from during the 2004-2011 period. We compute the length by measuring the number of quarters it takes for such a turnover to take place subsequent to the firm's first poor performance during the tenure of the CEO in question. This sample selection process might induce a bias when interpreting results as it allows one to observe only those firms that actually fire their CEOs but not the ones that choose not to take such an action in spite of the manager's poor performance. To address this problem known as incidental truncation, we employ Heckman's two step procedure. The first step in this procedure is to apply a probit model to the whole population of S&P 500 firms. The second step applies the least square estimates to the selected sample (i.e., firms that actually remove their CEOs).

Consistent with the hypothesis, we find that a firm with a better quality of governance is quicker to fire its poor-performing CEO. Although several studies examine the linkage between CEO firings and good system of corporate governance, we contribute to literature by relating corporate governance quality to the speed at which a poor-performing CEO is removed.

The remainder of this paper is organized as follows. Section 2 describes the sample, testing models, and methodology. Section 3 presents results supported by robustness checks and Section 4 concludes.

SAMPLE, DATA AND METHODOLOGY

Sample

Our sample originates from the S&P 500 firms covering the 2004-2011 periods. The firms with CEO turnovers are then identified by consulting with the ExecuComp database**.** The resulting lists of CEO turnovers are then cross-checked with the Wall Street Journal (WSJ) and Wall Street Journal Index (WSJI) to confirm the dismissal announcement date as well as to ascertain the stated reason for dismissal.

We classify all CEO turnovers into two categories: voluntary CEO turnovers and involuntary CEO turnovers based on the reasons given by the firm. A CEO change is considered as a voluntary CEO turnover when it occurs due to planned succession, retirement, voluntary resignation, stepping down, bad health, death, or interim replacement. An involuntary turnover occurs when a CEO is fired, forced to resign, or resigned due to scandal, accounting conflicts, and poor performance. This yields a final sample of 421 CEO turnovers, including 405 (96%) voluntary CEO turnovers and 16 involuntary CEO turnovers (about 4%). The annual average of involuntary CEO turnovers (involuntary CEO turnover/Number of years) is 47.5% which is consistent with what is reported in Taylor (2010) (48.85%, a sample of firms over 1970-2007) and Chen (2012) (41.4%, a sample of firms over 1995-2009). Out of the total 405 voluntary turnovers, only 58 are strictly voluntary in the sense these turnovers are not related to retirement, death, illness etc. We refer to these cases as pure voluntary turnovers.

Our sample might suffer from the incidental truncation problem as we may observe the length it takes to remove a CEO only for a subset of firms that actually remove their CEOs and not for firms that choose not to fire their CEOs. To address this problem, we resort to a procedure known as incidental truncation

by employing the Heckit method based on the work of Heckman (1976). First, we need to add an explicit selection equation to the population model:

$$y = x\beta + u, E(u|x) = 0 \quad (1)$$

$$s = 1[z\gamma + v \geq 0] \quad (2)$$

Where, s=1 if we observe y (the length), and zero otherwise. We assume that elements of x and z are always observed, we write $x\beta = \beta_0 + \beta_1 x_1 + ... + \beta_k x_k$ and $z\gamma = \gamma_0 + \gamma_1 z_1 + ... + \gamma_m z_m$

The equation of primary interest is (1), and we could estimate β by OLS given a random sample. The selection equation (2), depends on observed variables, z_h, and an unobserved error, v. A standard assumption, which we will make, is that z is exogenous in (1): $E(u|x,z) = 0$

In fact, for the following proposed methods to work well, we will require that x be a strict subset of z: any x_j is also an element of z, and we have some elements of z that are not also in x.

The error term v in the sample selection equation is assumed to be independent of z (and therefore x). We also assume that v has a standard normal distribution. The correlation between u and v generally causes a sample selection problem: to see why, assume that (u,v) is independent of z. Then taking the expectation of (1), conditional on z and v, and using the fact that x is a subset of z gives

$$E(y|z,v) = x\beta + E(u|z,v) = x\beta + E(u|v),$$

where $E(u|z,v) = E(u|v)$ because (u, v) is independent of z. Now if u and v are jointly normal (with zero mean), then $E(u|v) = pv$ for some parameter ρ. Therefore,

$$E(y|z,v) = x\beta + \rho v$$

We do not observe v, but we can use this equation to compute $E(y|z,s)$ and then specialize this to s=1. We now have:

$$E(y|z,s) = x\beta + \rho E(y|z,s)$$

Because s and v are related by (2), and v has a standard normal distribution, we can show that $E(v|z,s)$ is simply the inverse Mills ratio, $\lambda(z\gamma)$ then s=1. This leads to the important equation

$$E(\gamma|z, s = 1) = x\beta + \rho\lambda(z\gamma) \quad (3)$$

Equation (3) shows that the expected value of y, given z and observability of y, is equal to $x\beta$, plus an additional term that depends on the inverse Mills ratio evaluated at $z\gamma$. Remember, we hope to estimate β. This equation shows that we can do so using only the selected sample, provided we include the term $\lambda(z\gamma)$ as additional regressor.

If $\rho = 0, \lambda(z\gamma)$ does not appear, and OLS of y on x using selected sample consistently estimates β. Otherwise, we have effectively omitted a variable, $\lambda(z\gamma)$, which is generally correlated with x. When does $\rho = 0$? The answer is when u and v are uncorrelated. Because γ is unknown, we cannot evaluate $\lambda(z_i\gamma)$ for each i. However, from the assumptions we have made, s given z follows a probit model:

$$P(s = 1|z) = \Phi(z\gamma) \quad (4)$$

Therefore, we can estimate γ by probit of s_i on z_i using the entire sample.

In the second step, we estimate . The procedure can be summarized as follows

(i) Using all n observation, estimate a probit model of s_i on z_i and obtain the estimate $\hat{\gamma}_h$. Compute the inverse Mills ratio, $\hat{\lambda}_i = \lambda(z_i\hat{\gamma})$ for each i (actually, we only need these for the i with $s_i = 1$).

(ii) Using the selected sample, that is, the observations for which $s_i = 1$ (say, n_1 of them), run the regression of y_i on x_i, $\hat{\lambda}_i$. $\hat{\beta}_j$ is consistent and approximately normally distributed.

We use t-statistic from the second step (ii) on $\hat{\lambda}_i$ to test the hypothesis $H_0 : \rho = 0$. Not being able to reject the hypothesis implies that there is no sample selection problem.

VARIABLES DEFINED

1. Length

The length it takes to replace a CEO after the initial sign of poor firm performance (LENGTH) is measured by the difference between the time the firm shows the first sign of poor firm performance and the time when the CEO is dismissed. The LENGTH is measured in quarters.

2. Firm Performance

Following Smith (1990), Denis & Denis (1995), Yermack (1996), Allgood and Farrell (2000), Anderson and Reed (2003), Dezso (2005), We employ three measures of firm performance---Return on asset (ROA), return on equity (ROE) and market-to-book ratio (M/B).

ROA is defined as EBITDA over the book value of total assets, ROE is defined as EBITDA over total equity at the start of the year, and M/B as book value of assets plus market value of common stock less the book value of common equity divided by book value of total assets. Since operating income does not include taxes, dividends, or interest income received, or dividends paid to stockholders, it is argued to be a robust measure of changes in the operating performance of an organization and less vulnerable to managerial manipulation (Smith, 1990; Denis & Denis, 1995). To control for industry effects, we subtract the industry performance from the firm performance. The industry average is based on all firms that have the same 4-digit SIC code as the sample firm.

In addition to the three measures of performance discussed above, we also use a fourth measure based on previous studies, including Yermack (1996) and Farrell (2002). This measure calculates surprise earnings and abnormal returns by examining performance changes from two years prior to turnover to two years after the turnover. Surprise earnings are defined as the difference between the actual return and forecasted return, while abnormal returns are calculated by two methods---actual returns minus market returns, and actual returns minus the return predicted by the market model.

Initial sign of poor firm performance: Several studies document that the average CEO tenure is between 6 and 7 years. For instance, Kaplan and Minton (2008) place such tenure to less than seven years based on a sample of large U.S during the 1992-2005 period and Coates and Kraakman (2010) find that the average tenure is 6.91 years (sample of S&P 500 from 1992-2004). Therefore, in this paper we will focus on a 7-year period (t-7 through t-1 prior to the CEO firing (t_0) to identify the initial sign of poor firm performance. Initial sign is defined as the first time the firm performance is inferior to the industry performance.

3. Corporate Governance Variables

We focus on only three aspects of the board structure that have been shown to have implications for the effectiveness of the board. They are a) percentage of outside directors, b) board size, and c) CEO-Chairman duality.

Percentage of outside directors on the board: The board is the shareholders' first line of defense against incompetent management. And, the board becomes more independent and therefore, more effective, with increasing representation by outside directors. Fama and Jensen (1983) argue that outside directors, who tend to be major decision-makers at other organizations, have incentives to signal to the

labor market that they are experts in decision control by acting in shareholder interests. Outside directors increase the value of their human capital by strengthening their reputations as decision control experts. Inside directors, on the other hand, are more apt to be concerned about maintaining their current position in the firm. Existing literature supports this argument. For instance, Weisbach (1988) reports that outside directors (directors who neither work for the corporation nor have extensive dealings with the company as outside directors) represent shareholder interests better than inside directors (directors who are full-time employees of the corporation). Weisbach reports that firms with outsider dominated boards (all firms in which at least 60% of the board are outsiders are designated outsider-dominated firms) are significantly more likely than firms with insider dominated boards (all firms in which outsiders make up no more than 40% of the directors are considered insider-dominated firms) to remove the CEO following poor firm performance. He adds that outsider-dominated boards tend to add to firm value through their CEO changes and the addition to firm value is largest when the change is preceded by poor performance. In addition, the empirical results in Dimopoulos and Wagner (2010) and Gao et al (2013) also show that the better the quality of governance specifically the more outsider-dominated board, the higher is the likelihood of CEO turnovers. In other words, CEOs with more independent boards are significantly more likely to be replaced

Extending Weisbach's (1988) line of reasoning, Borokhovich et al (1996) argue that the decision to fire a CEO after bad firm performance does not benefit shareholders unless the board also appoints a more capable successor. They show that there is a positive relationship between the proportion of outside directors and the likelihood that an outsider is appointed CEO. In other words, outside directors are also more likely to fire a CEO with an executive from outside the firm since new CEOs from outside the firm appear to be perceived as more likely to alter firm policies in a way that benefits shareholders. Huson et al (2000) also support this point. They argue that successors from outside the firm are more willing to break with the failed policies of their predecessors. Based on the preceding discussion, we expect that there will be a negative relation between the length to fire a poor-performing CEO and the percentage of outsider-directors on board (i.e., the higher the percentage of outside directors, the shorter is the length).

Board size: The empirical work predominantly suggests that smaller board size is more effective than larger board size because the problems with coordination and processing overwhelm the advantages gained from having more people to draw on (Steiner (1971) and Hackman (1990)). Lipton and Lorch (1992) suggest that large boards can be less effective than small boards, and recommend limiting the size to seven or eight people in the board. Jensen (1993) reports that when a board gets beyond seven or eight members it is less likely to function effectively and easier to be controlled by the CEO. Yermack (1996) finds that a firm with smaller board is more likely to remove its CEO following a bad firm performance. Dimopouslos and Wagner (2010) assert that board size plays an important role in whether firm-level governance matters or not in improving firm performance following CEO turnover[2].

We hypothesize that board size will have a positive relation with the time it takes for A CEO to be fired. To be consistent with Yermack (1996) and Dezso (2005), we measure board size as the number of members of the board of directors as of the annual meeting date during each fiscal year, and then take the natural log of each.

CEO-Chairman Duality: When CEO also serves as the Board Chairman, the role of the board in monitoring CEO actions is compromised, jeopardizing board independence (e.g., Palvia (2011), Goyal and Park (2002), Adams, Almerda, and Ferreira (2005). Other studies take the view that duality entrenches CEOs and adversely affects the firm performance (e.g., Dalton and Rechner, 1991).[3] We expect to find a positive relation between duality and length.

CEO ownership: If a CEO is also a significant owner of the company, the probability of firing himself/herself after the poor firm performance dwindles due to conflict of interest (Denis et al (1997), Mikkelson and Partch (1997), Perry (2000), Coates and Kraakman (2007), Coates and Kraakman (2010) and Dimopoulos and Wagner (2010).Thus, a negative relation is expected between CEO ownership and CEO turnover. Consequently, we hypothesize that the length it takes to fire a CEO would be positively related to the ownership of the CEO. We calculate CEO percentage shareholdings by dividing the number of CEO shares by total shares outstanding.

Insider (managerial) ownership: Insider ownership has an important influence on internal monitoring mechanisms. Empirical work (for example, Ofek (1993), Denis and Denis (1994), Mikkelson and Partch (1996)) reports a negative relation between the managerial ownership and the rate of CEO turnover, suggesting that higher managerial ownership reduces the effectiveness of internal monitoring. Denis et al (1997) allow the relation between CEO turnover and firm performance to vary with the levels of various managerial ownerships of 1,394 Value Line Investment Survey firms over the period 1985-1988. Following Morck et al (1988), Denis et al. (1997) classify managerial ownership into three categories: less than or equal to 5%, between 5% and 25%, and greater than 25%. Their results suggest that managerial ownership has a significant impact on the sensitivity of turnover to performance. The probability of turnover is negatively related to performance when managerial ownership is less than 5% and significantly less sensitive to performance when the managerial ownership is between 5% and 25%. Their overall findings are consistent with the hypothesis that higher ownership partially insulates managers from internal monitoring mechanisms. We expect a positive relation between the degree of managerial ownership and the length taken to dismiss CEOs. We use ownership by all officers and directors as a proxy for managerial ownership. Managerial ownership is calculated by the number of all officers and directors' shares divided by total shares outstanding.

Block ownership by outsiders: Denis et al. (1997) and Dimopouslos and Wagner (2010) find that the negative relation between turnover and performance is significantly stronger in firms with higher outside block ownership.[4] We expect that higher ownership by outside block-holders would lead to more effective corporate governance measures such that the time elapsed between poor performance and dismissal of the CEO would be shorter[5]. Consistent with Denis et al (1997), Mikkelson and Partch (1997), Perry (2000)), we calculate outside block holder ownership by dividing the number of outside block holder shares by total shares outstanding.

Directors Compensation: Stock or option grants are likely to complement the managerial labor market in providing outside directors with incentive to represent stockholder interest. Some researchers argue that firms can increase the monitoring of management by providing outside directors with a financial stake in the performance of the firm.[6] For instance, firms can encourage outside directors to "think like shareholders" by compensating directors with incentive-based compensation. Perry (2000) reports that the likelihood of a CEO turnover (following poor stock performance) is significant when the directors of outside dominated board are given incentive-based compensations than when they are not. Accordingly, we hypothesize a negative relation between incentivized directors and the length of time it takes to fire a CEO. Following Perry (2000), we include a dummy equal to one when directors of independent boards receive incentive compensation, it is zero otherwise.

4. Control Variables

Number of subsidiaries: Firm size has been used as a control variable in many studies related to CEO turnover. These studies show that firm size affects the relationship between firm performance and CEO turnover (see, for example, Warner et al (1988), Denis et al. (1997), Perry (2000), Huson et al (2001), and Dezso (2005)). These studies, in general, agree that smaller firms are more likely than larger firms to remove CEOs after poor firm performance. For example, Denis et al., (1997) document that CEO turnover following bad firm performance is significantly less likely in larger firms. In addition, Parrino, (1997) finds that larger firms are more likely to appoint an insider to replace an outgoing CEO. A potential explanation for this empirical regularity is that smaller firms tend to have fewer senior managers that are qualified to replace the outgoing CEO and an outside candidate is more likely to be effective in a smaller, less complex organization.

In place of size, we use in this paper the number of subsidiaries as one of the control variables because it is more difficult to appraise the CEO's contribution to the firm's performance in a complex organization (many subsidiaries). We would expect the length (elapsed between poor performance and CEO firing) would be positively related to the number of subsidiaries. Number of subsidiaries is as the number of 4 digit subsidiaries for each firm.

CEO tenure: CEO tenure has been considered as a potential factor that influences the likelihood of turnover after poor firm performance in several studies (for example, Denis et al. (1997), Parrino (1997), Allgood and Farrell (2000), Goyal and Park (2002) and Gao et al (2013)). While Denis et al. (1997) find no significant relation between CEO tenure and CEO turnover after poor firm performance, Parrino (1997), Allgood and Farrell (2000), Goyal and Park (2002) and Gao et al (2013) report a positive and significant association. Specifically, Gao et al (2013) indicates that CEOs with longer tenure are significantly less likely to be replaced. In this paper, we expect the relation between tenure and the length of being fired to be negative and measure this variable in terms of the number of years a CEO has held the position.

Several studies raise the potential of a non-linear relationship between a CEO's tenure and the firm's performance (and therefore the length of time to get fired). Miller and Shamie (2001) conclude that managers' performance declines after 15 years in office due perhaps to their declining propensity to creativity. This view is shared by Katz (1982), Sonnenfeld (1988), Fredrickson, Hambrick, and Baumrin (1988), Hambrick et al (1993); Miller (1990, 1991, 1994), and Walsh (1995), who suggest that executives who stay on the job too long become 'stale in the saddle'—overly committed to the status and thus less effective. We employ **TNUR**^{2} to examine if a non-linear relation exists between the tenure of a CEO and the firm's performance and thus the length to get fired.

EXPANDED EQUATION

$$LogofLENGTH = y = \beta_0 + \beta_1 * (PercentageofOutsideDirector) + \beta_2 * (BoardSize) + \beta_3 * Duality + \beta_4 * (CEOownership) + \beta_5 * (ManagerialOwnership) + \beta_6 * (OutsideBlockholderOwnership) + \beta_7 * Dircomp + \beta_8 * (LogofTheNumberofSubsidiaries) + \beta_9 * (LogofCEOtenure) + \beta_{10} * (LogofCEOTenure)^2 + \varepsilon \quad (5)$$

where

LENGTH = the time it takes to get CEOs replaced after the initial sign of poor firm performance;

Percentage of Otside Directors= number of outside directors divided by the number of directors of the board;

Board Size= the log of number of members of the board of directors;

Duality= is dummy that takes on a value of 1 if a CEO is also a chairman, otherwise 0;

CEO Ownership= number of CEO shares divided by total shares outstanding (%);

Managerial Ownership = number of shares owned by all officers and directors divided by total shares outstanding (%);

Outside Blockholder Ownership= number of outside block holder shares divided by total shares outstanding (%);

Dircomp = a dummy variable that takes on a value of 1 if the company uses incentive compensation for outside directors, 0 otherwise;

Number of Subsidiaries = the number of 4 digit subsidiaries for each firm;

CEO Tenure= the number of quarters a chief executive had held this position with this company.

DATA SOURCES

The ownership and compensation data are collected from ExecuComp database and Compact Disclosure. Board size and board composition data are collected from Institutional Shareholder Services (ISS), Investors Responsibility Research Center (IRRC) and Compact Disclosure. Stock returns data are obtained from the Center for Research in Security Prices (CRSP) and accounting data from the Compustat database. We also require each company to have other data available besides CEO turnover between 1997 and 2011.

RESULTS

SUMMARY STATISTICS

Table 1 shows that the average size of S&P 500 boards is 10.8 directors in 2007 and 2008, and 10.7 directors in 2005. The median board size is 10 directors, of which 80.02% is outside directors. The median CEO tenure is 5.02 years, while the median CEO age is 54.56 years.[7] The ownership by insiders, CEOs, and outside block holders are 6.1%, 5.16%, 8.89%, respectively. Truly voluntary turnover firms have significantly higher percentage of ownership by directors ((at the 10% level) and significantly higher percentage (at the 5% level) of outside block holders than those of involuntary turnover firms.

TABLE 1
SUMMARY STATISTICS

Statistics are for a sample of 421 turnovers including 305 true voluntary and 16 involuntary during the 2004-2011 period.

Variables	All turnovers (1)	True Voluntary (2)	Involuntary (3)	Diff (1)-(3)	Diff (2)-(3)
Board size	10.01	9.98	10.00	0.01*	-0.02
CEO age	54.56	55.05	55.01	-0.45	0.04
CEO tenure	5.02	4.90	6.01	-0.99	-1.11
% outside directors (a)	80.02	82.13	79.85	0.17	2.28
% inside directors	19.05	17.77	18.49	0.56	-0.72
% ownership by directors (b)	6.10	7.23	6.45	-0.35	0.78*
% ownership by CEO (c)	5.16	4.87	5.42	-0.26	-0.55
% ownership by outside block holders (d)	8.89	8.99	7.87	1.02	1.12**

(a) Directors who neither work for the corporation nor have extensive dealings with the company as outside directors. Directors who are full-time employees of the corporation as inside directors. Those directors who are not employees, but who may not be independent of current management because of extensive business dealings with the company or family relationships with management, are classified as grey (lawyers, consultants, investment bankers, major suppliers).

(b) Ownership by directors: the number of all officers and directors shares divided by total shares outstanding.

(c) Ownership by CEO: the number of CEO shares divided by total shares outstanding.

(d) Ownership by outside block holders: the number of outside block holders shares divided by total shares outstanding (block holders are individuals, organizations or institutions who has at least 5% ownership of a firm)

***, **, * denote the significance level of 1%, 5%, 10%, respectively.

ABNORMAL STOCK RETURNS AROUND TURNOVERS

In this section, we examine firm long-run abnormal stock performance around CEO turnovers with a sample of 421 CEO turnovers as described in previous section. In doing so, we employ a four factor model that includes the market risk premium (the spread between CRSP value-weighted market return and risk-free rate), SMB (the return spread between portfolios of small and big capitalization stocks), HML (the return spread between portfolios of high and low book-to-market stocks), and a momentum factor. The market model parameters are estimated with data over the 24-month period seven quarters before the turnover announcement quarter.

Table 2 reports average abnormal stock returns over six window periods around the announcement [-Q7, -Q1], [-Q4, -Q1], [-Q1], where announcement quarter is Q = 0. The table shows that firms with involuntary turnovers exhibited poor performance at least seven quarters before the CEOs were removed. For the (-Q7, -Q1) period, firms with involuntary turnovers displayed -11.11% abnormal return (significant at the 10% level) compared to that of 3.06% (significant at the 5% level) of the voluntary turnover firms.

TABLE 2
ABNORMAL STOCK PERFORMANCE AROUND CEO TURNOVERS

This table reports abnormal stock performance over three window in the pre-turnover and post-turnover periods around the announcement [-Q7, -Q1], [-Q4, -Q1], [-Q1], [+Q1], [+Q1, +Q4], [+Q1, +Q7]. Stock returns are adjusted by a four factor model that includes the market risk premium (the spread between CRSP value-weighted market return and risk-free rate), SMB (the return spread between portfolios of small and big capitalization stocks), HML (the return spread between portfolios of high and low book-to-market stocks), and a momentum factor. The market model parameters are estimated with data over the 24-month period seven quarters before the turnover announcement quarter.

	Abnormal returns based on turnover and replacement types				
Period	All turnovers	Involuntary	True Voluntary	Diff	Diff
	(1)	(2)	(3)	(2)-(1)	(2)-(3)
-Q7 to -Q1	-6.65%	-11.11%	3.06%	-4.46%*	-14.17
-Q4 to -Q1	-7.67%	-9.12%	2.12%	-1.45%	-11.24
-Q1	-5.56%	-7.34%	-1.56%	-1.78%	-5.78*

***, **, * denote the significance level of 1%, 5%, 10%, respectively

ACCOUNTING AND MARKET PERFORMANCE AROUND CEO TURNOVERS

We evaluate accounting performance by employing two measures: ROA (= operating income/the book value of total assets) and ROE (= EBITDA/the book value of total assets) and market performance by market-to-book ratio (= book value of assets plus market value of common stock less the book value of common equity over book value of total assets). We calculate average annual change in both unadjusted and industry-adjusted returns for the [-Q7, -Q1] period. The results are produced in Table 3.

TABLE 3
CHANGES IN RETURN ON ASSETS (ROA), RETURN ON EQUITY (ROE) AND PRICE TO BOOK RATIO (P/B) BY TURNOVER TYPES

This table presents average changes in unadjusted and industry-adjusted ROA (operating income/the book value of total assets), unadjusted and industry-adjusted ROE (EBITDA/book value of total assets) and unadjusted and adjusted in price-to-book ratio during two periods [-Q7,-Q1], [+Q1, +Q7] around CEO turnovers for a sample of 421 turnovers for S&P 500 firms during the 2004-2011 periods.

Panel A: Change in ROA					
Period	All turnovers	Involuntary	True Voluntary	Diff	Diff
	(1)	(2)	(3)	(2)-(1)	(2)-(3)
Unadjusted ROA					
-Q7 to -Q1	-1.78	-3.28	1.79	-1.5	-5.07
Industry-adjusted ROA					
-Q7 to -Q1	-1.85	-3.01	1.52	-1.16*	-4.53*
Panel B: Change in ROE					
Period	All turnovers	Involuntary	True Voluntary	Diff	Diff
	(1)	(2)	(3)	(2)-(1)	(2)-(3)
Unadjusted ROE					
-Q7 to -Q1	-1.43	-2.67	2.77	-1.24*	-5.44
Adjusted ROE					
-Q7 to -Q1	-1.16	-2.22	2.47	-1.06*	-4.69
Panel C: Change in P/B					
Period	All turnovers	Involuntary	True Voluntary	Diff	Diff
	(1)	(2)	(3)	(2)-(1)	(2)-(3)
Unadjusted P/B					
-Q7 to -Q1	1.99	1.94	2.10	-0.05	-0.16
Adjusted P/B					
-Q7 to -Q1	2.14	2.13	2.05	-0.01*	0.08

***, **, * denote the significance level of 1%, 5%, 10%, respectively.

Panel A of Table 3 compares the average annual change in ROA, Panel B compares the ROE between the two groups, while Panel C compares the price-to-book.. In terms of industry-adjusted changes in

ROAs, the involuntary group shows negative changes from –Q7 to –Q1, while the change for the voluntary group during the same period is positive: the difference in the change is statistically significant at the 10% level. The result is similar with respect to adjusted ROE but not statistically significant. The increase in P/B from -Q7 to – Q1 for the involuntary firms is lower than that of the whole sample and significant at the 10% level.

To sum up, Table 3 provides evidence that firms with involuntary turnovers performed poorly relative to the all-firm-sample and more so relative to the voluntarily-resigning sample. Now we turn to the question of how early the governance systems of these firms were able to identify and remove the poor-performing CEOs. We hypothesize that proxies symbolizing good quality governance should be the early identifiers.

LENGTH VS. QUALITY OF CORPORATE GOVERNANCE

Econometric Model

Consistent with Huson et al. (2004), we use a two-step model developed in Heckman (1979) to deal with sample selection issue because some firms in the sample do not have involuntary CEO turnover until the end of the period 2004-2011. In the first step, we use probit model (6) to estimate the probability of removing CEOs and the inverse Mill's ratio ($\hat{\lambda}_i$):

$$P = \alpha_0 + \alpha_1 * quality\ of\ corporate\ governance + \alpha_2 * (LogOftheNumberOfSubsidiaries) + \alpha_3 * (LogOfCEOTenure) + \alpha_4 * (LogOfCEOtenure)^2 + \alpha_5 * Duality + \varepsilon \quad (6)$$

P is a binary variable that takes on a value of 1 if turnover is involuntary, 0 otherwise. Other variables are defined in previous sections.

In the second step, we estimate OLS model (7) with the $\hat{\lambda}_i$ added as an independent variable. The $\hat{\lambda}_i$ is supposed to capture the omitted variables in OLS regressions where data are censored (e.g., Heckman, 1979).

$$LogOfLength = \pi_0 + \pi_1 * quality\ of\ corporate\ governance + \pi_2 * \hat{\lambda}_i + v \quad (7)$$

Results of Model (6) and Model (7)

The results for probit model (6) and model (7) are reported respectively in column 1 and column 2 of Table 4. Table 4 indicates that the coefficients on percentage of outside directors are negative (-0.03114) for model (6) and (-0.02145) for model (7) (significant at the 1% and 5% levels respectively). The result implies a negative relation between representation of outsiders on board and the length of time the board takes to remove a poor performing CEO: This result is consistent with Weisbach (1988), Borokhovich et al (1996), Huson (2001), Maury (2006), Kato and Long (2006), Conyon and He (2008)). A negative relation also exists between ownership by outside blockholders and the length to dismiss a poor-performing CEO, suggesting that large equity stakes in the company provide block-holders an increased incentive to monitor management, resulting in higher performance-turnover sensitivity.

Coefficients on CEO ownership in both models are positive and significant: at the 5% level in model (6) and the 1% level in the model (7). Coefficients on managerial ownership almost mimic those of CEO ownership. These results are consistent with the findings of Denis et al. (1997) who report that higher levels of holdings by top managers decrease the sensitivity of turnover to performance. The effect of the board size on the length expired to fire a CEO is positive and significant (at the 5% level), implying that bigger board size has an adverse effect on the board efficiency. This result is consistent with Lipton and Lorch (1992), Jensen (1993) and Yermack (1996),

Consistent with Parrino, 1997, Allgood and Farrell, 2000, and Goyal and Park, 2002, along with others, we find a positive association between the log of CEO tenure and the length it takes to be removed

subsequent to poor performance. Table 4 results also suggest that the presence of duality (the CEO and the Chairman being the same person) delays removal of the CEO. This result is consistent with that found in Palvia (2011), Goyal and Park (2002), and Adams, Almerda, and Ferreira (2005) ,implying that that CEO/chairman duality jeopardizes board independence by increasing CEO power over the board.

In terms of the impact of incentive compensation for outside directors on the length on removing poor performing CEO, Table 4 shows that the length is significantly shorter when directors of independent boards (outside dominated board) receive incentive compensations than when they do not. Firms can increase the monitoring of the management team by providing directors with a financial stake in the performance of the firm. This result is consistent with Perry (2000) who documents that the likelihood of a CEO turnover following poor stock performance is high when outside directors of the board receive incentive compensation.[8]

Among the control variables, the number of subsidiaries (a proxy for the firm size and/or higher level of information asymmetry) has a positive relation (significant at the 5% level in Model 6) with the length.. The result implies that smaller firms tend to remove CEOs faster than larger firms. Denis et al. (1997) report similar results.

Coefficient on $\hat{\lambda}_i$ is positive 0.00713 and significant at 5%. A simple test of selection bias is available from regression (7). We can use the usual t statistics on $\hat{\lambda}_i$ as a test of $H_0 : \pi_2 = 0$. Under H_0, there is no sample selection problem. The coefficient on $\hat{\lambda}_i$ has a very small t statistics (0.1175), so we fail to reject $H_0 : \pi_2 = 0$, meaning that there is no evidence of a sample selection problem in estimating the length of removing CEOs.

TABLE 4
REGRESSION ANALYSIS OF DETERMINANT OF THE LENGTH IT TAKES TO REMOVE CEOS AFTER THE INITIAL SIGN OF POOR FIRM PERFORMANCE

This table reports regression results for the Heckman two-step model. Column 1 presents results for the first step where Probit model (6) is employed to estimate the probability of involuntary CEO turnover and the inverse Mill's ratio (λ). P is a binary variable that takes a value of 1 if there is a involuntary CEO turnover in companies, and 0 otherwise. Percentage of outside directors: number of outside directors divided by number of directors of the board. Board size: log of number of members of the board of directors. Managerial Ownership: number of all officers and directors shares divided by total shares outstanding (%). CEO Ownership: number of CEO shares divided by total shares outstanding (%).

Outside Blockholder Ownership: number of outside block holder shares divided by total shares outstanding (%). Dircomp: is dummy variable that is 1 if the company uses incentive compensation for outside directors. Number of subsidiaries: number of 4 digit subsidiaries for each firm. Firm performance is measured by ROA (return on assets). Dircomp*firm performance: interaction between firm performance and incentive compensation for outside directors. Column 2 presents results for the second step in the model (7). Length: the number of quarters a firm takes to fire its CEO subsequent to its first poor performance. CEO tenure: is measured by number of years a chief executive had been in office. Duality: is dummy variable that is 1 if a CEO is also a chairman.

	P	Log of Length
	(1)	(2)
Intercept	0.00452	0.00238*
Percentage of outside directors	-0.03114***	-0.01932**
Board size	0.00371	0.02385*
Duality	0.00318***	
CEO Ownership	0.00638**	0.006205***
Managerial Ownership	0.0349**	0.04529*
Outside Blockholder Ownership	-0.00310	-0.00307*
Dircomp	0.00325*	0.06822***
Dircomp * firm performance	-0.00892*	
Log of number of subsidiaries	0.00528**	
Log of CEO tenure	-0.00522**	
$(Log of CEO tenure)^2$	-0.00412	0.00558*
$\hat{\lambda}_i$ R-square	0.2615	0.3127

***, **, * denote the significance level of 1%, 5%, 10%, respectively.

ROBUSTNESS TEST

There are a few firms in our sample in which the first poor performance is followed by a second one. In this section, we examine whether the length to terminate a CEO is shortened in firms where there are two successive poor performances. The main regression:

$$P = \gamma_0 + \gamma_1 * (Percentage of Outside Director) + \gamma_2 * (Board Size) + \gamma_3 * (Managerial Ownership) + \gamma_4 * (CEO ownership) + \gamma_5 * (Outside Blockholder Ownership) + \gamma_6 * Dircomp + \gamma_7 * (Log of The Number of Subsidiaries) + \gamma_8 * (Log of CEO tenure) + \gamma_9 * (Log of CEO Tenure)^2 + \gamma_{10} * Duality + \gamma_{11} * D + \varepsilon \quad (8)$$

TABLE 5
REGRESSION ANALYSIS OF DETERMINANT OF THE LENGTH IT TAKES TO REMOVE CEOS AFTER THE SECOND SIGN OF POOR FIRM PERFORMANCE

This table reports regression results for the Heckman two-step model. Column 1 presents results for the first step where Probit model (6) is employed to estimate the probability of involuntary CEO turnover and the inverse Mill's ratio ( ). P is a binary variable that takes a value of 1 if there is an involuntary turnover, 0 otherwise. Percentage of outside directors=number of outside directors divided by number of directors of the board. Board size=log of number of members of the board of directors. Managerial Ownership: number of all officers and directors shares divided by total shares outstanding (%). CEO Ownership: number of CEO shares divided by total shares outstanding (%).

Outside Blockholder Ownership: number of outside block holder shares divided by total shares outstanding (%). Dircomp: is dummy variable that is 1 if the company uses incentive compensation for outside directors. Number of subsidiaries: number of 4 digit subsidiaries for each firm. Firm performance is measured by ROA (return on assets). Dircomp *firm performance: interaction between firm

performance and incentive compensation for outside directors. Column 2 presents results for the second step in the model (7). Length: the number of quarters a firm takes to fire its CEO subsequent to its first poor performance. CEO tenure: is measured by number of years a chief executive had been in office. Duality: is dummy variable that is 1 if a CEO is also a chairman. D is dummy variable that is 1 if firm performance is inferior performance once, 0 otherwise.

	P	Log of Length
	(1)	(2)
Intercept	0.00213*	0.01945
Percentage of outside directors	-0.00451*	-0.00926**
Board size	0.04544*	0.00278*
Duality	0.00432*	
CEO Ownership	0.00193**	0.00822**
Managerial Ownership	0.00651*	0.00877**
Outside Blockholder Ownership	-0.00229*	-0.00911*
Dircomp	0.02238*	0.00835*
Dircomp * firm performance	0.03428	
Log of number of subsidiaries	0.00650***	
Log of CEO tenure	-0.05060*	
	0.00297	
$(Log of CEO tenure)^2$		0.00445**
D	0.00238*	
$\hat{\lambda}_i$ R-square	0.2523	0.3034

***, **, * denote the significance level of 1%, 5%, 10%, respectively.

D is a binary variable, equals 1 if firm performance is inferior to the industry performance once, 0 otherwise. The other variables are defined as in the section 3.2.6. Using the same procedure Heckman two-step, overall finding suggests that the better the quality of internal corporate governance, the shorter is the time taken by the firm to get its poor performing CEO removed. In addition, firms experiencing poor performance more than once are more likely to remove their CEO faster.

CONCLUSION

In this paper, we investigate the effect of internal corporate governance on the length it takes to terminate CEOs after the initial sign of poor firm performance. Our sample consists of voluntary and involuntary CEO turnovers that occurred in the S&P 500 firm during 2004-2011. We investigate changes in firm performance proxied by three factors: ROA (return on assets), ROE (return on equity), and market-to-book ratio (M/B) by CEO turnover types.

The main result of this paper is that firms with more effective internal corporate governance are likely to be quicker in removing a poor-performing CEO. This result is consistent with the findings in the

previous literature (for instance Brickley et al. (1988); Weisbach (1988); Morck et al. (1988); McConnell and Servaes (1990); Denis et al. (1995, 1997)); Borokhovich et al (1996); Yermack (1996); Huson (2000); Perry (2000); Maury (2006); Kato and Long (2006); Conyon and He (2008)). Specifically, firms with higher proportion of outside directors, smaller board size, greater outside block-holder ownership, and higher incentive-based compensation for directors are associated with quicker dismissal of poor-performing CEOs. These three aspects of corporate governance have been found in empirical research to promote effectiveness of the governance system. On the other hand, firms with higher managerial as well as CEO ownership and in which a CEO is also the Chairman of the board are likely to take a longer time to remove the CEO. These features often lead to conflict of interests and partially insulate managers from internal monitoring mechanisms.

The above results prevail even after controlling for two factors that are not directly related to internal governance mechanisms----- number of subsidiaries and CEO tenure. A greater number of subsidiaries and longer CEO tenure delay the firing of a CEO pursuant to poor performance.

To address selection bias issue, we perform appropriate tests. The result shows that there is no evidence of a sample selection problem in estimating the length of removing CEOs. In summary, the more effective the internal corporate governance, the shorter the length it takes to get CEO removed following the initial sign of bad firm performance.

ENDNOTES

1. The negative relation between CEO turnover and firm performance are not limited to the U.S. firms, but are found abroad as well: Australia (Suchard et al (2001)), Belgium (Renneboog (2000)), Britain (Conyon (1998), Conyon and Florou(2002)), and China (Conyon and He (2008), Kato, and Long (2006)).
2. Although the overwhelming majority supports the greater efficiency of the smaller board size, this opinion is not unanimous. For example, Faleye (2003) do not find significant differences in the sensitivity of CEO turnover to performance based on the board size. Faleye suggests that both small and large boards are likely to terminate the CEO when faced with significant and consistent deterioration in performance.
3. Not all scholars view duality as having negative implications for the firm. These researchers argue that duality is merely a "natural result of succession process" and thus has no systematic impact on firm performance (e.g., Brickley, Jeffrey, and Gregg (1997), Adams et al (2005), and Chen (2012)). Zajac and Westphal (1996) argue that the power of a board is decided by its tenure relative to that of the CEO. It is reasonable to assume that duality alone will not significantly increase the power of a successor CEO over the board since the former is new to the CEO position.
4. A block-holder is defined as the one who owns at least 5% of the firm's shares and is not related to the top management team (or do not own shares over which managers have some voting authority).
5. However, the effect of outside block holders on the turnover sensitivity to performance might not be as strong as the sensitivity with respect to managerial ownership. The reason is that different outside block holders have different incentives to monitor managers. For example, Brickley et al (1988) argue that certain institutional investors with potential business relationships with a firm are more likely to align themselves with incumbent managers. Other institutions, lacking the potential for a business relationship are less likely to have their actions affected by the conflict of interest.
6. Since the early 1980's, the proportion of outside directors receiving stock options and stock grants has increased dramatically. In a 1989 Conference Board Survey of 909 firms, Bacon (1989) finds that six percent of firms granted stock to outside directors and 14 percent granted stock options. In the 1997 Conference Board survey, the percentage of firms paying stock-based compensation to outside directors had increased to 84 percent (Worrell (1997)). Also, Pearl Meyer and Partners (1996) report that the stock-based compensation paid to outside directors at the 200 largest industrial and service corporations increased from 2 percent to 22 percent of directors' total pay between 1985 and 1995.
7. This figure is close to CEO average age reported in Wall Street Journal: "The age of directors rose steadily since 2007, when the median age of directors was around 61, the firm said. The median age of newly-hired directors last year was 57, while in 2007 it was between 55 and 56." https://blogs.wsj.com/cfo/2015/06/17/average-director-age-creeps-higher/

8. Our result persists when we use ROE and abnormal returns as alternative measurements of firm performance.

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