Essays in Corporate Finance and Governance

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This dissertation consists of three essays in corporate governance.

The first essay examines the effects of exogenous CEO health shocks on firm performance and corporate decisions. I build a hand-collected data set of incumbent CEO accident, illness, and disease events. The results demonstrate that CEO health shocks have a negative effect on firm performance, whether the CEO departs as a result of the event or stays with the firm. In sub-sample analysis of CEOs who continue with their careers, I find a persistent change in within-manager behavior: CEOs who experience significant health shocks adopt more conservative corporate policies. This contributes the CEO managerial style literature and provides evidences that CEO style varies across tenure.

The second and third essays examine different aspects of CEO succession planning. The second essay examines the impact of CEO succession planning during CEO turnover events. To isolate the value of firm succession plans, I use the sudden death of CEOs as a natural experiment. Firms with succession plans have positive announcement effects and higher firm performance following the turnover event, and these effects are significant economically. I find evidence that firms with succession plans are less likely to appoint COOs or interim CEOs and make appointments from a larger section of the CEO labor market. These results highlight the economic importance of CEO succession planning as part of the board's monitoring function.

The third essay examines the factors affecting the likelihood of a firm having a CEO succession plan. I document a causal relationship between director experience and firm adoption of succession plans. To examine the effects of director experience, I study directors who have multiple directorships; I use only experience acquired from other firms after the director joined the current firm. This identification accounts for selection concerns by exploiting the exogenous variation in director experience. In a series of additional tests, I find a negative association with CEO power and a positive association with peer firms and the adoption of succession plans.

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Signed ..

Date.....

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Abstract

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Chapter 1

Introduction

1.1 Introduction

The Chief Executive Officer (CEO) has influence over crucial firm decisions (Bertrand and Schoar 2003; Graham, Harvey, and Puri 2013; Bernile, Bhagwat, and Rau 2016) and firm performance (Jensen and Meckling 1976; Adams, Almeida, and Ferreira 2005; Bertrand 2009; Jenter and Kanaan 2015). Estimating the impact of these top managers and explaining the heterogeneity of decision making is empirically challenging and a central question of research in corporate governance (Bennedsen, Perez-Gonzalez, and Wolfenzon 2006; Shue 2013; Nguyen and Nielsen 2014).

The first essay of this dissertation, investigates variations in the health of CEOs to examine the consequences on firm decisions and performance. How do shocks to the human capital of the CEO affect the firm in both the short run and long run?

Prior research shows that the managerial style of the CEO (Bertrand and Schoar 2003; Bertrand 2009; Fee, Hadlock, and Pierce 2013) explains variations in corporate policies that traditional firm, industry and market fundamentals cannot. Hence understanding factors that affect managerial style become important. Managerial style is determined in part by life experiences (Malmendier, Tate, and Yan 2011; Graham, Li, and Qiu 2012; Kaplan, Klebanov, and Sorensen 2012; Benmelech and Frydman 2015). The medical and psychology literature shows that accidents, diseases and illnesses (health shocks) are a particularly significant life experience (Holman, Silver, and Cohen Silver 1998; Turner and Kelly 2000; Seery, Holman, and Silver 2010).

As shown by Bertrand and Schoar in their seminal work (2003), corporate decisions can be attributed to these managerial fixed effects (managerial style). However, as noted by Fee, Hadlock, and Pierce (2013), CEO behavior is not fixed and experiences during the tenure can have a meaningful impact on future decisions. The first essay builds

on the CEO fixed effect literature and demonstrates using, CEO health shocks as a natural experiment, that CEO style varies across tenure. The finding provides evidence of variation of within-manager style and effort.

Using a hand collected data set to estimate the effects of CEO health shocks. I examine individuals who are currently CEOs of a firm. I exploit the exogenous assignment of accidents, disease, and illness events. I then examine changes in firm performance and corporate decisions. Importantly, by examining incumbent CEOs who experience an exogenous shock to their health, I can isolate the effect of the health shock while keeping all other CEO and firm factors constant and therefore address the identification problems related to selection and dynamic matching.

The results of the first essay show that shocks to the health of CEOs affect their ability to exert effort and have a negative impact on their productive capacity at time horizons of up to two years. A result consistent with the predictions of CEO performance models (Holmström 1982; Jenter and Kanaan 2015). In analysis of CEOs that survive the health shock and remain as a CEO, I observe a persistent change in risk-taking behavior as evidenced by the adoption of more conservative corporate policies.

Overall, the results of the first essay contribute to the literature on the importance of CEOs and how variations in their human capital, through health shocks, affect the firm. Specifically, I provide evidence on the economic effects of CEO health shocks as well as evidence of variation in within-manager behavior.

In essay's 2 and 3, I examine CEO succession plans. This research emerged in part from the examination of CEOs experiencing health shocks. It was found 42 percent of these CEOs passed away within 24 months of the initial disclosure, which required boards to appoint a CEO successor. Although a tragic personal circumstance, it is part of the

wider trend in CEO turnovers and the associated decline in CEO tenure, dropping 40 percent since 1992. Over 10 percent of S&P 500 firms transitioned to a new CEO in 2015. A result has been that boards are required to navigate the transition from one firm leader to another with greater frequency.

The responsibility of preparing for a CEO turnover begins in advance of the turnover event, the task of CEO succession planning is part of the board's ongoing monitoring functions (Vancil 1987). The Security and Exchange Commission (SEC) asserted that, "One of the board's key functions is to provide succession planning so that the company is not adversely affected due to a vacancy in leadership" (SEC 2009). Survey evidence indicates significant cross sectional variation in boards performing succession planning, Spencer and Stuart (2015) found one-third of boards do not discuss succession planning annually.

The second essay focusses on examining the effects of succession planning and establishing causation between succession planning and firm risk and performance surrounding CEO turnovers. As noted by Naveen (2006), "CEO succession as a process has received little explicit attention in the finance literature". This in part is due to the empirical challenges of identifying firm succession plans and isolating their effects on CEO turnovers. I exploit a natural experiment that causes unexpected CEO departures, sudden CEO deaths, exogenously identifying firms with and without succession plans.

I find evidence that succession planning has positive firm value effects around CEO turnover events. I find a positive association between the abnormal returns surrounding the departure of the CEO and firms that have evidence of succession plans across different measures. This is an important result, as I provide evidence that firms that have succession plans experience a positive price impact following the loss of the CEO

relative to those without succession plans. The existing literature on the firm value effects of CEO turnovers is mixed (Weisbach 1995; Parrino 1997; Huson, Malatesta, and Parrino 2004) and does not consider the importance of managerial succession planning.

In a further series of tests, I explore the economic rationale for the positive value effects of firm CEO succession plans. An obvious implication of a firm having a succession plan is that it will begin preparing for CEO turnover events in advance. The board will begin the learning and evaluation of candidates at an earlier point, ceteris paribus, than firms without succession plans (Hermalin and Weisbach 1998; Goel and Thakor 2008). I find that firms which have a succession plan have a larger and better skilled CEO candidate pool to select from, this result is consistent with CEO selection theory.

A further contribution of this essay is the development of a new measure to identify CEO succession plans. Using a text matching algorithm, I examine SEC Edgar filings and firm media releases to identify companies referring to succession plans. To the best of my knowledge, this is the first paper to identify firm succession plans based on actual firm disclosures. This allows for the identification ex-ante of firms engaging in succession planning. By hand-collecting firm disclosures related to succession plans, I do not rely on proxies and therefore improve the firm-level identification of succession plans (Shen and Cannella 2003; Naveen 2006).

Overall, the results of the second essay provide empirical evidence of the importance of CEO succession planning and its effect on the CEO turnover process. This essay provides evidence that CEO succession plans have a positive effect on firm value and documents that succession plans are a corporate governance mechanism to improve the efficiency of the matching process between the skills of the available talent in the CEO labor market and the skills demanded by the firm.

The third essay continues the examination of CEO succession plans, examining factors affecting the likelihood of firms having or adopting CEO succession plans. I hand-collect a unique dataset of firm level succession plan information as well as information on directors with succession planning experience.

I document a relationship between director experience and the likelihood of a firm having a succession plan. I observe that director succession planning is a type of expertise and an important determinant of whether a firm will adopt a succession plan and therefore contribute to the literature on director experience (Burak Güner, Malmendier, and Tate 2008; Custódio and Metzger 2014; Dass et al. 2014). This result is robust to concerns about endogeneity, as I exploit exogenous variations in director experience. Secondly, I find that the likelihood of a firm having a succession plan is negatively associated with CEO power (Shivdasani and Yermack 1999; Coles, Daniel, and Naveen 2014), a result that is consistent with the predictions of agency theory (Jensen and Meckling 1976; Fama and Jensen 1983).

The rest of the dissertation is organized as follows. Chapter 2 (essay 1) focusses on the economic effects of CEO health shocks and provides evidence of within-manager variation. Chapter 3 (essay 2) and chapter 4 (essay 3) investigate CEO succession planning. Chapter 3 provides evidence on the economic value and firm channels for CEO succession planning, while chapter 4 explores factors affecting the likelihood of a firm having and adopting a CEO succession plan. Chapter 5 concludes with a summary of the dissertations main findings. Each chapter is self-contained and has its own introduction, hypothesis development and empirical analysis.

Chapter 2

CEO Health Shocks: Cheating Death Can Change You and Your Firm

Abstact

This paper examines the effects of exogenous CEO health shocks on firm performance and corporate decisions. I build a hand-collected data set of incumbent CEO accident, illness, and disease events between 1996 and 2014. The results demonstrate that CEO health shocks have a negative effect on firm performance, whether the CEO departs as a result of the event or stays with the firm. In sub-sample analysis of CEOs who continue with their careers, I find a persistent change in within-manager behavior: CEOs who experience significant health shocks adopt more conservative corporate policies.

A day after he was diagnosed, Dimon called Lee Raymond, the former CEO of Exxon Mobil and the lead director on the JPMorgan Chase board. Raymond was supportive, as were his fellow board members. "Don't worry about the company," they told him. "Don't worry about us. Focus on yourself and family." ... He is not yet sure how the bout with cancer has changed him. He believes the way he can still make the most difference for the world is at JPMorgan.

(Cohan and Sean 2015)[1]

2.1 Introduction

The Chief Executive Officer (CEO) is the leader of the firm, affecting corporate policies (Bertrand and Schoar 2003; Graham, Harvey, and Puri 2013; Bernile, Bhagwat, and Rau 2016) and firm performance (Jensen and Meckling 1976; Bennedsen and Pérez-González 2006; Bertrand 2009; Nguyen and Nielsen 2014). Empirical evidence shows that the managerial style of the CEO (Bertrand and Schoar 2003) explains variations in corporate policies that traditional firm, industry, and market fundamentals cannot. Managerial style is determined in part by life experiences (Malmendier, Tate, and Yan 2011; Graham, Li, and Qiu 2012; Kaplan, Klebanov, and Sorensen 2012; Benmelech and Frydman 2015). A particularly significant life experience is an accident, disease, or illness (health shock). Management consultant Grant Thornton surveyed 250 CEOs of companies with revenues of $50 million or more: 22 percent reported that they have had an experience when they believed they would die and, of those, 61 percent said that it changed their long-term perspective on their life or career.

In this paper, I examine CEOs who have experienced a health shock, and the impact on their corporate decision making and firm performance. To test the effects of changes

[1]Excerpted from "Wall Street Executives from the Financial Crisis of 2008: Where are they now?", Vanity Fair, April 2015.

in incumbent CEO health, I hand-collect information on CEO health over the 1996 to 2014 period. I am able to identify 316 events, which include accidents, cancer, heart disease, and strokes. The events detected are significant life events, as evidenced by more than 60 percent of the sample taking a period of medical leave and 42 percent passing away within 24 months of the initial disclosure.

Estimating the effects of a particular CEO's experience on a firm faces two identification problems: selection and dynamic matching. Selection bias occurs when a CEO with an unobserved characteristic self-selects into a peer group. This makes drawing a causal link between the experience and CEO decision making susceptible to concerns about endogeneity. For example, drawing a causal link between graduating from Harvard and a CEO's corporate policy is not possible, as an unobserved factor may drive both outcomes. Certain types of students may select into Harvard, and Harvard may instill a particular management philosophy into its graduates (Shue 2013).

The second empirical challenge, is the issue of dynamic matching between firms and individuals (Roberts and Whited 2012; Bernile, Bhagwat, and Rau 2016). Since CEO selection is endogenous (Adams, Hermalin, and Weisbach 2010), a firm may appoint a CEO because of industry factors or a particular strategy. For example, firms in the defense industry may be more likely to appoint a CEO with military experience. As noted by Ellis, Guo, and Mobbs (2015), this dynamic matching issue is "particularly difficult to overcome ... because in most contexts the executive has already obtained the relevant experience prior to being appointed"; therefore, drawing a causal link between the experience and the firm outcomes is challenging.

In this paper I use a novel empirical design to estimate the effects of CEO health shocks. I examine individuals who are currently CEOs of a firm. I exploit the exogenous

assignment of accidents, disease, and illness events. I then examine changes in firm performance and corporate decisions. Importantly, by examining incumbent CEOs who experience an exogenous shock to their health, I can isolate the effect of the health shock while keeping all other CEO and firm factors constant and therefore address the identification problems related to selection and dynamic matching.

Following an adverse change in health, a utility-maximizing manager will rationally trade off private life activities with firm productive outcomes (Becker 1965). The CEO experiences an attention shock (Falato, Kadyrzhanova, and Lel 2014), which results in a variation in within-manager effort. Consistent with models of CEO performance (Holmström 1982; Jenter and Kanaan 2015), I find that firms that have CEOs who experience a health shock suffer negative firm effects surrounding the disclosure period. On average, firms disclosing a health shock experience a loss in value of 2.38 percent. This is economically significant with a loss in firm value of $158 million.

An implication of a CEO becoming unwell is that the outcome is not certain. In the sample 43 percent pass away within 24 months of the initial disclosure. To investigate the effects of the uncertainty, I examine changes in volatility. Idiosyncratic volatility is found to increase in the 12 months following the health shock but incrementally declines over the period, returning to the pre-disclosure levels.

I find that shocks to the health of CEOs affect their ability to exert effort and have a negative impact on their productive capacity. For example, the average effect, all else being equal, for a firm of which the CEO experiences a health event is a reduction in firm performance of 3.85 percent. When illnesses are categorized based on severity, it is found that a chronic illness results in a reduction of 6.67 percent compared with an acute medical event, which adversely affects performance by 1.27 percent. This result

is supported by the medical literature, which finds that acute illnesses are usually isolated to one bodily area and respond to treatment. In contrast, chronic illnesses are generally long-term conditions that frequently involve multiple bodily systems and have an uncertain future. In addition, chronic illnesses usually require more care and resources to maintain normalization in lifestyle (Murrow and Oglesby 1996).

In an examination of CEOs who continue with their careers, I observe a persistent change in behavior. The psychology literature shows that health related events are a traumatic life experience (Holman, Silver, and Cohen Silver 1998; Turner and Kelly 2000; Seery, Holman, and Silver 2010).Variations in health are found to influence an individual's degree of risk aversion and rate of time preferences (Rosen and Wu 2004). Significant life events can have a persistent effect on behavior, for example, Malmendier, Tate, and Yan (2011) observe the effects of being born during the Great Depression, and Bernile, Bhagwat, and Rau (2015) document how early life disaster experiences affect risk taking in later life.

Following a health shock, CEOs are likely to increase their holdings of cash and make fewer investments. This finding is consistent with the literature in that key life experiences have an effect on CEOs' risk-taking propensity (Malmendier and Tate 2008; Kaplan, Klebanov, and Sorensen 2012; Graham, Harvey, and Puri 2013). I do not find any evidence that there are any permanent effects on firm performance following adverse health experiences.

This paper is related to the literature on the effect of CEOs on firm performance and policies, for example Bertrand (2009), Benmelech and Frydman (2015), and Bernile, Bhagwat, and Rau (2016). Overall, the results of this paper show that CEO illness events are associated with a reduction in firm performance at time horizons of up to

two years but at longer time horizons the effect of the event diminishes. Persistent effects of CEO firm decisions are observed following health shocks.

Related papers include those by Bennedsen, Perez-Gonzales, and Wolfenzon (2012) and Holland and Lel (2015). The aforementioned papers examine the effects of CEO hospitalization in Denmark and non-sudden executive deaths in the US, respectively. My findings examining the effects on firm performance in the period surrounding CEO health events find consistent directional effects with these related works. There is variation in the economic magnitudes, this paper contains large US listed firms as compared to the Bennedsen, Perez-Gonzales, and Wolfenzon (2012) sample which includes all Danish firms and is therefore skewed towards small and medium sized firms. There is also significant difference in the research question and empirical design of this paper, I examine whether CEO health events have a persistent effect on within-manager behavior. That is, I examine a sample of CEOs who continue on with the firm and the implications for firm decisions and performance. These other papers do not examine the persistent effects of CEO health events on the firm or CEO.

A technical contribution of this paper is the method used to identify CEO health events. The sample is constructed using key word matching and natural language processing techniques. The use of these tools allows the for the accurate examination of a large set of information sources that manual examination prohibits. This technique, to my knowledge, is not used in the previous finance and economics literature.

The remainder of the paper is organized as follows. Section 2.2 reviews the literature and develops the paper's testable hypotheses. Section 2.3 discusses the experimental design. Section 2.4 concerns the sample development and data. Section 2.5 shows the main results. Section 2.6 presents alternative robustness tests, and Section 2.7

concludes.

2.2 Motivation and Literature Review

This paper examines the effects of CEO health on firm performance and corporate decision making. The following section reviews the previous literature and develops the paper's hypotheses.

2.2.1 CEO Health and Attention Shocks: What Happens in the Short Run?

The CEO is an important factor of production for the firm and is one of the key decision makers, determining corporate policy (Bertrand and Schoar 2003; Graham, Harvey, and Puri 2013) and firm performance (Jensen and Meckling 1976; Fama and Jensen 1983; Bertrand 2009; Nguyen and Nielsen 2014). The performance of the CEO is a function of the CEOs effort and a random component beyond the control of the CEO (Holmström 1982; Jenter and Kanaan 2015). A related view, based on Becker's (1965) seminal labor model, would argue that a utility-maximizing manager will rationally trade off labor for productive outcomes with the firm versus rewards from private-life activities. Both theories support the view, that firm performance is affected, at least in part, by the effort exerted by the CEO. It thus follows that shocks to the health of the CEO affect his or her ability to exert effort within the firm, and have a negative impact on his or her productive capacity.

Several prior studies estimate the effect of the CEO's labor input on firm value following

the death of the CEO. Albeit a tragic personal circumstance, the sudden death of the CEO creates exogenous variation in the management of the firm and allows the value and manager-specific effects of the CEO to be isolated[2]. For example, an early work by Johnson et al. (1985) examines a small sample of 53 CEO deaths and finds a negative abnormal announcement effect for non-founder CEOs. Falato, Kadyrzhanova, and Lel (2014) find that the sudden death of directors and CEOs creates an "attention shock," increasing the work commitments of board members. Fracassi and Tate (2012) examine how changes in CEO and director ties due to death and retirement affect firm value, while Pan, Wang, and Weisbach (2015) find that, stock volatility increases following the death of a CEO. A unifying thread of these studies is the examination of firm effects from a complete change in the CEO. In contrast, this paper examines the effects of keeping the same CEO and varying the CEOs human capital. Simply put, earlier research examines the effects of a change to zero (death) (Becker 1965; Gronau 1976), while this study examines the effects of a partial depreciation in human capital.

This leads to the paper's first hypothesis:

H1.1 CEO medical events negatively affect firm performance.

The prior literature examining the economic impact of health shocks largely focuses on the general population or sub-cultural groups and the effects on labor productivity (Thompson et al. 1998; Alsan and Wanamaker 2016; Blanchet et al. 2016). Variations in health are found to influence individuals' marginal utility of consumption, their degree of risk aversion, and their rate of time preferences (Rosen and Wu 2004). For example, Finkelstein, Notowidigdo, and Finkelstein (2013) estimate that chronic disease

[2]Examples of studies that use death to study the effects of the CEO on the firm include the following: Johnson et al. (1985); Worrell et al. (1986) ; Salas (2010); Fracassi and Tate (2012); Fee, Hadlock, and Pierce (2013); Nguyen and Nielsen (2014); and Pan, Wang, and Weisbach (2015).

results in a 10–25 percent decline in the marginal utility of consumption. This paper extends this to the firm level to understand how health shocks to key decision makers affect firm performance and corporate decisions.

Complementary work examining firm effects from health shocks includes Bennedsen, Perez-Gonzalez, and Wolfenzon's (2012) paper, which investigates CEO hospitalization events in Denmark and finds that profitability, revenue, and investment outcomes are economically and statistically affected following hospitalization events of five days or more. Similar results are obtained by Holland and Lel (2015), who examine non-sudden deaths of senior executives and find that firms adopt more conservative investment, cash, and leverage policies. These empirical results are consistent with the theory that CEOs rationally allocate effort away from the firm if they are affected by a matter in their private life, such as a health shock.

This leads to the paper's second hypothesis:

H1.2 CEO medical events affect corporate policies.

2.2.2 CEO Health and Manager-Specific Impacts: What Happens in the Long Run?

While a fraction of CEOs who experience accidents, disease, and illness will subsequently pass away (a complete depreciation of human capital), a proportion of them will continue with their careers. The second hypothesis of this paper, is that these health events have a persistent effect on manager-specific characteristics.

Following the seminal study by Bertrand and Schoar (2003), which highlights the role of manager-specific effects on corporate policies, a large literature has developed that

studies how the life experience of a CEO matters to managerial style. CEOs' managerial style explains a large fraction of the variation in firm corporate policies that traditional firm-level fundamentals cannot explain (Bertrand and Schoar 2003; Fee, Hadlock, and Pierce 2013; Graham, Harvey, and Puri 2013).

There is strong evidence that the life experiences of CEOs affect their attitude towards corporate policies. Malmendier and Tate (2005) study education, Kaplan, Klebanov, and Sorensen (2012) examine personal characteristics, and Güner, Malmendier, and Tate (2008), Graham, Harvey, and Puri (2013), and Benmelech and Frydman (2015) and Cain and McKeon (2016) analyze personal traits. A common thread in this literature is the notion that exposure to a particular life experience has an effect on a CEO's risk-taking propensity and hence on corporate policies.

Health related events are a traumatic life experience (Holman, Silver and Silver 1998; Turner and Kelly 2000; Seery, Holman, and Silver 2010). Bennedsen, Perez-Gonzalez, and Wolfenzon (2006), using a large sample of Danish firms, observe that the death of a CEO's family member has a negative impact on the firm. Their result that family member deaths have a systematic effect on firm profitability is supportive of the concept that there is time variation in within-manager behavior (Fee, Hadlock, and Pierce 2013).

This paper postulates that CEOs who experience health shocks and continue in their functions as CEO are affected by the experience. One possibility is that CEOs' attitude is affected by the health shock, for example an individual who recovers fully from a vehicle accident but, as a result of the event, experiences a change in risk aversion and time horizons. In this condition the CEO recovers but the experience has an economic effect on his or her decision making. An alternative possibility is that the CEO continues to experience adverse effects from the health shock; in this condition the CEO remains

in his or her role but the human capital is reduced, for example a CEO who suffers a heart attack or a chronic illness and has a reduced ability to exert effort.

Disentangling the conditions is challenging, as the CEO does not have a legal obligation to reveal private medical information (American Disability Act 1990). However, the SEC's overarching disclosure principle is that any material event that affects the market valuation of a firm to the market and its current or potential shareholders must be disclosed, including the ability of the CEO to carry out his or her functions[3]. Both conditions lead to the same effect: health shocks experienced by CEOs have long-term effects on their behavior.

This leads to the paper's final hypothesis:

H1.3 CEO medical events have a persistent effect on the CEO's manager-specific characteristics.

2.3 Empirical Strategy: CEO Experience and Endogeneity

In this paper, I estimate the effects of CEO health shocks by exploiting the idiosyncratic nature of accidents, illnesses, and diseases. This empirical strategy generates exogenous variation in the CEOs' human capital through random assignment while keeping all other factors constant. The use of exogenous health shocks to incumbent CEOs creates an ideal experimental setting to examine within-manager variation.

[3]There is a well-developed literature debating the disclosure obligations of firms in relation to employees' health matters. Examples include Abril and Olazábal (2009), Horwich (2009) and Stokes (2011).

Estimating the effects of a specific CEO experience on firm performance or corporate policy faces the twin identification problem of selection (Prabhala and Li 2007; Adams, Hermalin, and Weisbach 2010; Roberts and Whited 2012) and dynamic matching (Roberts and Whited 2012; Ellis, Guo, and Mobbs 2015; Bernile, Bhagwat, and Rau 2016). Selection occurs when unobserved characteristics result in self-selection into peer groups; therefore, drawing causal links between the experience and the firm effects is problematic due to concerns about endogeneity. Simply put, is a CEO who has military experience (Benmelech and Frydman 2015), holds a pilot license (Cain and McKeon 2016), or is unmarried (Roussanov and Savor 2014) different from his or her peers who do not have this experience or qualification? The experience may simply be a proxy for unobserved heterogeneity. The non-random assignment of the experience makes it challenging to establish causal effects.

To address the challenges of selection, one approach is to use life experiences that are exogenous. Two notable examples are Malmendier and Tate (2005) and Malmendier, Tate, and Yan (2011), who use births during the Great Depression, and Bernile, Bhagwat, and Rau (2016), who use early life exposure to disaster events. An appealing feature of this setting is that these events generate exogenous variation in an individual's life. However, as the relevant experience is acquired prior to appointment, it is difficult to address the problem of dynamic matching between firms and CEOs. The challenge of dynamic matching occurs because of the highly endogenous nature of CEO selection (Hermalin and Weisbach 1998; Adams, Hermalin, and Weisbach 2010). This makes it difficult to isolate the effects of the experience on the firm, as the experience was acquired prior to joining the firm.

In this regard this paper's empirical set up addresses these estimation challenges by

examining CEOs who already hold the appointment and subsequently experience exogenous variation in their health through the random assignment of different accidents, illnesses, and diseases while keeping all other factors constant. This allows for causal links between the effects of CEO health shocks on firm performance and the corporate decisions.

A final empirical challenge concerns reverse causality. That is, changes in firm performance or corporate decisions are the driver of CEO health shocks. For example, poor firm performance may increase the incidence of stress and an associated decline in health. Recent empirical evidence by Engelberg and Parsons (2016) shows a causal relationship between stock returns and hospital admissions, particularly for conditions related to stress, such as anxiety and panic attacks. To address this, I restrict the sample selection to non-stress related illnesses.

2.4 Sample Selection and Summary Statistics

This section outlines the paper's approach to the identification of CEO health events and the construction of the CEO health shock sample. Two samples are examined. The first sample includes all CEO health shocks, pooling together CEOs who do and do not recover from the health shock. This sample tests the implications of variations in CEO effort for the firm. The second sample is restricted to CEOs who experience a health shock and continue in their role as CEO. The second sample examines whether CEOs' health shocks have a persistent effect on within-manager behavior. The sample begins in 1996, the earliest year for which board, CEO, and firm information can comprehensively be developed, and ends in 2014.

2.4.1 Identifying CEO Illness Events

To identify events related to CEO health, I examine over 1.2 million SEC 8-K and 10-K filings as well as the news aggregation sources Factiva, LexisNexis[4], and Capital IQ between 1996 and 2014. The initial sample of CEO health events is identified using keyword matching and natural language processing. The accurate examination of a large set of information sources prohibits the use of manual examination initially. Like a number of recent papers, I use keyword matching; see for example Nguyen and Nielsen (2010); Cohen, Frazzini, and Malloy (2012); Falato, Kadyrzhanova, and Lel (2014); and Nguyen and Nielsen (2014). Examples of keywords include medical leave, accident, cancer, and health related. An innovation of this paper is the use of natural language processing tools that consider the context of the word usage. Keyword matching in isolation can result in imprecise sample construction. For example, a keyword search related to cancer will capture all references to cancer (35,678 references). In contrast, a natural language process combined with keyword matching reduces this to 1879 matches and therefore increases the precision of the initial sample[5]. This technique, to my knowledge, is not used in the previous finance or economics literature.

The use of a broad set of information sources, including both company filings and media, is important to mitigate the potential sample selection issues that arise from ambiguity about disclosure requirements. While there is no SEC rule requiring disclosure of a CEO's health status on an ongoing basis, the SEC does require disclosure when a CEO is unable to perform his or her responsibilities for a significant period of time or, on a

[4]Lexis-Nexis and Factiva searches include the following publications: *BusinessWeek*, *Dow Jones News Service*, *Financial Times*, *Forbes*, *Fortune*, *International Herald Tribune*, *Los Angeles Times*, *The Economist*, *The New York Times*, *The Wall Street Journal*, *The Washington Post*, and *USA Today*.

[5]Appendix A.3 provides further details about the search tools used in this paper.

quarterly basis, when a company becomes aware of a risk that could materially affect its operating results. It is necessary to examine different information sources, as news agencies may be the first to raise queries relating to CEO health. Reliance on company announcements or SEC filings could result in the incorrect identification off the earliest public reference to a change in the CEO's health status.

To be classified as a CEO health event, I require the individual to hold the position of CEO at the time of the health shock. Health conditions identified prior to being appointed CEO, for example pre-existing medical conditions, are excluded from the sample. The event must also clearly reference a change in the health condition of the CEO. For example, leave taken for "personal reasons" is not included in the sample, as the underlying cause cannot be identified. An extensive manual search of these information sources is undertaken to identify the earliest reference to the health shock, the cause, whether medical leave is taken, and the duration of the medical event. To ensure accuracy when imposing duration measures, I use beginning and ending dates rather than the year in identifying the illness period and subsequent matching with firm performance.

If information concerning the beginning of the illness is not disclosed, then this observation is removed from the sample. If the ending date of the health event is not able to be identified, I assume either the CEO's departure from the firm or one calendar year from the beginning of the illness if the CEO remains with the firm. To classify a CEO as recovering from the illness, I require the CEO to return to his or her previous position and maintain the appointment for at least 24 months after resuming their function.

2.4.2 CEO Health Shock Summary Statistics

The sample consists of 316 CEO illness events between 1996 and 2014. Figure 2.1 reports the time series distribution of CEO Health Shocks.

< Insert Figure 2.1 Approximately Here >

For the classification of health shocks, I rely on the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention. The NCHS collects information from all resident death certificates filed in the US, using demographic and medical characteristics, and follows the International Classification of Diseases, Tenth Revision (ICD-10). As reported in Table 2.2, the two most common medical events disclosed are heart disease (24.68 percent) and cancer (26.90 percent). In the sample 61.34 percent of CEOs take medical leave and 57.98 percent recover. It is noteworthy that the CEOs in our sample display differences in the types of medical events relative to members of the same age group in the general US population.

< Insert Table 2.1 Approximately Here >

Information on the CEOs is obtained from ExecuComp and BoardEx, SEC 8-K and 10-K filings, and media sources. To match across databases, I use a name-matching algorithm that takes into account misspelling, incorrect word order, nicknames, and name omissions and accounts for the tonal characteristics of names[6]. Observations are then manually checked for missing values or potential error observations (outliers or

[6]I thank Robert Tumarkin for providing this matching algorithm. Please see Sen and Tumarkin's (2015) online internet appendix for a detailed discussion of the matching procedure.

different age records for the same CEO among different databases). Table 2.2 Panel A reports the CEO characteristics.

< Insert Table 2.2 Approximately Here >

Next, I collect firm fundamental data from Compustat and stock return data from CRSP. Firms that are not contained in Compustat are excluded from the final sample. I follow Adams, Almeida, and Ferreira (2005) by cleaning the Compustat fundamental data, dropping firms with missing or negative values for total assets (AT), capital expenditures (CAPX), property, plant, and equipment (PPENT), cash holdings (CHE), or sales (SALE). I also drop firms for which the cash holdings, capital expenditures, or property, plant, and equipment are larger than the total assets. Table 2.2 Panel B reports the firm characteristics.

2.5 Results

2.5.1 Sick CEOs and Firm Outcomes: What Happens in the Short Run?

2.5.1.1 Market Reaction to CEO Health Shocks

In this section I examine the effect on the firm from disclosing that a CEO has suffered a health shock (non-death medical event). To examine the stock price reaction to health shocks, I access the daily returns from the Center for Research in Security Prices (CRSP) for each of the 316 events for an 11-day period around the disclosure date (from day

-5 to day +5) as well as a 255-day pre-event estimation period (this period is -300 to -46 days prior to the illness event). The event day is defined as the trading day of the earliest reference to the CEO's medical event. If the announcement occurs on a non-trading day, the event trading day is defined as the first trading day following the announcement. For each observation I check for the possibility of confounding news in the period immediately surrounding the CEO medical event, day -1 to day +2. Examples of confounding events include earnings announcements, mergers and acquisitions, and stock repurchases.

The results of the event study are reported in Table 2.3. Panel A reports the time series of abnormal returns for the 11 trading days around the CEO illness announcement. The mean abnormal return and the number of positive and negative abnormal returns for each of the trading days is reported. Panel A indicates that on average the disclosure of a CEO medical event is associated with a loss of 1.58 percent; this is significant at the 1 percent level as measured by the parametric Patell Z-score (Patell 1976) and non-parametric generalized Z-score (Cowan 1992). This provides evidence that the disclosure of changes in the health of the CEO has a significant negative effect on the valuation of the firm.

In Panel B of Table 2.3, the event study results for alternative cumulative abnormal returns (CAR) periods are reported. In general terms two sets of windows are reported, one prior to the event and one surrounding the event. The window prior to the CEO illness announcement (day -30 to day -5) is reported to examine whether there is evidence of either information leakage or a general pricing trend that may drive the results. In the window -30 to -5, I observe a negative mean CAR (-0.88 percent), which is not statistically significant. The lack of statistical significance prior to the CEO illness

announcement provides support that no information leakage occurs and indicates that the results observed during the event window are not driven by a confounding event observable over a long time horizon.

Panel B reports three event windows surrounding the event, -1 to 0, -1 to +1, and -1 to +3. These event windows are selected as information about changes in the health condition may occur over a short time horizon. For example, a firm may disclose that a CEO has been involved in an accident and further details may emerge over time. It is observed that, for all three event windows surrounding the CEO medical shock, the CARs are negative (-1.84 percent to -2.33 percent), and they are all significantly different from zero at the 1 percent level. Given that the average market capitalization of the sample firms is $6.8 billion, the health shock results in a loss in value of between $125 million and $158 million.

< Insert Table 2.3 Approximately Here >

Overall, the results in Table 2.3 show that the share price declines are both statistically and economically significant following the disclosure of CEO medical events. This is supportive of the hypothesis that a change in the ability of the CEO's ability to function has a meaningful effect on shareholder value.

2.5.1.2 Effect of CEO Illness on Firm Volatility

Next, I examine the effect of CEO health shocks on firm volatility. A change in the health status of the CEO induces uncertainty about the ability of the CEO to function

and expend effort. As investors learn about these changes and price in the effects on the firms' future cash flows, there are also implications for the firm's stock return volatility (Pástor and Pietro 2003; Pan, Wang, and Weisbach 2015).

Figure 2.2 reports the monthly idiosyncratic volatility for the 12 months before the CEO illness announcement and the 12 months following it. The volatility increases substantially around the time of the initial disclosure.

< Insert Figure 2.2 Approximately Here >

Following this, the effect of CEO illness on firm volatility is examined in a multivariate regression framework. I estimate the effect of CEO illness on idiosyncratic volatility at incrementally longer time horizons. I follow Ang et al. (2006) by estimating the idiosyncratic return volatility and calculating the monthly volatility of the residual stock return on the market model as per equation (2.1).

$$Vol_{(i,t)} = \alpha * Illness_{(i,t)} + \beta * Characteristics_{(i,t)} + \delta * X_{(i,t)} + \mu_t + \mu_{firm} + \varepsilon_{(i,t)} \quad (2.1)$$

The dependent variable is idiosyncratic volatility at different horizons surrounding the CEO illness event, $Illness_{(i,t)}$. The coefficient of interest in the regressions is α, which relates to whether a firm has a CEO suffering from a medical-related event and the effect on firm idiosyncratic volatility.

Table 2.4 reports the results, in which Models I to V measure idiosyncratic volatility at incrementally longer time horizons. I observe positive coefficients across all the

models following the CEO illness disclosure, that is, a positive and generally statistically significant relationship between firms with CEOs experiencing illness-related events and idiosyncratic volatility. Importantly, the size of the illness event coefficient decreases at longer time horizons. This provides evidence that the impact on firm volatility from a CEO illness event and its effects are greatest in the period immediately surrounding the CEO turnover event (-1, +10 and -1, +21) and diminish as uncertainty is resolved over time.

As a placebo test, I examine the relationship between the illness event indicator variable and the firm volatility prior to the earliest reference to the change in the condition of the CEO (-20, -5). I observe no statistical relationship. The result shows that there is no relationship with firm volatility prior to the illness event.

< Insert Table 2.4 Approximately Here >

2.5.1.3 Firm Performance Following CEO Health Shocks

In this section I examine the effects of CEO health shocks on firm performance to understand the financial effects better. Table 2.5 reports the baseline results estimating the following panel OLS regression:

$$y_{(i,t)} = \alpha * HealthShock_{(i,t)} + \beta * Characteristics_{(i,t)} + \delta * X_{(i,t)} + \mu_t + \mu_{firm} + \varepsilon_{(i,t)} \quad (2.2)$$

Where $y_{(i,t)}$ is a measure of firm value as proxied by Tobin's Q. I follow the corporate governance literature and measure firm performance using Tobin's Q (Bhagat and Bolton 2013; Benmelech and Frydman 2015; Bernile, Bhagwat, and Rau 2016). In accordance with Benmelech and Frydman (2015), I correct for large outliers and force Q to be between zero and ten. The coefficient of interest in the regressions is α, which relates to whether a firm has a CEO suffering from a medical related event and the effect on firm performance. The variable $HealthShock_{(i,t)}$ is an indicator variable that pools together all CEO medical events. The $HealthShock_{(i,t)}$ variable is one in the year of the health shock and zero otherwise. To examine how differences in CEO health conditions affect firm value, I separate CEO health events into $ChronicIllness_{(i,t)}$, $AcuteIllness_{(i,t)}$, and $UndisclosedIllness_{(i,t)}$. I categorize illnesses into chronic and acute medical events, following Murrow and Oglesby (1996). The firm-level controls include return on assets (ROA), firm size as proxied by the log of total assets, profitability as measured by cash to assets, and leverage. In all the specifications, I control for a vector of CEO characteristics, $Characteristics_{(i,t)}$, that includes the CEO's age and gender. CEO age may be associated with risk-taking behavior and managerial style (Bertrand and Schoar 2003; Bertrand 2009). I also control for gender effects, as there is evidence that men and women differ in risk aversion (Barber and Odean 2001; Bertrand 2009; Huang and Kisgen 2013). These control variables are used in the prior literature on CEO behavior and managerial style. As specified, I include firm fixed effects, μ_{firm}, as well as year fixed effects, μ_t, to control for differences across firms as well as time trends in the outcome variables. Standard errors are clustered at the firm level.

Table 2.5 reports the baseline result of the paper as per regression equation (2.2). For columns (I) to (IV), no control variables or fixed effects are included and each specification only contains the key independent variables of interest. Models (V) to

(IX) report the results from the panel regressions, including control variables as well as firm and year fixed effects.

The following discussion focuses on the results of Models (V) to (IX); however, consistent results are found across all the model specifications.

As reported in Model (V), I observe a negative and statistically significant relationship between firm performance and firms that have a CEO who has experienced a medical shock. This is supportive of the hypothesis that illness events have an impact on the human capital of the CEO and the ability to exert effort. Models (VI) to (VIII) study how the severity of the CEO illness affects the firm performance, running each key variable separately. Model (IX) includes all the key variables. I find that chronic illness has a larger negative effect (-0.0661), which is statistically significant at the 1 percent level, than acute CEO illness events (-0.0144). This result is supported by the medical literature, which finds that acute illnesses are usually isolated to one bodily area and respond to treatment. In contrast, chronic illnesses are generally long-term conditions frequently involving multiple bodily systems and have an uncertain future. In addition, chronic illnesses usually require more care and resources to maintain normalization in the lifestyle (Murrow and Oglesby 1996). Undisclosed medical event types are observed to have a negative association with firm performance; the coefficient is of a similar magnitude to chronic illness events (-0.0658) and is statistically significant at the 1 percent level. Undisclosed illness events pool together acute and chronic illness events.

< Insert Table 2.5 Approximately Here >

The results taken together provide evidence that CEO health events have a negative

effect on firm performance that is statistically and economically significant. Figure 2.2 and Table 2.4 provide evidence of the short-term effects on stock returns and firm volatility. Table 2.3 and Table 2.5 provide evidence that market participants differentiate rationally between different CEO health shocks and the ability of the CEO to function.

2.5.1.4 Effect of CEO Illness on Corporate Financial Policies

The previous section showed how the health status of the CEO affects firm value. Changes in the effort of the CEO affect firm value across several dimensions. The following section examines how health shocks impact corporate policy decisions.

Table 2.6 reports the estimates from the panel regression, where the dependent variable in Panel A is the cash-to-asset ratio of the firm and Panel B is book leverage. Adverse changes in the health condition of the CEO are found to be positively associated with increases in cash holdings. Specifically, Model (I), which pools all CEO health shocks, finds that there is an increase in the cash-to-asset holdings of 2.64 percent in the year of the health shock, approximately a $91 million increase in cash holding. The increase in the cash holdings may be due to sick managers having less time to devote to labor or changes in managerial risk aversion. The estimates reported in Models (II) to (V) indicate that CEOs who experience adverse health conditions increase cash holdings. The effect is greatest for chronic health conditions (3.97 percent) compared with acute medical events (0.91 percent). CEO health shocks are found not to have an effect on the book leverage in the year of the event. This result is consistent with the literature, which shows that corporate financial policies are sticky (Bernile, Bhagwat, and Rau 2015). Changes in the capital structure have lower elasticity than policies related to

cash holdings.

< Insert Table 2.6 Approximately Here >

Associated with CEOs who experience an adverse change in health, Table 2.7 examines the effects on firm investment activity. Models (I) to (V) include the same key independent variables as well as controls and firm and year fixed effects. Table 2.7 finds that there is a negative relationship between CEO health shocks and investment activity during the year in which the health shock occurs. Equivalent to a 12 percent change in the sample mean investment activity. This is consistent with the findings of Table 2.6 that sick managers either have less time to devote to labor or experience a change in managerial risk aversion as a result of the medical event.

< Insert Table 2.7 Approximately Here >

In sum, the results of Tables 2.6 and 2.7 indicate that firms with CEOs who experience a health shock increase the cash holdings and reduce the investment activity in the period immediately surrounding the exogenous event.

2.5.2 Sick CEOs and Firm Outcomes: What Happens in the Long Run?

The reported results show that CEO health shocks has a negative impact on firm value and increases the volatility of the stock price. However, the results so far are not able

to disentangle whether the effect on firm value is due to a reduction in the ability of the CEO to exert effort or a serious medical condition changing the CEO in a more fundamental way. A change in the health of a CEO may change his or her prospective time horizon. It is important to note that I focus on examining CEOs who experience a medical event but remain in their role as CEO.

The following sample includes CEOs who experience a health shock and subsequently continue with the firm. The analysis focuses on three main types of corporate outcomes: firm performance (as measured by Tobin's Q and OROA), financial policies (as measured by cash to assets and book leverage), and investment decisions (as measured by investment activity). The following model is estimated for each of the respective corporate outcomes:

$$y_{(i,t)} = \alpha * Illness_{(i,t-n)} + \beta * Characteristics_{(i,t)} + \delta * X_{(i,t)} + \mu_t + \mu_{firm} + \varepsilon_{(i,t)} \quad (2.3)$$

Where $y_{(i,t)}$ is a measure of the corporate decision or firm performance. The coefficient of interest in the regressions is α, which relates to whether a firm has a CEO suffering from a medical-related event and the effect on the corporate decision or firm performance.

To examine whether CEO illness events have an effect on firm performance or corporate decisions, I use $Illness_{(t-n)}$. This is an indicator variable that takes the value of 0 or 1 if an illness occurred in the period $t - n$, where t is the illness event year and n is the specified period that follows. For example, $Illness_{t-2}$ measures the relationship between $y_{(i,t)}$ and a CEO illness event that occurred 2 years previously. To measure the long-term effects of CEO illness on firm performance, three alternative illness variables are used. The first two measures are indicator variables that take the value of one in the year

after ($Illness_{t-1}$) and two years after ($Illness_{t-2}$) the illness event. These variables capture whether CEO health shocks have persistent effects on firm performance or corporate decisions or weaken over time. The sample only includes CEOs who have returned to work; those who are on medical leave or have passed away are excluded from the sample. The final illness measure,$Illness_t$, is an indicator variable that takes the value of one for the years after the health shock while the individual remains in the position of CEO. Prior to the health shock, this indicator variable is zero. This variable captures the long-term impact of CEO health shocks on firm performance and corporate decisions.

2.5.2.1 Effect of CEO Health on Firm Value

Table 2.8 reports the long-term effects on firm performance as measured by Tobin's Q. Models (I) to (V) report the results without any fixed effects. Models (VI) to (IX) include firm and year fixed effects. Model (VI) reports the results for whether there are persistent effects on firm performance following a health event. No statistically significant result is observed. In contrast, in Models (VII) and (VIII), which examine the two years after the health shock, a negative and statistically significant effect on firm performance is found. This is supportive of the hypothesis that illness events influence the human capital of the CEO for an extensive period of time and reduce his or her ability to exert effort. However, the effect of the CEO health shock on firm performance at longer time horizons diminishes.

< Insert Table 2.8 Approximately Here >

Overall, this result shows that CEO illness events are associated with a reduction in firm performance at time horizons of up to two years, but the effect of the event diminishes over longer time horizons.

2.5.2.2 Effect of CEO Health on Corporate Financial Policies

Table 2.9 reports the estimate from the panel regression in which the dependent variable of interest is the cash-to-asset ratio and book leverage of the firms in the sample. Across all the model specifications, the evidence indicates that CEOs who experience a health shock are associated with less risky policies.

< Insert Table 2.9 Approximately Here >

Specifically, Model (I) shows that, compared with the period prior to the medical event, all else being equal, firms with CEOs who experience a health shock have a 3.01 percent lower cash holding ratio. Across Models (II) – (IV), which examine the years immediately after the health shock, the results are similar. The magnitude of the effect in the two years is slightly stronger, and the key coefficient estimates maintain the same signs and remain statistically and economically significant.

How do these results reconcile with the results presented in Table 2.6, which showed a negative association between CEO health shocks and cash to assets? The literature shows that corporate financial policies are sticky. The evidence presented indicates that the effects of the health shock are long lasting and that CEOs adjust firms' capital structure over time.

Next, I report the effects of CEO health events on firms' investment policies, which are shown in Table 2.10. The analysis follows a similar format and begins by determining whether CEO health shocks have a persistent effect, examining the time period immediately after the event as well as longer time periods. It is important to note that I focus on examining CEOs who experience a medical event but continue to remain as CEO. Overall, the results show that, following a health shock, a CEO has a lower investment activity level. The size of the effect is greatest in the immediate years that follow (Models II to IV); however, there is a persistent negative effect (Model I). In all the specifications, that observed result is statistically significant at the 5 percent level or higher.

< Insert Table 2.10 Approximately Here >

2.6 Robustness Checks

2.6.1 Difference-in-Difference

In the event that there is a time-series trend that biases the estimated effects of CEO health shocks, a control group of firms is examined. In this robustness analysis, the following model is estimated:

$$y = \beta_0 + \beta_1 HealthShock{\times}Treatment + \beta_2 HealthShock + \beta_3 Treatment + \varepsilon \quad (2.4)$$

Where $HealthShock$ is an assignment variable equal to one if the CEO experiences a reported change in health and zero otherwise. $Treatment$ is the post-treatment indicator, which is equal to one in the period after the $HealthShock$ and zero otherwise.

The inclusion of the control group for robustness addresses two potential challenges to the identification of the effects of CEO health shocks. Firstly, the use of a treatment and control group ensures that any time-invariant differences between the treatment and the control group are differenced away by including the HealthShock indicator variable. Secondly, any common trends affecting the treatment and control groups are again differenced away by the inclusion of the Treatment indicator variable (Roberts and Whited 2012).

I use propensity score matching to form an alternative matched sample to mitigate the possibility that the observed differences in firms that have CEO health shocks are potentially due to differences in observable firm characteristics between the two samples. Following Atanasov and Black (2015), I estimate propensity scores and form a matched sample on scores in the entire period prior to the health shock to ensure that the health shock produces balanced covariates between the two groups of firms. The propensity scores are estimated using a probit model that is based on the following matching criteria: total assets as a proxy for firm size, net income, ROA, and industry as measured by the three-digit SIC. Next, I match to the nearest neighbor firm-year observation. I also restrict the matched pseudo-firm-year observations to be in the year prior to any health shock, and the matched firm must not experience a CEO health shock at either an earlier or a later date. This results in a total of 2658 pseudo-firm-year observations in the final matched sample.

Table 2.2 reports the CEO and firm characteristics of the matched sample. I find

that firm size, performance, investment expenditures, and financial policies are not significantly different between the two samples of firms.

Table 2.11 reports the difference-in-difference estimates for the effect of CEO health shocks on firm performance and corporate decisions. The interaction between these two variables represents the effect of being exogenously affected by a CEO health shock. The controls are the same as those used in all the models. The models also include firm and year fixed effects, and the robust standard errors are clustered at the firm level. The key coefficient is $HealthShock \times Treatment$ which, as reported in Models (I) to (IV), shows consistent results with the hypothesis that CEO health shocks have a negative effect on firm performance and that, as a result of the adverse health event, cash holdings increase and investment activity declines during the year of the event.

< Insert Table 2.11 Approximately Here >

2.6.2 Alternative Dependent Variables

Tables 2.12 and 2.13 report the results for alternative measures of firm performance, specifically operating return on assets (OROA). All the specifications include the same control variables as well as firm and year fixed effects; standard errors are clustered at the firm level. Panel A of Tables 2.12 and 2.13 re-report the results for the dependent variable Tobin's Q for comparison. Table 2.12 examines the CEO health shock in the year of the event.

< Insert Table 2.12 Approximately Here >

Table 2.13 examines the persistence of the firm performance effects following the health shock. The results reported in both Table 2.12 and Table 2.13 are consistent with the earlier findings.

< Insert Table 2.13 Approximately Here >

2.7 Conclusion

This paper demonstrates that adverse changes in the health of firm CEOs through accidents, diseases, or illnesses have a statistical and economically significant effect on firm performance and corporate decisions.

Consistent with the predictions from labor economics and the allocation of effort between firm productive outcomes and private life activities, exogenous shocks to CEOs' health have a negative effect on their productive capacity. I find robust evidence that firms experience negative announcement effects following the disclosure of adverse changes in CEO health and associated increases in idiosyncratic volatility.

In the examination of whether the effects of CEO health shocks have a persistent effect. I find no evidence of differences in firm performance. However, I find that those CEOs who continue with the firm following the adverse change in health experience an increase in risk aversion. This finding is consistent with the related literature on traumatic life

experiences affecting risk aversion. Evidence of this includes a persistent increase in cash holdings and a negative effect on investment activity.

The paper makes several important contributions. Firstly, the empirical design of the study provides robust causal evidence of the effects of health shocks on firm performance and corporate decisions. Secondly, the paper provides evidence of variation within manager behavior. As noted by Fee, Hadlock, and Pierce (2013), CEO behavior is not fixed and experiences during the tenure can have a meaningful impact on future decisions. This paper builds on the CEO fixed effect literature and demonstrates, using CEO health shocks as a natural experiment, that CEO style varies across tenure.

Figure 2.1: Time Series Distribution of CEO Health Shocks

The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths. The sample period is from 1996 to 2014. The figure reports the percentage of health shocks per year.

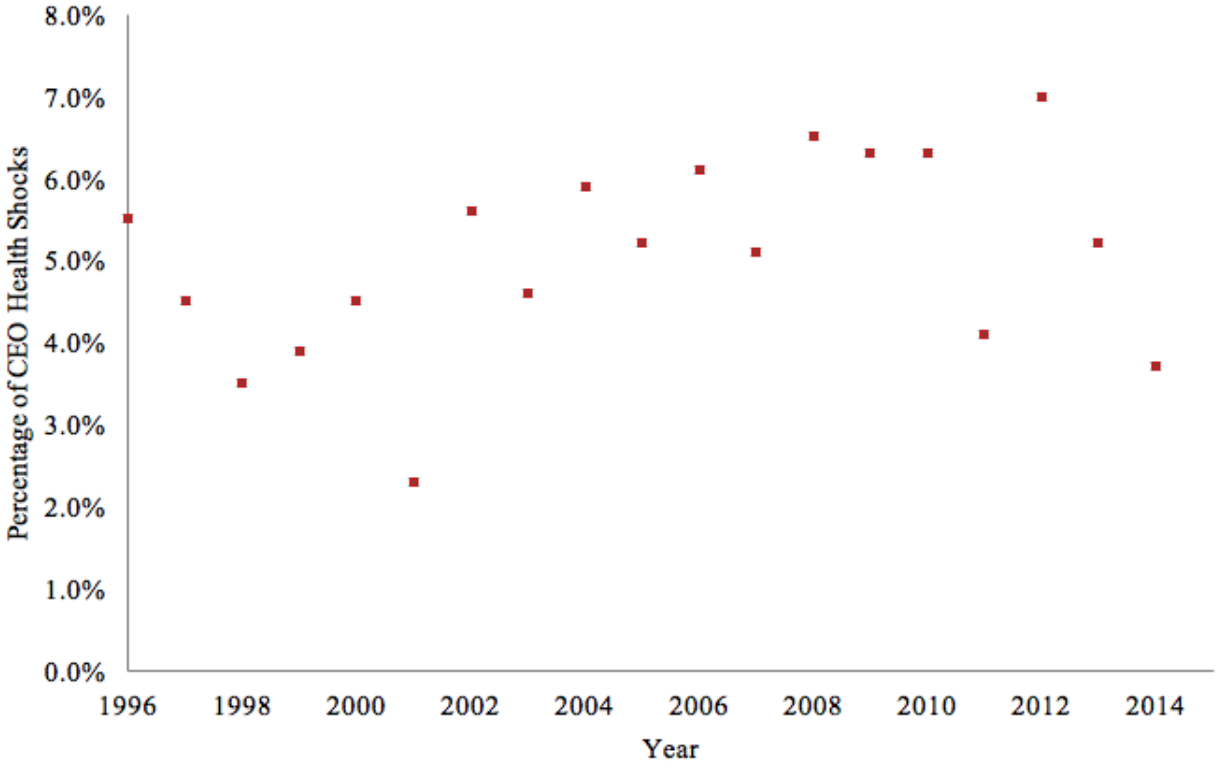

Figure 2.2: Firm Volatility Surrounding CEO Medical Events

The figure shows the average idiosyncratic volatility in the 12 months before and after a CEO medical event. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths between 1996 and 2014. Sudden CEO death events are excluded to avoid potential bias. I follow Ang et al. (2006) and calculate the volatility of the residual daily stock returns of the market model.

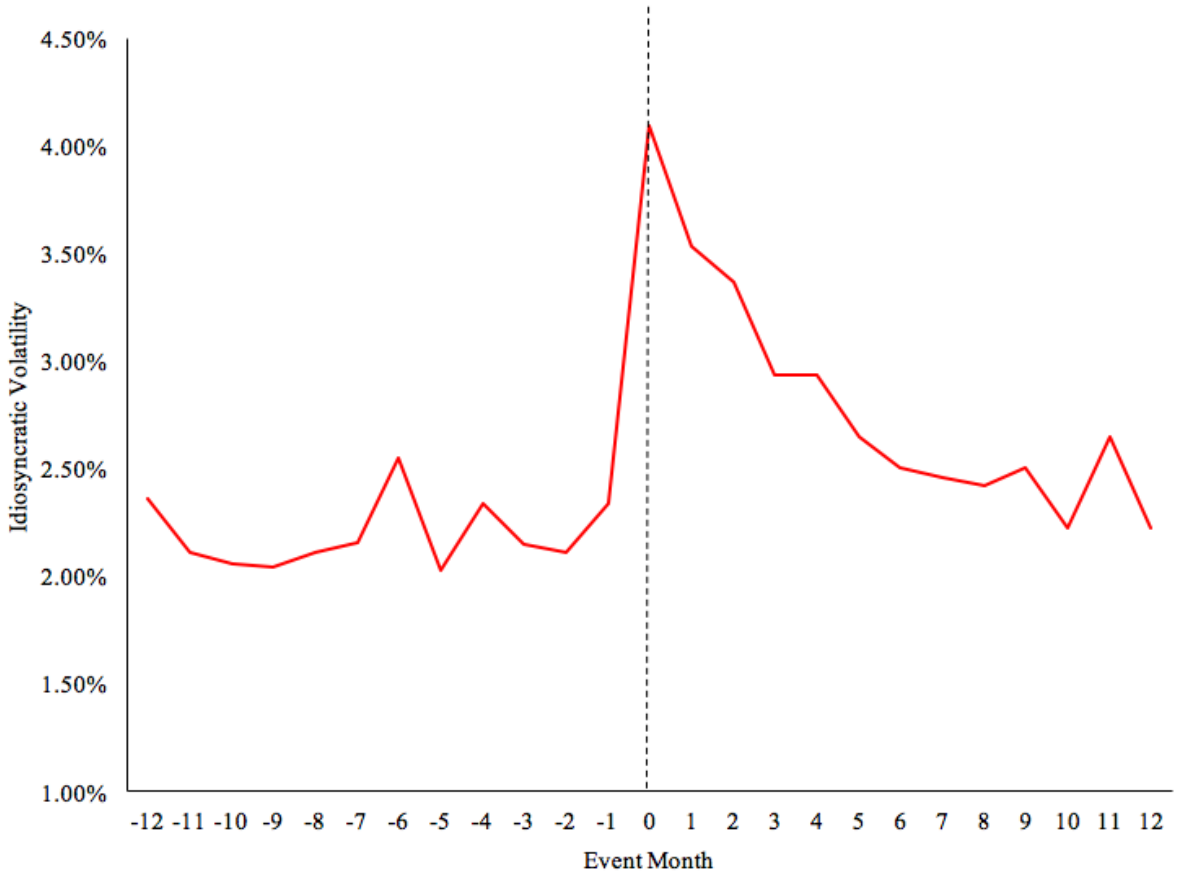

Table 2.1: Cause of CEO Medical Shocks

This table reports summary statistics of the sample of CEO health shocks over the period 1996 to 2014. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths. Panel A reports the composition of the sample's medical events based on the cause cited in either company filings or media reports. Panel A classifies medical events in accordance with the Centers for Disease Control and Prevention, which follow the International Classification of Diseases (ICD-10) classification system. Panel A reports the incidence of medical events compared with the United States Age-Adjusted Death Rate as collected by the National Centers for Health Statistics in 2015. Panel B reports the associated effects of the medical event. CEO Recovers is defined as a CEO who either reports recuperation from the health event or maintains the appointment of CEO for at least 24 months after the event. CEO Takes Medical Leave is defined as a CEO who discloses leave in either company filings or media reports in the period surrounding the medical event. All the variables are defined in Table A.1 of the Appendix.

Panel A: CEO Medical Shocks

	CEO Illness Sample		**United States Age-Adjusted Death Rate**
	N	**Percentage**	**Percentage**
Accidents	13	4.11%	5.38%
Cancer	85	26.90%	22.30%
Chronic Lower Respiratory Diseases	13	4.11%	5.75%
Heart Disease	78	24.68%	23.20%
Influenza and Pneumonia	3	0.95%	2.17%
Stroke	36	11.39%	4.95%
Undisclosed	88	27.85%	
Other			36.25%
Total	316	100.00%	100.00%

Panel B: Medical Effects on CEO

	N	**Mean**	**Std Dev.**
CEO Recovers	183	0.5798	0.4946
CEO Takes Medical Leave	193	0.6134	0.488

Table 2.2: CEO and Firm Descriptive Statistics

This sample consists of all 316 CEO health events in US listed firms from 1996 to 2014 identified in 8-K and 10-K filings and media releases. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths. Panel A reports the summary statistics for the CEO in the medical event year provided in proxy statements, 8-K and 10-K filings, and news releases as well as the Capital IQ and BoardEx databases; Panel B reports the summary statistics for firm-level attributes in the CEO health years provided by Compustat; all the variables are defined in Table A.1 of the Appendix.

	Health Shock CEOs				**Non-Health Shock CEOs**				
Panel A: CEO Characteristics									
	N	**Mean**	**Median**	**Std. Dev**	**N**	**Mean**	**Median**	**Std. Dev**	**Difference in Means**
CEO Age	2799	58.77	59	9.53	2658	59.16	59	9.36	-0.39
Ln CEO Age	2799	4.01	4.03	0.25	2658	4.07	4.08	0.24	-0.06
CEO Male	2812	0.98	1	0.12	2786	0.98	1	0.14	0
CEO Tenure	2812	6.61	5	11.42	2786	4.04	0.72	7.89	2.5**
CEO-Chairman	2812	0.51	0.5	0.46	2786	0.56	0.57	0.46	-0.05
Percentage of total shares owned by CEO	2812	4.04	0.72	7.89	2786	3.89	0.5	8.56	0.15**
Panel B: Firm Characteristics									
Total Assets ($mil)	3174	15038.2	2408.87	87885.59	2799	16837.73	2392.79	89846.53	-1799.53**
Market Capitalization ($ mil)	3020	6885.42	1487.43	32795.21	2788	6901.42	1447.82	22052.66	-16
Market to book	2869	2.65	1.68	5.5	2775	2.3	1.5	2.62	0.35
ROA	3170	0.06	0.05	0.12	2785	0.05	0.04	0.11	0.01
Tobin Q	2869	1.93	1.43	0.91	2768	1.78	1.44	0.74	0.15
Book Leverage	2869	0.25	0.24	0.18	2775	0.23	0.21	0.17	0.02**
Sales ($mil)	2869	5604.5	1279.76	17798	2788	4463.2	410.79	18102	1141.3**
Cash to Assets	2869	0.15	0.08	0.19	2788	0.13	0.09	0.14	0.02
Investment	2869	0.06	0..057	0.08	2773	0.09	0.07	0.09	-0.03*

Table 2.3: Stock Price Reaction to CEO Illness Announcements

This table shows the stock price reaction to the disclosure of CEO medical events. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths. Panel A reports the mean abnormal return for each trading day from five days before the medical event disclosure date to five days after it. Panel B shows the cumulative abnormal return for various event windows surrounding the medical event disclosure date. In addition to the mean abnormal return, the corresponding Patell Z, the number of positive and negative stock price reactions, the median return, and the signed-rank test are reported for all the event windows. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Market Model Abnormal Returns, Equally Weighted Index

Day	N	Mean Abnormal Return	Positive : Negative	Patell Z	Generalized Sign Z
-5	316	-0.69%	98:140	-1.47	-1.445
-4	316	-0.66%	98:140	-1.53	-1.445
-3	316	0.18%	112:126	0.725	-0.161
-2	316	0.25%	112:126	-0.175	-0.162
-1	316	-0.22%	114:124	0.276	0.023
0	316	-1.58%	80:158	-5.530***	-3.097***
1	316	-0.04%	108:130	0.091	-0.528
2	316	-0.05%	106:132	-0.263	-0.711
3	316	0.91%	134:104	0.082	1.45
4	316	0.58%	124:114	1.01	0.94
5	316	0.03%	122:116	0.857	0.757

Panel B: Market Model Cumulative Abnormal Returns, Equally Weighted Index

Days	N	Mean Cumulative Abnormal Return	Precision-Weighted CAAR	Positive : Negative	Patell Z	Generalized Sign Z
(-30,+5)	316	-0.88%	0.05%	114:124	0.04	-0.592
(-1,0)	316	-1.84%	-0.79%	90:148	-3.715***	-2.179**
(-1,+1)	316	-1.96%	-0.87%	86:152	-2.918***	-2.546***
(-1,+3)	316	-2.33%	-1.05%	106:132	-1.345**	-2.363***

Table 2.4: The Effect of CEO Medical Events on Return Volatility

The table presents the result estimated using CEO health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths. The sample includes CEO health events with CEO-related information from BoardEx and Compustat for firm fundamentals and CRSP for stock returns. The dependent variables are idiosyncratic return volatilities surrounding CEO turnovers. To estimate idiosyncratic return volatility, I follow Ang et al. (2006) and calculate the volatility of the residual daily stock returns of the market model within the periods of (-20, -5), (-1, +10), (-1, +21), (-1, +64), and (-1, +252). Implied volatility calculated based on the daily prices of the thirty-day at-the-money call options written on the firm's common stock.All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics adjusted for heterogeneity for the two-sided test are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Idiosyncratic Return Volatility					**Implied Volatility**	
	(-20,-5)	**(-1.,+10)**	**(-1,+21)**	**(-1,+64)**	**(-1,+252)**		
Illness Event t	0.0047	0.0109**	0.0112***	0.0077**	0.0040*	0.0103*	0.009*
	(1.472)	(2.314)	(2.914)	(2.534)	(1.667)	(-1.767)	(-2.524)
ROA	-0.0232**	-0.0248***	-0.0283***	-0.0201***	-0.0280***	-0.0380***	-0.0267***
	(-2.538)	(-2.625)	(-3.777)	(-2.983)	(-4.297)	(-4.257)	(-2.643)
Ln (Total Assets)	-0.0036***	-0.0037***	-0.0031***	-0.0040***	-0.0041***	-0.0041***	-0.0026***
	(-2.847)	(-4.720)	(-4.580)	(-6.570)	(-6.359)	(-7.455)	(-3.820)
Cash to Assets	0.0031	0.0093	0.006	0.0076	0.0107	0.0089	0.0083
	(0.154)	(0.669)	(0.513)	(0.819)	(1.157)	(-1.157)	(-0.579)
Leverage	0.0037	0.0046	0.0049	0.0104*	0.0119**	0.0219**	0.0036
	(0.320)	(0.471)	(0.649)	(1.766)	(2.174)	(-3.164)	(-0.571)
Ln (CEO Tenure)	-0.0001	0.0004	0.0002	0.0001	0.0001	0.0000	0.0002
	(-0.250)	(1.007)	(0.624)	(0.006)	(0.043)	(-0.043)	(-1.067)
CEO Age	-0.0002	-0.0002	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001
	(-0.647)	(-0.774)	(-0.680)	(-0.379)	(-0.888)	(-0.675)	(-0.674)
CEO is Male	-0.0065	-0.0169*	-0.0222*	-0.0214**	-0.0242	-0.0252	-0.0139*
	(-0.964)	(-1.680)	(-1.944)	(-2.482)	(-1.524)	(-1.627)	(-1.520)
Constant	0.0671**	0.0704***	0.0704***	0.0717***	0.0802***	0.0706***	0.0644***
	(2.344)	(3.740)	(4.129)	(5.918)	(4.163)	(-4.132)	(-3.630)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	No	Industry
Observations	316	316	316	316	316	93	93
Adjusted R2	0.721	0.260	0.333	0.423	0.462	0.332	0.317

Table 2.5: The Effect of CEO Medical Events on Short Term Firm Performance

The table reports the coefficient estimates from the regression of CEO medical events in year t. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable is Tobin's Q. *Illness Event t* is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and 0 otherwise. Chronic illness events are defined following the World Health Organization as diseases of long duration and slow progression. Acute illness events are defined as conditions of severe and sudden onset. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in the Appendix Table A.1.

	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**	**(IX)**
Illness Event t	-0.0568***				-0.0385***				
	(-2.860)				(-2.963)				
Chronic Illness Event		-0.0610***				-0.0642***			-0.0661***
		(-2.880)				(-2.977)			(-3.044)
Acute Illness Event			-0.0472**				-0.0127***		-0.0144**
			(-2.042)				(-2.624)		(-2.208)
Undisclosed Illness Event				-0.0401***				-0.0635***	-0.0658***
				(-2.721)				(-2.640)	(-2.798)
ROA					1.7579***	1.7570***	1.7544***	1.7553***	1.7580***
					(4.980)	(4.987)	(4.987)	(4.987)	(4.984)
Ln (Total Assets)					0.4916***	0.4946***	0.4982***	0.4965***	0.4918***
					(2.639)	(2.665)	(2.679)	(2.680)	(2.651)
Leverage					0.4895	0.4749	0.4457	0.4577	0.4963
					(0.294)	(0.287)	(0.268)	(0.275)	(0.298)
CEO is Male					-1.0585	-1.0571	-1.0494	-1.1057	-1.0866
					(-1.157)	(-1.107)	(-1.109)	(-1.159)	(-1.151)
CEO Age					-0.0496	-0.0491	-0.05	-0.0495	-0.0487
					(-1.061)	(-1.050)	(-1.069)	(-1.056)	(-1.038)
Constant	2.6999***	2.6623***	2.6547***	2.6550***	9.2675**	9.2355**	9.2935**	9.3216**	9.2364**
	(24.114)	(25.309)	(25.450)	(25.362)	(2.293)	(2.282)	(2.292)	(2.299)	(2.274)
Fixed Effects	None	None	None	None	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2869	2869	2869	2869	2529	2529	2529	2529	2529
Adjusted R2	0.101	0.100	0.100	0.102	0.217	0.217	0.217	0.217	0.217

Table 2.6: The Effect of CEO Medical Events on Short Term Financial Policies

The table reports the coefficient estimates from the regression of CEO medical events in year t. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable in Panel A is cash to assets, and in Panel B it is book leverage. Illness Event t is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and 0 otherwise. Chronic illness events are defined following the World Health Organization as diseases of long duration and slow progression. Acute illness events are defined as conditions of severe and sudden onset. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in the Appendix Table A.1.

	Panel A: Cash to Assets					**Panel B: Book Leverage**				
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**	**(IX)**	**(X)**
Illness Event t	0.0264***					0.028				
	(3.087)					(0.928)				
Chronic		0.0397**			0.0405**		0.021			0.0189
Illness Event		(2.437)			(2.485)		(0.325)			(0.292)
Acute			0.0091		0.0093			0.053		0.0542
Illness Event			(0.582)		(0.595)			(0.501)		(1.115)
Undisclosed				0.0280	0.0295*				0.0385	0.0424
Illness Event				(1.647)	(1.742)				(1.014)	(1.098)
ROA	0.0063	0.006	0.0061	0.0061	0.0061	-0.0675	-0.2691*	-0.2856**	-0.2690*	-0.2684*
	(1.351)	(1.282)	(1.285)	(1.293)	(1.304)	(-1.144)	(-1.946)	(-1.977)	(-1.946)	(-1.942)
Ln (Total Assets)	-0.0188***	-0.0184***	-0.0183***	-0.0184***	-0.0186***	0.0173	-0.0600*	-0.0238	-0.0602*	-0.0610*
	(-4.074)	(-4.013)	(-3.976)	(-3.999)	(-4.052)	(1.045)	(-1.827)	(-1.556)	(-1.834)	(-1.844)
Leverage	-0.016***	-0.016***	-0.016***	-0.016***	-0.016***					
	(-3.250)	(-3.246)	(-3.243)	(-3.248)	(-3.250)					
CEO is Male	-0.0483*	-0.0497*	-0.0476*	-0.0465*	-0.0478*	-0.0014	-0.1736	0.1897***	-0.163	-0.1739
	(-1.784)	(-1.937)	(-1.806)	(-1.799)	(-1.839)	(-0.031)	(-1.624)	-4.826	(-1.539)	(-1.600)
CEO Age	-0.0028*	-0.0028*	-0.0027*	-0.0028*	-0.0028*	-0.0172**	-0.0171**	-0.0011	-0.0172**	-0.0174**
	(-1.905)	(-1.898)	(-1.868)	(-1.902)	(-1.919)	(-2.135)	(-2.105)	(-0.829)	(-2.108)	(-2.126)
Constant	0.4637***	0.4641***	0.4601***	0.4614***	0.4640***	0.1712	1.8553**	0.3239**	1.8480**	1.8773**
	(4.025)	(4.035)	(3.981)	(4.010)	(4.031)	(0.513)	(2.515)	(2.489)	(2.504)	(2.528)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529
Adjusted R2	0.221	0.226	0.225	0.224	0.224	0.324	0.323	0.183	0.323	0.323

Table 2.7: The Effect of CEO Medical Events on Short Term Investment Activity

The table reports the coefficient estimates from the regression of CEO medical events in year t. The sample consists of health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable is investment activity. Illness Event t is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and 0 otherwise. Chronic illness events are defined following the World Health Organization as diseases of long duration and slow progression. Acute illness events are defined as conditions of severe and sudden onset. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in the Appendix Table A.1.

	Investment Activity				
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**
Illness Event t	-0.0047***				
	(-2.851)				
Chronic Illness Event		-0.0071***			-0.0073***
		(-2.659)			(-2.719)
Acute Illness Event			-0.0089***		-0.0091***
			(-2.658)		(-2.692)
Undisclosed Illness Event				-0.0032***	-0.0037**
				(-2.769)	(-2.376)
ROA	-0.0008	-0.0016	-0.0016	-0.0016	-0.0016
	(-0.875)	(-1.538)	(-1.520)	(-1.505)	(-1.561)
Ln (Total Assets)	-0.0014**	-0.0012*	-0.0013*	-0.0013*	-0.0012*
	(-2.384)	(-1.911)	(-1.952)	(-1.968)	(-1.836)
Leverage	-0.0230***	-0.0031***	-0.0031***	-0.0031***	-0.0031***
	(-3.756)	(-2.979)	(-3.047)	(-2.996)	(-3.029)
CEO is Male	-0.0180***	0.0039	0.0019	0.0027	0.0018
	(-4.746)	(1.006)	(0.535)	(0.713)	(0.462)
CEO Age	-0.0003	-0.0003	-0.0004	-0.0004	-0.0003
	(-1.174)	(-1.335)	(-1.398)	(-1.378)	(-1.319)
Constant	0.0672***	0.0441**	0.0471**	0.0460**	0.0459**
	(3.292)	(2.096)	(2.242)	(2.189)	(2.185)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2529	2529	2529	2529	2529
Adjusted R2	0.201	0.223	0.223	0.222	0.224

Table 2.8: Long Term Effects of CEO Health on Firm Value

The table reports the coefficient estimates from the regression of CEO medical events and excludes sudden CEO death events to avoid potential bias. The sample includes CEO health events with CEO-related information from BoardEx and Compustat for firm fundamentals and CRSP for stock returns. The sample consists of health shocks to CEOs including diseases, illnesses, and accidents but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable is Tobin's Q. Illness Event t is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and for all the years after the medical event while holding the CEO title and 0 otherwise. *Illness Event t-1* and *Illness Event t-2* are lagged indicator variables, which take the value of 1 if a CEO medical event occurred at *t-1* or *t-2* and 0 otherwise. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**	**(IX)**
Illness Event *t*	-0.0872			-0.0483		-0.0600			
	(-0.930)			(-1.037)		(-1.183)			
Illness Event *t-1*		-0.0519***			-0.0561***		-0.0385***		-0.0399***
		(-2.622)			(-2.614)		(-2.963)		(-3.019)
Illness Event *t-2*			-0.0708***		-0.0425**			-0.0354**	-0.0390**
			(-4.032)		(-2.230)			(-2.046)	(-2.197)
ROA				-0.8478*	-0.8448*	-1.7662***	-1.7579***	-1.7548***	-1.7585***
				(-1.927)	(-1.915)	(-4.997)	(-4.980)	(-4.986)	(-4.978)
Ln (Total Assets)				-0.1061*	-0.1260**	-0.4673**	-0.4916***	-0.4956***	-0.4881***
				(-1.836)	(-2.270)	(-2.461)	(-2.639)	(-2.665)	(-2.615)
Leverage				5.7603***	5.6457***	0.6666	0.4895	0.4607	0.5118
				(4.191)	(4.148)	(0.387)	(0.294)	(0.277)	(0.307)
CEO Age				-0.0044	-0.0018	-0.0457	-0.0496	-0.0496	-1.052
				(-0.579)	(-0.213)	(-0.964)	(-1.061)	(-1.060)	(-1.1918)
CEO is Male				0.5450	0.5118	-0.9857	-1.0585	-1.023	-1.0148
				(1.388)	(1.236)	(-1.021)	(-1.157)	(-1.104)	(-1.149)
Constant	2.8459***	2.6687***	2.6720***	1.1908	1.0466	8.8877**	9.2675**	9.2380**	9.1918**
	(21.667)	(24.952)	(25.128)	(1.186)	(1.027)	(2.147)	(2.293)	(2.281)	(2.273)
Fixed Effects	None	None	None	None	None	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2358	2358	2358	2187	2186	2187	2187	2187	2187
Adjusted R2	0.124	0.124	0.125	0.257	0.453	0.453	0.455	0.456	0.453

Table 2.9: The Long Term Effects of CEO Medical Events on Financial Policies

The table reports the coefficient estimates from the regression of CEO medical events and excludes sudden CEO death events to avoid potential bias. The sample includes CEO health events with CEO-related information from BoardEx and Compustat for firm fundamentals and CRSP for stock returns. The sample consists of health shocks to CEOs including diseases, illnesses, and accidents but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable in Panel A is cash to assets, and for Panel B it is book leverage. *Illness Event t* is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and for all the years after the medical event while holding the CEO title and 0 otherwise. *Illness Event t-1* and *Illness Event t-2* are lagged indicator variables, which take the value of 1 if a CEO medical event occurred at *t-1* or *t-2* and 0 otherwise. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1

	Panel A: Cash to Assets				**Panel B: Book Leverage**			
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**
Illness Event *t*	0.0301***				-0.0358**			
	(3.637)				(-2.083)			
Illness Event *t-1*		0.0638***		0.0614***		-0.0321**		-0.0321**
		(4.177)		(4.2770		(-2.250)		(-2.215)
Illness Event *t-2*			0.0547**	0.0553**			-0.0330***	-0.0330***
			(2.264)	(2.287)			(-2.565)	(-2.428)
ROA	-0.013	-0.0766***	-0.0805***	-0.0807***	-0.0772	-0.0705	-0.0706	-0.0705
	(-1.307)	(-4.446)	(-4.833)	(-4.864)	(-1.635)	(-1.166)	(-1.158)	(-1.147)
Ln (Total Assets)	-0.0165***	-0.0087*	-0.0091*	-0.0091*	0.0168*	0.009	0.0091	0.0089
	(-10.300)	(-1.800)	(-1.812)	(-1.819)	(1.908)	(0.614)	(0.624)	(0.603)
Leverage	-0.0320***	-0.1187**	-0.1226**	-0.1229**				
	(-3.757)	(-2.089)	(-2.085)	(-2.079)				
CEO Age	-0.0010***	0.0002	-0.0001	-0.0001	0.0268	0.0071	-0.0275	-0.0259
	(-2.775)	(0.181)	(-0.088)	(-0.074)	(0.616)	(0.172)	(-0.681)	(-0.625)
CEO is Male	0.0072	0.0086	0.0198	0.0206	-0.0007	-0.0001	0.0001	-0.0001
	(0.249)	(0.137)	(0.334)	(0.346)	(-0.371)	(-0.012)	(0.027)	(-0.012)
Constant	0.2598***	0.2023**	0.1846**	0.1842**	0.1286	0.2117	0.2328	0.2438
	(6.963)	(2.242)	(2.154)	(2.141)	(0.951)	(0.634)	(0.699)	(0.715)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2187	2187	2187	2187	2187	2187	2187	2187
Adjusted R2	0.343	0.343	0.334	0.336	0.452	0.45	0.453	0.452

Table 2.10: The Long Term Effects of CEO Medical Events on Investment Activity

The table reports the coefficient estimates from the regression of CEO medical events in year t. The sample consists of health shocks to CEOs including diseases, illnesses, and accidents but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable is investment activity. *Illness Event t* is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and for all the years after the medical event while the CEO holds the position and 0 otherwise. *Illness Event t-1* and *Illness Event t-2* are lagged indicator variables, which take the value of 1 if a CEO medical event occurred at *t-1* or *t-2* and 0 otherwise. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Investment Activity			
	(I)	**(II)**	**(III)**	**(IV)**
Illness Event *t*	-0.0063***			
	(-4.422)			
Illness Event *t-1*		-0.0154***		-0.0156***
		(-4.051)		(-4.037)
Illness Event *t-2*			-0.0119**	-0.0120**
			(-2.429)	(-2.443)
ROA	-0.0013	0.0056	0.0056	0.0055
	(-1.310)	(1.216)	(1.214)	(1.194)
Ln (Total Assets)	-0.0010***	-0.001	-0.001	-0.001
	(-3.555)	(-0.907)	(-0.903)	(-0.922)
Leverage	-0.0025***	0.0052	0.0051	0.0049
	(-3.900)	(0.446)	(0.439)	(0.425)
CEO Age	-0.0002***	-0.0002	-0.0002	-0.0002
	(-3.275)	(-0.741)	(-0.731)	(-0.713)
CEO is Male	0.0086	0.0096	0.0099	0.0101
	(1.560)	(1.322)	(1.363)	(1.370)
Constant	0.0324***	0.0212	0.0203	0.0204
	(4.341)	(1.209)	(1.159)	(1.158)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2187	2187	2187	2187
Adjusted R2	0.325	0.325	0.323	0.328

Table 2.11: Difference-in-Difference

The table reports the coefficient estimates from the difference-in-difference estimates of firm performance and corporate policy, where *Treatment* is a treatment assignment variable equal to 1 if the CEO experiences a reported change in health and 0 otherwise. *HealthShock* is the post-treatment indicator, which is equal to 1 in the year in which the health shock occurs and 0 otherwise. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Market to Book	**OROA**	**Cash to Assets**	**Investment**
	(I)	**(II)**	**(III)**	**(IV)**
Treatment	-0.0595	0.0546***	0.0042	-0.0056
	(-0.171)	(2.809)	(0.166)	(-0.827)
HealthShock	-0.0263	0.0212	-0.0266	0.0347**
	(-0.583)	(1.091)	(-1.187)	(2.019)
HealthShock*Treatment	-0.0869***	-0.0475**	0.0084***	-0.0089**
	(-3.282)	(-2.063)	-2.823	(-2.059)
ROA	-1.2604**	0.7323***	-0.0042	-1.2336*
	(-2.032)	(3.383)	(-0.781)	(-1.907)
Ln (Total Assets)	-0.0087*	-0.1260*	-0.0091*	0.1058*
	(-1.800)	(-1.812)	(-1.819)	(-1.836)
Leverage	4.0298***	0.0773***	-0.0003	-3.0869**
	(4.922)	(6.689)	(-0.419)	(-2.021)
CEO is Male	-1.0571	0.1130***	-0.0483*	0.0027
	(-1.107)	(3.127)	(-1.784)	(0.713)
CEO Age	-0.0491	0.0038**	-0.0028*	-0.0004
	(-1.050)	(2.151)	(-1.905)	(-1.378)
Constant	2.3095*	0.094	-0.1892	-1.8018
	(1.756)	(0.517)	(-0.616)	(-0.953)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	5067	5067	5067	5067
Adjusted R2	0.685	0.821	0.22	0.287

Table 2.12: The Effect of CEO Medical Events on Short Term Firm Performance: Alternative Dependent Variable

The table reports the coefficient estimates from the regression of CEO medical events in year t. The sample consists of health shocks to CEOs including diseases, illnesses, and accidents but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable in Panel A is Tobin's Q and in Panel B it is operating return on assets (OROA). Illness Event t is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and 0 otherwise. Chronic illness events are defined following the World Health Organization as diseases of long duration and slow progression. Acute illness events are defined as conditions of severe and sudden onset. All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1

	Panel A: Tobin *Q*					**Panel B: OROA**				
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**	**(IX)**	**(X)**
Illness Event t	-0.0385***					-0.0304***				
	(-2.963)					(-3.527)				
Chronic		-0.0642***			-0.661***		-0.0359**			-0.0334*
Illness Event		(-2.977)			(-3.044)		(-2.282)			(-1.862)
Acute			-0.0127***		-0.0144**			-0.0324**		-0.0330**
Illness Event			(-2.624)		(-2.208)			(-2.062)		(-2.142)
Undisclosed				-0.0635***	-0.0658***				-0.0498**	-0.0521**
Illness Event				(-2.640)	(-2.698)				(-2.144)	(-2.236)
ROA	-1.7579***	-1.7570***	-1.7544***	-1.7553***	-1.7580***	0.0409**	0.0411**	0.0308*	0.0308*	0.0307*
	(-4.980)	(-4.987)	(-4.987)	(-4.987)	(-4.984)	(2.122)	(2.124)	(1.704)	(1.702)	(1.703)
Ln (Total Assets)	-0.4916***	-0.4946***	-0.4982***	-0.4965***	-0.4918***	0.0368***	0.0364***	0.0351***	0.0352***	0.0355***
	(-2.639)	(-2.665)	(-2.679)	(-2.680)	(-2.651)	(6.499)	(6.465)	(6.195)	(6.210)	(6.261)
Leverage	0.4895	0.4749	0.4457	0.4577	0.4963	-0.0924*	-0.0938*	-0.0210*	-0.0209*	-0.0209*
	(0.294)	(0.287)	(0.268)	(0.275)	(0.298)	(-1.921)	(-1.939)	(-1.846)	(-1.840)	(-1.835)
CEO is Male	-1.0585	-1.0571	-1.0494	-1.1057	-1.0866	0.1130***	0.1141***	0.1785***	0.1742***	0.1691***
	(-1.157)	(-1.107)	(-1.109)	(-1.159)	(-1.151)	(3.127)	(2.937)	(3.976)	(3.738)	(3.731)
CEO Age	-0.0496	-0.0491	-0.05	-0.0495	-0.0487	0.0038**	0.0038**	0.0046***	0.0047***	0.0048***
	(-1.061)	(-1.050)	(-1.069)	(-1.056)	(-1.038)	(2.151)	(2.154)	(2.831)	(2.884)	(2.921)
Constant	9.2675**	9.2355**	9.2935**	9.3216**	9.2364**	-0.5023***	-0.5021***	-0.6092***	-0.6092***	-0.6080***
	(2.293)	(2.280)	(2.292)	(2.299)	(2.274)	(-3.463)	(-3.458)	(-4.367)	(-4.366)	(-4.372)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529
Adjusted R2	0.217	0.217	0.217	0.217	0.217	0.568	0.567	0.556	0.557	0.558

Table 2.13: The Effect of CEO Medical Events on Long Term Firm Performance: Alternative Dependent Variable

The table reports the coefficient estimates from the OLS regression of CEO medical events and excludes sudden CEO death events to avoid potential bias. The sample includes CEO health events with CEO-related information from BoardEx and Compustat for firm fundamentals and CRSP for stock returns. The sample consists of health shocks to CEOs including diseases, illnesses, and accidents but not including sudden CEO deaths between 1996 and 2014, which correspond to the years for which the CEO holds that position with the same firm. The dependent variable in Panel A is Tobin's Q and in Panel B it is operating return on assets (OROA). *Illness Event t* is an indicator variable taking the value of 1 if a CEO medical event occurs in that year and for all the years after the medical event while holding the CEO title and 0 otherwise. *Illness Event t-1* and *Illness Event t-2* are lagged indicator variables, which take the value of 1 if a CEO medical event occurred at t-1 or t-2 and 0 otherwise. The All the regressions include a constant. All the standard errors are White robust standard errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in the Appendix Table A.1.

	Panel A: Tobin *Q*				**Panel B: OROA**			
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**
Illness Event *t*	-0.0600				-0.0337			
	(-1.183)				(-0.204)			
Illness Event *t-1*		-0.0385***		-0.0399***		-0.0404***		-0.0420***
		(-2.963)		(-3.019)		(-2.781)		(-2.892)
Illness Event *t-2*			-0.0354**	-0.0390**			-0.0218**	-0.0231**
			(-2.046)	(-2.197)			(-2.322)	(-2.467)
ROA	-1.7662***	-1.7579***	-1.7548***	-1.7585***	0.0579***	0.0581***	0.0580***	0.0580***
	(-4.997)	(-4.980)	(-4.986)	(-4.978)	(2.607)	(2.610)	(2.613)	(2.612)
Ln (Total Assets)	-0.4673**	-0.4916***	-0.4956***	-0.4881***	0.0306***	0.0297***	0.0297***	0.0299***
	(-2.461)	(-2.639)	(-2.665)	(-2.615)	(13.439)	(13.151)	(13.103)	(13.199)
Leverage	0.6666	0.4895	0.4607	0.5118	-0.1905***	-0.1955***	-0.1960***	-0.1935***
	(0.387)	(0.294)	(0.277)	(0.307)	(-7.806)	(-7.920)	(-7.947)	(-7.874)
CEO Age	-0.0457	-0.0496	-0.0496	-1.052	0.0506*	0.0020***	0.0020***	0.0020***
	(-0.964)	(-1.061)	(-1.060)	(-1.191)	(1.738)	(5.659)	(5.668)	(5.677)
CEO is Male	-0.9857	-1.0585	-1.023	-1.0148	0.0019***	0.0453	0.0441	0.0441
	(-1.021)	(-1.157)	(-1.104)	(-1.149)	(5.530)	(1.569)	(1.514)	(1.534)
Constant	8.8877**	9.2675**	9.2380**	9.1918**	-0.2709***	-0.2673***	-0.2659***	-0.2658***
	(2.147)	(2.293)	(2.281)	(2.273)	(-6.706)	(-6.646)	(-6.593)	(-6.632)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
Observations	2187	2187	2187	2187	2187	2187	2187	2187
Adjusted R2	0.217	0.217	0.218	0.217	0.399	0.398	0.400	0.402

Table 2.14: The Effect of CEO Medical Events on Return Volatility: Alternate Specification

The table presents the result estimated using CEO health shocks to CEOs including accidents, diseases and illness but not including sudden CEO deaths. The sample includes CEO health events with CEO-related information from BoardEx and Compustat for firm fundamentals and CRSP for stock returns. The dependent variables are idiosyncratic return volatilities surrounding CEO turnovers. To estimate idiosyncratic return volatility, I follow Ang et al. (2006) and calculate the volatility of the residual daily stock returns of the market model within the periods of (-20, -5), (-1, +10), (-1, +21), (-1, +64), and (-1, +252). Implied volatility calculated based on the daily prices of the thirty-day at-the-money call options written on the firm's common stock.All the regressions include a constant. All the standard errors are clustered at the industry level. Robust t-statistics adjusted for heterogeneity for the two-sided test are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Idiosyncratic Return Volatility					**Implied Volatility**	
	(-20,-5)	**(-1.,+10)**	**(-1,+21)**	**(-1,+64)**	**(-1,+252)**		
Illness Event t	0.0041	0.0106**	0.0108***	0.0079**	0.0038*	0.0103*	0.009*
	(1.652)	(2.356)	(2.814)	(2.553)	(1.676)	(-1.767)	(-2.524)
ROA	-0.0231**	-0.0225***	-0.023***	-0.0211***	-0.0284***	-0.0380***	-0.0267***
	(-2.545)	(-2.785)	(-3.756)	(-2.884)	(-4.367)	(-4.257)	(-2.643)
Ln (Total Assets)	-0.0036***	-0.0037***	-0.0032***	-0.0042***	-0.0045***	-0.0041***	-0.0026***
	(-2.847)	(-4.720)	(-4.580)	(-6.570)	(-6.359)	(-7.455)	(-3.820)
Cash to Assets	0.0033	0.0096	0.0063	0.0086	0.0157	0.0089	0.0083
	(0.154)	(0.670)	(0.512)	(0.819)	(1.177)	(-1.157)	(-0.579)
Market Leverage	0.0057	0.0096	0.0104*	0.0158*	0.0125**	0.0219**	0.0036
	(0.750)	(0.691)	(1.713.)	(1.866)	(2.174)	(-3.164)	(-0.571)
Ln (CEO Tenure)	-0.0001	0.0004	0.0002	0.0001	0.0001	0.0000	0.0002
	(-0.250)	(1.007)	(0.624)	(0.006)	(0.043)	(-0.043)	(-1.067)
CEO Age	-0.0002	-0.0002	-0.0002	-0.0001	-0.0001	-0.0001	-0.0001
	(-0.647)	(-0.774)	(-0.680)	(-0.379)	(-0.888)	(-0.675)	(-0.674)
CEO is Male	-0.0065	-0.0169*	-0.0222*	-0.0214**	-0.0242	-0.0252	-0.0139*
	(-0.964)	(-1.680)	(-1.944)	(-2.482)	(-1.524)	(-1.627)	(-1.520)
Constant	0.0781**	0.0824***	0.0826***	0.0756***	0.0843***	0.0706***	0.0644***
	(2.356)	(3.830)	(4.134)	(5.925)	(4.171)	(-4.132)	(-3.630)
Fixed Effects	Industry	Industry	Industry	Industry	Industry	No	Industry
Observations	316	316	316	316	316	93	93
Adjusted R2	0.428	0.360	0.383	0.363	0.372	0.332	0.317

Chapter 3

Another Look at CEO Turnovers: CEO Succession Plans the Costs and Benefits

Abstract

The rate of CEO turnovers has been increasing since the 1970s, requiring boards to face succession events with greater frequency. This paper examines the impact of CEO succession planning during CEO turnover events. To isolate the value of firm succession plans, I use the sudden death of CEOs as a natural experiment. Firms with succession plans have positive announcement effects and higher firm performance following the turnover event, and these effects are significant economically. I find evidence that firms with succession plans are less likely to appoint COOs or interim CEOs and make appointments from a larger section of the CEO labor market. These results highlight the economic importance of CEO succession planning as part of the board's monitoring function.

"The primary job of a Board of Directors is to see that the right people are running the business and to be sure that the next generation of leaders is identified and ready to take over tomorrow."

(Berkshire Hathaway Inc, Shareholder Letter 2011)

"If we don't get this right, it can have a significant impact on how we are perceived by Wall Street, by investors, and by our own people."

(IED, Stanford University, 2014[1])

3.1 Introduction

A CEO turnover is a major event for a company, impacting volatility (Clayton, Hartzell, and Rosenberg 2005; Pan, Wang, and Weisbach 2015), firm performance (Murphy and Zimmerman 1993; Huson, Malatesta, and Parrino 2004) and investment decisions (Weisbach 1995). Following a turnover event, the board is responsible for the selection and appointment of the new CEO (Vancil 1987; Adams, Hermalin, and Weisbach 2010). However, the responsibility of preparing for a CEO turnover begins in advance of the turnover event, and the task of CEO succession planning is part of the board's ongoing monitoring function (Vancil 1987). The Security and Exchange Commission (SEC) asserted that "One of the board's key functions is to provide succession planning so that the company is not adversely affected due to a vacancy in leadership" (SEC 2009). This paper examines the effects of succession planning on CEO turnover events.

An important corporate trend has been the decline in CEO tenure, which has dropped 40 percent since 1992. Over 10 percent of S&P 500 firms transitioned to a new CEO in 2015. While multiple causal factors may have led to this (Huson, Parrino, and Starks

[1]The Institute of Executive Development (IED) and the Rock Center for Corporate Governance at Stanford University conducted in-depth interviews with executives and directors at 20 companies regarding their succession and executive development practices.

2001; Guo and Masulis 2015; Jenter and Kanaan 2015), the result has been that boards are required to navigate the transition from one firm leader to another with greater frequency. Lapses in CEO succession planning can have significant economic effects on firm performance. For example, the CEO of Twitter, Dick Costolo, announced his resignation on June 11, 2015, and a successor was not announced until October 5, 2015. During this period, the stock price of Twitter declined 21 percent. "We are stunned that we have now passed over 100 days since the announcement of the former CEO's resignation," wrote technology analyst Robert Peck, who went on to say that "feedback we hear from investors is that the process has taken too long" (See Forbes Magazine, September 21, 2015). Not surprisingly, the announcement of a CEO successor led to a 7 percent rise in Twitter's stock price. Moreover, succession plans can also have positive implications for firm performance. McDonalds had two CEOs who died within a nine-month window. However, the capability of McDonalds to implement its succession plan gave "immediate reassurance to employees, franchisees and investors..." (See Wall Street Journal, April 20, 2004).

In this paper, I examine how firms with or without CEO succession plans are affected by CEO turnover events. The CEO turnover literature has implicitly assumed that the effects of succession planning on the firm are subsumed either in the incumbent or the successor's tenure[2]. This paper offers a more complete view of the turnover process and the effects of CEO succession planning. Simply put, the prior literature implies that planning for a CEO turnover event does not matter for subsequent CEO selection or firm performance.

[2]CEO turnover research generally examines either the factors affecting the likelihood of CEO turnover. For example: industry shocks (Eisfeldt and Kuhnen 2013), board independence (Guo and Masulis 2015) and relative firm performance (Jenter and Kanaan 2015). Alternatively, the consequences of CEO turnover on firm performance: see for example Denis and Denis (1995), Weisbach (1995), Huson, Malatesta, and Parrino (2004) and Fee, Hadlock, and Pierce (2013).

A CEO succession plan is a guideline for the board to manage a turnover event and to appoint a new CEO (Vancil 1987). It is the process by which the board ensures that the firm has the optimal CEO overtime and can efficiently transition from one leader to another. Succession plans are a corporate governance mechanism to improve the efficiency of the matching process between the skills of available talent in the CEO labor market and the skills demanded by firms. CEO selection theory shows that observing the skills of a CEO and potential CEO successors requires the board to process a noisy signal (Hermalin and Weisbach 1998; Goel and Thakor 2008; Eisfeldt and Papanikolaou 2013; Campbell 2014). A board that engages in succession planning consistently monitors the pool of potential CEO replacements. This monitoring effort helps to reveal the true ability of potential successors. As the duration of the planning process increases, the precision of the signals regarding a candidate's ability increases (Hermalin 2005; Adams, Hermalin, and Weisbach 2010). This results in better matching of labor market talents with the skill needs of the firm in selecting a CEO successor. An important implication of the above proposition is that regardless of the reason for a turnover event (for example, forced, voluntary or exogenously occurring), firms that engage in succession planning have more precise signals about potential CEO abilities and have improved CEO candidate selection.

In estimating the effects of CEO succession plans, data availability, selection and reverse causality issues emerge. Data challenges occur because firms are not required to disclose detailed succession plan information[3]. Selection issues may arise for two reasons. First, firms that do disclose succession plan information may differ from firms that do not. Secondly, since most CEO turnover events are endogenous, examining all turnover

[3]Between 2008 and 2013 there were 32 shareholder sponsored proposals for information relating to firm succession plans. All proposals failed to achieve sufficient support. Please see Appendix Table A.2 for more detailed information.

events may induce a self-selection bias, that is, the non-random assignment of CEO turnovers creates problems in the estimation of causal effect (Roberts and Whited 2012). In addition, reverse causality may result in the incorrect identification of causal relationships, and the turnover event may lead to the adoption of the succession plan[4].

To address these empirical challenges, I exploit a natural experiment that causes unexpected CEO departures and exogenously identifies firms with and without succession plans. Specifically, I hand collect data regarding CEO sudden death events. This empirical technique was originally employed by Johnson et al. (1985), and more recently, in the corporate governance literature, for example, Fee, Hadlock, and Pierce (2013), Nguyen and Nielsen (2014), and Pan, Wang, and Weisbach (2015). An attractive feature of this identification strategy is that it rules out reverse causality, as there is no causal relationship between a firm having a succession plan and the sudden death of a CEO. This natural experiment allows the isolation of the succession plan and allows the ex-ante planning and monitoring efforts of the board to be revealed.

In the absence of a formal requirement to disclose detailed information on succession plans, the approach adopted in the literature has been to equate a succession plan with the individual holding the title of Chief Operating Officer (COO) or President (Naveen 2006; Mobbs and Raheja 2012; Borokhovich et al. 2014[5]). This approach is appealing due to the ease of identification using major databases. However, it is not consistent with the empirical trends in CEO appointments (Hermalin 2005; Ferris, Jayaraman, and

[4]Please see Chapter four for a detailed examination of factors affecting the likelihood of a firm having a CEO succession plan.

[5]Papers published in finance journals in the last ten years include Naveen (2006), Mobbs and Raheja (2012) and Borokhovich, Boulton, and Brunarski (2014). These papers examine succession planning from an alternate perspective to this research. Naveen (2006) examines how the complexity of the firm affects the likelihood of an internal successor. Mobbs and Raheja (2012) study the structure of the internal labor market and its effect of successor choice. Borokhovich, Boulton, and Brunarski (2014) study the incentive of grey directors.

Lim 2015), models of CEO selection (Hermalin and Weisbach 1998; Goel and Thakor 2008; Masulis and Zhang 2013) and the labor market decisions of COOs/Presidents (Shen and Cannella 2003). In this paper, I develop three new measures to identify firms' succession plans. First, I examine firm disclosures for ex-ante references to succession planning. Secondly, I examine media releases surrounding CEO turnover events for references to firm succession plans. Third, I use a time-based measure to identify the time between the turnover event and the appointment as a proxy for the preparedness of the firm. In addition, I hand collect information on the firm's succession process, such as the duration of the transition period, the appointment of an interim successor, and the choice of an external or internal successor. This identification approach is more robust than the previous literature, which infers the existence of a succession plan and potential candidates by using proxies such as the number of executive titles.

I provide evidence that succession planning has positive firm value effects around CEO turnover events. The first channel I examine is the stock price reaction to the unexpected loss of the CEO. The underlying assumption is that the stock price reaction towards a CEO death should reflect not only the loss of CEO talent, but also the expectations about the quality of the successor CEO and the search time to find a replacement CEO. In contrast to the earlier research on this aspect, I consider the confounding factors relating to the loss of the CEO. In the empirical analysis, which is restricted to the exogenous CEO death sample, I find a positive association between the abnormal returns surrounding the departure of the CEO and firms that have evidence of succession plans across different measures. This is an important result, as I provide evidence that firms that have succession plans experience a positive price impact following the loss of the CEO relative to those without succession plans. The existing literature on the firm value effects of CEO turnovers is mixed (Weisbach 1995; Parrino

1997; Huson, Parrino, and Starks 2001) and does not consider the effects of managerial succession planning.

Further, I examine whether succession planning has effects beyond the immediate turnover period. First, I analyze the long-term effects of succession planning to examine whether firms falsely signal that they have CEO succession plans. Investors, in the short run, may not be able to detect the misreporting of a CEO succession plan. However, as time progresses, this information asymmetry should diminish (Pan, Wang, and Weisbach 2015) as investors learn about the true state of a firm's succession planning and the quality of the successor CEOs. I observe that firms with succession plans have superior firm performance at time horizons of up to 12 months. This provides evidence that firms do not engage in false succession planning signals on average. Second, I investigate how the search time for a successor affects the firm value and find a negative relationship between firm performance and search time. Moreover, the size of the negative effect increases as the search time increases. This result is consistent with Bennedsen, Perez-Gonzales, and Wolfenzon (2012), who found that the longer the absence of a CEO, the more negative the impact on firm performance.

In a further series of tests, I explore the economic rationale for the positive value effects of firm CEO succession plans. An obvious implication of a firm having a succession plan is that it will begin preparing for CEO turnover events in advance. The board will begin the review and evaluation of candidates at an earlier point, ceteris paribus, than firms without succession plans (Hermalin and Weisbach 1998; Goel and Thakor 2008). I find that firms that have a succession plan have a larger and better skilled CEO candidate pool from which they can select. Importantly, I observe a negative relationship between firms with succession plans and the likelihood of appointing COOs/Presidents.

This finding indicates that proxying for succession plans using executive titles is not an appropriate measure. This finding is consistent with recent empirical trends in CEO successors that show an increase in the appointment of external CEO candidates (Hermalin 2005; Ferris, Jayaraman, and Lim 2015) and that the CEO labor market is a tournament (Mobbs and Raheja 2012; Burns, Minnick, and Starks 2016; Masulis and Zhang 2013).

This paper, using a hand-collected data set, documents the effects of CEO succession plans. I show that firms that engage in succession planning have superior firm performance following CEO turnover events. This is an important finding, as the prior CEO turnover literature does not explicitly consider the economic effects of CEO succession planning. I document that succession planning has effects on CEO selection, and that firms with succession plans select CEOs from a wider pool of candidates. This is a result consistent with the empirical trends of CEO selection. Importantly, I show that existing measures of succession planning that equate CEO succession planning with the COO or President being the "heir apparent" are not correct. The results are robust to concerns about endogeneity by using sudden CEO turnover events, specifically, CEO deaths.

A further contribution of this paper is the techniques used to develop the CEO death sample. The absence of a formal database to identify CEO deaths necessitates the examination of a large number of documents. The study uses several language processing innovations, including named entity recognition, to develop what is, to the best of my knowledge, the largest executive death sample to date.

The rest of the paper is organized as follows. Section 3.2 discusses the related literature and hypothesis development. Section 3.3 develops the empirical strategy and data

collection methods. Section 3.4 discusses the results of the paper. Section 3.5 presents additional tests and robustness checks. Section 3.6 concludes.

3.2 Literature Review and Hypothesis Development

For CEO succession planning to be an important part of a board's monitoring function, it must be of economic importance to the firm. This section begins by outlining what a succession plan is. This is followed by the development of the paper's testable hypotheses.

3.2.1 What is a CEO Succession Plan?

A CEO succession plan is the process by which the board ensures that the firm has the optimal CEO over time and can smoothly transition from one leader to another. It a guideline for the board to evaluate the CEO labor market, allowing firms to prepare in advance of CEO turnover events (Vancil 1987). Succession plans are a corporate governance mechanism to improve the efficiency of the CEO selection process.

The general nature of what a succession plan is reflects the absence of a uniform way for firms to approach the task. While there is no standard definition of what a succession plan is, shareholder proposals requesting information on companies' succession plans[6] provide key insights into the firm owners' expectations. An examination of shareholder proposals related to succession plans between 2008 and 2012 finds that shareholders

[6]Between 2008 -2012 there were 32 shareholder sponsored proposals for information relating to firm succession plans. All proposals failed to achieve sufficient support. Please see Appendix A.2 for more detailed information.

request information on the criteria for the CEO position, what the formal assessment process is to evaluate candidates and whether potential candidates are identified in advance. Importantly, there is a notable absence of shareholder requests for the firm to appoint an individual as the successor who is commonly referred to as an "heir apparent". There is an important distinction between a successor and a succession plan. A firm can engage in succession planning and not necessarily have an individual successor identified in advance.

Succession planning forms part of the CEO selection process. It is an ongoing function that is undertaken by the board in advance of the turnover event and is akin to the board evaluating a pool of candidates (Hermalin and Weisbach 1998). More recent theoretical work provides a formal representation of how boards evaluate potential successors. For example, in Goel and Thakor's (2008) CEO selection model, a manager's ability is initially unknown and is learned about over time, and the board replaces the incumbent CEO by following a "rational ability filtering process". The board learns about potential successors by observing them and then selects the manager with the "highest perceived ability". This filtering process by the board is analogous to CEO succession planning.

An implicit assumption of these CEO selection models is that the board is undertaking this ongoing monitoring and learning process, which results in a succession plan. In the absence of a succession plan, the board of the firm will begin the learning and evaluation process for a CEO successor from the beginning. Based on this proposition, firms with CEO succession plans, ceteris paribus, have the ability to improve CEO selection and to make the transition to the CEO successor more efficient.

3.2.1.1 Is an Heir Apparent a Succession Plan?

The general nature of what a succession plan is creates challenges for researchers. As noted by Naveen (2006), "CEO succession as a process has received little explicit attention in the finance literature". A common approach to identifying a firm's CEO succession plan is to identify the individual holding the title of Chief Operating Officer (COO) or President and then to assume that this executive is the "heir apparent". Examples of studies using this approach include Naveen (2006), Mobbs and Raheja (2012) and Borokhovich, Boulton, and Brunarski (2014). This approach is appealing from an empirical perspective, as it makes the identification of a firm's succession plan a straightforward case that is easily matched using common data sources.

However, treating a COO/President title as the equivalent to a succession plan is not easily reconciled with the empirical trends in CEO appointments (Hermalin 2005; Ferris, Jayaraman, and Lim 2015), the models of CEO selection (Hermalin and Weisbach 1998; Goel and Thakor 2008) or the labor market decisions of COOs/Presidents (Shen and Cannella 2003). As noted by Shen and Cannella (2003), one third of these heir apparent CEOs depart from the firm prior to their promotion to the CEO position. This is a curious result given these individuals have been picked to be the CEO. In fact, an alternate interpretation could be that these individuals leave the firm because they are not among the firm's potential candidates in the succession plan.

An additional limitation of using COO/Presidents as a proxy for succession planning is that it equates succession planning and successors. This contrasts with the theoretical (Hermalin and Weisbach 1988; Goel and Thakor 2008) and empirical evidence that CEO selection is a tournament (Mobbs and Raheja 2012; Masulis and Zhang 2013) with candidates competing in the internal and external labor market to become a

CEO, rather than the COO/President being assured of promotion to the CEO position (Huson, Parrino, and Starks 2001; Hermalin 2005; Ferris, Jayaraman, and Lim 2015).

A serious concern with using COO/President titles to proxy for succession planning is that this will mistakenly lead to the inclusion of firms that do not have a succession plan. A succession plan is an ongoing evaluation process conducted by the board to learn about candidates and select the optimal replacement. In the absence of a succession plan, this evaluation and monitoring process will not have occurred. In the event of a turnover event, a firm that does not have a succession plan will not have evaluated any alternate candidates and is therefore more likely to promote the COO/President, as this is the second highest ranked executive. In this case, the use of COOs/Presidents to proxy for succession planning will have the unintended outcome of grouping together firms that do not have succession plans with firms that have succession plans.

3.2.2 Succession Planning and Firm Value

Next, I consider how succession plans affect firm values. I focus on the effects of succession plans around CEO turnover events. The reason for this is that succession plans form part of the "board's role in the oversight of company's management of risk" (SEC 2009). As succession plans play an important role in the transition from one firm leader to his (or her) successor, I focus on the effects during CEO turnover events.

Given capital market efficiency, the price reaction following a turnover event should reflect the loss of human capital, as well as expectations about the quality of the successor and the time needed to find a replacement CEO. A number of studies have examined stock price reactions following the loss of executives, including the CEO (Johnson et al.

1985; Salas 2010; Nguyen and Nielsen 2014). Shareholder wealth effects following the loss of the CEO depend on confounding events, the loss of the incumbent CEO's talent and the perceived challenge in finding a replacement. Firms that have a succession plan are expected to have a larger and better skilled CEO candidate pool from which to choose, ceteris paribus.

The value of a succession plan will be reflected in common stock price responses when a turnover event occurs. Firms with CEO succession plans will be able to appoint a replacement and better match the CEO labor requirements of the firm than those without them (Marcel, Cowen, and Ballinger 2013). This positive effect will be reflected in the share price response to turnover announcements.

An important consideration is how shareholders learn about a board's succession planning efforts. The learning process by the shareholders has been confirmed by empirical evidence provided by Pan, Wang, and Weisbach (2015). Shareholders learn about the board's succession plan activities via firm disclosures prior to CEO turnover events, as well as by observing firm behavior around the turnover event. For example, market participants can learn about firm succession plans from company filings (SEC 2009) or the speed with which a successor is appointed following a turnover event. This conjecture does not require assumptions about the speed of learning by a board or the ability of the CEO successor (Pan, Wang, and Weisbach 2015).

This leads to the paper's first hypothesis:

H1.1 Shareholders react more positively to CEO turnover announcements in firms with a succession plan than in those without succession plans.

Observing the skills of a potential CEO successor requires the board to process a noisy signal (Goel and Thakor 2008; Eisfeldt and Kuhnen 2013; Campbell 2014). The board

learns about candidates by observing imprecise measures of skills to infer their potential abilities. A board that engages in succession planning consistently monitors a pool of potential CEO replacements. This monitoring effort helps to reveal the true ability of potential replacements after observing the noisy signals. Succession planning is an ongoing monitoring process. As the duration of the planning process increases, the precision of the signals regarding a candidate's ability increases. This will result in better matching of labor market talents with the skill needs of the firm during CEO turnover events.

An important implication of the above proposition is that regardless of the reason for the turnover event, for example, forced, voluntary or exogenously occurring, firms that engage in succession planning have more precise signals of potential CEO abilities and therefore have improved CEO candidate selection.

This leads to the second hypothesis:

H1.2 Firm performance is positively affected following a turnover event if a succession plan is present.

3.2.3 CEO Selection and Consequences for Monitoring

The selection of the CEO is one of the board's most important functions, and it is a process in which the board exercises significant control (Borokhovich et al. 2006; Goel and Thakor 2008; Campbell 2014) For the CEO selection process to function efficiently, the skills of the available talent in the CEO labor market must match the demands of the firm. A mechanism that improves the efficiency of the matching process is the board's CEO succession plan. I argue that firms that have succession plans will observe

a wider pool of candidates and will observe signals about ability for a longer period, ceteris paribus, than firms that do not engage in succession planning.

The succession plan literature has implicitly assumed that all firms adopt a "relay successions" approach. In a relay succession, the successor is identified in advance of a CEO turnover event and takes on the COO or President title (Vancil 1987; Shen and Cannella 2003). The evidence for the prevalence of this succession process is limited. For example, the key work identifying this succession method, Vancil (1987), uses anecdotal evidence from twenty-nine firms during the late 1980s and does not represent a large cross-section or time-series of firms. As outlined previously, this assumption is not consistent with the theoretical models of CEO selection (Hermalin and Weisbach 1988; Goel and Thakor 2008), the empirical trends in CEO appointments (Huson, Parrino, and Starks 2001; Hermalin 2005; Ferris, Jayaraman, and Lim 2015) or the high departure rate of these heirs apparent prior to their promotion (Shen and Cannella 2003). These findings indicate the diminished validity of proxying for firm succession plans based only on executive titles.

This leads to the following hypothesis:

H2.1. Firms with CEO succession plans are more likely to appoint non-COOs/Presidents as successors following turnover events.

Related to the decision about who to appoint following a CEO turnover event is the time required for the board to appoint a CEO. There is evidence that disruptive turnover events have a negative impact on firm performance (Ballinger and Marcel 2010) and that the use of an interim CEO is viewed by shareholders as a lapse in governance (Marcel, Cowen, and Ballinger 2013). I argue that firms that have a CEO succession plan will exercise a learning and evaluation process for candidates, ceteris paribus,

more frequently than a firm that does not engage in succession planning. Firms that have succession plans will have a smoother transition from one leader to another, and therefore, are less likely to require the use of interim CEOs.

This leads to the following hypothesis:

H2.2. Firms with CEO succession plans are less likely to appoint an interim CEO following turnover events.

3.2.4 CEO Succession Plans and the Consequences for Monitoring

3.2.4.1 Benefits of CEO Succession Plans

The intensity of the board's monitoring function is correlated with the likelihood of a CEO turnover event. For example, Hermalin's (2005) model of CEO selection showed that greater board diligence will lead to shorter CEO tenures. Recent empirical work by Coles, Daniel, and Naveen (Coles, Daniel, and Naveen 2014) and Guo and Masulis (2015) showed how board independence affects board monitoring and the propensity for CEO turnover. A key part of the board's wider monitoring function is succession planning (Vancil 1987; SEC 2009).

A succession plan is a corporate governance mechanism for the board to learn about the ability of potential CEO successors. Boards that engage in CEO succession planning will observe the ability of the incumbent CEO relative to the estimated ability of the pool of candidates.

This leads to the following hypothesis:

H3.1. Firms with CEO succession plans will lead to shorter CEO tenures on average.

3.2.4.2 Costs of CEO Succession Plans

If a consequence of CEO succession planning is a higher probability of dismissal, this will discourage CEOs from accepting an offer (Hermalin 2005). One of the implications would be that boards with CEO succession plans will be required to pay the CEOs more to compensate for their loss of utility.

This leads to the paper's final hypothesis:

H3.2. Firms with CEO succession plans will pay higher CEO compensation on average.

3.3 Data and Empirical Design

This section outlines the paper's approach to the identification of firms' succession plans and the empirical strategy to examine the effects of succession planning on firm performance, CEO selection surrounding CEO turnover events, as well as the tenure and compensation effects. To establish a causal relationship between succession planning and firm effects, the paper uses three samples. The first sample includes all CEO turnover events in S&P 1500 firms. To ensure that the results are not the result of endogenous factors, a second sample of exogenous CEO turnover events are examined, specifically, sudden CEO deaths. The third sample is a panel data set of S&P 1500 firm year observations, and it is used to examine whether consistent findings are observed across a broader set of firms. The sample begins in 1996, the earliest year for which board, CEO and firm information can comprehensively be developed, and it ends in 2014.

3.3.1 Succession Plan Measures

In this paper, I use three measures to identify CEO succession plans. The first measure identifies firms with succession plans in advance of CEO turnover events based on SEC regulatory disclosures. The second measure examines the media disclosures surrounding CEO turnover events. The third measure infers succession plans from the time taken to appoint a CEO successor following a turnover event.

The first measure of CEO succession planning is the *Succession Planning Mentioned in Proxy Statement*, which is measured by whether or not the firm discusses succession planning in its SEC proxy filings (DEF 14A) prior to a CEO turnover event. The initial sample is created using keyword matching techniques to examine documents that contain succession plan related words, for example, hand over, replacement, succession plan, and successor. Each match is then manually examined to determine its relevance. Appendix A.3 provides further details about the search tools used in this paper.

Figure 3.1 reports the number of firms that discuss succession planning in their proxy statements in the period from 1994 to 2014. The use of ex-ante proxy statement disclosures identifies firms that disclose the presence of succession plans prior to the occurrence of the turnover event. The proportion of firms that discuss succession planning increased from 5 percent to 40 percent between 1994 and 2014 for the Compustat sample.

<Insert Figure 3.1 Approximately Here.>

The use of actual firm disclosures to identify firm succession plans holds a number of sample selection advantages over the use of proxy measures. First, firms face regulatory

and legal consequences for false disclosures. Secondly, I do not infer whether a firm has a succession plan from a title or other firm information.

A potential concern is that a firm does not have an incentive to reveal detailed information about its CEO succession plans. The reasoning underlying this concern is that revealing CEO succession plan information would impact the incentives for the firm members' effort (Fama and Jensen 1983), the likelihood of remaining with the firm and the willingness to acquire firm-specific knowledge (Acharya, Myers, and Rajan 2011). In addition, it may have external effects, including signaling high quality labor and inducing competitors to recruit the "successors" to change firms (Shen and Cannella 2003). The reluctance of firms to disclose detailed succession plan information is evident in shareholder proposals in relation to succession plans. For example, 32 shareholder proposals for firm succession plan information occurred between 2008-2013[7]. In all circumstances, International Shareholder Services (ISS) recommended voting for the proposal and the management recommended against it. All the proposals failed to pass. An important distinction is that these proposals seek detailed information on the firms' CEO succession plans, for example, the criteria for the CEO position, a list of internal candidates and information on specific features of the succession plan. The measures used in this paper do not require detailed information about the succession plan; rather, they require evidence of whether and when boards do engage in succession planning, as measured on an annual basis.

The second measure of CEO succession planning is *Revealed Succession Planning in News Release*. This proxy is constructed by examining firm announcements relating to CEO turnovers. I identify references in firm media filings and news articles to succession planning related keywords. For the CEO death sample, both death events and successor

[7]See Appendix A.2 for detailed information of succession plan shareholder proposal voting results.

announcements are examined.

The third measure of CEO succession planning is *CEO Appointments within x Days Following a Death Event*. To proxy for whether a firm has a CEO succession plan, I examine the ability of the firm to name a CEO successor following the turnover event. Vancil (1987) observed that a succession plan identifies viable candidates in advance of the CEO turnover. The board's ability to appoint a CEO successor within a short time period following a death event is evidence of an ex-ante succession plan. A firm with a succession plan will be able to appoint a successor in a shorter amount of time than a firm without a succession plan, when everything else is the same. For the empirical tests, alternate CEO appointment windows are examined: *1 day*, *2 days* and *3 days*. Figure 3.2 shows that nearly 80 percent of CEO successor announcements are made within 3 days, providing a justification for the selection of the appointment windows. To create this dummy variable, I determine the time between the earliest record of death and the firm's appointment of a CEO successor.

<Insert Figure 3.2 Approximately Here.>

3.3.2 Empirical Strategy

To estimate the effects of CEO succession plans, I exploit a natural experiment that causes unexpected CEO departures and exogenously identifies firms with and without succession plans. To ensure that the results are robust, it is necessary to examine exogenous CEO turnover events. This is necessary to prevent incorrect causal inferences,

as the underlying turnover event may drive the results (Huson, Parrino, and Starks 2001; Huson, Malatesta, and Parrino 2004; Jenter and Kanaan 2015; Pan, Wang, and Weisbach 2015). Specifically, I hand collect CEO sudden death events. This empirical technique was originally employed by Johnson et al. (1985), and more recently, in the corporate governance literature, for example, Fee, Hadlock, and Pierce (2013), Nguyen and Nielsen (2014), and Pan, Wang, and Weisbach (2015). I extend the current approaches by examining all 8-K, 10-K and DEF 14A filings and collecting information on the firm's succession process, such as the duration of the transition period, the interim successor, whether there is an external or internal successor, as well as whether the firms indicated ex ante whether they had a succession plan. Consequently, I can confidently draw causal conclusions about the impact of succession plans. Further, this identification approach is more robust than the previous literature, which infers the existence of a succession plan and potential candidates by using proxies such as the number of executive titles, etc. The use of these proxies in isolation creates sample selection errors.

3.3.3 Sample Descriptions

3.3.3.1 S&P 1500 CEO Turnover Sample

This sample consists of all CEO turnover events in Standard and Poor's 1500 firms from 1996 to 2014. Turnover events are identified from ExecuComp and only include CEOs that have a tenure of three years or longer. Table 3.1 reports the summary statistics on the CEOs and boards during CEO turnover events. Year 1996 is the first year that I can develop comprehensive information on the underlying boards due to the coverage of the RiskMetrics Database on board information. The initial sample

contains 4,728 unique CEO turnover events. I use the information on Annual Title, Date Became CEO, Date Left as CEO and CEO Annual Flag provided by ExecuComp to identify CEOs at the firm-year level, following Pan, Wang and Weisbach (2015). To match across databases, I use either common identifiers or a name-matching algorithm[8]. Observations are manually checked for missing values or potential error observations.

Panel A reports the summary statistics for the incumbent CEO at the turnover year identified as the year of Left as CEO in ExecuComp; Panel B reports the summary statistics for the successor CEO at the CEO turnover year identified as the year of Became CEO in ExecuComp; Panel C reports the summary statistics for the dummy variable of whether the firm mentioned a CEO succession plan in its proxy statements by scanning all DEF 14A filings in the Edgar database from the SEC; Panel D reports the summary statistics for firm-level attributes at the CEO turnover years provided in Compustat; and Panel E reports the board data available in RiskMetrics or BoardEx at the CEO turnover years. All variables are defined in Table A.1 of the Appendix.

<Insert Table 3.1 Approximately Here.>

3.3.3.2 CEO Sudden Death Sample

To isolate the effects of CEO succession plans, I use sudden death events as a natural experiment to force firms to disclose more information about their succession plans.

[8]I thank Robert Tumarkin for providing this matching algorithm. Please see Sen and Tumarkin (2015) online internet appendix for a detailed discussion on the matching procedure. The name matching algorithm that takes into account misspelling, incorrect word order, nick names, name omissions and also accounts for tonal characteristics of names.

The use of death as an exogenous shock is documented in a number of existing corporate governance studies (Johnson et al. 1985; Nguyen and Nielsen 2010; Falato, Kadyrzhanova, and Lel 2014; Nguyen and Nielsen 2014; Pan, Wang, and Weisbach 2015). Appendix A.3 explains in detail the development of the study's death sample, including the use of keyword matching and natural language processing tools. Through an extensive search of over 1.2 million documents of 8-K and 10-K filings, I identify 181 CEO sudden death events. Table 3.2 reports the summary statistics on the CEO sudden death sample.

<Insert Table 3.2 Approximately Here.>

After collecting CEO sudden death related information, such as the date and cause of death[9], I merge the death data with the firm's fundamental data from Compustat and the stock return data from the Center for Research in Security Prices (CRSP). Firm deaths not contained in Compustat are excluded from the final sample. I follow Adams, Almeida, and Ferreir (2005) to clean the Compustat fundamental data, dropping firms with missing or negative values for total assets (AT), capital expenditures (CAPX), property, plant and equipment (PPENT), cash holdings (CHE), or sales (SALE). I also drop firms for which the cash holdings, capital expenditures or property, plant and equipment are larger than the total assets.

Information on the deceased CEOs, firm boards and corporate governance is obtained from ExecuComp, BoardEx, RiskMetrics, Capital IQ (Professional) and Audit Analytics. I match across the different databases using an advanced name matching algorithm

[9]For a detailed explanation see Appendix A.3

manual check. I use name matching techniques (TFIDF and SoundEx) to match the CEO in ExecuComp, RiskMetrics, BoardEx, Capital IQ Professional and Capital IQ compensation. I collect individual information for each CEO-firm pair (e.g. age, gender, tenure, committee membership, title, outside position, etc.). For the missing values or potential error observations (outliers or different age records for the same CEO among the different databases), I manually correct more than 38 observations. Approximately 10 percent of the CEO executive observations in ExecuComp do not include age information. I manually search for these observations if publicly available.

Panel A reports the summary statistics for the dead CEO at the time of death. Panel B reports the successor information based on the year of appointment to the CEO position. Panel C reports information on the firms' succession plans.

3.3.3.3 Panel Data Set

This sample consists of all firm-year observations from 1996 to 2014 of the Standard and Poor's 1500 firms in the ExecuComp database. I follow a similar process to that described above and collect CEO, board and firm information from ExecuComp, BoardEx, RiskMetrics, Capital IQ (Professional) and AuditAnalytics. Matching across the database occurs either through the use of common identifiers or via a name-matching algorithm. The observations are manually checked for missing values or potential error observations.

Table 3.3 Panel A reports the summary statistics for incumbent CEOs in ExecuComp; Panel B reports the summary statistics for the dummy variable of whether the firm mentioned a CEO succession plan in its proxy statements, and it was manually collected by scanning all the filings in the Edgar database from the SEC; Panel C reports the

summary statistics for other firm-level attributes provided in Compustat; and Panel D reports the board data available in RiskMetrics or BoardEx. All variables are defined in Table A.1 of the Appendix.

<Insert Table 3.3 Approximately Here.>

3.3.3.4 Controls

In the regression specification, the following explanatory controls are included. Firm size is measured by Total Assets. It has been observed that the size of the organization can affect the succession process (Parrino 1997; Naveen 2006). Board independence is captured by the Independent Director Ratio. Guo and Masulis (2015) documented a positive relationship between board independence and CEO turnover. I also follow Coles, Daniel, and Naveen (2008; 2014)[10], controlling for board size, female director ratio, as well as CEO power and entrenchment measures, such as CEO founder, CEO duality, CEO tenure and the age of the CEO. Because of the documented relationship between CEO turnover and firm performance, I also include ROA (Huson, Malatesta, and Parrino 2004; Jenter and Kanaan 2015). Most of these control variables have been used in prior CEO turnover studies.

[10]I would like to thanks Coles, Daniel and Naveen for providing the code to clean the RiskMetrics director database.

3.4 Empirical Results

3.4.1 Market Reaction to CEO Turnovers: With and Without Succession Planning

3.4.1.1 Univariate Results

Table 3.4 reports the univariate results and the event study analysis tests for differences in the announcement effects of CEO turnovers, with and without succession plans. The price reaction following a turnover event reflects the loss of human capital and the expectations about the quality of the successor. I follow the standard event study literature and assume a market factor model, where beta is estimated using the data from the pre-event window. I estimate equations (3.1) and (3.2) for All CEO Turnover Events (Panel A) and for CEO Sudden Deaths (Panel B), where $AR_{i,t}$ is the abnormal return for each security in the sample relative to the event. CAR_i is the cumulative abnormal return measuring the abnormal performance for the window specified around the event date.

$$AR_{i,t} = R_{i,t} - E[R_{i,t}|\Omega_{i,t}] \tag{3.1}$$

$$CAR_i = \sum_{t=T+1}^{T_2} = AR_{i,t} \tag{3.2}$$

To examine the stock price reaction, I access the daily returns from CRSP for each of the events for an 11-day period around the disclosure date (from day -5 to day +5), as well as a 255 day pre-event estimation period (This period is -300 to -46 days prior to the illness event). I follow Nguyen and Nielsen (2010) and check for confounding events surrounding the turnover announcement, for example, merger announcements, financial

results, stock repurchases and other unrelated company news. These observations are excluded from the sample.

An empirical challenge of running an event study of CEO turnover events is that the departure of the CEO will frequently coincide with the appointment of the successor. As shown in Figure 3.2, over 80 percent of turnover/successor announcements occur on the same day (day 0) or within one day of each other (+1). Therefore, disentangling the announcement effects is problematic.

Table 3.4 Panel A reports cross-sectional differences for all CEO turnover events in the S&P 1500 sample. As the announcement effects may be driven by the cause of the turnover, for example, differences between forced and voluntary, I examine the stock market reaction to announcements of CEO deaths and examine the differences between firms with and without succession plans.

Panel A reports the event study results for the valuation effects of CEO turnover announcements. The cumulative abnormal returns (CAR) are reported for three event windows for both the turnover and successor announcement, prior to the event (-30, -5), surrounding the event (-1, +1) and post event (+5, +64). For all three event windows, the announcement of the departure of the incumbent CEO results in a negative CAR, and these results are statistically significant at the 1 percent level. The average CAR surrounding the event (-1, +1) is 0.0047. Similarly, for successor announcements, the CAR is negative for all three event windows, and these results are statistically significant at the 1 percent level. However, as noted, 80 percent of these results occur within one day of each other. The univariate analysis, in many ways, highlights the empirical challenge of isolating the value of succession plans due to the confounding effects.

<Insert Table 3.4 Approximately Here.>

Panel B reports the announcement effects of the CEO sudden death sample. In the period prior to the death, no statistically significant effects are found. This provides evidence that the loss of the CEO is exogenous and not anticipated. For the event period (-1, +1), the announcement of the loss of the CEO is negative, -0.0013. However, the appointment of a successor has a positive value effect, +0.0029. These results are statistically significant at the 5 percent level. This provides early evidence that firms that experience the exogenous loss of a CEO do experience the negative value effects of the loss of the talents of the CEO (Bennedsen, Perez-Gonzalez, and Wolfenzon 2006; Bennedsen, Perez-Gonzales, and Wolfenzon 2012); however, firms able to appoint successors experience positive value effects.

3.4.1.2 Multivariate Analysis

In this section, I extend the univariate results to examine the differences in the announcement effect between firms with and without succession plans. To disentangle the effects of the turnover from succession planning, I restrict this section of the analysis to the CEO sudden death sample. The use of exogenous CEO turnover events alleviates the possibility that the cause of the turnover is driving the results.

Table 3.5 reports the multivariate regression analysis. The dependent variables are the announcement CARs for the (-1, +5) window around the earliest reference to the death of the incumbent CEO. Models I to V report the results for alternate succession plan measures. Models VI and VII report the results for alternate event windows. Throughout the analysis, I control for the incumbent (deceased) CEO's characteristics,

including age, tenure and dummy variables for founder and chairman. Firm controls include market capitalization, as measured by total assets, and firm profitability, as measured by return on assets. I also include a series of controls for board characteristics, including board size and the ratio of independent directors.

In Model I, the key independent variable is whether a firm discloses in its regulatory filings whether it has a succession plan ex ante to the exogenous CEO turnover event. The coefficient is positive and statistically significant at the 5 percent level. The economic effect of this, given the average market capitalization, is $9.3 billion. The difference in performance between firms with and without succession plans following the exogenous loss of a CEO is $108.81 million.

Model II to Model V examine the association between the CAR and the alternate succession plan measures. In Model II, the key independent variable is an indicator variable for whether a firm mentions a succession plan in a news release. Models III to V proxy the presence of a succession plan by the time taken to appoint a successor following the CEO turnover. For the alternate specifications (Models II to V), there is a consistent positive and statistically significant relationship between the CAR and firms that have succession plans.

To ensure that the results are not being affected by the CAR window selection (-1, +5), Models VI and VII re-run the analysis with alternate CAR windows, (-1, +3) and (-1, +4). The results are consistent for changes in the specification of the dependent variable.

The results reported in Table 3.5 provide further evidence that there are differences in CEO turnover announcements between firms that have succession plans and those that do not. This indicates that the firms with evidence of a succession plan experience a

positive price response following CEO turnovers.

<Insert Table 3.5 Approximately Here.>

3.4.2 Firm Performance: With and Without Succession Planning

In this section, I examine the long-term effects of CEO succession planning on firm performance to better understand whether the financial consequences of succession planning are reversed over time. This analysis also helps to provide insight into the drivers of the value effect differences between treatment and control firms by assessing changes in CEO selection, compensation and tenure.

Table 3.6 reports the estimates of the relationship between firm performance and succession planning. Firm performance is measured by the abnormal buy and hold returns for four different event windows. The event window is limited to one year, because more than 97 percent of succession processes are resolved within periods of less than a year, as reported in Figure 3.2. Again, I identify firms with ex-ante CEO succession plans using three alternate proxies. First, there is an indicator variable equal to one if a firm discusses a succession plan prior to the CEO death event in its proxy statements. Secondly, there is an indicator variable equal to one if a firm references a succession plan in media releases following the turnover event, and finally, there is an indicator variable equal to one if a firm can appoint a CEO successor in three days or less following a CEO death.

As reported in Table 3.6, for all specifications, I observe a positive relationship between firms having CEO succession plans and firm performance. Models I to VIII are significant at the 5 percent level or higher. To investigate the effects of succession plans on long-term firm performance, I look at firms that are able to announce a CEO successor within 3 days of the exogenous CEO turnover event. In unreported results, I examine the alternate succession plan measures and find consistent results. I observe, across Model III (-1, +10) to Model VIII (-1, +252), that the succession plan coefficient is positive and that a stronger effect is found between the succession plan variable and firm performance at longer time horizons.

<Insert Table 3.6 Approximately Here.>

A potential concern with using the time taken to appoint a CEO as evidence of an ex-ante succession plan is that I will capture firms that do have a CEO succession plan, but also firms that quickly appoint a CEO and did not have a succession plan ex ante. This selection bias, in effect, would mean that I would be pooling firms with and without succession plans. The effect of this would be a bias against finding a positive relationship between firms with succession plans and longer term firm performance.

Next, I test the relationship between the search time for a CEO and firm performance. The dependent variable is the buy and hold abnormal returns at different investment horizons. The key independent variable of interest is the log of the CEO search time (measured by days between the death announcement and the earliest reference to a successor). Table 3.7 reports the results. At short time horizons of less than 21 days, a negative relationship exists between the search time and firm performance; however,

it is not found to be statistically significant. This provides evidence that at short time horizons, the returns of the firm are not adversely affected. For Models III and IV, showing 64 days and 252 days, respectively, both coefficients are negative and statistically significant at the 5 percent level. This result is consistent with Bennedsen, Perez-Gonzales, and Wolfenzon (2012), in that the longer the absence of a CEO, the more negative the impact on firm performance.

<Insert Table 3.7 Approximately Here.>

Table 3.4 to Table 3.7, taken together, provide evidence of the positive effect that CEO succession planning has on firm performance. Tables 3.4 to 3.6 show the positive effect of succession planning on firm performance, because it allows firms to have a smoother turnover process. Table 3.7 provides evidence of the negative effects of not having a succession plan and the impact of the search time on firm performance.

3.4.3 The Benefits and Costs of Succession Planning

3.4.3.1 Larger Talent Pool

The evidence reported shows that succession plans have a positive effect on firm value following CEO turnover events. This section provides an economic rationale for these value effects by examining the implications of firms' CEO succession plans.

An obvious implication of a firm having a succession plan is that it will begin preparing for CEO turnover events in advance. The board will begin the reviewing and evaluation of candidates at an earlier point, ceteris paribus, than firms without succession plans.

Firms that have a succession plan are expected to have a larger and better skilled CEO candidate pool from which to select a successor.

I examine the effects of succession plans on CEO selection in Table 3.8. The dependent variable identifies the background of the appointed successor. Importantly, this analysis does not impose any constraints on the CEO selection parameters. Models I to IV test for the relationship between succession plans and the likelihood of appointing an external (Parrino 1997; Hermalin 2005), interim (Marcel, Cowen, and Ballinger 2013), retired or founder CEO (Bennedsen, Perez-Gonzalez, and Wolfenzon 2006) successor. Models V to X examine the likelihood of selecting different internal candidates based on employment titles. Models V to X provide evidence on the relationship between a COO heir apparent (Shen and Cannella 2003; Naveen 2006) and the tournament theory (Mobbs and Raheja 2012; Burns, Minnick, and Starks 2013). All the models include board, CEO and firm controls. To control for potential differences in CEO selection across industries, the industry fixed effects are included. The standard errors are clustered at the firm level.

In Table 3.8, I find that firms that have succession plans are less likely to appoint an interim CEO successor (Model II), and this result is statistically significant at the 5 percent level. This result is consistent with evidence that succession plans are a corporate governance mechanism to improve the efficiency of the CEO selection process and to make the transition from the incumbent CEO smoother.

Firms that have succession plans are likely to consider a wider pool of candidates. Model V reports a negative relationship between firms with succession plans and the likelihood of appointing the COO or President following a turnover event. This result is statistically significant at the 1 percent level. I find a positive relationship between firms

with succession plans and the likelihood of appointing an outside CEO; however, this relationship is not found to be statistically significant. An implication of the results reported in Table 3.8 is that it provides evidence that the use of executive titles to proxy for succession plans is problematic (Shen and Cannella 2003). That is, I find that firms with succession plans are less likely to appoint the COO/President. The remaining models in Table 3.8 do not find any statistically significant relationships. These findings, when combined with Models II and V, provide evidence that succession plans result in the boards' consideration of a wider pool of candidates.

<Insert Table 3.8 Approximately Here.>

Next, I examine whether succession plans affect the quality of the CEO successor. Boards that fulfill their monitoring function and prepare for leadership transition are better placed, on average, to select higher quality successors. I examine the quality of the successor by looking at their compensation and the prestige of their previous employment ranking. These measures are motivated by evidence that executive pay is a measure of the expected contribution to shareholder value (Nguyen and Nielsen 2014). Table 3.9 reports the results. To identify the benefits, the key dependent variables are an indicator variable for S&P 500 experience (Model I), previous total compensation ranking among all S&P 1500 firms the year prior to the turnover event (Model II) and the successor's previous ranking by total assets in the year prior to the turnover events (Model III). To identify the costs, the dependent variable is the total compensation of the successor in the year after the turnover event (Model IV). All the models include the previously used controls, as well as the industry fixed effects. The standard errors

are clustered at the firm level. I observe that firms with succession plans are able to appoint successors with higher previous compensation (Model II) and from more prestigious firms (Model III). The prior S&P500 coefficient (Model I) is positive and nearly statistically significant. I also find that firms with succession plans pay higher compensation to the successors. The results, taken together, provide evidence supportive of the hypothesis that succession plans help the board to learn about the ability of potential CEO successors.

<Insert Table 3.9 Approximately Here.>

3.4.3.2 Improved Monitoring

Succession planning is part of the board's monitoring function and allows for a smoother and more positive transition in firm leadership. In this section, I examine how succession plans affect the monitoring of the CEO. In Table 3.10, I report the effects of succession planning on the likelihood of a firm having a CEO turnover event. I find a positive association between firms that have succession plans and the likelihood of having a CEO turnover. This result is robust for the S&P 1500 and the larger BoardEx sample, as well as for the inclusion of either the industry or firm fixed effects. This result is consistent with evidence that improved monitoring is correlated with the likelihood of CEO turnover events (Coles, Daniel, and Naveen 2014; Guo and Masulis 2015).

<Insert Table 3.10 Approximately Here.>

Closely tied with a firm's propensity to dismiss the incumbent CEO is CEO tenure. In Table 3.11, I report the results, where the key dependent variable is CEO tenure. Again, I observe that firms with succession plans have a negative association with CEO tenure. This result is robust for the S&P 1500 and the larger BoardEx sample, as well as for the inclusion of either the industry or firm fixed effects. However, CEO succession planning seems not to apply to family firms. One possible explanation is that the block of family shareholdings might dominate the decision by the board and override a decision for CEO succession planning by the board (Bennedsen, Perez-Gonzalez, and Wolfenzon 2006). Consequently, the benefits of a CEO succession plan can be weakened. Another possible explanation is the measurement error. Whether firms mention a CEO succession plan in their proxy statement may not be a suitable measure for family firms. They can discuss the succession issue among the family members, rather than among the board, to protect certain business secrets from their competitors.

<Insert Table 3.11 Approximately Here.>

3.5 Additional Tests and Robustness Checks

3.5.1 Potential Channels

<Insert Figure 3.3 Approximately Here.>

<Insert Figure 3.4 Approximately Here.>

<Insert Figure 3.5 Approximately Here.>

how CEO succession plans impact the operation of firms through different channels. In Figure 3.3, I report the change of the capital structure in firms (Panel A) and the capital expenditures (Panel B) of firms with or without CEO succession plans during CEO turnover periods. The capital structure is measured by the debt to equity ratios and the capital expenditures are the capital expenditures over the total assets. Firms with succession plans experience larger changes in capital structure, but smaller changes in capital expenditures than firms without succession plans. Also, Figure 3.4 shows that R&D expenditures drop significantly after CEO turnover for the firms without CEO succession plans. Finally, Figure 3.5 illustrates that the ROA drops considerably surrounding a CEO turnover for firms without CEO succession plans. These findings are consistent with the theoretical predications that due to the absence of leadership, the uncertainty of the firm increases and firms are less likely to make major investments in new projects. Also, because of the increased risk, the return on equity required by investors increases, as the future cash flow might decrease and the discount rate might increase. After showing the impact of a CEO succession plan, I conduct a multivariate examination on the size of the effect. Table 3.12 reports these results and confirms the results from Figures 3.3 to 3.5. Specifically, CEO succession planning helps to reduce the changes in capital structure, capital expenditures, R&D expenditures, ROA and stock prices during CEO turnover events.

<Insert Table 3.12 Approximately Here.>

3.5.2 Interim or Permanent

Table 3.13 explores the heterogeneity in the announcement effect created by interim versus permanent successor announcements. Prior research focusing on executive (Zhang and Rajagopalan 2004) and CEO (Ballinger and Marcel 2010) successions examined the effect of disruptive successions on firm performance. I link this earlier research to succession planning by exploiting the differences in death type, i.e. sudden and non-sudden deaths, and test the valuation effects. To measure the valuation impact, I measure the announcement effect for the death, the interim successor announcement and the permanent successor announcement. I then aggregate the CAR to measure the full effect of the turnover and succession process. For the non-sudden CEO death sample, I find that the announcement effect for an interim successor is -1.02 percent and the full effect is -2.102 percent. This compares with the sudden death sample, where firms are not punished for naming an interim successor, 0.133 percent, and the full effect is 8.085 percent. I argue that if a firm experiences a non-sudden death and names an interim successor, this will be viewed as a lapse in monitoring by the board. These findings provide evidence that firms are punished for lapses in succession planning.

<Insert Table 3.13 Approximately Here.>

In Table 3.14, I show the value of strategic announcements. However, the effect from interim successor announcements only lasts for a short time. In the short term, if the firm can timely announce a temporary successor, shareholders react positively to this quick reaction and decision by the board members to avoid the absence of CEO talent. However, in the long run, when the shareholders realize the true capability of

the successor CEO, the shareholders will adjust their beliefs accordingly, rather than continue to believe that the interim CEO is the best for the firm value.

<Insert Table 3.14 Approximately Here.>

3.6 Conclusion

This paper provides evidence that CEO succession plans have a positive effect on firm value. This effect is observed in the period immediately surrounding the CEO turnover, but importantly, firms that have succession plans experience the benefits at longer time horizons. Prior research that examined the firm effects of CEO turnover events implicitly assumed that the effects of succession planning on the firm are subsumed either by the incumbent or the successor. By using a novel hand-collected data set of CEO sudden deaths and firm and CEO successor information, I provide empirical support that succession planning is an important part of a board's monitoring function.

In addition, this paper documents that succession plans are a corporate governance mechanism to improve the efficiency of the matching process between the skills of the available talent in the CEO labor market and the skills demanded by the firm. I provide evidence that firms that have succession plans select CEO successors from a wider set of candidates than firms that do not. Firms with succession plans are less likely to appoint interim CEOs or COOs. I find that firms that have succession plans are able to appoint more skilled CEOs than firms that do not. This is consistent with CEO selection theory in that firms that engage in succession planning have better CEO candidate selection. I

note that CEO succession planning is part of the board's ongoing monitoring function. Consistent with this, I find that firms that engage in succession planning are better monitors.

Overall, the results of this paper contribute to the CEO turnover literature and provide evidence of the importance of CEO succession planning.

Figure 3.1: Percentage of Firms Mentioning Succession Plans in Their Proxy Statements

This figure shows the time trend of references to succession plans mentioned in DEF14A for all listed firms during the period from 1994 to 2014. Also reported is the average CEO tenure for S&P 1500 firms during the period from 1992 to 2014.

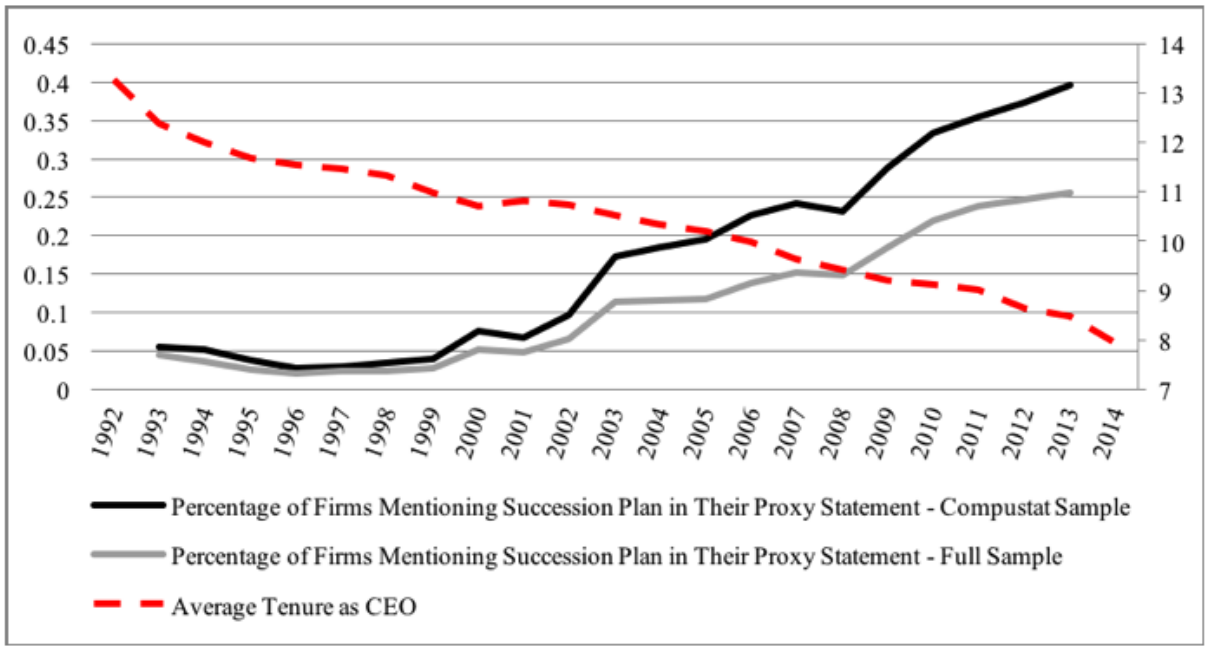

Figure 3.2: Number of Days between Turnover and Successor Announcement

This figure shows the succession gap for all CEO turnover events in the S&P 1500 firms from 1996 to 2014. The overlap succession histogram shows turnover events where the incumbent CEO and CEO successor appointments have been publicly made. The succession gap histogram shows the period of time between the CEO turnover event and the appointment of the CEO successor. The CEO death figure shows the succession gap for all CEO death events in all listed firms during the period from 1996 to 2014. The figures show the period of time between the turnover event and the appointment of the successor.

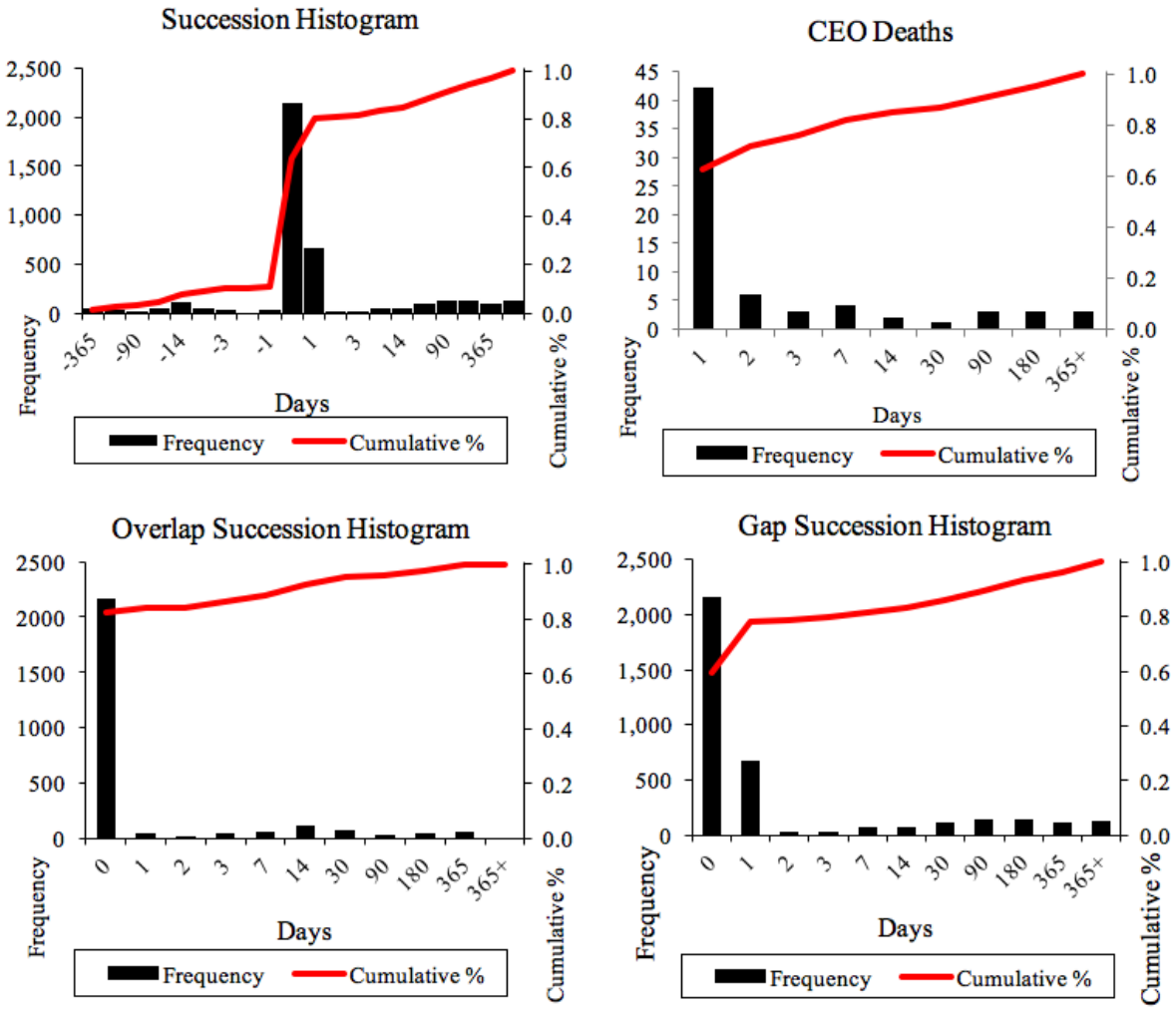

Figure 3.3: Change of Capital Structure and Capital Expenditures Surrounding the CEO Turnovers: Spelling Corrected

This figure shows the change of capital structure and capital expenditures surrounding all CEO turnover events in the S&P 1500 firms from 1996 to 2014. The red solid lines represent the firms with CEO succession plans and the black dashed lines represent the firms without CEO succession plans. The capital structure is measured by the debt to equity ratio, and the capital expenditures are the capital expenditures over total assets. The debt ratio is capped at the turnover years for the firms without CEO succession plans in the left figure, and the capital expenditures drop considerably for the firms without CEO succession plans.

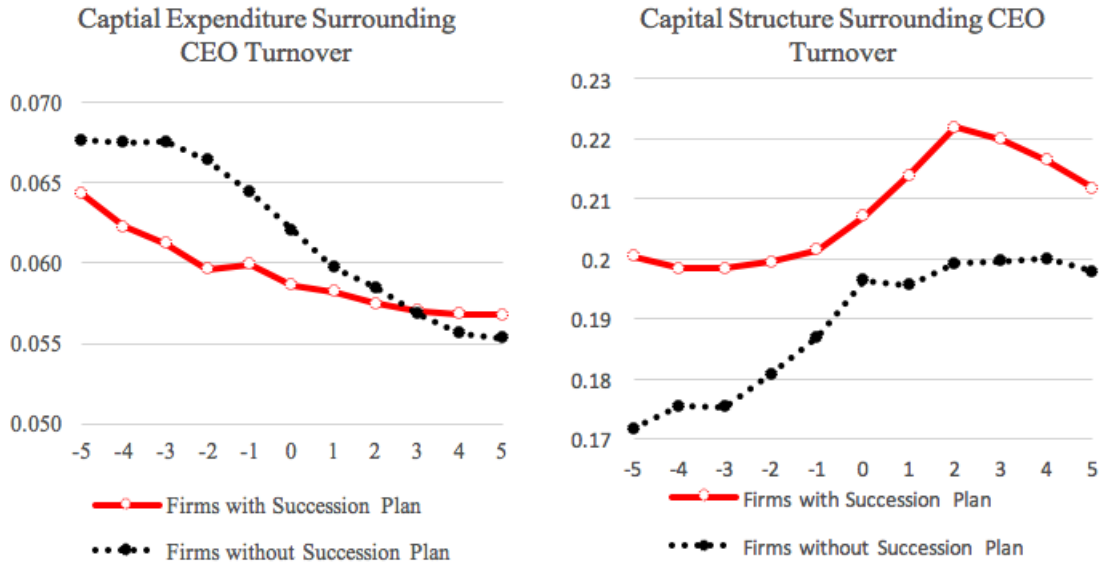

Figure 3.4: R&D Expenditures Surrounding the CEO Turnovers Spelling Corrected

This figure shows the change in R&D expenditures surrounding all CEO turnover events in the S&P 1500 firms from 1996 to 2014. The red solid lines represent the firms with CEO succession plans and the black dashed lines represent the firms without CEO succession plans. The R&D expenditures are measured by the R&D expenditures to sales ratios. The R&D expenses dropped considerably after the CEO turnover for the firms without CEO succession plans.

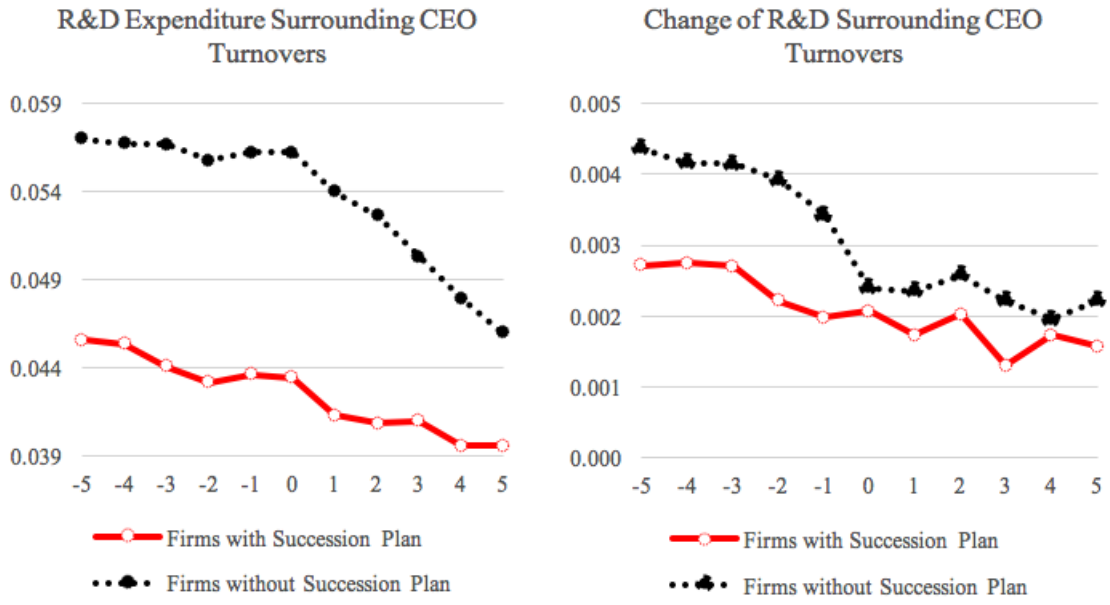

Figure 3.5: Accounting Performance and Market Performance Surrounding CEO Turnovers

This figure shows the change of accounting performance and market performance surrounding all CEO turnover events in the S&P 1500 firms from 1996 to 2014. The red solid lines represent the firms with CEO succession plans and the black dashed lines represent the firms without CEO succession plans. The R&D expenditures are measured by the R&D expenditures to sales ratios. The accounting performance is measured by ROA, and the marking performance is measured by accumulated raw return from the end of fiscal year price [prcc_f]. The ROA drops considerably surrounding the CEO turnovers for the firms without CEO succession plans in the left figure, and the stock prices drop for all firms, but the stock prices drop more for the firms without CEO succession plans.

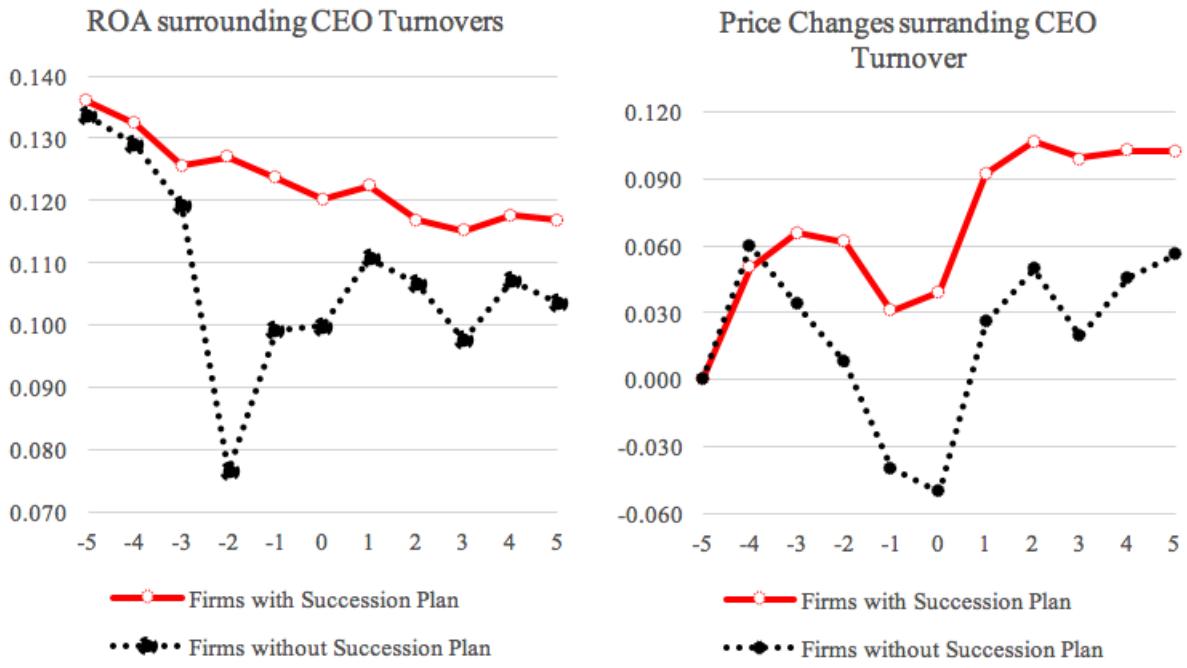

Table 3.1: Summary Statistics for All CEO Turnover Events of S&P 1500 Firms

This sample consists of all CEO turnover events in the Standard and Poor's 1500 firms from 1996 to 2014 identified in ExecuComp for CEOs that have tenure of three years or longer. I use the information on Annual Title, Date Became CEO, Date Left as CEO and CEO Annual Flag provided by ExecuComp to identify CEOs at the firm year level following Pan, Wang and Weisbach (2015). Panel A reports the summary statistics for incumbent CEOs at the turnover year identified as the year of Left as CEO in ExecuComp; Panel B reports the summary statistics for the dummy variable of whether the firm mentioned a CEO succession plan in its proxy statements or 10-K, manually collected by scanning all the filings in the Edgar database from the SEC; Panel C reports the summary statistics for the successor CEOs at the CEO turnover year identified as the year of Became CEO in ExecuComp; Panel D reports the summary statistics for the firm level attributes at the CEO turnover years provided in Compustat; and Panel E reports the board data available in RiskMetrics or BoardEx at the CEO turnover years. All variables are defined in Table A.1 of the Appendix.

Variables	**N**	**Mean**	**SD**	**p25**	**Median**	**p75**
Panel A: Incumbent CEO Information						
CEO Age	3164	58.67	7.94	53	59	64
CEO Female	3267	0.02	0.13	0	0	0
CEO Tenure	3101	10.26	6.89	5	9	14
Founder	1524	0.06	0.24	0	0	0
# of Outside Positions	1710	0.98	1.32	0	1	2
CEO Network Size	1922	26.99	26.25	10	16	35
Outsider CEO	1924	0.12	0.32	0	0	0
Panel B: Successor CEO Information						
CEO Age	4669	52.23	7.24	47	52	57
CEO Female	4728	0.03	0.18	0	0	0
# of Outside Positions	2294	0.96	1.31	0	0	2
CEO Network Size	2543	26.86	25.71	10	17	34
Outsider CEO	2544	0.09	0.29	0	0	0
Panel C: CEO Succession Plan Information						
Succession Plan Mentioned in DEF 14A	3232	0.29	0.45	0	0	1
Panel D: Firm Fundamental Information						
Total Assets ($ mil)	4404	15252.95	101464.6	433.04	1567.52	5448.13
Market Capitalization ($ mil)	4404	6552.67	22678.09	380.92	1187.1	4097.96
Tobin's Q	4404	1.93	3.29	1.11	1.41	2.01
ROA	4305	0.1	0.17	0.06	0.11	0.17
Sale	4404	5604.42	17827.99	420.1	1262.48	3980.8
Cash Flow	4402	0.08	0.14	0.03	0.08	0.13
Earnings Volatility	4307	0.1	0.17	0.06	0.11	0.17
Research and Development	4400	112.57	600.56	0	0	28.01
R&D Missing	4399	0.44	0.5	0	0	1
Capital Expenditure	4393	0.09	0.26	0.02	0.04	0.08
Long-Term Leverage	4115	0.2	0.22	0.03	0.17	0.31
Leverage	4120	0.24	0.24	0.06	0.22	0.35

Table 3.1 Continued

Variables	N	Mean	SD	p25	Median	p75
Panel E: Board Information						
Average Age of the Board (years)	2634	59.58	4.32	57.14	59.84	62.43
Board Female	2660	0.1	0.1	0	0.1	0.15
Average Board Tenure	2634	7.21	3.94	4.49	6.85	9.48
CEO-Chairman Duality	2660	0.51	0.5	0	1	1
Board Size	2665	9.61	2.77	8	9	11
Independence Ratio	2660	0.73	0.16	0.67	0.78	0.86
Average Number of Outside Positions	1225	3.14	2.5	0	4.1	6

Table 3.2: Summary Statistics for the CEO Sudden Death Sample

This sample consists of all 181 CEO sudden death events in all US listed firms from 1996 to 2014 that were identified in 8-K filings and media releases (for the detailed procedure, see Appendix). Panel A reports the summary statistics for the dead CEO at the turnover year provided in proxy statements, 8-K or 10-K filings, news releases, as well as the ExecuComp, Capital IQ, RiskMetrics and BoardEx databases; Panel B reports the summary statistics for CEO Succession Plan related information; Panel C reports the summary statistics for successor CEOs at the CEO turnover years identified in the proxy statements, 8-k filings, news releases, as well as the ExecuComp, Capital IQ, RiskMetrics and BoardEx databases; Panel D reports the summary statistics for the firm level attributes at the CEO death years provided in Compustat; and Panel E reports the board data available in Capital IQ, RiskMetrics or BoardEx at the CEO death years. All variables are defined in Table A.1 of the Appendix.

Variables	**N**	**Mean**	**SD**	**p25**	**Median**	**p75**
Panel A: Dead CEO Information						
CEO Age	129	63.94	11.21	56	63	70
CEO Female	180	0.01	0.1	0	0	0
CEO Tenure	113	13.81	10.58	6.1	11.9	20.9
Founder	151	0.08	0.27	0	0	0
# of Outside Positions	114	1.34	0.93	1	1	2
CEO Network Size	107	39.92	267.98	0	0	0
Panel B: Successor CEO Information						
CEO Age	170	54.29	10.53	48	53	61
CEO Female	181	0.05	0.22	0	0	0
# of Outside Positions	65	1.38	0.98	1	1	1
CEO Network Size	65	38.88	478.16	1	29	45
Outsider CEO	181	0.17	0.37	0	0	0
Panel C: CEO Succession Plan Information						
Succession Plan Mentioned in DEF 14A	181	0.27	0.44	0	0	1
Succession Plan Mentioned in News Release	181	0.14	0.35	0	0	0
Successor Announcement within 1-day	181	0.7	0.46	0	1	1
Successor Announcement within 2-day	181	0.77	0.42	1	1	1
Successor Announcement within 3-day	181	0.82	0.38	1	1	1
Transitional Committee Formed	181	0.03	0.13	0	0	1

Table 3.2 Continued

Variables	N	Mean	SD	p25	Median	p75
Panel D: Firm Fundamental Information						
Total Assets ($ mil)	151	12794.03	49017.87	193.88	817.25	4891.83
Market Capitalization ($ mil)	151	9308.01	34404.89	146.24	806.4	3331.42
Tobin's Q	151	1.91	2.05	1.04	1.37	1.99
ROA	146	0.09	0.22	0.03	0.12	0.18
Sale	151	5487.83	18400.34	92.05	569.59	2414.2
Cash Flow	151	0.07	0.15	0.01	0.07	0.14
Earnings Volatility	146	0.09	0.22	0.03	0.12	0.18
Research and Development	151	123.4	662.17	0	0	12.6
R&D Missing	151	0.5	0.5	0	0	1
Capital Expenditure	148	0.07	0.18	0.01	0.03	0.06
Long-Term Leverage	142	0.16	0.18	0	0.1	0.27
Leverage	142	0.21	0.28	0.01	0.15	0.33
Panel E: Board Information						
Average Age of the Board (years)	130	60.94	4.3	58.58	61	63.2
Board Female	129	0.09	0.1	0	0.09	0.15
Average Board Tenure	130	8.63	4.68	4.95	7.94	11.25
CEO-Chairman Duality	131	0.53	0.5	0	1	1
Board Size	131	8.78	2.91	6	9	11
Independence Ratio	131	0.63	0.48	0.63	0.75	0.83
Average Number of Outside Positions	130	3.42	6.51	0	0.41	5

Table 3.3: Summary Statistics S&P 1500 Firms

This sample consists of all firm-year observations from 1996 to 2014 of the Standard and Poor's 1500 firms in the ExecuComp database. Panel A reports the summary statistics for the incumbent CEOs in ExecuComp; Panel B reports the summary statistics for the dummy variable of whether the firm mentioned a CEO succession plan in its proxy statements and 8-K or 10-K filings, which were manually collected by scanning all the filings in the Edgar database from the SEC; Panel C reports the summary statistics for the other firm level attributes provided in Compustat; and Panel D reports the board data available in RiskMetrics or BoardEx. All variables are defined in Table A.1 of the Appendix.

Variables	**N**	**Mean**	**SD**	**p25**	**Median**	**p75**
Panel A: Incumbent CEO Information						
CEO Age	45763	55.21	7.7	50	55	60
CEO Female	46310	0.02	0.15	0	0	0
CEO Tenure	45064	6.83	7.18	2	5	9
Founder	17145	0.07	0.25	0	0	0
# of Outside Positions	23283	0.87	1.21	0	0	1
CEO Network Size	25985	25.69	25.87	9	16	32
Outsider CEO	25996	0.15	0.35	0	0	0
Panel B: CEO Succession Plan Information						
Succession Plan Mentioned in DEF 14A	33465	0.25	0.43	0	0	1
Panel C: Firm Fundamental Information						
Total Assets ($ mil)	43536	12886.58	87726.45	452.08	1439.79	5165.57
Market Capitalization ($ mil)	43536	6583.83	22268.52	465.43	1284.26	4107.66
Tobin's Q	43536	2	2.25	1.15	1.49	2.18
ROA	42225	0.12	0.53	0.08	0.13	0.18
Sale	43536	5063.64	16347.37	396.76	1116.55	3525.62
Cash Flow	43460	0.08	0.41	0.04	0.09	0.14
Earnings Volatility	42312	0.12	0.53	0.08	0.13	0.18
Research and Development	43356	97.92	528.71	0	0	25.62
R&D Missing	43267	0.45	0.5	0	0	1
Capital Expenditure	43390	0.1	1.38	0.02	0.04	0.08
Long-Term Leverage	40244	0.19	0.19	0.02	0.16	0.3
Leverage	40513	0.23	0.74	0.05	0.2	0.34
Panel D: Board Information						
Average Age of the Board (years)	26865	60.17	4.39	57.6	60.42	63
Board Female	26976	0.1	0.1	0	0.1	0.17
Average Board Tenure	26865	8.43	4.15	5.55	7.94	10.73
CEO-Chairman Duality	26976	0.65	0.48	0	1	1
Board Size	27245	9.41	2.65	8	9	11
Independence Ratio	26976	0.75	0.16	0.67	0.78	0.88
Average Number of Outside Positions	12433	3.7	2.24	0	2.25	6.33

Table 3.4: Univariate Test

The table presents the results estimated using all CEO turnover events among S&P 1500 firms and all CEO death turnovers among all US listed firms from 1996 to 2014. This table shows the stock price reaction to the disclosure of CEO turnover events and CEO successor announcements. Panel A reports the cumulative abnormal return (CAR) for S&P 1500 firms. Panel B reports the CAR for the CEO sudden death sample. In addition to the mean abnormal return, the corresponding Patell Z, the number of stock price reactions, is also reported for all event windows. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel A: All Turnovers

Event Window	**Incumbent Departure Announcement**			**Successor CEO Announcement**		
	N	**Mean**	**Patell z**	**N**	**Mean**	**Patell z**
(-30, -5)	3164	-0.0223	-10.787***	3095	-0.0144	-7.970***
(-1 +1)	3164	-0.0047	-6.345***	3095	-0.0015	-4.403***
(+5,+64)	3164	-0.0269	-8.730***	3095	-0.0217	-9.605***

Panel B: CEO Sudden Deaths

Event Window	**Incumbent Departure Announcement**			**Successor CEO Announcement**		
	N	**Mean**	**Patell z**	**N**	**Mean**	**Patell z**
(-30, -5)	181	0.0138	0.544	181	0.0188	0.032
(-1 +1)	181	-0.0013	-2.253**	181	0.0029	2.196**
(+5,+64)	181	0.0099	0.403	181	0.0268	0.361

Table 3.5: Do CEO Succession Plans Create Value?

The table presents the results estimated using CEO sudden death events. The sample includes CEO sudden death events with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals and CRSP for stock returns. The dependent variables are the cumulative abnormal returns (CARs). Columns I, II, III and IV capture the CARs around the death events in the window from (-1, +5). Columns V, VI and VII capture the CARs around the death events in the window from (-1, +3), (-1, +4) and (-1, +5), respectively. All regressions include a constant. All standard errors are White Robust Standard Errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	CAR						
	(-1, +5)	**(-1, +5)**	**(-1, +5)**	**(-1, +5)**	**(-1, +5)**	**(-1, +3)**	**(-1, +4)**
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**
Succession Plan	0.0177**						
Mentioned in DEF 14A	(2.121)						
Succession Plan		0.0175**					
Mentioned in News Release		(2.334)					
Successor Announcement			0.0535**			0.0500**	
within 1-day			(2.349)			(2.369)	
Successor Announcement				0.0617**			0.0570**
within 2-day				(2.529)			(2.478)
Successor Announcement					0.0530**		
within 3-day					(2.115)		
Transitional Committee	-0.0142	-0.0001	0.0159	0.0279	0.0224	0.008	0.0205
Formed	(-0.921)	(-0.016)	(0.809)	(1.256)	(0.983)	(0.439)	(0.980)
Dead CEO Founder Title	-0.0242	-0.0156	-0.0228	-0.0263	-0.0265	-0.0154	-0.016
	(-0.783)	(-1.380)	(-0.759)	(-0.880)	(-0.879)	(-0.554)	(-0.568)
Dead CEO Chairman Title	0.0102	-0.0188**	0.0141	0.0174	0.0158	0.0129	0.0172
	(0.574)	(-2.333)	(0.812)	(1.000)	(0.899)	(0.800)	(1.047)
Dead CEO Age	-0.0008	0.0005	-0.0009	-0.0008	-0.0008	-0.0013	-0.0014
	(-0.835)	(1.478)	(-0.961)	(-0.887)	(-0.808)	(-1.493)	(-1.525)
Dead CEO Tenure	0.0004	0.0003	0.0004	0.0002	0.0002	0.0009	0.0005
	(0.489	(0.886)	(0.494)	(0.204)	(0.207)	(1.243)	(0.643)

Table 3.5 Continued

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
ROA	0.0416	0.0121	0.0324	0.0366	0.0365	0.0029	0.0076
	(0.798)	(0.578)	(0.641)	(0.729)	(0.720)	(0.061)	(0.160)
Total Asset	-0.6325	-0.3671	-0.3984	-0.326	-0.3181	-0.4551	-0.2834
	(-1.085)	(-1.581)	(-0.711)	(-0.581)	(-0.557)	(-0.876)	(-0.536)
Independent Ratio	0.0088	-0.008	-0.0072	-0.0276	-0.0251	-0.0366	-0.0502
	(0.141)	(-0.374)	(-0.118)	(-0.445)	(-0.397)	(-0.650)	(-0.858)
Board Size	0.0024	0.0011	0.0013	0.001	0.0016	0.0013	-0.0004
	(0.828)	(1.050)	(0.466)	(0.350)	(0.544)	(0.502)	(-0.145)
Board Female Ratio	-0.0108	0.004	-0.0214	-0.0035	-0.0221	0.0009	0.0066
	(-0.138)	(0.138)	(-0.280)	(-0.046)	(-0.288)	(0.013)	(0.092)
Constant	0.0255	-0.0265	0.0239	0.0246	0.0215	0.0737	0.093
	(0.338)	(-0.918)	(0.327)	(0.339)	(0.293)	(1.088)	(1.358)
R-squared	0.061	0.142	0.112	0.12	0.102	0.135	0.126
N	100	100	100	100	100	100	100

Table 3.6: The Effects of CEO Succession Plans on Firm Performance

The table presents the results estimated using CEO sudden death events. The sample includes CEO sudden death events with successor announcements and available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes Compustat for firm fundamentals and CRSP for stock returns. The dependent variables are the long-term buy and hold abnormal returns (BHARs). Columns I to IV capture the BHARs around the death events in the window from (-1, +10), and Columns V, VI and VII capture the event windows of (-1, +21), (-1, +64) and (-1, +252), respectively. All regressions include a constant. All standard errors are White Robust Standard Errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Long-term BHAR							
	(-1, +10)	**(-1, +10)**	**(-1, +10)**	**(-1, +10)**	**(-1, +10)**	**(-1, +21)**	**(-1, +46)**	**(-1, +252)**
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(VIII)**
Succession Plan	0.0512**							
Mentioned in DEF 14A	(2.093)							
Succession Plan		0.0204*						
Mentioned in News Release		(1.727)						
Successor Announcement			0.0649**					
within 1-day			(2.524)					
Successor Announcement				0.0786***				
within 2-day				(2.867)				
Successor Announcement					0.0594**	0.1100**	0.2117**	0.4355**
within 3-day					(2.065)	(2.359)	(2.628)	(2.195)
Transitional Committee	-0.0177	0.0092	0.0191	0.0362	0.0195	0.0635	0.1494**	0.3612**
Formed	(-1.015)	(0.648)	(0.862)	(1.450)	(0.748)	(1.503)	(2.049)	(2.011)
Dead CEO Founder Title	-0.0649*	-0.0476*	-0.0634*	-0.0678**	-0.0643*	-0.1236**	-0.2438**	-0.3232
	(-1.858)	(-1.746)	(-1.871)	(-2.020)	(-1.861)	(-2.206)	(-2.521)	(-1.356)
Dead CEO Chairman Title	0.0056	0.0086	0.0104	0.0148	0.007	0.0549*	0.1404**	0.2420*
	(0.276)	(0.442)	(0.529)	(0.758)	(0.352)	(1.708)	(2.529)	(1.770)
Dead CEO Age	-0.0001	0.0001	-0.0002	-0.0001	0.0002	-0.0017	-0.0046	-0.0074
	(-0.067)	(-0.003)	(-0.194)	(-0.111)	(0.228)	(-1.012)	(-1.616)	(-1.062)
Dead CEO Tenure	0.0009	0.0014*	0.0008	0.0006	0.0005	0.0009	0.0024	0.0028
	(0.958)	(1.970)	(0.980)	(0.655)	(0.626)	(0.656)	(0.992)	(0.475)

Table 3.6 Continued

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
ROA	0.0822	0.1142**	0.0736	0.0781	0.1027*	0.1255	0.1096	0.5618
	(1.393)	(2.252)	(1.288)	(1.385)	(1.794)	(1.353)	(0.684)	(1.423)
Total Asset	-0.4221	-0.4826	-0.096	0.006	-0.052	-0.3517	-0.2661	2.0183
	(-0.640)	(-0.860)	(-0.152)	(0.009)	(-0.080)	(-0.332)	(-0.145)	(0.448)
Independent Ratio	-0.0509	-0.0311	-0.0663	-0.0937	-0.0649	-0.082	-0.0097	-0.0475
	(-0.718)	(-0.606)	(-0.965)	(-1.342)	(-0.931)	(-0.726)	(-0.049)	(-0.099)
Board Size	-0.0007	-0.0008	-0.0018	-0.0023	-0.0007	0.0003	-0.0016	-0.0256
	(-0.205)	(-0.321)	(-0.554)	(-0.712)	(-0.204)	(0.065)	(-0.169)	(-1.131)
Board Female Ratio	-0.0174	-0.0121	-0.0310	-0.0088	-0.0177	-0.2486*	-0.2916	-0.4968
	(-0.197)	(-0.172)	(-0.359)	(-0.103)	(-0.201)	(-1.735)	(-1.178)	(-0.815)
Constant	0.0458	0.002	0.0412	0.0423	0.0019	0.0748	0.0612	0.1579
	(0.537)	(0.029)	(0.500)	(0.519)	(0.023)	(0.555)	(0.263)	(0.276)
R-squared	0.094	0.123	0.146	0.163	0.132	0.165	0.204	0.141
N	100	100	100	100	100	100	100	100

Table 3.7: The Effects of CEO Successor Search Process Duration on Long-Term Firm Performance

The table presents the results estimated using CEO sudden death events. The sample includes CEO sudden death events with successor announcements and available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals and CRSP for stock returns. The dependent variables are the long-term buy and hold abnormal returns (BHARs). Columns I, II, III and IV capture the BHARs around the death events in the windows from (-1, +10), (-1, +21), (-1, +64) and (-1, +252), respectively. All regressions include a constant. All standard errors are White Robust Standard Errors. Robust t-statistics adjusted for heterogeneity for two-sided tests are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Long-term BHAR			
	(-1, +10)	**(-1, +21)**	**(-1, +64)**	**(-1, +252)**
	(I)	**(II)**	**(III)**	**(IV)**
Log (Search Time+1)	-0.0133	-0.0258	-0.0685**	-0.1353**
	(-1.253)	(-1.600)	(-2.502)	(-2.252)
Dead CEO Founder Title	-0.0795	-0.2362*	-0.5139**	-0.9173**
	(-1.003)	(-1.953)	(-2.508)	(-2.038)
Dead CEO Chairman Title	0.0216	0.0643	0.1476	0.2581
	(0.561)	(1.096)	(1.486)	(1.183)
Dead CEO Age	-0.002	-0.0025	-0.0024	-0.0029
	(-0.988)	(-0.793)	(-0.451)	(-0.247)
Dead CEO Tenure	0.0024	0.0059**	0.0112**	0.0184*
	(1.390)	(2.248)	(2.528)	(1.892)
ROA	0.1528	0.2609	0.2710	0.4331
	(1.425)	(1.595)	(0.978)	(0.712)
Total Asset	-0.9703	-1.8001	-1.7281	0.4335
	(-1.066)	(-1.297)	(-0.735)	(0.084)
Independent Ratio	-0.0288	0.0196	-0.0148	-0.4699
	(-0.210)	(0.094)	(-0.042)	(-0.605)
Board Size	0.0015	0.0129	0.0121	-0.0061
	(0.229)	(1.266)	(0.699)	(-0.160)
Board Female Ratio	-0.0742	-0.3281	-0.3655	-0.5920
	(-0.513)	(-1.487)	(-0.978)	(-0.721)
Constant	0.1317	-0.0096	-0.0629	0.3152
	(0.818)	(-0.039)	(-0.151)	(0.345)
R-squared	0.026	0.219	0.266	0.093
N	100	100	100	100

Table 3.8: Succession Plan and New CEO Selection

The table presents the results of succession plans on the background of the successors. The sample includes all non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals and CRSP for stock returns. The dependent variables of Columns I-IV are dummy variables, which are equal to one if the successor is an outsider, interim CEO, retired-age executive or founder, respectively, and the dependent variables of Columns V-X are dummy variables, which are equal to one if the successor is its former COO, former CFO, former Chairman, former VP or former employee, respectively. All regressions include a constant. All standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Successor Selection								
	Outside	**Interim**	**Retired**	**Founder**	**Former COO**	**CFO**	**Chairman**	**VP**	**Employee**
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**	**(VII)**	**(IX)**	**(X)**
Succession Plan	0.023	-0.0144**	-0.0076	-0.0031	-0.0607***	-0.0055	-0.0163	0.0333	-0.0058
Mentioned in DEF 14A	(1.056)	(-2.202)	(-0.571)	(-1.040)	(-3.037)	(-0.277)	(-0.603)	(1.180)	(-1.124)
Incumbent CEO	0.0533	-0.0066	-0.0189	-0.0041	0.055	-0.0334	-0.0667*	-0.041	-0.0024
Founder Title	(1.083)	(-1.576)	(-0.832)	(-1.120)	(1.338)	(-1.292)	(-1.687)	(-0.929)	(-0.255)
Incumbent CEO	0.0554	-0.0102**	0.0317	0.0174	0.0232	-0.0492*	0.0597	-0.0601	0.009
Chairman Title	(1.301)	(-2.064)	(1.235)	(0.960)	(0.596)	(-1.720)	(1.352)	(-1.377)	(0.781)
Incumbent CEO	-0.0013	-0.0002	-0.0016	-0.0003	0.0044***	0.0005	-0.0008	0.0063***	-0.0012**
Age	(-0.719)	(-0.323)	(-1.488)	(-0.794)	(2.954)	(0.407)	(-0.418)	(3.344)	(-2.274)
Incumbent CEO	-0.0020**	0.0001	-0.0009*	0.0002	0.0001	-0.0008	-0.0006	0.0012	0.0004*
Tenure	(-2.502)	(0.106)	(-1.962)	(0.842)	(0.130)	(-0.907)	(-0.490)	(0.916)	(1.660)
ROA	-0.1528	-0.0098	-0.0499	0.0049	0.3692***	-0.0198	-0.053	0.5013***	-0.0233
	(-1.371)	(-0.520)	(-0.981)	(0.219)	(3.6100	(-0.283)	(-0.347)	(4.477)	(-1.240)
Total Asset	-0.0001*	0.0000	-0.0000	-0.0000	-0.0000	-0.0000***	-0.0000	-0.0000***	0.0000
	(-1.918)	(1.025	(0.467)	(-0.115)	(-0.799)	(-2.621)	(-0.467)	(-3.985)	(0.391)

Table 3.8 Continued

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(IX)	(X)
Independent Ratio	0.0576	0.0083	-0.0148	-0.0026	-0.4376***	0.1858***	0.0031	0.2207***	-0.0211
	(1.049)	(0.857)	(-0.267)	(-0.178)	(-6.261)	(3.471)	(0.038)	(2.664)	(-0.773)
Board Size	-0.0089**	-0.0005	-0.0044**	-0.0004	0.0151***	-0.0035	0.0130**	0.0139**	0.0004
	(-2.183)	(-0.449)	(-2.154)	(-0.656)	(3.197)	(-0.835)	(2.402)	(2.294)	(0.392)
Board Female Ratio	-0.0792	-0.0056	0.0382	0.0048	-0.1094	0.3726***	0.4103***	0.032	0.0231
	(-0.790)	(-0.172)	(0.538)	(0.590)	(-1.069)	(3.128)	(2.662)	(0.202)	(1.206)
Constant	0.2331*	0.0259	0.2272***	0.0229	0.0526	-0.0052	0.1776	-0.3591***	0.0858*
	(1.940)	(0.714)	(2.724)	(1.031)	(0.532)	(-0.060)	(1.327)	(-2.772)	(1.948)
Fixed Effect	Industry	Industry	Industry	Industry	Industry	Industry	Industry	Industry	Industry
R-squared	0.118	0.115	0.079	0.034	0.129	0.093	0.062	0.096	0.048
N	768	1484	1457	1448	768	768	768	736	732

Table 3.9: Benefits and Costs of Succession Plans: New CEO Talent and Composition

The table presents the results of succession plans on the quality of the successors and on successor CEO compensation. The sample includes all non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals and CRSP for stock returns. The dependent variable of Column I is a dummy variable, which is equal to one if the successor has S&P executive experience; the dependent variables of Columns II and III are the successors' previous total compensation rankings among all S&P 1500 firms pooled at year t-1 and the successors' previous employer prestige rankings by total assets at year t-1, respectively; and the dependent variables of Column IV are the total compensation of the successors at year t+1. All regressions include a constant. All standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Successor CEO Talent and Compensation			
	Benefit: CEO Talent S&P 500 Experience	**Previous Total Compensation Ranking**	**Previous Employment Prestige Ranking**	**Cost: CEO Payment Total Compensation**
	(I)	**(II)**	**(III)**	**(IV)**
Succession Plan	0.0449	352.2648**	289.1398*	352.2648**
Mentioned in DEF 14A	(1.607)	(2.466)	(1.828)	(2.466)
Incumbent CEO	-0.0211	36.58	-74.1962	36.58
Founder Title	(-0.480)	(0.140)	(-0.280)	(0.140)
Incumbent CEO	-0.0259	460.9825**	489.2794**	460.9825**
Chairman Title	(-0.638)	(2.032)	(1.999)	(2.032)
Incumbent CEO	-0.0001	-15.2808	-17.5986	-15.2808
Age	(-0.079)	(-1.367)	(-1.528)	(-1.367)
Incumbent CEO	0.0037***	12.3675**	11.4577*	12.3675**
Tenure	(3.134)	(2.120)	(1.844)	(2.120)
ROA	0.3507***	2553.0633***	2468.8419***	2553.0633***
	(3.173)	(3.263)	(3.179)	(3.263)
Total Asset	0.0000***	0.0011**	0.0011**	0.0011**
	(4.857)	(2.514)	(2.503)	(2.514)
Independent Ratio	0.1553*	1244.2029**	1197.6869**	1244.2029**
	(1.812)	(2.561)	(2.113)	(2.561)
Board Size	0.0539***	267.3701***	272.7317***	267.3701***
	(8.859)	(8.952)	(8.786)	(8.952)
Board Female Ratio	0.2017	-163.7521	-524.5705	-163.7521
	(1.376)	(-0.180)	(-0.560)	(-0.180)
Constant	-0.4205***	3932.5390***	4225.1841***	3932.5390***
	(-3.468)	(5.000)	(4.953)	(5.000)
Fixed Effect	Industry	Industry	Industry	Industry
R-squared	0.118	0.115	0.079	0.034
N	768	1484	1457	1448

Table 3.10: Succession Planning and the Likelihood of CEO Turnovers

The table presents the results of succession plans on the likelihood of CEO turnovers. The Column I and II use the sample of all S&P1500 firms; the Column III and IV use the sample of all listed non-financial firms with available information in BoardEx/RiskMetrics/ExecuComp and Compustat; and Column V and VI use sample of family firms in S&P 1500 firms identified by block shareholding over 5%. The dependent variables are dummies, which equal to one if the firm has a CEO turnover event in year t, 0 otherwise. Column I, II use the sample of S&P 1500 firms, column III and IV uses the full BoardEx sample and column V and VI are S&P 1500 family firms, respectively. All regressions include a constant. All standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Likelihood of CEO Turnover					
	S&P1500		**BoardEx Sample**		**Family Firms**	
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**
Succession Plan	0.0318***	0.0298***	0.0161***	0.0113*	0.0151	0.0156
Mentioned in DEF 14A	(5.489)	(3.323)	(3.366)	(1.789)	(1.034)	(1.130)
Incumbent CEO	-0.0741***	-0.0769	0.0088	-0.0149	0.0124	0.026
Founder Title	(-7.122)	(-1.467)	(0.767)	(-0.715)	(0.603)	(1.414)
Incumbent CEO	-0.0964***	-0.1565***	-0.0697***	-0.0790***	-0.0858***	-0.0874***
Chairman Title	(-14.686)	(-11.240)	(-12.532)	(-8.683)	(-5.139)	(-5.687)
Incumbent CEO	-0.0000**	-0.0000*	-0.0035	-0.004	-0.0278	-0.011
Network Size	(-2.173)	(-1.671)	(-0.477)	(-0.323)	(-0.967)	(-0.401)
Independent Ratio	-0.1806***	-0.4080***	-0.1622***	-0.3283***	-0.1830***	-0.1690***
	(-7.878)	(-8.551)	(-8.454)	(-11.192)	(-4.178)	(-4.026)
Board Size	0.0061***	0.0062**	0.0059***	0.0069***	0.0079**	0.0077***
	(4.219)	(1.970)	(5.349)	(3.320)	(2.407)	(2.607)
Board Female Ratio	0.0032	-0.2154***	-0.0015	-0.2057***	-0.0266	0.0143
	(0.106)	(-3.123)	(-0.062)	(-4.865)	(-0.386)	(0.244)
Average Director	0.001	-0.0003	0.0005	-0.0015	0.0046***	0.0043***
Age	(1.284)	(-0.158)	(0.863)	(-1.172)	(2.750)	(2.730)
Average Director	-0.0066***	-0.0064***	-0.0066***	-0.0058***	-0.0053***	-0.0055***
Tenure	(-9.268)	(-3.005)	(-11.102)	(-4.247)	(-2.941)	(-3.396)
Average Director	0.0001	-0.0005	0.0000	-0.0007	0.0022*	0.0023*
Outside Positions	(0.363)	(-0.540)	(0.083)	(-1.005)	(1.682)	(1.864)
Total Asset	0.0068***	0.0065	0.0028	-0.0067	0.0049	-0.0010
	(2.817)	(0.604)	(1.587)	(-1.130)	(0.854)	(-0.203)
ROA	-0.1016***	-0.1423***	-0.1101***	-0.1054***	-0.0292	-0.0021
	(-3.277)	(-2.683)	(-4.255)	(-3.436)	(-0.370)	(-0.032)
Constant	0.2270***	0.4559***	0.2287***	0.4682***	-0.0505	-0.005
	(3.391)	(3.169)	(3.940)	(5.317)	(-0.511)	(-0.055)
Fixed Effect	Industry	Firm	Industry	Firm	Industry	Firm
R-squared	0.041	0.155	0.03	0.102	0.055	0.041
N	15270	15445	16647	23003	1938	1938

Table 3.11: Succession Planning and the Length of CEO Tenure

The table presents the results of succession plans on the likelihood of CEO turnovers. The Column I and II use the sample of all S&P1500 firms; the Column III and IV use the sample of all listed non-financial firms with available information in BoardEx/RiskMetrics/ExecuComp and Compustat; and Column V and VI use sample of family firms in S&P 1500 firms identified by block shareholding over 5%. The dependent variables are the lengths of CEO tenures (measured in years). Column I, II use the sample of S&P 1500 firms, column III and IV uses the full BoardEx sample and column V and VI are S&P 1500 family firms, respectively. All regressions include a constant. All standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	CEO Tenure Length					
	S&P1500		**BoardEx Sample**		**Family Firms**	
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**
Succession Plan	-0.9472***	-0.1630*	-0.9279***	-0.2039**	-0.4362	-1.4591
Mentioned in DEF 14A	(-3.900)	(-1.894)	(-3.536)	(-2.239)	(-0.464)	(-1.428)
Incumbent CEO	9.4077***	2.4372	3.2572***	5.7191***	4.7388**	3.017
Founder Title	(8.434)	(1.422)	(2.750)	(21.038)	(2.467)	(1.440)
Incumbent CEO	2.2417***	0.8737***	2.3316***	0.7857***	4.5140***	4.0747***
Chairman Title	(8.065)	(9.025)	(7.636)	(7.867)	(4.243)	(3.737)
Incumbent CEO	-0.0001	0.0005***	-0.4548	0.197	-0.2856	-0.1816
Network Size	(-0.377)	(4.223)	(-0.968)	(1.081)	(-0.142)	(-0.076)
Independent Ratio	-0.2224	2.4360***	0.6717	2.9665***	0.5714	2.8965
	(-0.160)	(6.347)	(0.440)	(7.444)	(0.132)	(0.710)
Board Size	-0.2359***	-0.0022	-0.2230***	0.0356	-0.0449	-0.2362
	(-2.871)	(-0.081)	(-2.816)	(1.249)	(-0.159)	(-0.879)
Board Female Ratio	-3.3632**	-0.3209	-3.6724**	-0.0441	1.9331	-7.9003
	(-2.189)	(-0.567)	(-2.160)	(-0.075)	(0.326)	(-1.075)
Average Director	0.0350	-0.0319*	0.0128	-0.0154	0.0196	0.0196
Age	(0.597)	(-1.842)	(0.201)	(-0.849)	(0.125)	(0.121)
Average Director	0.7528***	0.3525***	0.7492***	0.3332***	0.7235***	0.6756***
Tenure	(14.779)	(18.561)	(14.143)	(16.880)	(4.816)	(4.432)
Average Director	-0.0129	-0.0077	-0.0194	-0.0204**	-0.0854	-0.1246
Outside Positions	(-0.638)	(-0.960)	(-0.854)	(-2.154)	(-0.916)	(-1.238)
Total Asset	0.0966	0.3717***	0.1462	0.2407**	0.3465	0.3238
	(0.733)	(4.034)	(1.125)	(2.547)	(0.524)	(0.519)
ROA	2.3115**	1.1112**	3.5504**	1.4131***	12.0255*	8.2079
	(2.249)	(2.570)	(2.506)	(3.252)	(1.677)	(0.932)
Constant	3.8689	6.8108***	3.6316	5.5282***	-3.6132	-0.5316
	(1.219)	(5.613)	(1.035)	(4.362)	(-0.388)	(-0.053)
Fixed Effect	Industry	Firm	Industry	Firm	Industry	Firm
R-squared	0.263	0.873	0.262	0.839	0.338	0.17
N	11218	11318	9893	12669	1167	1167

Table 3.12: Succession Planning and Firm Channels

The table presents the results of succession plans on the alternate firm channels. The sample includes all non-financial firms from 1996 to 2013 with available information available information in ExecuComp/Capital IQ for incumbent CEO related variables, BoardEx and RiskMetrics for board and corporate governance related attributes, Compustat for firm fundamentals and CRSP for stock returns. The firm channel follows (Gibbons and Murphy 1990). All regressions include a constant. All standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Variation during CEO Turnover Periods (-1, +1)				
	Long-term Leverage	**Capital Expenditure**	**R&D Expenditure**	**ROA**	**Raw Return**
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**
Succession Plan	-0.0145*	-0.0043***	-0.0014*	-0.0121**	-0.0190*
Mentioned in DEF 14A	(-1.743)	(-3.027)	(-1.915)	(-2.555)	(-1.832)
Incumbent CEO	-0.0009	-0.0012	-0.0013	0.0009	-0.0010
Founder Title	(-0.120)	(-0.579)	(-1.625)	-0.203	(-0.062)
Incumbent CEO	0.0034	-0.001	0.0002	-0.0054	-0.0246
Chairman Title	(0.512)	(-0.546)	(0.198)	(-1.129)	(-1.460)
Incumbent CEO	0.0004	0.0001	0.0001	0.0006**	-0.0015**
Age	(0.989)	(0.401)	(1.177)	(2.401)	(-2.139)
Incumbent CEO	-0.0006**	-0.0001	-0.0001	-0.0006***	-0.0005
Tenure	(-2.250)	(-1.076)	(-1.582)	(-4.150)	(-1.100)
Total Asset	-0.0071	0.0196	0.0020**	0.0136*	0.0731
	(-0.918)	(1.211)	(2.330)	(1.689)	(1.389)
Independent Ratio	0.0164	-0.0053	-0.0017	-0.0054	-0.0930***
	(0.663)	(-1.326)	(-0.686)	(-0.378)	(-2.834)
Board Size	-0.0032**	-0.0003	-0.0004***	-0.0036***	-0.0095***
	(-2.324)	(-1.049)	(-2.707)	(-5.197)	(-4.350)
Board Female Ratio	-0.0093	-0.0081	-0.0075**	-0.0160	-0.0257
	(-0.456)	(-1.409)	(-2.363)	(-1.031)	(-0.478)
Constant	0.0624***	0.0232***	0.0139***	0.0547***	0.5701***
	(2.881)	(3.963)	(3.333)	(3.968)	(12.901)
Fixed Effect	Firm + Year	Firm + Year	Firm + Year	Firm + Year	Firm + Year
R-squared	0.12	0.177	0.253	0.171	0.128
N	1653	1650	1653	1646	1653

Table 3.13: Announcement Effects of Interim vs. Permanent Successor: Univariate Test

The table presents the result estimated using CEO death events. I illustrate CARs at the announcement of CEO deaths, interim successor appointment and permanent successor appointment. I compare the effect (CARs) of appointing a permanent CEO directly versus appointing an interim CEO firstly and then appointing the same person as a permanent successor. This empirical test was designed to examine the impact of Milgrom (2008) versus Guttman, Ilan, and Skrzypacz (2014) and the impact of strategic disclosure.

	CEO Sample			
	Deaths Announcement	**Interim Successor Announcement**	**Permanent Successor Announcement**	**Full Effect**
Panel A: Full Sample				
Interim Successor Sample				
# of Observations	136	135	109	
Announcement CAR (-1, +2)	-0.43%	-0.45%	4.59%	3.70%
Direct Successor Sample				
# of Observations	146		141	
Announcement CAR (-1, +2)	0.19%		1.47%	1.66%
Panel B: Sudden Deaths Sample				
Interim Successor Sample				
# of Observations	70	69	55	
Announcement CAR (-1, +2)	0.58%	0.13%	7.37%	8.09%
Direct Successor Sample				
# of Observations	75		70	
Announcement CAR (-1, +2)	-1.33%		1.05%	-0.28%
Panel C: Non-Sudden Deaths Sample				
Interim Successor Sample				
# of Observations	66	66	54	
Announcement CAR (-1, +2)	-1.88%	-1.02%	0.80%	-2.10%
Direct Successor Sample				
# of Observations	71		71	
Announcement CAR (-1, +2)	1.49%		1.84%	3.33%

Table 3.14: Announcement Effects of Interim vs. Permanent Successor: Multivariate Test

The table presents the result estimated using CEO sudden death events. The sample includes CEO sudden death events with permanent successor announcements directly or with the interim successor announcements where the permanent successors are the same as the interim successors. This sample requires available information in ExecuComp/Capital IQ for incumbent CEO related variables, BoardEx and RiskMetrics for board and corporate governance related attributes, Compustat for firm fundamentals and CRSP for stock returns. The dependent variables are the long-term buy and hold abnormal returns (BHARs). Column I, II, III and IV capture the BHARs around the death events in the window from (-1, +10), (-1, +21), (-1, +64) and (-1, +252), respectively. The interim announcement dummy is a dummy, which equals to one if there is interim CEO successor announced. All regressions include a constant. All standard errors are White Robust Standard Errors. Robust t-statistics adjusted for heterogeneity for two sides test are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All other variables are defined in the Appendix Table A.1.

	Long-term BHAR			
	(-1, +10)	**(-1, +21)**	**(-1, +46)**	**(-1, +252)**
	(I)	**(II)**	**(III)**	**(IV)**
Interim Announcement	0.0557**	0.0777*	0.1076	0.1395
Dummy	(2.094)	(1.694)	(1.382)	(0.791)
Dead CEO Founder Title	-0.0629	-0.159	-0.3706	-0.7453
	(-1.152)	(-1.287)	(-1.436)	(-1.588)
Dead CEO Chairman Title	0.001	0.0288	0.1097	0.0477
	(0.030)	(0.407)	(0.881)	(0.203)
Dead CEO Age	-0.0030*	-0.0031	-0.0025	0.0012
	(-1.790)	(-0.934)	(-0.416)	(0.098)
Dead CEO Tenure	0.0024	0.0035	0.0071	0.0099
	(1.487)	(1.176)	(1.471)	(0.969)
ROA	0.1328	0.0649	-0.3091	-0.0107
	(1.057)	(0.338)	(-0.673)	(-0.015)
Total Asset	-1.2060**	-1.8572**	-1.1954	0.7959
	(-2.507)	(-2.569)	(-0.811)	(0.302)
Independent Ratio	-0.0431	-0.0135	0.1016	-0.0091
	(-0.344)	(-0.069)	(0.267)	(-0.011)
Board Size	0.0018	0.0112	0.0209	0.0239
	(0.233)	(0.842)	(1.215)	(0.678)
Board Female Ratio	0.0757	0.0307	-0.3414	-0.6672
	(0.375)	(0.095)	(-0.464)	(-0.497)
Constant	0.1691	0.0573	-0.2196	-0.4467
	(1.164)	(0.234)	(-0.499)	(-0.522)
R-squared	0.01	0.01	0.01	0.01
N	100	100	100	100

Chapter 4

Succession Plan Adoption

Abstract

This paper examines the factors affecting the likelihood of a firm having a CEO succession plan. I document a causal relationship between director experience and firm adoption of succession plans. To examine the effects of director experience, I study directors who have multiple directorships; I use only experience acquired from other firms after the director joined the current firm. This identification accounts for selection concerns by exploiting the exogenous variation in director experience. In a series of additional tests, I find a negative association with CEO power and a positive association with peer firms and the adoption of succession plans.

The primary job of the Board of Directors is to see that the right people are running the business and to be sure that the next generation of leaders is identified and ready to take over tomorrow.

(Berkshire Hathaway Inc, Shareholder Letter 2011)

Many corporate boards fumble the changing of the guard, widely considered their most important duty. Power transfers recently have tripped up Walt Disney Co., home builder Pulte Group Inc. and teen retailer Abercrombie & Fitch Co.

(Wall Street Journal, 2016)

4.1 Introduction

A key responsibility that is assigned to the board "is to provide succession planning so that the company is not adversely affected due to a vacancy in leadership" (SEC 2009). Despite boards being responsible for the selection, monitoring, and retention (or dismissal) of the CEO (Hermalin 2005; Adams, Hermalin, and Weisbach 2010; Guo and Masulis 2015; Jenter and Kanaan 2015), survey evidence indicates that boards frequently do not engage in CEO succession planning. One-third of boards do not discuss CEO succession planning annually (Spencer Stuart 2015), and the boards that do engage in succession planning dedicate only one hour per year to it on average (Larcker and Saslow 2014).

If CEO succession planning is an important part of the board's monitoring function[1] and a responsibility of the board (Vancil 1987), then why do lapses occur? In this paper I examine the factors affecting the likelihood of firms having or adopting CEO succession plans. I hand-collect a unique data set of firm-level succession plan information as well as information on directors with succession planning experience.

[1]See chapter three for a detailed exposition of the firm value effects of CEO succession planning.

Recent empirical work shows that director experience plays an important role in board decision making. For example, director skills such as industry experience (Dass et al. 2014; Meyerinck, Oesch, and Schmid 2016), financial expertise (Burak Güner, Malmendier, and Tate 2008; Huang et al. 2014), and legal expertise (Krishnan, Wen, and Zhao 2011) are all observed to affect board decisions and firm performance. It follows that, since CEO turnovers are a significant firm-level event, directors gain valuable knowledge and experience about the CEO succession process. Ellis, Guo, and Mobbs (2015) find that forced turnover experiences help directors to improve their monitoring skills. I hypothesize that directors who are actively involved in establishing a CEO succession plan learn from that experience and will be more likely to lead to the firms associated with these directors subsequently adopting succession plans.

A challenge with examining director experience and its effects is related to identification and the problem of dynamic matching (Roberts and Whited 2012). That is, some unobserved characteristic results in the assignment to the treatment group and therefore the drawing of causal links between this experience and the firm are problematic due to non-random selection into treatment and control groups. Drawing causal inferences regarding why some firms engage in succession planning is challenging due to the endogenous nature of firm choices and the dynamic matching with directors. For example, a firm may undertake CEO succession planning because the directors are specifically selected due to their experience in handling leadership transitions. That is, the firms and boards that have CEO succession plans differ because of certain characteristics that may not be observed and controlled for in a standard ordinary least squares (OLS) regression and lead to incorrect causal inferences.

In this paper I address this issue by examining the change in a firm's adoption of suc-

cession plans from before to after a director acquires the experience while controlling for other fixed effects and time-varying characteristics. This identification accounts for the selection concerns by exploiting exogenous variation in director experience. To examine the effects of director experience, I examine directors who have multiple directorships. I then examine how the succession-planning and turnover experience gained on the other boards affects the likelihood of the connected firm adopting a succession plan.

I find that, if a director gains succession planning experience, then the firm connected to the director is 38 percent more likely to adopt a succession plan in the following year. I find that directors who experience a CEO turnover event are 7 percent more likely to adopt a new succession plan in the connected firm in the following year.

To investigate whether differences in turnover experience drive the relationship, I separate CEO turnovers into those with and without evidence of a succession plan. I find that directors who gain CEO turnover experience in firms that have succession plans are 2.6 percent more likely to be in interconnected firms that subsequently adopt succession plans. In contrast, directors who gain CEO turnover experience in firms without succession plans take this experience forward, and I observe a negative association between CEO turnover experience without succession plans and the likelihood of a firm having a succession plan.

In a further series of tests, I use CEO health events to test the causal relationship between CEO turnover and firm succession plan adoption. CEO health shocks have a positive causal relationship with CEO turnover (Bennedsen, Perez-Gonzales, and Wolfenzon 2012). The exogenous increase in the probability of a CEO turnover event allows me to examine whether this leads to an increase in the likelihood of firms adopting succession plans. I do not find evidence of a causal relationship between CEO health

events and succession plan adoption.

In this paper I also examine other factors that may influence the likelihood of a firm having a succession plan. Specifically, I examine the effects of CEO power (Coles, Daniel, and Naveen 2014), board legal expertise (Krishnan, Wen, and Zhao 2011), and the role of peer firms (Leary and Roberts 2014).

As a succession plan involves the board considering potential alternative CEOs, it is analogous to the board preparing a pool of replacements (Hermalin and Weisbach 1998; Goel and Thakor 2008). CEOs who are seeking to increase their bargaining power have an incentive to discourage the board from examining labor markets for potential candidates. I find evidence consistent with the predictions of agency theory (Jensen and Meckling 1976; Fama 1980) that the likelihood of firms having a succession plan is negatively associated with powerful CEOs. Firms with CEO–founders are almost 7 percent less likely to have a succession plan. Similarly, for each additional title that the CEO has, there is nearly a 2 percent reduction in the likelihood of having a succession plan.

I find evidence that peer firms play a role in determining the corporate policies of a firm (Leary and Roberts 2014). I find that peer firms, grouped by SIC industry, exert an impact on the adoption of succession plans. There is a 3.5 percent increase in the likelihood of a firm adopting a succession plan if a peer group firm adopts a succession plan in the prior year.

This paper makes several contributions to the literature on CEO succession planning. Firstly, I document the relationship between the director experience and the likelihood of a firm having a succession plan. I observe that director succession planning is a type of expertise and an important determinant of whether a firm will adopt a succession

plan and therefore contribute to the literature on director experience (Burak Güner, Malmendier, and Tate 2008; Custódio and Metzger 2014; Dass et al. 2014). This result is robust to concerns about endogeneity, as I exploit exogenous variations in director experience. Secondly, I find that the likelihood of a firm having a succession plan is negatively associated with CEO power (Shivdasani and Yermack 1999; Coles, Daniel, and Naveen 2014), a result that is consistent with the predictions of agency theory (Jensen and Meckling 1976; Fama and Jensen 1983). Finally, this paper contributes by developing a new measure for identifying firms with succession plans. By hand-collecting firm disclosures related to succession plans, I do not rely on proxies and therefore improve the firm-level identification (Shen and Cannella 2003; Naveen 2006).

The rest of the paper is organized as follows. Section 4.2 discusses the related literature and hypothesis development. Section 4.3 develops the empirical strategy and data collection methods. Section 4.4 discusses the results of the paper. Section 4.5 presents additional tests, and Section 4.6 concludes.

4.2 Literature Review and Hypothesis Development

This section begins by outlining the definition of a succession plan. This is followed by the development of the paper's testable hypotheses.

4.2.1 What is a CEO Succession Plan?

A CEO succession plan is the process by which the board ensures that the firm has the optimal CEO over time and can transition smoothly from one leader to another.

It is a guideline for the board to evaluate the CEO labor market, allowing the firm to prepare for CEO turnover events in advance (Vancil 1987). Succession plans improve the efficiency of this CEO selection process.

The literature most closely related to CEO succession planning is the work relating to CEO turnover. As noted by Naveen (2006), the CEO succession "process has received little explicit attention in the finance literature."[2] This is in part due to the empirical challenges of identifying firm succession plans and isolating their effect on CEO turnovers. The CEO turnover literature implicitly assumes that the effects of succession planning on the firm are subsumed either by the incumbent or by the successor, rather than CEO succession planning being a "deliberate process."

The general nature of a succession plan reflects the absence of a uniform way in which firms approach the task. While there is no standard definition of a succession plan, shareholder proposals requesting information on companies' succession plans[3] provide key insights into firm owners' expectations. An examination of shareholder proposals related to succession plans between 2008 to 2013 finds that shareholders request information on the criteria for the CEO position, the formal assessment process to evaluate candidates, and whether potential candidates are identified in advance. Importantly, there is a notable absence of firms appointing an individual as the successor, commonly referred to as an "heir apparent." There is an important distinction between a successor and a succession plan. A firm can engage in succession planning and not necessarily identify an individual successor in advance.

[2]Notable succession papers published in finance journals since 2006 are those by Naveen (2006), who examines how the complexity of the firm affects the likelihood of an internal successor, Mobbs and Raheja (2012), who study the structure of the internal labor market, and Borokhovich, Boulton, and Brunarski, who (2014) examine the incentive of grey directors surrounding CEO turnover events.

[3]Between 2008 and 2013, there were 32 shareholder-sponsored proposals for information relating to firm succession plans. All the proposals failed to achieve sufficient support. Please see Appendix Table A.2 for more detailed information.

Succession planning forms part of the CEO selection process. It is an ongoing function that is undertaken by the board in advance of the turnover event and akin to the board evaluating a pool of candidates (Hermalin and Weisbach 1998). More recent theoretical work provides a formal representation of how boards evaluate potential successors. For example, in Goel and Thakor's (2008) CEO selection model, a manager's ability is initially unknown and learnt about over time and the board replaces the incumbent CEO by following a "rational ability filtering process." The board learns about potential successors by observing them and then selects the manager with the "highest perceived ability." This filtering process by the board is analogous to CEO succession planning.

4.2.2 CEO Succession Planning Lapses

Succession planning is a responsibility that is assigned to the board. This is supported from a regulatory (SEC 2009), theoretical (Hermalin and Weisbach 1998; Goel and Thakor 2008), and empirical (Naveen 2006; Borokhovich et al. 2014; Larcker and Saslow 2014) perspective.

If CEO succession planning is an important function of the board (Vancil 1987), then why do lapses occur? Survey evidence indicates that one-third of boards do not discuss CEO succession planning annually (Spencer Stuart 2015). An analysis of SEC proxy statements (DEF 14A) finds that only 40 percent of firms discuss succession planning.

4.2.2.1 Director Experience and Succession Planning

As observed by Hermalin (2005), one of the key decisions taken by a board is the selection, monitoring, and retention (dismissal) of the CEO. Turnover events and the

selection by the board of a CEO successor have an economically significant effect on firm performance (Huson, Malatesta, and Parrino 2004; Pan, Wang, and Weisbach 2015). In addition to the effects on firm performance, directors often experience negative utility effects following CEO turnover events. Board decisions are heavily scrutinized during CEO turnover events, and directors face considerable reputational consequences (Fama, Eugene 1980). The board composition changes and the rate of director turnover increases following a CEO turnover event (Hermalin and Weisbach 1988; Parrino 1997; Fee and Hadlock 2004).

Recent empirical work shows that director experience is an important factor in board decision making (see for example Fahlenbrach, Low, and Stulz, 2010; Dass, Kini, Nanda, and Onal, 2014; Meyerinck, Oesch, and Schmid, 2016). Ellis, Guo, and Mobbs (2015) examine how directors who gain forced turnover experience increase their monitoring behavior and become more sensitive to CEO performance and turnover decisions. I conjecture that directors who are actively involved in establishing CEO succession plan learn from that experience.

This leads to the following hypothesis:

H1.1 Directors who have CEO succession planning experience are more likely to facilitate firm CEO succession plan adoption.

Associated with director experience is the composition of board members' expertise. Empirical evidence indicates that the expertise of the directors has implications for monitoring and advising. For example, the presence of legal backgrounds may potentially make board members more concerned about the litigation risks that are associated with inadequate or inaccurate succession-planning activities. The SEC highlights the responsibility of boards in regard to succession planning (SEC 2009). Linck, Netter,

and Yang (2009) report that, in the wake of the Sarbanes–Oxley Act, the share of board seats held by lawyers increased from 5.6 percent in 2001 to 8.6 percent in 2004. Companies have added proportionately more lawyers to their boards than any other category of new appointees, including financial experts.

This leads to the following hypothesis:

H1.2 Directors who have legal expertise are more likely to facilitate firm CEO succession plans.

4.2.2.2 CEO Power

The CEO and the board have competing incentives to prepare succession plans. CEOs who are seeking to increase their bargaining power have an incentive to discourage the boards from carrying out their succession-planning functions. Boards that engage in succession planning exert an effort to learn about potential CEO successors (Goel and Thakor 2008) and prepare a "pool of potential replacements" (Hermalin and Weisbach 1998). Therefore, CEOs have an incentive to discourage boards from examining the CEO labor market for potential candidates.

Theoretical work shows that the willingness to monitor the CEO decreases with CEO power. For example, Hermalin and Weisbach (1998) model the intensity of the board's monitoring effort as a function of the CEO's influence over board selection. Similarly, Warther (1998) shows how the CEO's power to select and retain board members reduces the board's scrutiny. Shivdasani and Yermack (1999) conclude that the CEO's power over the director selection process reduces the board's independence. Director co-option (Coles, Daniel, and Naveen 2014) and social ties (Hwang and Kim 2009) result in less

independent boards and lower monitoring efforts. In sum, the prior empirical research emphasizes a negative relationship between CEO power and monitoring.

This leads to the following hypothesis:

H2.1 The likelihood of a firm having a succession plan is negatively associated with the power of the CEO.

4.2.2.3 Peer Firm Effects

Peer firms play a central role in shaping a number of corporate policies, including the capital structure (Leary and Roberts 2014) and CEO compensation (Bizjak, Lemmon, and Naveen 2008). The motivation for boards to follow industry competitors is based on models of learning (e.g. Conlisk 1980) and reputational concerns (e.g. (Scharfstein and Stein 1990). That is, if a competitor in the industry adopts a succession plan, the firm, out of concern for negative effects, mimics the peer and adopts a succession plan.

This leads to the paper's final hypothesis:

H3.1 The likelihood of a firm having a succession plan is positively associated with peer firms adopting succession plans.

4.3 Data and Empirical Design

This section outlines the paper's approach to the identification of firms' succession plans and the empirical strategy to examine the effects of CEO power and director experience on succession plan adoption. The paper uses three samples. The first sample includes

all the CEO turnover events in S&P 1500 firms. The second sample is a panel data set of S&P 1500 firm-year observations and is used to examine whether consistent findings are observed across a broader set of firms. To ensure that the results are not produced by endogenous factors, a third sample of exogenous CEO health events is examined. The sample period begins in 1996, the earliest year for which board, CEO, and firm information can be developed comprehensively, and ends in 2014.

4.3.1 Empirical Strategy

I use three alternative empirical models to test the hypotheses. First, I use a standard OLS regression to examine the association between the firm and CEO or board characteristics and the likelihood of having a succession plan. This model specification is likely to compromise endogeneity assumptions, as omitted variables may drive the results.

To provide more robust evidence, I examine directors who hold multiple directorships and exploit the exogenous variations in succession planning and CEO turnover experience. An attractive feature of this experimental design is that exploiting variations in experience while holding the same multiple directorships addresses the problem of dynamic matching between firms and directors (Roberts and Whited 2012). A challenge with director experience and firm effects is that the directors may be selected because of their experience (Custódio and Metzger 2014; Huang et al. 2014; Meyerinck, Oesch, and Schmid 2016). By observing directors who hold multiple directorships simultaneously, I am able to observe how this experience influences the interconnected firm. Figure 4.1 presents the paper's empirical strategy.

<Insert Figure 4.1 Approximately Here.>

Observing the causal relationship between succession planning and CEO turnover is challenging. An OLS or lagged regression will not identify the causal channel, that is, whether succession plans lead to CEO turnover events or vice versa. To disentangle the causal relationship between succession planning and turnover events, I use CEO health shocks[4]. CEOs, like all members of the population, are susceptible to accidents, illnesses, and disease. I exploit the random assignment of health shocks among CEOs to create an exogenous setting. CEO health shocks have a positive causal relationship with CEO turnover (Bennedsen, Perez-Gonzales, and Wolfenzon 2012). The exogenous increase in the probability of CEO turnover allows me to examine whether this leads to an increase in the likelihood of firms adopting succession plans.

4.3.2 Identification of Firm Succession Plans

In this paper I identify CEO succession plans by whether or not the firm discusses succession planning in the SEC filings contained in the Edgar database. The initial sample is created using keyword-matching techniques to examine documents that contain succession plan-related words, for example handover, replacement, succession plan, and successor. Each match is then examined manually to determine its relevance. To the best of my knowledge, this is the first paper to identify firms' succession-planning activities based on firm disclosures rather than making inferences from executive titles.

[4]See Chapter two for detailed information on the CEO health shock sample.

Figure 4.2 reports the number of firms that discuss succession planning in their proxy statements from 1996 to 2014. The use of ex ante proxy statement disclosures identifies firms that disclose the presence of succession plans prior to the turnover event occurring. The proportion of firms that discuss succession planning increased from 5 percent to 40 percent over the sample period.

<Insert Figure 4.2 Approximately Here.>

The use of actual firm disclosures to identify firm succession plans offers a number of sample selection advantages. Firstly, firms face regulatory and legal consequences of false disclosures. A potential concern is that a firm does not have an incentive to reveal detailed information about its CEO succession plans and therefore there may be selection bias with this measure. Firms may reason that revealing CEO succession plan information would have an impact on the incentives of firm members' effort (Fama and Jensen 1983), the likelihood of remaining with the firm (Shen and Cannella 2003), and the willingness to acquire firm-specific knowledge (Acharya, Myers, and Rajan 2011). The reluctance of firms to disclose detailed succession plan information is evident in succession plan-related shareholder proposals. For example, 32 shareholder proposals for firm succession plan information occurred between 2008 and 2013[5]. In all circumstances the Institutional Shareholder Services (ISS) recommended voting for the proposal and the management against it, and 100 percent of the proposals failed to pass. An important distinction is that these proposals seek detailed information on the firms' CEO succession plan, for example the criteria for the CEO position, a list

[5]See Appendix A.2 for detailed information on the voting results of succession plan shareholder proposals

of internal candidates, and information on specific features of the succession plan. The measures used in this paper do not require detailed information about the succession plan; rather, evidence of whether and when boards engage in succession planning is measured on an annual basis.

The general nature of a succession plan creates challenges for researchers. As noted by Naveen (2006), "CEO succession as a process has received little explicit attention in the finance literature." A common approach to identifying a firm's CEO succession plan is to identify the individual holding the title of Chief Operating Officer (COO) or President and then assume that this executive is the "heir apparent." Examples of studies following this approach include Naveen (2006), Mobbs and Raheja (2012), and Borokhovich, Boulton, and Brunarski (2014). This approach is appealing from an empirical perspective, as it makes the identification of a firm's succession plan a straightforward case, easily matched with common data sources.

However, the equating of a COO/President title as equivalent to a succession plan is not easily reconciled with the empirical trends in CEO appointments (Hermalin 2005; Ferris, Jayaraman, and Lim 2015), models of CEO selection (Hermalin and Weisbach 1998; Goel and Thakor 2008), or the labor market decisions of COOs/Presidents (Shen and Cannella 2003). As noted by Shen and Cannella (2003), one-third of these heir apparent CEOs depart from the firm prior to being promoted to the CEO position. This is a curious result given that these individuals have been picked to be the CEO; in fact, an alternative interpretation could be that these individuals leave the firm because they are not part of its succession plan of potential candidates.

An additional limitation of using executive titles as a proxy for succession planning is that it equates succession planning and successors. This contrasts with the theoretical

(Hermalin and Weisbach 1998; Goel and Thakor 2008) and empirical evidence about CEO selection being a tournament (Mobbs and Raheja 2012; Masulis and Zhang 2013), with candidates competing in the internal and external labor market to become a CEO rather than the COO/President being assured of promotion to the CEO position (Huson, Parrino, and Starks 2001; Hermalin 2005; Ferris, Jayaraman, and Lim 2015).

A serious concern with using COO/President titles as a proxy for succession planning is that it will mistakenly also include firms that do not have a succession plan. A succession plan is an ongoing evaluation process conducted by the board to learn about candidates and select the optimal replacement. In the absence of a succession plan, this evaluation and monitoring process will not have occurred. In the event of a turnover event, a firm that does not have a succession plan will not have evaluated any alternative candidates and is therefore more likely to promote the COO/President, as this is the second-highest-ranked executive. In this case the use of COOs/Presidents as a proxy for succession planning will have the unintended outcome of grouping together firms that do not have succession plans with firms that do have succession plans.

4.3.3 Sample Descriptions

4.3.3.1 S&P 1500 CEO Turnover Sample

This sample consists of all the CEO turnover events in Standard and Poor's 1500 firms from 1996 to 2014. Turnover events are identified from ExecuComp and only include CEOs who have tenure of three years or longer. Table 4.1 reports the summary statistics for CEOs and boards during CEO turnover events. The year 1996 is the first year for which I can develop comprehensive information on the underlying boards due to the

coverage of board information in the RiskMetrics Database. The initial sample contains 4,728 unique CEO turnover events. I use the information on the annual title, date becoming CEO, date leaving as CEO, and CEO annual flag provided by ExecuComp to identify CEOs at the firm-year level following Pan, Wang, and Weisbach (2015). To match across databases, I use either common identifiers or a name-matching algorithm[6]. Observations are manually checked for missing values or potential error observations.

Panel A reports the summary statistics for incumbent CEOs in the turnover year identified as the year of leaving as CEO in ExecuComp; Panel B reports the summary statistics for successor CEOs in the CEO turnover year identified as the year of becoming CEO in ExecuComp; Panel C reports the summary statistics for the dummy variable showing whether the firm mentioned a CEO succession plan in its proxy statements or 10-K, manually collected by scanning all the filings in the Edgar database from the SEC; Panel D reports the summary statistics for firm-level attributes in the CEO turnover years provided by Compustat; and Panel E reports the board data available from RiskMetrics or BoardEx in the CEO turnover years. All the variables are defined in Table A.1 of the Appendix.

<Insert Table 4.1 Approximately Here.>

[6]I thank Robert Tumarkin for providing this matching algorithm. Please see Sen and Tumarkin's (2015) online internet appendix for a detailed discussion of the matching procedure. The name-matching algorithm takes into account misspelling, incorrect word order, nicknames, and name omissions and accounts for the tonal characteristics of names.

4.3.3.2 Panel Data Sample

This sample consists of all the firm-year observations from 1996 to 2014 of the Standard and Poor's 1500 firms in the ExecuComp database. I follow a similar process to the one described above and collect CEO, board, and firm information from ExecuComp, BoardEx, RiskMetrics, Capital IQ (Professional), and AuditAnalytics. Matching across the database occurs either through the use of common identifiers or via a name-matching algorithm. Observations are manually checked for missing values or potential error observations.

Table 4.2 Panel A reports the summary statistics for incumbent CEOs in ExecuComp; Panel B reports the summary statistics for the dummy variable showing whether the firm mentioned a CEO succession plan in its proxy statements or 10-K, manually collected by scanning all the filings in the Edgar database from the SEC; Panel C reports the summary statistics for other firm-level attributes provided by Compustat; and Panel D reports the board data available from RiskMetrics or BoardEx. All the variables are defined in Table A.1 of the Appendix.

<Insert Table 4.2 Approximately Here.>

4.3.3.3 CEO Health Shock Sample

The sample consists of 316 CEO illness events occurring between 1996 and 2014. For the classification of health shocks, I rely on the National Center for Health Statistics

(NCHS) of the Centers for Disease Control and Prevention. The NCHS collects information from all resident death certificates filed in the US using demographic and medical characteristics and follows the International Classification of Diseases, Tenth Revision (ICD-10). The two most common medical events disclosed are heart disease (24.68 percent) and cancer (26.90 percent). In the sample 61.34 percent of CEOs take medical leave and 57.98 percent recover.

Information on the CEOs is obtained from ExecuComp and BoardEx, SEC 8-K and 10-K filings, and media sources. To match across databases, I use name-matching algorithm observations and then manually check for missing values or potential error observations (outliers or different age records for the same CEO among different databases). Table 4.3 Panel A reports CEO characteristics.

<Insert Table 4.3 Approximately Here.>

Next, I collect firm fundamental data from Compustat and stock return data from CRSP. Firms that are not contained in Compustat are excluded from the final sample. I follow Adams, Almeida, and Ferreira (2005)to clean the Compustat fundamental data, dropping firms with missing or negative values for total assets (AT), capital expenditures (CAPX), property, plant and equipment (PPENT), cash holdings (CHE), or sales (SALE). I also drop firms for which the cash holdings, capital expenditures, or property, plant, and equipment are larger than the total assets. Table 4.3 Panel B reports the firm characteristics.

4.3.3.4 Controls

In the regression specification, the following explanatory controls are included. Firm size is measured by total assets. It is observed that the size of the organization can affect the succession process (Parrino 1997; Naveen 2006). Board independence is captured by the independent director ratio. Guo and Masulis (2015) document a positive relationship between board independence and CEO turnover. I also follow Coles, Daniel, and Naveen (2008, 2014[7]) by controlling for the board size and female director ratio as well as CEO power and entrenchment measures, such as CEO–founder, CEO duality, CEO tenure, and CEO age. Because of the documented relationship between CEO turnover and firm performance, I also include the ROA (Huson, Malatesta, and Parrino 2004; Jenter and Kanaan 2015). Most of these control variables are used in prior CEO turnover studies (Bushman and Wang 2010; Jenter and Kanaan 2015).

4.4 Empirical Results

This section reports the factors affecting the likelihood of a firm having and adopting a CEO succession plan. The analysis begins by examining the relationship between director experience and firm succession plans. The final set of results examines the effects of CEO power, peer firms, and legal expertise on succession plan adoption.

[7]I would like to thanks Coles, Daniel, and Naveen for providing the code to clean the RiskMetrics director database.

4.4.1 Board Expertise and Succession Planning

The following section presents evidence regarding how director experience affects the likelihood of a firm having a succession plan. I examine directors with multiple directorships across firms. Accordingly, I examine directors who either experience a CEO turnover event or gain succession planning experience at another firm in a prior time period. I then examine the likelihood of the interconnected firm subsequently having a succession plan, as shown in Figure I.

Table 4.4 reports the results, where the dependent variable is a dummy variable equal to one if the firm has a succession plan. All the models include firm and year fixed effects and robust standard errors clustered at the firm level. Models I through III focus on the association between the succession planning experience and the likelihood of a firm having a succession plan. Models IV through VI examine the effects of CEO turnover experience and the likelihood of a firm having a succession plan.

Models I to III report a positive relationship between directors who have experience with succession planning and the likelihood of a firm having a succession plan. Three alternative measures of succession planning experience are reported in Table 4.4. Importantly, I only include director experience when the interconnected firm adopts a succession plan. For example, a director who sits on an interconnected board that already has a succession plan would not be counted, as it is not clear that the director gained experience in the adoption of a succession plan. In model I the key independent variable is the succession-planning expertise ratio, which is a ratio of the directors on the firm's board who have experienced the adoption of a succession plan at another firm in an earlier time period. In Model II the key variable of interest, is the experience of succession planning, which measures the average number of succession plan adoptions

of the board at interconnected firms in prior periods. Model III examines directors who experience CEO turnovers with succession plans. In models I to III there is a positive association between the succession-planning experience and the likelihood of a firm having a succession plan. This relationship is significant at the 1 percent level. This provides support for the hypothesis that succession planning is a director skill and an important factor affecting the likelihood of a firm having a succession plan.

Following this I examine how directors who experience CEO turnovers influence the likelihood of a firm having a succession plan. In model IV the key independent variable of interest is the CEO turnover experience of directors. This is a measure of the average number of CEO turnovers that the board has experienced in interconnected firms. I find that there is a positive and highly statistically significant relationship between the level of turnover experience and the likelihood of the interconnected firm having a succession plan.

In the sub-sample analysis, I examine whether directors who obtain this turnover experience with and without succession plans have implications for the likelihood of the connected firm having a succession plan. As reported in model V, directors who gain turnover experience without succession plans are more likely not to have succession plans in the connected firm. This indicates that the relationship between CEO turnover experience and succession planning is not uniform. Model VI combines the key independent variables and shows no significant variation in the sign, size, or statistical significance of the coefficients.

Taken together, these results provide evidence that director experience is an important factor in determining the likelihood of a firm having a succession plan. I observe a positive relationship between the level of director succession-planning experience and

the likelihood of a firm having a succession plan. For CEO turnover experience, I find non-uniform effects on the propensity of firms to have a succession plan. Directors who experience a CEO turnover event at a firm with a succession plan are more likely to have succession plans in the connected firm. Similarly, if the director experiences the CEO turnover event without a succession plan, there is a negative likelihood of the connected firm having a succession plan.

<Insert Table 4.4 Approximately Here.>

4.4.2 When Do Firms Adopt Succession Plans?

In this section I examine the relationship between CEO turnover and succession plans. Specifically, I provide evidence of the timing of a firm's adoption of a succession plan in relation to CEO turnover events.

I begin by examining how succession plans affect the monitoring of the CEO. In Table 4.5 I report the effects of succession planning on the likelihood of a firm having a CEO turnover event. I find a positive association between firms that have succession plans and the likelihood of having a CEO turnover event. This result is robust to the S&P 1500 (models I and II) and larger BoardEx samples (models III and IV) as well as to the inclusion of either industry or firm fixed effects. It is consistent with the evidence that improved monitoring is correlated with the likelihood of CEO turnover events (Coles, Daniel, and Naveen 2014; Guo and Masulis 2015). This outcome provides evidence of a positive association between succession plans and CEO turnover events, but it does not provide evidence of a causal relationship.

<Insert Table 4.5 Approximately Here.>

To determine the timing of the adoption of succession plans in relation to turnover events, I use two main panel regression specifications and exploit time series variation between the events. In Table 4.6 models I to III, the dependent variable is an indicator variable equal to one if a firm adopts a new succession plan. In models I to III, the key independent variables are indicator variables showing whether a firm has a CEO turnover event within a three-year window prior to the adoption of the succession plan. Importantly, I only include firms that previously have not had succession plans.

As reported in models I to III, a positive and statistically significant relationship is found between the CEO turnover and the likelihood of a firm adopting a new succession plan at time horizons up to two years following the CEO turnover. This result indicates that firms are more likely to adopt succession plans after CEO turnover events.

Model IV attempts to address the potential reverse causality, specifically that succession plans lead to CEO turnovers. The dependent variable is an indicator variable equal to one if a firm has a CEO turnover event that year. The key independent variable is an indicator variable equal to 1 if a firm adopts a new succession plan in the year before the turnover event. I find that firms that have a CEO turnover event are less likely to adopt a succession plan in the year prior to the turnover event.

<Insert Table 4.6 Approximately Here.>

To provide robust evidence of the effects of director experience on succession plan adoption, I examine directors who have multiple directorships. I then examine how

succession-planning and turnover experience affects the likelihood of the connected firm adopting a succession plan.

Table 4.7 reports the results of director experience and succession plan adoption. The dependent variable is an indicator variable equal to one if a firm adopts a new succession plan. In Model I the key independent variable is an indicator variable for a director who gains succession-planning experience in the previous year. This variable is created by looking at the directors of firms that adopt new succession plans. I find that, if a director gains succession-planning experience, then the interconnected firm is 38 percent more likely to adopt a succession plan in the following year. Similarly, when I examine directors who gain CEO turnover experience, I find evidence that turnover experience in one firm affects the likelihood of adopting a succession plan in another. In Model III I find that directors who experience a CEO turnover event are 7 percent more likely to adopt a new succession plan in the interconnected firm in the following year. This effect diminishes over time, as shown in models II and IV; after two years a firm is statistically no more likely to adopt succession plans.

<Insert Table 4.7 Approximately Here.>

In the final set of results, I use exogenous CEO health shocks to examine the causal relationship between CEO turnover and firms' adoption of succession plans. As reported in Table 4.8, there is no statistically significant relationship between firms that experience an exogenous increase in the likelihood of CEO turnover and the likelihood of them adopting a succession plan. I do not find evidence of a causal relationship between CEO health events and succession plan adoption.

<Insert Table 4.8 Approximately Here.>

4.5 Additional Tests

The section examines alternative channels that may influence the likelihood of a firm having a succession plan: the power of the CEO (Coles, Daniel, and Naveen 2014), whether the board has legal expertise (Krishnan, Wen, and Zhao 2011), and the behavior of peer firms (Leary and Roberts 2014).

4.5.1 Legal Expertise

Linck, Netter, and Yang (2009) report that, in the wake of the Sarbanes–Oxley Act, the share of board seats held by lawyers increased from 5.6 percent in 2001 to 8.6 percent in 2004. Companies have added proportionately more lawyers to their boards than any other category of new appointees, including financial experts. The presence of legal backgrounds may potentially make board members more concerned about the litigation risks (Krishnan, Wen, and Zhao 2011) that are associated with inadequate or inaccurate succession-planning activities. The SEC highlights the responsibility of boards in regard to succession planning (SEC 2009).

I define a director as a legal expert if s/he has a law school degree, such as JD or LLM, and/or has working experience as a lawyer, for example, at a law firm or as a legal counsel.

Table 4.9 reports the results of director legal expertise and the likelihood of a firm having a succession plan. The key independent variable is an indicator variable for a

director who has legal expertise. I find a positive association between the legal expertise and the likelihood of a firm having a succession plan; however, it is not statistically significant.

<Insert Table 4.9 Approximately Here.>

4.5.2 CEO Power

Table 4.10 reports the results, in which the dependent variable is a dummy variable equal to one if the firm has a succession plan. All the models include firm and year fixed effects and robust standard errors clustered at the firm level. Models I to IV focus on alternative measures of CEO power.

As reported in Table 4.10, I find evidence of a negative relationship between the CEO power and the likelihood of a succession plan. In model I firms with CEOs who also hold the position of chairman are nearly 5 percent less likely to have succession plans. The effect is stronger in firms with CEO–founders; in model II there is a 7 percent lower likelihood of having a succession plan. Similarly, in model III, for each additional title that the CEO has, there is almost a 2 percent reduction in the likelihood of a firm engaging in succession planning. A negative association between the likelihood of a firm having a succession plan and the CEO voting power is observed in model IV. All the relationships between CEO power and succession plans are negative and statistically significant at the 5 percent level or higher. This is consistent with the hypothesis that CEO power is negatively related to succession planning. Taken together, these findings

provide evidence of variations in CEO power affecting the likelihood of a firm engaging in succession planning.

<Insert Table 4.10 Approximately Here.>

4.5.3 Peer Firm Effects

Peer firms play a central role in shaping a number of corporate policies, including the capital structure (Leary and Roberts 2014) and CEO compensation (Bizjak, Lemmon, and Naveen 2008). While theoretically intuitive, identifying peer effects is empirically challenging because of the reflection problem (Manski 1993). This problem refers to a specific form of endogeneity that arises when trying to infer whether the actions or characteristics of a group influence the actions of the individuals that comprise the group. For peer firms I use two-digit SIC industry codes for the grouping of firms. As shown in Table 4.11, I find that a firm is 3.5 percent more likely to adopt a succession plan if a peer firm adopts one in the prior year; this relationship is statistically significant at the 1 percent level. These results are consistent with the implications of models based on learning (e.g. Conlisk 1980) and reputational concerns (e.g. Scharfstein and Stein 1990).

<Insert Table 4.11 Approximately Here.>

4.6 Conclusion

The paper finds that, despite increased shareholder and regulatory attention to firm succession planning, a majority of firms do not engage in succession planning on an annual basis. Using a unique hand-collected data set of S&P 1500 firms, I observe that approximately 30 percent of firms engage in succession planning. This result is consistent with the existing survey evidence (Larcker, Miles, and Tayan 2014; Spencer and Stuart 2014). This paper is the first to document this effect across a large sample of firms and to demonstrate the increasing trend of succession plan adoption.

This paper makes several contributions to the literature on CEO succession planning. Firstly, I examine how variations in director experience affect the likelihood of a firm having a succession plan. I find, consistent with the literature on director experience, that variations in director succession planning and CEO turnover experience have implications for the likelihood of a firm having and adopting a succession plan. Variations in director experience with CEO turnovers are an important factor in determining the likelihood of a firm having a succession plan. Directors who experience turnovers with succession plans are more likely to have succession plans subsequently. Conversely, directors who experience turnovers without succession plans are more likely not to have succession plans. This result is robust to concerns about endogeneity, as I exploit exogenous variations in director experience. Secondly, I find a negative association with CEO power (Shivdasani and Yermack 1999; Coles, Daniel, and Naveen 2014), a result that is consistent with the predictions of agency theory (Jensen and Meckling 1976; Fama and Jensen 1983).

The paper also makes an important contribution in terms of the measure used to identify firm succession plans. To the best of my knowledge, I am the first to identify succession

plans based on actual firm disclosures and not to rely on the use of heir apparent titles to infer the presence of a firm succession plan.

Figure 4.1: Empirical Strategy: Causal Relationship between Experience and Succession Planning

In this paper I examine directors who hold multiple directorships and exploit variations in succession planning and CEO turnover experience. Accordingly, I examine directors who either experience a CEO turnover event or gain succession planning experience at another firm in a prior time period. I then examine the likelihood of the connected firm subsequently having a succession plan. By exploiting variations in experience while holding the directorships and firms constant, I address the challenge of dynamic matching between firms and directors (Roberts and Whited 2012). This empirical strategy solves the problem of dynamic matching between directors and firms (Custódio and Metzger 2014; Huang et al. 2014; Meyerinck, Oesch, and Schmid 2016).

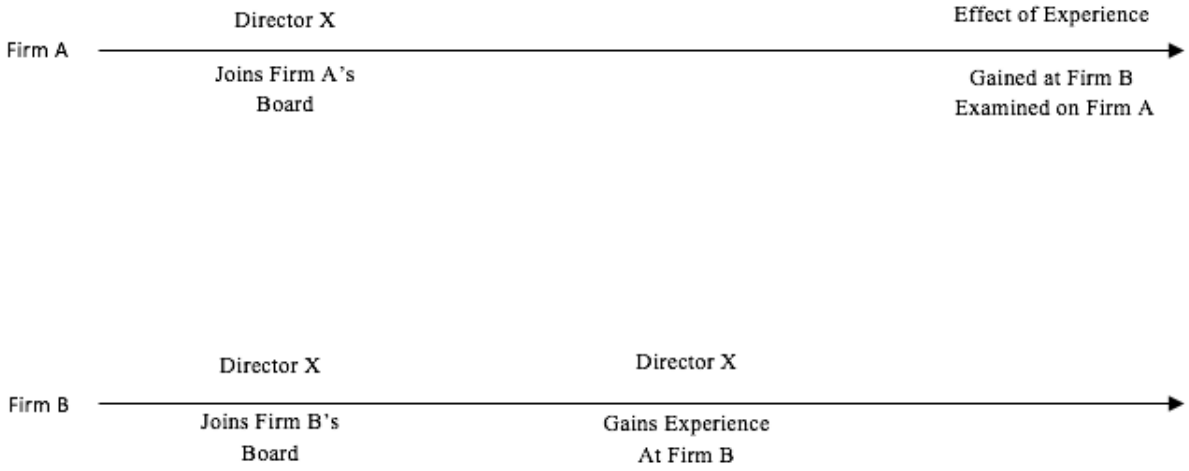

Figure 4.2: Percentage of Firms Mentioning a Succession Plan in Their Proxy Statement

This figure shows the time trend of references to succession plans in the DEF 14A for all listed firms during the period from 1994 to 2014. Also shown is the average CEO tenure for S&P 1500 firms during the period of 1992–2014.

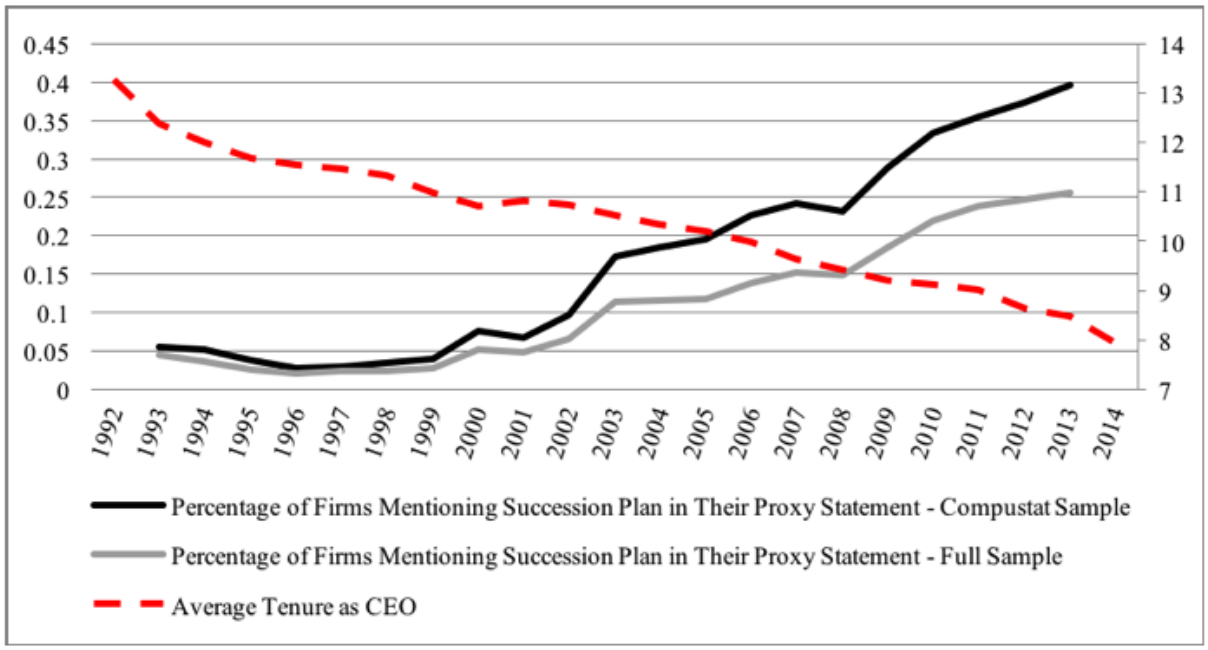

Table 4.1: Summary Statistics for All CEO Turnover Events of S&P 1500 Firms

This sample consists of all CEO turnover events in the Standard and Poor's 1500 firms from 1996 to 2014 identified in ExecuComp for CEOs that have tenure of three years or longer. I use the information on Annual Title, Date Became CEO, Date Left as CEO and CEO Annual Flag provided by ExecuComp to identify CEOs at the firm year level following Pan, Wang and Weisbach (2015). Panel A reports the summary statistics for incumbent CEOs at the turnover year identified as the year of Left as CEO in ExecuComp; Panel B reports the summary statistics for the dummy variable of whether the firm mentioned a CEO succession plan in its proxy statements or 10-K, manually collected by scanning all the filings in the Edgar database from the SEC; Panel C reports the summary statistics for the successor CEOs at the CEO turnover year identified as the year of Became CEO in ExecuComp; Panel D reports the summary statistics for the firm level attributes at the CEO turnover years provided in Compustat; and Panel E reports the board data available in RiskMetrics or BoardEx at the CEO turnover years. All variables are defined in Table A.1 of the Appendix.

Variables	**N**	**Mean**	**SD**	**p25**	**Median**	**p75**
Panel A: Incumbent CEO Information						
CEO Age	3164	58.67	7.94	53	59	64
CEO Female	3267	0.02	0.13	0	0	0
CEO Tenure	3101	10.26	6.89	5	9	14
Founder	1524	0.06	0.24	0	0	0
# of Outside Positions	1710	0.98	1.32	0	1	2
CEO Network Size	1922	26.99	26.25	10	16	35
Outsider CEO	1924	0.12	0.32	0	0	0
Panel B: Successor CEO Information						
CEO Age	4669	52.23	7.24	47	52	57
CEO Female	4728	0.03	0.18	0	0	0
# of Outside Positions	2294	0.96	1.31	0	0	2
CEO Network Size	2543	26.86	25.71	10	17	34
Outsider CEO	2544	0.09	0.29	0	0	0
Panel C: CEO Succession Plan Information						
Succession Plan Mentioned in DEF 14A	3232	0.29	0.45	0	0	1
Panel D: Firm Fundamental Information						
Total Assets ($ mil)	4404	15252.95	101464.6	433.04	1567.52	5448.13
Market Capitalization ($ mil)	4404	6552.67	22678.09	380.92	1187.1	4097.96
Tobin's Q	4404	1.93	3.29	1.11	1.41	2.01
ROA	4305	0.1	0.17	0.06	0.11	0.17
Sale	4404	5604.42	17827.99	420.1	1262.48	3980.8
Cash Flow	4402	0.08	0.14	0.03	0.08	0.13
Earnings Volatility	4307	0.1	0.17	0.06	0.11	0.17
Research and Development	4400	112.57	600.56	0	0	28.01
R&D Missing	4399	0.44	0.5	0	0	1
Capital Expenditure	4393	0.09	0.26	0.02	0.04	0.08
Long-Term Leverage	4115	0.2	0.22	0.03	0.17	0.31
Leverage	4120	0.24	0.24	0.06	0.22	0.35

Table 4.1 Continued

Variables	N	Mean	SD	p25	Median	p75
Panel E: Board Information						
Average Age of the Board (years)	2634	59.58	4.32	57.14	59.84	62.43
Board Female	2660	0.1	0.1	0	0.1	0.15
Average Board Tenure	2634	7.21	3.94	4.49	6.85	9.48
CEO-Chairman Duality	2660	0.51	0.5	0	1	1
Board Size	2665	9.61	2.77	8	9	11
Independence Ratio	2660	0.73	0.16	0.67	0.78	0.86
Average Number of Outside Positions	1225	3.14	2.5	0	4.1	6

Table 4.2: Summary Statistics of S&P 1500 Firms

This sample consists of all firm-year observations from 1996 to 2014 of the Standard and Poor's 1500 firms in the ExecuComp database. Panel A reports the summary statistics for the incumbent CEOs in ExecuComp; Panel B reports the summary statistics for the dummy variable of whether the firm mentioned a CEO succession plan in its proxy statements and 8-K or 10-K filings, which were manually collected by scanning all the filings in the Edgar database from the SEC; Panel C reports the summary statistics for the other firm level attributes provided in Compustat; and Panel D reports the board data available in RiskMetrics or BoardEx. All variables are defined in Table A.1 of the Appendix.

Variables	**N**	**Mean**	**SD**	**p25**	**Median**	**p75**
Panel A: Incumbent CEO Information						
CEO Age	45763	55.21	7.7	50	55	60
CEO Female	46310	0.02	0.15	0	0	0
CEO Tenure	45064	6.83	7.18	2	5	9
Founder	17145	0.07	0.25	0	0	0
# of Outside Positions	23283	0.87	1.21	0	0	1
CEO Network Size	25985	25.69	25.87	9	16	32
Outsider CEO	25996	0.15	0.35	0	0	0
Panel B: CEO Succession Plan Information						
Succession Plan Mentioned in DEF 14A	33465	0.25	0.43	0	0	1
Panel C: Firm Fundamental Information						
Total Assets ($ mil)	43536	12886.58	87726.45	452.08	1439.79	5165.57
Market Capitalization ($ mil)	43536	6583.83	22268.52	465.43	1284.26	4107.66
Tobin's Q	43536	2	2.25	1.15	1.49	2.18
ROA	42225	0.12	0.53	0.08	0.13	0.18
Sale	43536	5063.64	16347.37	396.76	1116.55	3525.62
Cash Flow	43460	0.08	0.41	0.04	0.09	0.14
Earnings Volatility	42312	0.12	0.53	0.08	0.13	0.18
Research and Development	43356	97.92	528.71	0	0	25.62
R&D Missing	43267	0.45	0.5	0	0	1
Capital Expenditure	43390	0.1	1.38	0.02	0.04	0.08
Long-Term Leverage	40244	0.19	0.19	0.02	0.16	0.3
Leverage	40513	0.23	0.74	0.05	0.2	0.34
Panel D: Board Information						
Average Age of the Board (years)	26865	60.17	4.39	57.6	60.42	63
Board Female	26976	0.1	0.1	0	0.1	0.17
Average Board Tenure	26865	8.43	4.15	5.55	7.94	10.73
CEO-Chairman Duality	26976	0.65	0.48	0	1	1
Board Size	27245	9.41	2.65	8	9	11
Independence Ratio	26976	0.75	0.16	0.67	0.78	0.88
Average Number of Outside Positions	12433	3.7	2.24	0	2.25	6.33

Table 4.3: Summary Statistics of the CEO Illness Sample

This sample consists of all 316 CEO health events in US listed firms from 1996 to 2014 identified in 8-K and 10-K filings and media releases. The sample consists of health shocks to CEOs, including diseases, illnesses, and accidents but not including sudden CEO deaths. Panel A reports the summary statistics for the CEO in the medical event year provided in proxy statements, 8-K and 10-K filings, and news releases as well as the Capital IQ and BoardEx databases; Panel B reports the summary statistics for firm-level attributes in the CEO health years provided by Compustat; all the variables are defined in Table A.1 of the Appendix.

Variables	**N**	**Mean**	**Median**	**Std Dev.**
Panel A: CEO Characteristics				
CEO Age	2799	58.77	59	9.53
Ln CEO Age	2799	4.01	4.03	0.25
CEO Male	2812	0.98	1	0.12
CEO Tenure	2812	6.61	5	11.42
CEO–Chairman	2812	0.51	0.5	0.46
Percentage of Total Shares Owned by CEO	2812	4.04	0.72	7.89
Panel B: Firm Characteristics				
Total Assets ($ m)	3174	15038.2	2408.87	87885.59
Market Capitalization ($ m)	3020	6885.42	1487.43	32795.21
Market to Book	2869	2.65	1.68	5.5
ROA	3170	0.06	0.05	0.12
Tobin's Q	2869	1.93	1.43	0.91
Book Leverage	2869	0.25	0.24	0.18
Sales ($ m)	2869	5604.5	1279.76	17798
Cash to Assets	2869	0.15	0.08	0.19
Investment	2869	0.06	0..057	0.08

Table 4.4: The Likelihood of Having a Succession Plan: Board Expertise

The table presents the result of board expertise on the preparation of valid CEO succession plans. The sample includes all the non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables of Columns I to VIII are dummy variables, which equal one if the firm has a valid succession plan mentioned in its proxy filings and 0 otherwise. The dependent variable in Column IX is a dummy variable equal to 1 if a director has CEO turnover experience without a CEO succession plan. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	The Likelihood of Having a Succession Plan					
	Succession Plan Experience			**CEO Turnover Experience**		
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**
Succession Planning	0.8923***					
Expertise Ratio	(56.104)					
Experience of Succession		0.5043***				
Planning		(38.529)				
CEO Turnover Experience			0.4031***			0.4818***
With a Succession Plan			(17.231)			(35.649)
CEO Turnover Experience				0.0437***		0.1459***
of Directors				(4.168)		(6.317)
CEO Turnover Experience					-0.2289***	-0.1446***
Without a Succession Plan					(-11.272)	(-8.415)
Incumbent CEO Founder	0.0011	-0.0166	-0.0196	0.0055	-0.0464*	-0.0572**
	(0.061)	(-0.760)	(-0.894)	(0.234)	(-1.916)	(-2.477)
Board Size	0.0065**	0.0125***	0.0080**	0.0088**	0.0078**	0.0120***
	(2.196)	(3.847)	(2.452)	(2.533)	(2.231)	(3.821)
Independent Ratio	0.0379	0.0641	0.1109**	0.0828*	0.0839*	0.0822**
	(0.983)	(1.514)	(2.500)	(1.749)	(1.798)	(2.005)
Board Female Ratio	-0.0729	-0.1049	-0.0908	-0.0728	-0.0892	-0.1209
	(-0.954)	(-1.268)	(-1.044)	(-0.802)	(-0.988)	(-1.493)
Average Tenure	-0.0075***	-0.0069**	0.0008	-0.0003	0.0015	-0.0053**
of All Directors	(-2.973)	(-2.555)	(0.303)	(-0.106)	(0.490)	(-2.021)
Average Outside Positions	-0.0521***	-0.0295**	-0.0085	-0.0003	0.0265*	-0.0197
Held by All Directors	(-4.076)	(-2.041)	(-0.583)	(-0.020)	(1.714)	(-1.380)
Average Age	-0.0047*	-0.0041	-0.0034	-0.0028	-0.0003	-0.0037
of All Directors	(-1.890)	(-1.531)	(-1.230)	(-0.921)	(-0.111)	(-1.431)
CEO–Chairman	-0.013	-0.0063	0.0156	-0.0032	-0.0268**	-0.0075
	(-1.492)	(-0.663)	(1.437)	(-0.286)	(-2.393)	(-0.789)
ROA	0.0265	0.0115	0.0197	0.0222	-0.0047	0.0099
	(1.305)	(0.499)	(0.835)	(0.829)	(-0.143)	(0.741)

Table 4.4 Continued

Total Asset	-0.0028	0.0072	0.0185	0.014	0.0125	-0.0017
	(-0.240)	(0.524)	(1.400)	(0.988)	(0.896)	(-0.070)
Constant	-0.1699	-0.4150**	-0.2975	-0.1649	-0.1502	-0.4536***
	(-1.054)	(-2.341)	(-1.617)	(-0.827)	(-0.758)	(-2.634)
Fixed Effects	Firm+Year	Firm+Year	Firm+Year	Firm+Year	Firm+Year	Firm+Year
R-squared	0.708	0.679	0.559	0.533	0.538	0.724
N	14273	14273	14273	14273	14273	14273

Table 4.5: Succession Planning and the Likelihood of CEO Turnovers

The table presents the result of succession planning on the likelihood of CEO turnovers. Columns I and II use the sample of all S&P 1500 firms; Columns III and IV use the sample of all listed non-financial firms with available information in BoardEx/RiskMetrics/ExecuComp and Compustat. The dependent variables are dummies, which equal one if the firm has a CEO turnover event in year t and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Likelihood of CEO Turnover			
	S&P 1500		**BoardEx Sample**	
	(I)	**(II)**	**(III)**	**(IV)**
Succession Plan	0.0318***	0.0298***	0.0161***	0.0113*
Mentioned in DEF 14A	(5.489)	(3.323)	(3.366)	(1.7890
Incumbent CEO	-0.0741***	-0.0769	0.0088	-0.0149
Founder Title	(-7.122)	(-1.467)	(0.767)	(-0.715)
Incumbent CEO	-0.0964***	-0.1565***	-0.0697***	-0.0790***
Chairman Title	(-14.686)	(-11.240)	(-12.532)	(-8.683)
Incumbent CEO	-0.0000**	-0.0000*	-0.0035	-0.0040
Network Size	(-2.173)	(-1.671)	(-0.477)	(-0.323)
Independent Ratio	-0.1806***	-0.4080***	-0.1622***	-0.3283***
	(-7.878)	(-8.551)	(-8.454)	(-11.192)
Board Size	0.0061***	0.0062**	0.0059***	0.0069***
	(4.219)	(1.970)	(5.349)	(3.320)
Board Female Ratio	0.0032	-0.2154***	-0.0015	-0.2057***
	(0.106)	(-3.123)	(-0.062)	(-4.865)
Average Director	0.001	-0.0003	0.0005	-0.0015
Age	(1.284)	(-0.158)	(0.863)	(-1.172)
Average Director	-0.0066***	-0.0064***	-0.0066***	-0.0058***
Tenure	(-9.268)	(-3.005)	(-11.102)	(-4.247)
Average Director	0.0001	-0.0005	0.0001	-0.0007
Outside Positions	(0.363)	(-0.540)	(0.083)	(-1.005)
Total Asset	0.0068***	0.0065	0.0028	-0.0067
	(2.817)	(0.604)	(1.587)	(-1.130)
ROA	-0.1016***	-0.1423***	-0.1101***	-0.1054***
	(-3.277)	(-2.683)	(-4.255)	(-3.436)
Constant	0.2270***	0.4559***	0.2287***	0.4682***
	(3.391)	(3.169)	(3.940)	(5.317)
Fixed Effect	Industry	Firm	Industry	Firm
R-squared	0.041	0.155	0.03	0.102
N	15270	15445	16647	23003

Table 4.6: The Timing of the Adoption of New Succession Plans: CEO Turnover Events

The table presents the result of CEO turnover events and CEO illness announcements on the timing of the adoption of a new CEO succession plan. The sample includes all non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables of Columns I, II, and III are dummies, which equal one if the firm adopts a valid succession plan in year t and 0 otherwise. The dependent variable of Column IV is a dummy, which equals one if the firm has a CEO turnover event in year t and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	TThe Likelihood of Adopting a New Succession Plan			
	New Succession Plan			**CEO Turnover**
	(I)	**(II)**	**(III)**	**(IV)**
CEO Turnover	0.0269***			
in Year T	(2.681)			
CEO Turnover		0.0203*		
in Year T-1		(1.750)		
CEO Turnover			0.0008	
in Year T-2			(0.068)	
Adopting a New Succession Plan				-0.0194*
in Year T-1				(-1.721)
Board Size	0.002	0.0021	0.0022	0.0101***
	(0.656)	(0.658)	(0.627)	(3.442)
Independent Ratio	0.007	-0.0031	-0.0202	-0.1029***
	(0.189)	(-0.076)	(-0.458)	(-2.735)
Board Female Ratio	0.0287	0.0422	0.0351	-0.1289*
	(0.380)	(0.518)	(0.400)	(-1.728)
Average Tenure	-0.0021	-0.0018	-0.0026	0.0044**
of All Directors	(-0.827)	(-0.649)	(-0.891)	(2.036)
Average Outside Positions Held	-0.0189	-0.018	-0.0204	-0.0039
by All Directors	(-1.564)	(-1.383)	(-1.450)	(-0.346)
Average Age	-0.0031	-0.0031	-0.0023	0.0002
of All Directors	(-1.452)	(-1.319)	(-0.902)	(0.107)
CEO–Chairman	0.0033	0.0039	-0.0019	-0.0475***
	(0.348)	(0.384)	(-0.174)	(-4.341)
ROA	0.0162	0.0139	0.0129	-0.0134
	(1.453)	(1.126)	(0.932)	(-1.287)
Total Assets	-0.0012	-0.0181	-0.014	-0.3139***
	(-0.073)	(-0.497)	(-0.339)	(-6.571)
Constant	0.2749*	0.3034*	0.3036*	0.2809*
	(1.875)	(1.886)	(1.722)	(1.946)
Fixed Effects	Firm+Year	Firm+Year	Firm+Year	Firm+Year
R-squared	0.331	0.340	0.350	0.182
N	12268	11179	9958	16270

Table 4.7: The Timing of the Adoption of a New Succession Plan: Director Experience

The table presents the result of the pressures from a peer firm and its board members on the timing of the adoption of a new CEO succession plan. The sample includes all non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables are dummies, which equal one if the firm adopts a valid succession plan in year t and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1

	Director Effects			
	(I)	**(II)**	**(III)**	**(IV)**
Succession Planning Experience	0.3800***			
in Year T-1	(3.479)			
Succession Planning Experience		0.1007		
in Year T-2		(0.908)		
CEO Turnover Experience			0.0704***	
in Year T-1			(2.665)	
CEO Turnover Experience				0.0500
in Year T-2				(1.644)
Board Size	-0.0023	-0.0036	-0.0025	-0.0024
	(-0.721)	(-1.045)	(-0.806)	(-0.751)
Independent Ratio	0.2252***	0.2304***	0.2304***	0.2274***
	(5.884)	(5.459)	(6.405)	(5.917)
Board Female Ratio	0.3187***	0.3246***	0.3056***	0.3268***
	(4.367)	(4.101)	(4.447)	(4.458)
Average Tenure	-0.0058**	-0.0079***	-0.0055**	-0.0059**
of All Directors	(-2.235)	(-2.803)	(-2.253)	(-2.261)
Average Outside Positions Held	-0.0331**	-0.0381***	-0.0349***	-0.0333**
by All Directors	(-2.517)	(-2.675)	(-2.843)	(-2.531)
Average Age	0.0093***	0.0108***	0.0089***	0.0095***
of All Directors	(4.188)	(4.446)	(4.350)	(4.275)
CEO–Chairman	-0.0194*	-0.0217*	-0.0151	-0.0167*
	(-1.910)	(-1.956)	(-1.567)	(-1.651)
ROA	-0.0337	-0.0333	-0.0039	-0.0335
	(-0.929)	(-0.804)	(-0.194)	(-0.922)
Total Assets	0.1174***	0.1270***	0.1142***	0.1194***
	(10.419)	(9.960)	(11.005)	(10.539)
Constant	-1.4206***	-1.5590***	-1.3742***	-1.4481***
	(-11.645)	(-11.445)	(-12.116)	(-11.834)
Fixed Effects	Firm+Year	Firm+Year	Firm+Year	Firm+Year
R-squared	0.297	0.292	0.273	0.295
N	10974	9732	12268	10974

Table 4.8: The Timing of the Adoption of a New Succession Plan: CEO Illness Events

The table presents the result of CEO turnover events and CEO illness announcements on the timing of the adoption of a new CEO succession plan. The sample includes all the non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables of Columns I, II, and III are dummies, which equal one if the firm adopts a valid succession plan in year t and 0 otherwise. The dependent variable of Column VII is a dummy, which equals one if the firm has a CEO turnover event in year t and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	The Likelihood of Adopting a New Succession Plan		
	(I)	**(II)**	**(III)**
CEO Illness Announcement	0.1134		
in Year T	(1.610)		
CEO Illness Announcement		0.0622	
in Year T-1		(1.236)	
CEO Illness Announcement			0.0712
in Year T-2			(0.807)
Board Size	0.0022	0.0020	0.0021
	(0.706)	(0.780)	(0.616)
Independent Ratio	0.0064	-0.0026	-0.0197
	(0.1720	(-0.081)	(-0.446)
Board Female Ratio	0.0235	0.0354	0.0312
	(0.311)	(0.534)	(0.355)
Average Tenure	-0.0018	-0.0019	-0.0025
of All Directors	(-0.711)	(-0.939)	(-0.864)
Average Outside Positions Held	-0.0191	-0.0182*	-0.0205
by All Directors	(-1.584)	(-1.743)	(-1.455)
Average Age	-0.0032	-0.0031	-0.0024
of All Directors	(-1.498)	(-1.616)	(-0.921)
CEO–Chairman	0.0027	0.0004	-0.0018
	(0.288)	(0.048)	(0.160)
ROA	0.0162	0.0141	0.0133
	(1.447)	(1.419)	(0.960)
Total Assets	-0.0038	-0.0185	-0.0145
	(-0.222)	(-0.566)	(-0.352)
Constant	0.2800*	0.3072**	0.3014*
	(1.913)	(2.367)	(1.711)
Fixed Effects	Firm+Year	Firm+Year	Firm+Year
R-squared	0.331	0.34	0.35
N	12268	11179	9958

Table 4.9: The Likelihood of Having a Succession Plan: Board Legal Expertise

The table presents the result of board legal expertise on the likelihood of a firm having a valid succession plan. The sample includes all the non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables are dummies, which equal one if the firm has a valid succession plan mentioned in its proxy filings and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Legal Expertise	
	(I)	**(II)**
Board Legal Expertise	0.0426	0.0408
	(0.618)	(0.435)
CEO–Founder		0.0289*
		(1.734)
Board Size		0.0035
		(1.219)
Independent Ratio		0.0228
		(0.608)
Board Female Ratio		0.0146
		(0.184)
Average Tenure		-0.0015
of All Directors		(-0.591)
Average Outside Positions Held		-0.0137
by All Directors		(-1.085)
Average Age		-0.0043*
of All Directors		(-1.908)
CEO–Chairman		-0.0057
		(-0.561)
Total Assets		0.0002
		(0.015)
ROA		0.0045
		(0.215)
Constant	0.1822***	0.3716**
	(22.363)	(2.492)
Fixed Effects	Firm + Year	Firm + Year
R-squared	0.308	0.263
N	16172	8792

Table 4.10: The Likelihood of Having a Succession Plan: CEO Power

The table presents the result of CEO power on the likelihood of a firm having a valid succession plan. The sample includes all the non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables are dummies, which equal one if the firm has a valid succession plan mentioned in its proxy filings and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	CEO Power			
	(I)	**(II)**	**(III)**	**(IV)**
CEO–Chairman	-0.0467***			
	(-3.532)			
CEO–Founder		-0.0662**		
		(-2.534)		
# of Titles of CEO			-0.0178**	
			(-2.072)	
CEO Voting Power				-0.3178**
				(-2.458)
Board Size	0.0056*	0.0054	0.0079**	0.0039
	(1.777)	(1.398)	(2.030)	(0.624)
Independent Ratio	0.1033**	0.1093*	0.026	0.1316
	(2.093)	(1.794)	(0.426)	(1.137)
Board Female Ratio	-0.0938	-0.1086	-0.1562*	-0.3811***
	(-1.238)	(-1.189)	(-1.916)	(-2.619)
Average Tenure	-0.0002	-0.002	-0.0003	-0.0009
of All Directors	(-0.064)	(-0.603)	(-0.112)	(-0.159)
Average Outside Positions Held	-0.0026*	-0.003	-0.0001	-0.0044
by All Directors	(-1.751)	(-1.584)	(-0.007)	(-1.431)
Average Age	0.0023	0.0021	0.002	-0.0021
of All Directors	(1.096)	(0.773)	(0.774)	(-0.429)
CEO Social Connections	0.0001***	0.0001	0.0001	0.0001**
	(9.360)	(1.324)	(1.607)	(2.555)
Total Assets	0.0274***	0.0255*	0.0269*	0.0356
	(2.774)	(1.870)	(1.700)	(1.126)
ROA	0.0034**	0.0181	-0.0263	-0.0776
	(2.159)	(1.007)	(-0.394)	(-0.475)
Constant	-0.5050***	-0.3798**	-0.3459*	-0.0802
	(-3.542)	(-2.094)	(-1.861)	(-0.217)
Fixed Effects	Firm + Year	Firm + Year	Firm + Year	Firm + Year
R-squared	0.558	0.595	0.567	0.599
N	18431	14533	15445	4746

Table 4.11: The Timing of Adopting a New Succession Plan: Peer Firm Pressure

The table presents the result of the pressures from a peer firm and its board members on the timing of adopting a new CEO succession plan. The sample includes all the non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables are dummies, which equal one if the firm adopts a valid succession plan in year t and 0 otherwise. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	Peer Firm Effects	
	(I)	**(II)**
Peer Firm Adopts a Succession Plan	0.0343***	
in Year T-1	(4.077)	
Peer Firm Adopts a Succession Plan		0.0109
in Year T-2		(1.175)
Board Size	-0.0030	-0.0044
	(-0.943)	(-1.286)
Independent Ratio	0.2258***	0.2330***
	(5.826)	(5.455)
Board Female Ratio	0.3064***	0.3187***
	(3.722)	(3.547)
Average Tenure	-0.0063**	-0.0085***
of All Directors	(-2.389)	(-2.988)
Average Outside Positions Held	-0.0338**	-0.0420***
by All Directors	(-2.559)	(-2.942)
Average Age	0.0092***	0.0109***
of All Directors	(4.130)	(4.482)
CEO–Chairman	-0.0189*	-0.0217*
	(-1.849)	(-1.941)
ROA	-0.028	-0.0312
	(-0.770)	(-0.752)
Total Assets	0.1182***	0.1288***
	(10.391)	(10.027)
Constant	-1.4323***	-1.5723***
	(-11.633)	(-11.450)
Fixed Effects	Firm + Year	Firm + Year
R-squared	0.283	0.292
N	11179	9958

Table 4.12: The Likelihood of Having a Succession Plan: Board Expertise - Alternate Specification

The table presents the result of board expertise on the preparation of valid CEO succession plans. The sample includes all the non-financial firms from 1996 to 2014 with available information in ExecuComp/Capital IQ for incumbent CEO-related variables, BoardEx and RiskMetrics for board and corporate governance-related attributes, Compustat for firm fundamentals, and CRSP for stock returns. The dependent variables of Columns I to VIII are dummy variables, which equal one if the firm has a valid succession plan mentioned in its proxy filings and 0 otherwise. The dependent variable in Column IX is a dummy variable equal to 1 if a director has CEO turnover experience without a CEO succession plan. All the regressions include a constant. All the standard errors are clustered at the firm level. Robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All the other variables are defined in Appendix Table A.1.

	The Likelihood of Having a Succession Plan					
	Succession Plan Experience			**CEO Turnover Experience**		
	(I)	**(II)**	**(III)**	**(IV)**	**(V)**	**(VI)**
Succession Planning	0.9423***					
Expertise Ratio	(26.104)					
Experience of Succession		0.4783***				
Planning		(18.529)				
CEO Turnover Experience			0.4242***			0.4318***
With a Succession Plan			(11.231)			(16.649)
CEO Turnover Experience				0.0326***		0.1159***
of Directors				(4.171)		(7.317)
CEO Turnover Experience					-0.2470***	-0.1146***
Without a Succession Plan					(-8.234)	(-6.415)
Incumbent CEO Founder	0.0011	-0.0164	-0.0196	0.0031	-0.0294*	-0.0513**
	(0.061)	(-0.770)	(-0.898)	(0.134)	(-1.846)	(-2.517)
Board Size	0.0058**	0.0126***	0.0081**	0.0088**	0.0078**	0.0120***
	(2.166)	(3.877)	(2.354)	(2.533)	(2.231)	(3.821)
Independent Ratio	0.0379	0.0632	0.1202**	0.0828*	0.0839*	0.0822**
	(0.973)	(1.543)	(2.501)	(1.749)	(1.798)	(2.005)
Board Female Ratio	-0.0721	-0.1059	-0.0907	-0.0894	-0.0892	-0.1209
	(-0.923)	(-1.252)	(-1.044)	(-0.842)	(-0.912)	(-1.454)
Average Tenure	-0.0075***	-0.0069**	0.0008	-0.0003	0.0015	-0.0053**
of All Directors	(-2.973)	(-2.555)	(0.303)	(-0.106)	(0.490)	(-2.021)
Average Outside Positions	-0.0521***	-0.0295**	-0.0085	-0.0003	0.0265*	-0.0197
Held by All Directors	(-4.076)	(-2.041)	(-0.583)	(-0.020)	(1.714)	(-1.380)
Average Age	-0.0047*	-0.0041	-0.0034	-0.0028	-0.0003	-0.0037
of All Directors	(-1.890)	(-1.531)	(-1.230)	(-0.921)	(-0.111)	(-1.431)
CEO–Chairman	-0.0131	-0.0051	0.0156	-0.0032	-0.0268**	-0.0075
	(-1.492)	(-0.624)	(1.444)	(-0.286)	(-2.393)	(-0.789)
ROA	0.0228	0.0145	0.0177	0.0222	-0.0047	0.0099
	(1.345)	(0.502)	(0.784)	(0.829)	(-0.143)	(0.741)

Table 4.12 Continued

Total Asset	-0.0048	0.0042	0.0215	0.014	0.0125	-0.0017
	(-0.231)	(0.541)	(1.401)	(0.988)	(0.896)	(-0.070)
Constant	-0.1699	-0.4150**	-0.2975	-0.1649	-0.1502	-0.4536***
	(-1.047)	(-2.333)	(-1.716)	(-0.827)	(-0.758)	(-2.634)
Fixed Effects	Year	Year	Year	Year	Year	Year
R-squared	0.723	0.7163	0.617	0.689	0.648	0.710
N	14273	14273	14273	14273	14273	14273

Chapter 5

Conclusion

The first essay of this dissertations, contributes to the literature on managerial style and the impact of CEOs. Following the seminal work of Bertrand and Schoar (2003) a large literature documents managerial fixed effects, commonly referred to as managerial style. The implication of this prior work is that managerial style can help explain variations in firm policies that traditional firm, industry and market fundamentals cannot. I demonstrate, using exogenous variations in the health of the CEO, that managerial style is not fixed and that experiences during the CEOs tenure can have a statistical and economically significant effect on corporate policies and firm performance.

Using a hand collected data set of CEOs that experience accidents, disease and illness events, I document that a reduction in human capital negatively impacts firm performance at time horizons of up to two years. In analysis of CEOs that survive the health shock and continue to remain as CEO, I show a persistent change in with-in manager behavior. Using a novel natural experiment, I find evidence that CEO behavior is not fixed and that experiences during the tenure can have a meaningful impact on firm policies. The managerial implications of the first essay are that CEO health matters are economically important and that managerial style can change over the tenure of the CEO.

The second and third essay investigate CEO succession plans. To date succession planning has received limited attention in the finance literature, in part due to the empirical challenges of identifying and isolating the effects of succession plans. Using sudden CEO deaths as a natural experiment and ex-ante firm succession plan disclosures, I find that firms that engage in CEO succession planning have a positive effect on firm value. The second essay, documents that succession plans are a corporate governance mechanism to improve the efficiency of the matching process between the skills of the available

talent in the CEO labor market and the skills demanded by the firm. These findings provide empirical evidence of the importance of succession planning as part of the board monitoring function.

The third essay examines the heterogeneity in firms having and adopting succession plans. Using exogenous variation in director experience, I provide evidence that succession planning is a director skill. I establish a causal link between director experience and the likelihood of a firm adopting a succession plan. In further analysis, I find a negative association with CEO power and a positive association with peer firms and the adoption of succession plans. This essay contributes to the literature on the role of director experience and the variation on the likelihood of a firm engaging in succession planning.

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Appendix A.1: Definition of Variables

Variable	Description	Source
Board Characteristics		
Board Size	The number of directors on the board.	RiskMetrics
Board Female	Percent of Female Directors on the board.	RiskMetrics
Independent Ratio	Percent of independent directors on the board.	RiskMetrics
CEO-Chairman Duality	Indicator that equals one if the CEO is also the chairperson of the board and equals zero otherwise.	RiskMetrics
Busy Board	Indicator variable that equals one if a majority of the independent outside directors each hold 3 or more additional directorships and equals zero otherwise.	RiskMetrics
CEO Characteristics		
CEO Age	The age of CEO.	ExecuComp/RiskMetrics/ BoardEx/Capital IQ/Edgar
CEO Female	Indicator that equals one if the CEO is female, and equals zero otherwise.	ExecuComp/RiskMetrics/ BoardEx/Capital IQ/Edgar
CEO Tenure	One plus the total number of years a CEO has been the CEO in the firm and calculated fiscal year end date minus date became CEO	ExecuComp/RiskMetrics/ BoardEx/Capital IQ/Edgar
Founding CEO	Indicator that equals one if the CEO is the founder, co-founder or founding partner of the firm, and equals zero otherwise.	BoardEx
CEO Voting Power	Percent ownership of the CEO in the firm.	RiskMetrics
CEO Network Size	The number of social connections the CEO has outside the firm	BoardEx
# of Outside Positions	Number of additional public firm positions identified	ExecuComp/RiskMetrics/ BoardEx/Capital IQ/Edgar
Total CEO pay	Total CEO compensation (including value of option grants), in million, divided by total assets.	ExecuComp
CEO turnover	Indicator that equals one if a change in the CEO has occurred compared to the previous year, and equals zero otherwise.	ExecuComp
Outsider CEO	Indicator that equals one if the CEO is promoted outside the firm, and equals zero otherwise.	ExecuComp/RiskMetrics/ BoardEx/Capital IQ/Edgar

Director Succession Experience Proxies		
CEO Turnover Experience of Directors	The average number of CEO turnover experiences of the board.	BoardEx
CEO Turnover Experience with Succession Plans	The average number of CEO turnover events that directors have experienced in which the firm had a succession plan.	BoardEx
CEO Turnover Experience without Succession Plans	The average number of CEO turnover events that directors have experienced in which the firm did not have a succession plan.	BoardEx
CEO Turnover Expertise Ratio	A dummy variable that equal one if members of the board have turnover experience at a prior firm.	BoardEx
Directors with CEO Turnover Experience	A dummy variable that equals one if the director has experienced a CEO turnover in her/his director career and zero otherwise.	BoardEx
Directors with Succession Planning Experience	A dummy variable that equals one if the director is a member of the board and the firm adopts a succession plan and zero otherwise.	BoardEx
Experience of Succession Planning	The average number of succession plan adoptions of the board.	BoardEx
Succession Planning Expertise Ratio	The ratio of directors who have experienced a succession plan adoption at another firm.	BoardEx
Firm Characteristics		
Tobin's Q	The market value of common equity plus the book value of total liabilities divided by the book value of total assets. [(at + (prcc_f*csho) - ceq - txdb)/at]	Compustat
ROA	Ratio of net income to total assets. ROA (%) is ROA expressed as a p ercent of total assets. [oibdp/at]	Compustat
Earnings Volatility	Standard deviation of annual EBIT scaled by beginning of year total assets over the past five years	
R&D	The ratio of research and development (R&D) expenditures to total asset. Missing observations are set to zero. [xrd / at]	
R&D Missing	Indicator that equals one if the ratio of research and development (R&D) expenditures is missing, and equals zero otherwise.	

Firm Characteristics		
Leverage	Year-ending Long-term Debt plus Debt in Current Liabilities divided by year-end Total Assets. [(dltt + dlc)/at]	Compustat
Market Leverage	Total debt scaled by the sum of total debt and market equity as per Coles and Li (20212). [td/[td+mkt eq]	Compustat
Capital Expenditure	The ratio of capital expenditure to total assets. [capex/at]	Compustat
E-index	Calculated using staggered board, poison pill, limits to amend bylaws, limits to amend charter, supermajority and golden parachutes based on Bebchuk, Cohen and Ferrell (2009).	RiskMetrics
Family Firm	Indicator that equals one if block shareholding over 5% and equals zero otherwise	Thomson Reuters.
Institutional Ownership	Total percentage institutional ownership. Institutional block equals one if the firm has a 5% institutional block holder.	Thomson Reuters.
High-tech indicator	Indicator that equals one if the high-tech firms are identified by SIC codes 2833-2836, 3570-3577, 3600-3674, 7371-7379 or 8731-8734, following Baginski, Hassell, and Kimbrough (2004), and equals zero otherwise.	Compustat
Firm age	Natural logarithm of one plus the number of years from the firm's IPO or log of one plus the number of years since its first appearance in CRSP.	CRSP/Capital IQ /SDC
Health Shock Variables		
Sudden Death	An indicator that equals one if the death of the director or officer is unexpected and zero otherwise. Sudden death is defined as "an unexpected death that occurs instantaneously or within 24 hours of an abrupt change in the person's previous clinical state" (Nguyen and Nielsen 2010). To include deaths that are sudden and not expected by the stock market, Nguyen and Nielsen (2010) exclude deaths attributed to cancer, complications from illnesses, past strokes, and surgery.	BoardEx/CapitalIQ/ Edgar/Hand Collection
Illness Event	An indicator that equals one in the year in which a CEO experiences a health shock, including diseases, illnesses, and accidents but not including sudden CEO deaths, and zero otherwise.	BoardEx/CapitalIQ/ Edgar/Hand Collection
Acute Illness	An indicator equal to one if the disclosed health shock meets the classification of an acute health event according to the Centers for Disease Control and Prevention, which follow the International Classification of Diseases (ICD-10) classification system, and zero otherwise.	BoardEx/CapitalIQ/ Edgar/Hand Collection

Health Shock Variables		
Chronic Illness	An indicator equal to one if the disclosed health shock meets the classification of a chronic health event according to the Centers for Disease Control and Prevention, which follows the International Classification of Diseases (ICD-10) classification system, and zero otherwise.	BoardEx/CapitalIQ/ Edgar/Hand Collection
Undisclosed Illness	An indicator that equals one if a CEO experiences a health shock but in regulatory filings or media disclosures no references is made to the specific cause of the health shock and zero otherwise.	BoardEx/CapitalIQ/ Edgar/Hand Collection
Nominating Committee (NC) Characteristics		
Founder on NC	Indicator that equals one if the found sits on the nominating committee and equals zero otherwise.	BoardEx
Chairman on NC	Indicator that equals one if the chairman sits on the nominating committee and equals zero otherwise.	BoardEx
Chairman or Lead Independent Director on NC	Indicator that equals one if the chairman or lead independent director sits on the nominating committee and equals zero otherwise.	BoardEx
Stock Return Volatility Variables		
Standard Deviation	The standard deviation of monthly excess returns in a given fiscal year.	CRSP
Idiosyncratic Volatility	The calculated volatility of the residual daily stock returns of the market model following Ang et al. (2006).	CRSP
Succession Plan Proxies		
CEO Appointments within 3 Days following a Death Event	The dummy variable equals to one if the successor is appointed within 3 days after the CEO death event, and equals zero otherwise.	BoardEx/CapitalIQ/ Edgar/Hand Collection
Succession Planning Mentioned in Proxy Statement	The dummy variable equals to one if succession planning is mentioned in its DEF14A before the CEO succession events, and equals zero otherwise.	Edgar/Hand Collection
Revealed succession planning in News Release	The dummy variable equals to one if a news article or firm announcement references a succession plan in appointing the successor, and equals zero otherwise.	Hand Collection

Succession Plan Proxies		
Directors with Succession Planning Experience	The dummy variable equals to one if the director has seat in the nominating committees of the firms mentioning succession planning in their proxy statement, and equals zero otherwise.	BoardEx
Directors with CEO Turnover Experience	The dummy variable equals to one if the director has experienced a CEO turnover in her/his director career, and equals zero otherwise.	BoardEx

Appendix A.2: Voting results

Name	Year	Sponsor	MGMT Rec	ISS Rec	Voted For	Vote Result
Apple Inc.	2011	Central Laborers Pension Fund	Against	For	18.70%	Fail
Bank of America Corporation	2001	Bouhadiba, Omar	Against			Fail
Bank of America Corporation	2008	Laborers' International Union of NA	Against			Fail
Bank of America Corporation	2010	Laborers National Staff Pension Fund	Against	For	26.31%	Fail
Bank of America Corporation	2010	Connecticut Retirement Plans & Trust Funds	Against			Fail
Bank of America Corporation	2010	Laborers' International Union of NA	Against		40.10%	Fail
Berkshire Hathaway Inc.	2012	The AFL-CIO Reserve Fund	Against	For	3.09%	Fail
Citigroup Inc.	2009	Central Laborers' Pension, Welfare & Annuity Fund	Against			Fail
Comcast Corporation	2010	Central Laborers' Pension	Against	For	12.18%	Fail
FedEx Corporation	2010	Massachusetts Laborers' Pension Fund	Against	For	19.10%	Fail
FedEx Corporation	2010	Unknown	Against		23.80%	Fail
Fortune Brands, Inc.	2009	Central Laborers' Pension, Welfare & Annuity Fund	Against			Fail
Google Inc.	2013	Laborers' District Council and Contractors' Pension Fund of Ohio	Against	For	5.88%	Fail
Intel Corporation	2010	United for a Fair Economy/Resp. Wealth	Against			Fail
Kohl's Corporation	2011	Trustee of Trowel Trades S&P 500 Index Fund	Against	For	19.65%	Fail
Kohl's Corporation	2012	Trowel Trades S&P 500 Index Fund of the International Union of Bricklayers and Allied Craftworkers	Against	For	14.90%	Fail
Meritage Homes Corp	2008	Laborers' International Union of NA	Against			Fail
National Instruments Corporation	2009	Laborers' International Union of NA	Against			Fail
Pinnacle Entertainment, Inc.	2009	Laborers District Council & Contractors Pension Fund of OH	Against			Fail
Safeway Inc.	2012	Laborers National Pension Fund	Against	For	23.25%	Fail

Name	Year	Sponsor	MGMT Rec	ISS Rec	Voted For	Vote Result
Sirius XM Holdings, Inc.	2013	The Central Laborers' Pension Fund	Against	For	6.45%	Fail
Sotheby's	2012	Not Disclosed	Against	For	28.83%	Fail
The Black & Decker Corporation	2009	Massachusetts Laborers' Pension Fund	Against			Fail
Toll Brothers, Inc.	2008	Laborers' International Union of NA	Against			Fail
United Natural Foods, Inc.	2011	International Brotherhood of Teamsters T.A.P.P. Fund	Against	For	25.64%	Fail
Verizon Communications	2008	Laborers' International Union of NA	Against			Fail
Verizon Communications Inc.	2010	Laborers Staff & Affiliates Pension Fund	Against	For	20.62%	Fail
Verizon Communications Inc.	2010	Laborers' International Union of NA	Against		32.40%	Fail
Whole Foods Market, Inc.	2009	Laborers' International Union of NA	Against			Fail
Whole Foods Market, Inc.	2010	Central Laborers' Pension	Against	For	20.08%	Fail
Whole Foods Market, Inc.	2010	Laborers' International Union of NA	Against		29.40%	Fail
Zions Bancorporation	2009	Laborers' International Union of NA	Against			Fail

Appendix A.3: Creation of Death Sample

Data

Firms disclose key employee deaths through a variety of mediums and use no standard format. Our initial sample contains over 1.2 million documents (observations), which makes manual examination challenging. To provide scalability to the search process, I use a textual analysis approach. Like a number of existing papers, I use keyword searches (Nguyen and Nielsen 2010; Falato, Kadyrzhanova, and Lel 2014; Nguyen and Nielsen 2014); I extend the keyword search approach, using natural language processing techniques. This results, to the best of my knowledge, in the development of the largest death sample, with 1909 unique deaths (Table A3-3), spanning the longest sample period, 1900 – 2014 (Table A3-1).

Data Sources

I identify death events from three sources: 8-K filings (1993-2014[1]), BoardEx (1999-2013) and the Notable Names Database (1900-2015). 8-K filings are the primary source

[1] 2014 1st Quarter

examined; this data source is selected as it is a comprehensive source for firm disclosures required by the SEC for major events, including director and executive changes. I examine all electronically available 8-Ks via the Edgar database[2], as it is ideally structured for the use of computational searches, such as web scrapping and text matching techniques. A potential concern is the non-disclosure of director and executive deaths prior to 2006, because there was no formal requirement to report director and executive departures. The SEC now requires, via Item 5.02, reporting of the Departure of Directors or Principal Officers, the Election of Directors, and the Appointment of Principal Officers. However, despite this, "Item 5.02(b) of Form 8-K does not require a registrant to report the death of a director or listed officer (April 2, 2008)[3]". Therefore, I supplement our examination with the other data sets to ensure a comprehensive search. BoardEx is used, as it captures changes in board structure, including hiring and departures, as well as the reason for the changes. To further extend the search, I use the Notable Names Database (NNDB)[4], which is a data source on people of influence; it is included as it captures information on the deaths of individuals who are in positions of influence, but do not receive public attention. This source is included to overcome concerns about capturing only directors and executives that receive media coverage, for example, those from large firms and powerful executives and directors.

To supplement and verify the information on the deceased directors and officers, I use a number of sources including, the Marquis Who's Who, Wikipedia, Factiva, Lexis Nexis, Business Week, Bloomberg, Legacy.com, search.ancenstry.com, and company websites.

[2]The Edgar database captures all 8-K forms filed after May 6th, 1996. This represents over 1.2 million 8-K forms filed by public companies.

[3]SEC's interpretation of 8-K reporting requirements. See Section 217.04.

[4]http://www.nndb.com/about/. NNDB includes the deaths of "holders of certain public offices, civic, or business positions. In some cases, people of importance may have escaped public notice yet may hold a position of substantial power. Thus, I may select a member of the board of directors of a specific company for listing."

These sources are primarily used to verify the date and cause of death.

Identification

The initial sample of potential death events is identified by performing keyword searches across all data sources. The only requirement is that a document contains a word related to death[5] (for example, "die", "pass away" and "suicide"). This stage of the sample development is as general as possible to maximize the number of potentially relevant observations. For example, I do not include keywords related to common director and executive positions (for example, CEO or chairman) or type of death (sudden, unexpected, etc.).

Our general keyword approach results in the identification of 173,539 filings containing death-related keywords. Because the search process is as general as possible, it results in a large number of matches; however, it is likely that many of them are not actual director and executive death events. A few examples are included to illustrate the challenge associated with using a keyword search approach in isolation. Exhibit A3-1: Panel A is a disclosure from an 8-K filing that does include the word "death", but is clearly not referring to an actual death of a director or executive. The use of keyword searches in isolation does not consider the context of the words.

To improve the identification of director and executive deaths, I use two techniques, which are necessitated in the absence of uniform disclosure standards. First, I use natural language techniques, which allow us to consider the context of the death keywords without imposing any constraints on the structure or location of the death-related dis-

[5]The dictionary developed contains 27 words commonly associated with death.

closures. Secondly, I keep the filings in which the death-related keywords are in 8-K Item 5.02 and Item 8.01. Item 5.02 reports director and officer departures, and therefore, is a likely location for director or executive deaths to be indicated. Item 8.01 reports Other Events and is also found to be a common place for relevant death disclosures. When this approach is used, the only requirement is that a death-related keyword is contained under Item 5.02 or 8.01. The two search approaches complement each other, increasing the likelihood of identifying director and executive deaths. I next outline the search approaches in greater detail.

The specific natural language process techniques used are tokenization, contained in the Tactful Tokenizer package (Pentheroudakis, Bradlee, and Knoll 2006), and named entity recognition (NER), contained in the Treat package[6]. The use of these advanced natural language process techniques substantially enhances the keyword-only analysis.

I now explain how each of these tools functions and interacts to improve the identification of death events. Tactful Tokenizer is a linguistic tool that splits texts into segments based on naturally occurring boundaries, such as words, sentences or paragraphs. First, using the Tokenizer, I segment matched documents that contain a death-related keyword into sentences. Second, I use NER, which tags words that are the names of things, for example, a person, company or title. Third, I combine these tools to measure the proximity of keywords and names to identify a likely match. I require the death-related keywords to be contained in a segment that also has content related to people, for example, names or titles.

I begin by showing how a keyword approach functions relative to an approach that uses

[6]Treat and Tactful Tokenizer are Ruby Gems. The treat gem can be downloaded from https://github.com/louismullie/treat. The Tactful Tokenizer gem can be downloaded from https://github.com/zencephalon/Tactful_Tokenizer.

natural language process techniques. Exhibit A3-1 (Example A.1 and Example A.2) demonstrates that death-related keywords, in isolation, may refer to many situations observed in a firm, such as "the law passed", or "until their earlier death, resignation or removal", etc. When I combine the natural language process techniques discussed above, I can provide context to the death-related keywords. Panel B (B.1 and B.2) demonstrates that the word "died" refers to individuals that have unfortunately passed. In both cases, they would be identified by the NER requiring individuals' names or employee titles, for example, chief executive officer or board of directors. This approach identified 8,587 potential death events. Next, I manually confirm each death event by reviewing the matched document to confirm whether an actual director or executive death occurred.

The second approach considers the structure of the document and imposes a requirement that a keyword is located in a specific section, 8-K Item 5.02 and Item 8.01. Although this approach is likely to capture many of the death events identified by the natural language approach (Example B.2), I adopt the more conservative and thorough search approach. I use this approach for robustness to ensure the highest likelihood of detecting director and executive deaths. This approach identified 1,927 potential death events. Again, I manually review the identified observations to confirm the death event.

I also identify directors' and executives' deaths from the BoardEx database. Death events are identified using two methods: the director's profile database and the corporate news database. BoardEx is used to identify director candidates for corporations, as it contains all information about the potential candidates for independent directors. If the candidates died for certain reasons, BoardEx will record this in this sub-database. BoardEx also records the corporate news announcement regarding a change of directors,

including the reasons (e.g. death), and this sub-database provides us with a supplementary data source for death events. To the best of my knowledge, this is the first study to use BoardEx for the identification of directors' and executives' deaths. A limitation of BoardEx, and the likely reason it is not commonly used by existing death-related studies, is that it does not provide any information relating to the cause of death. I overcome this by performing my own extensive search using Google, Factiva, Lexis Nexis, Business Week, Bloomberg, Legacy.com, ancenstry.com and company websites to manually check the death and to identify a cause of death.

This final sample identifies 2,222 (Table A3.2) firms and 1,909 unique director and executive deaths (Table A3.3) over the sample period, 1900-2014. The majority of these deaths occurred after 1996, which will form the beginning of the sample period for this study.

Exhibit A.3-1: An Example of Text Matching on Company Filings

The initial sample is examined for keywords related to death, for example, died, passed away and succumbed as well as words related to health conditions associated with death, for example, cancer, heart attack and life threatening. A keyword dictionary of 78 words was developed. All documents in 8-K filings and the entire BoardEx database were examined for observations containing these keywords. Exhibit 1(A) is an example of text matching using only keywords. Exhibit 1(B) is an example of a match identified when the text matching incorporates keyword searches, tokenization of the document and Natural Entity Recognition (NER).

Panel A: Keyword Text Matching

Example A.3 (1)

SEC FILE NUMBER: 030-32311

SECTION APPENDIX

The law was ***passed*** [*keyword*] to overturn the ruling earlier this year by the Michigan Federal District Court that the Taubman family had violated the statute by not obtaining shareholder approval for their voting shares.

Example A.3 (2)

SEC FILE NUMBER: 000-03274

SECTION 1.05 Directors and Officers.

The directors of Acquiror Sub immediately prior to the Effective Time shall be the initial directors of the Surviving Corporation, each to hold office in accordance with the Amended Articles and Amended By-Laws, and the officers of the Company immediately prior to the Effective Time shall be the initial officers of the Surviving Corporation, in each case until their respective successors are duly elected or appointed and qualified, or until their earlier ***death*** [*keyword*], resignation or removal.

Panel B: Keyword Text Matching, Tokenization and Named Entity Recognition

Example A.3 (3)

SEC FILE NUMBER: 001-04434

Item 1 Changes in Control of Registrant.

On November 22, 1995, **Israel Cohen** [*name*], the **Chief Executive Officer** [*name*] and the **Chairman of the Board of Directors** [*name*] of Registrant, ***died*** [*keyword*] of complications associated with Non-Hodgkin's Lymphoma.

Example A.3 (4)

SEC FILE NUMBER: 039-42654

Item 5.02 Departure of **Directors** or **Principal Officers** [*name*]; Election of **Directors** [*name*]; Appointment of **Principal Officers** [*name*].

(b) **John P. Mulroney** [*name*], 68, a dedicated member of the **Board of Directors** [*name*] of Alcoa Inc. since 1987, ***died*** [*keyword*] suddenly on Friday, September 24, 2004.

The company is deeply saddened by his [*name*] untimely ***death*** [*keyword*] and extends its condolences to his family and many friends.

Table A.3 - 1

Previous Studies Using Death Events at the Firm Level

Reference	Sample Period	Sample Size	Data Sources
Borokhovich et al.(2006)	1978-2000	161 CEO deaths	LexisNexis,Wall Street Journal, Edgar Online
			Standard and Poor's Register of Corporations,
			Directors and Executives
Etebari and Horrigan (1987)	1972 – 1982	110 CEO's initially identified	Wall Street Journal Index
		Final sample 48 CEO sudden deaths	
Falato, Kadyrzhanova, and Lel (2014)	1988 – 2007	633 independent directors	Edgar Online, Factiva,Lexis Nexis
		189 CEO deaths	
Fee, Hadlock, and Pierce (2013)	1990-2007	208 CEO health and death events	Factiva
(Fracassi and Tate 2012)	2000-2007	Undisclosed	Undisclosed
Hayes and Schaefer (1999)	1979-1994	29 sudden CEO deaths	Lexis Nexis
Johnson et al. (1985)	1971-1982	210 deaths of senior executives	Wall Street Journal
		53 sudden deaths	
Nguyen and Nielsen (2010)	1994 – 2007	772 deceased directors	Edgar Online, Factiva, Lexis Nexis
		229 sudden director deaths	
		108 independent directors	
Nguyen and Nielsen (2014)	1991-1998	520 deceased top executives	Edgar Online, Factiva, Lexis Nexis
		Final sample 149 sudden deaths of top executives	
Salas (2010)	1972-2008	195 sudden senior executive deaths	Etebari, 1987, Lexis Nexis,
			Wall Street Journal
Worrell et al. (1986)	1967-1981	220 deaths initially identified	Wall Street Journal
		127 key executives meeting sample criteria	
		61 Chairman	
		23 CEO's	
		43 CEO and Chairman	

Table A.3 - 2

Executive and Director Deaths Sample

Source	Change	Sample Size
All 8-K Filings		1,203,060
Exclude the largest 3 observations	-3	1,203,057
Identify the filings containing death related key words	-1,029,518	173,539
Use Ruby to analyze filings containing the death key words and output a log of the analysis results	-164,952	8,587
Manually select the ones with director and executive deaths and scan the documents to extract all related information from the filings and remove duplicates deaths identified by two processing methods	-7,154	1,433
Add in BoardEx Director with Death Date	12,763	14,196
Add in BoardEx news announcement table of Director and Executive deaths	472	14,668
Drop the duplicates death event and drop the death after resignation	-10238	4,430
Match CUSIP and company names from 8-K filings with CRSP and COMPUSTAT		2,550
No data in CRSP database including the observations during the market close	-328	
Final Sample Size		2,222

Table A.3 - 3

Source of Executive and Director Deaths

The table presents the source of director and executive deaths. If a death is detected by multiple sources, then only one source will be counted.

Source	Frequency	Percent (%)	Cum (%)
8-K	725	37.98	37.98
BoardEx	998	52.28	90.26
NNDB and Other Sources	186	9.74	100
Total	1,909	100	