CEO TURNOVER AND THE

AGENCY COST OF DEBT

by

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A DISSERTATION

IN

BUSINESS ADMINISTRATION - FINANCE

Submitted to the Graduate Faculty
of Texas Tech University in
Partial Fulfillment of
the Requirements for
the Degree of

DOCTOR OF PHILOSOPHY

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ACKNOWLEDGEMENTS

I have been aided greatly in this dissertation by the helpful suggestions and guidance provided by my dissertation committee members: Professors Scott E. Hein and Sattar A. Mansi as co-chairmen, and Professors John W. Cooney and Peter H. Westfall.

A debt of gratitude is owed to Professor Sattar A. Mansi for providing data from the Lehman Brothers Fixed Income database and to Robert Parrino for access to his CEO turnover database. The discussions I had with members of the Finance Area, Texas Tech University were extremely valuable. I am grateful to Professors Steve Sears, Paul Goebel, Robert Ritchey, Drew Winters, Mike Stegemoller, Scott Bauguess, Phil English, Jeff Mercer, and William Dukes. I am also grateful to Shirley Jerden, Finance Area, for her support.

For their support, love, and sacrifice, I thank my wife Sue, and our children; Melodee, Natalie, Natasha, Shane, and Zachary. Likewise, I am deeply grateful to my parents. I dedicate this dissertation to my wife.

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ABSTRACT

This dissertation examines the impact of CEO turnover on bondholder's wealth. Using publicly traded corporate bond data for the period from 1973 to 2000, I find that CEO turnover events are generally value decreasing to bondholders. Specifically, I find that (i) CEO turnover events are associated with higher yield spreads, (ii) bondholders are most affected when the CEO is forced out, when the CEO is replaced by an outsider of the firm, and when the replacement is from outside industry, (iii) CEO turnover effects are more pronounced in firms with non-investment than investment grade debt, and (vi) losses to bondholders are a function of governance variables such as board size, institutional holdings, CEO equity ownership, and CEO age and tenure. Further testing examining the likelihood of a change in credit ratings for forced, outside, and outside industry turnover announcements indicates that bond ratings are more likely to be downgraded than upgraded one month after the event. This dissertation also examines the relationship between the cost of publicly traded debt and CEO turnover and provides evidence that higher debt costs are associated with an increased likelihood of forced CEO turnover. The results contribute to the understanding of the effects of corporate governance mechanisms, of which CEO turnover is an extreme form, on bondholders.

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CHAPTER 1

INTRODUCTION

Chief Executive Officers (CEOs) play an important role in determining many corporate polices and are arguably the most visible representative of the firm to investors. Shareholders appoint boards in an effort to protect the value of their investment in the firm and to monitor top executives. Recent scandals involving the top executives of many high profile firms and subsequent dramatic declines in firms' share values underscore the importance of the board of directors' role as monitoring agents for shareholders. Given the difficulty of directly observing the board's internal monitoring function, researchers have instead focused their efforts on observable actions initiated by the boards. Perhaps the most visible result of board monitoring concerns the CEO turnover event (e.g., Huson, Parrino, Starks 2001).

This dissertation extends the literature and examines the relation between CEO turnover and firm performance from an alternative perspective, namely that of bondholders, using event study methods. An advantage to examining corporate debt instead of common stock is that bonds have well-defined payouts and shorter durations, and their valuations are well specified and less subject to the criticism that the results might be driven by misspecification of the equilibrium asset pricing model, when compared to equity. Bonds are also less subject to endogeneity problems as the causality may run in one direction but not the other (changes in CEO turnover may cause yield spreads to change quickly but it is less likely that changes in yield spreads directly result in immediate CEO turnover decisions).

This study begins by asking a simple question: How do CEO turnover events impact the cost of debt financing? Prior research on the impact of CEO turnover on firm performance (both equity returns and accounting measures of performance) suggests that CEO turnover may indirectly have an impact on bond prices and yields. First, since CEO turnover events are often associated with poorly performing firms and declining stock prices (Warner, Watts and Wruck 1988), turnover events may be related to higher yield spreads due to lower profitability, coverage ratios, and overall performance. Kwan (1996) examines the correlation between the returns of individual stocks and yield changes of individual bond issues and finds a negative relation between corporate bond yields and past stock returns. This suggests that if CEO turnover is associated with poor performing firms then turnover events should be reflected in pre-turnover bond prices and yields. As such, bondholders may require additional risk premia around CEO turnover events.

Second, since CEO turnover can act as a governance device to replace poor performers and for long term firm performance to change, turnover events may have an impact on bond prices and yields that may be different from the well documented announcement positive abnormal returns enjoyed by stockholders. While Hotchkiss and Ronen (2002) find the informational efficiency of stock and bond returns to be similar and that stock and bond returns are generally positively and significantly related, certain corporate governance mechanisms which serve to weaken shareholder rights may affect this relation. For example, recent research evidence (see Klock, Mansi, and Maxwell 2004; Ashbaugh, Collins, and LaFond 2004) suggest that corporate governance devices, such as antitakeover amendments, are significantly and economically associated with bond yield spreads and credit ratings. Anderson, Mansi, and Reeb (2003) find that stock ownership of

incumbent CEOs tend to increase over time, possibly reducing risk taking incentives to the benefit of bondholders. This suggests that CEO turnover events, as corporate governance mechanisms, can serve to realign shareholder and management interests. This realignment, while potentially beneficial to shareholders, may not be viewed favorably by bondholders if new CEOs are more likely to pursue riskier investment and financial policies.

Third, recent evidence on the impact of CEO turnover on equity volatility (e.g., Clayton, Hartzell, and Rosenberg 2005) find that turnover is associated with increased future stock volatility as a result of a possible change in firm policy and/or strategy. Increase in equity volatility is associated with an increase in the probability of financial distress and a possible change in credit rating, causing the required return for bondholders to increase (e.g., Merton 1974). Campbell and Taksler (2003) also find that firm specific volatility explain variations in bond yields as well as credit ratings; further evidence that equity volatility is an important element in the pricing of bonds. Changes in equity volatility could also exacerbate agency problems causing a possible wealth redistribution effect between the various stakeholders of the firm.

Using data from the Lehman Brothers Fixed Income database and an extension of the Huson, Parrino, and Starks (2001) CEO turnover sample of over 670 turnover events for the period 1973 through 2000, I find that CEO turnover events are viewed negatively in the bond market (i.e., CEO turnover events are associated with an increase in the cost of debt financing) while stock prices react positively. Consistent with the notion that CEO turnover represents a possible increase in current and future firm volatility, I find the mean abnormal yield spread on corporate bonds in the CEO turnover announcement month to be about 7 basis points (statistically significant at the one percent level) and mean abnormal stock

returns are a positive 0.6%. These results suggest CEO turnover may exhibit a wealth transfer effect from bondholders to stockholders. Segmenting the full sample based on the nature of the turnover event, i.e., whether the incumbent CEO voluntarily resigns or is forcibly removed, I find greater abnormal yield spreads for forced as opposed to voluntary turnover. I report significantly positive mean abnormal yield spreads of about 28 basis points and 3 basis points for forced turnover and voluntary turnover, respectively. Consistent with prior research on the equity side (e.g., Huson et al., 2001; Denis and Denis, 1995) I find large positive abnormal stock returns associated with announcements of forced turnover events.

Further segmentations are provided on the CEO turnover data to examine the cost of debt financing by turnover type. First, I segment the turnover data based on the origin of the successor CEO (selected from inside or outside the firm), the notion being that outside selected CEOs are more likely to pursue significant policy changes than insiders. Inside replacement announcements in the sample experience mean (median) abnormal yield spreads of about 5 basis points while outside replacement firms experience mean abnormal yield spreads of about 11 basis points. Second, I segment the data to evaluate effects of voluntary turnover with inside and outside replacement; finding mean abnormal yield spreads for voluntary with inside replacement of about 3 basis points (statistically significant at the 10 percent level). The less common voluntary and outside replacement events have lower and insignificant mean abnormal yield spreads of about 2 basis points (however the abnormal yield spreads are significant under median testing). Third, I segment the data to investigate the effects of forced turnover with inside and outside replacement on the cost of debt financing and find mean abnormal yield spreads of approximately 28 basis points for

the forced outside replacements. The results suggest that bondholders view the inside and outside industry replacement decisions differently in assessing their required return on the firm's debt. Mean abnormal yield spreads are significant for both inside and outside industry replacement although outside replacement spreads are larger (10 basis points for outside industry replacement announcements versus 6 basis points for inside industry). Overall the results, based on further segmentations, suggest that bondholders are concerned with CEO turnover events due to the increased uncertainty concerning the future strategic policies and the increase in firm risk. The increases in firm risk are greatest for forced turnover with outside replacement events. The results are consistent with Merton's (1974) prediction of a positive relation between increased equity volatility and the likelihood of default. The findings of increased abnormal yield spreads for forced and outside replacement firms support the notion bondholders view the CEO turnover event as increasing firm specific risk and they reevaluate their required return as a result of this new information.

This study further examines the issue of CEO turnover and the cost of debt by splitting the data into firms with investment and non-investment grade debt. The idea is that if there is a significant probability the firm would be in financial distress, then changes in CEO turnover events would be reflected more in bond prices and yields. Firms with higher free cash flow are less likely to default on their debt than firms with lower levels of free cash flow for a given change in risk. The CEO turnover event, as a firm specific risk factor, should be reflected more in bond yields as when the likelihood of financial distress is high. This suggests that the positive relation between bond yield and CEO turnover events would be even stronger for firms that have a higher probability of getting into financial distress. In addition, bonds below investment grade tend to trade more frequently and are more

sensitive to changes in default risk (Hand, Holthausen, and Leftwich 1992). Therefore, I expect the yield spreads of lower rated debt to increase more on the announcement of CEO turnover than higher rated debt. Consistent with the prediction of increased sensitivity to CEO turnover for firms with lower credit ratings, I find non-investment grade firms experience mean abnormal yield spreads of about 40 basis points (significant at the 5 percent level) while investment grade firms report a smaller and insignificant mean abnormal yield spread of about 2 basis points. I also find that bond investors demand larger risk premiums for firms with non-investment grade forced turnover vs non-investment grade voluntary turnover (mean abnormal yield spreads of about 84 basis points for forced turnover vs. 11 basis points for voluntary turnover). The results suggest that investors demand compensation for turnover events and that this compensation is larger for riskier firms (i.e., firms with non-investment grade debt).

A major component of yield spread is the probability of default for the bond. Since firm specific risk factors are related to the probability of bankruptcy (e.g., Opler and Titman 1994; Asquith, Gertner, and Sharfstein 1994), CEO turnover events, as firm-specific events, may be related to the likelihood of default. The evidence indicates bond investors view the turnover event as increasing the risk of the firm's debt and therefore bond investors demand additional risk premia. Forced, outside firm, and outside industry CEO turnover events represent increased risk relative to voluntary, inside firm, and inside industry replacement decisions as evidenced by the higher relative stock price volatility. If the turnover event changes the riskiness of debt and therefore the likelihood of default, I would expect credit rating downgrades to be positively related to these events and most likely to increase default risk. Therefore, I examine the likelihood of credit rating changes against CEO turnover

characteristics in the cross section and find forced turnover to be positively related to the likelihood of subsequent credit downgrades. Firms in the sample who elected to forcibly remove their CEO are about 37% more likely to subsequently have their publicly traded debt downgraded than voluntary turnover firms. These results are significant at the one percent level.

If incumbent CEO characteristics are related to current default risk, then changes in CEO may provide information concerning future default risk. Parrino, Poteshman, and Weisbach (2003) and Shleifer and Vishney (1997) contend a CEO who receives equity based compensation is likely to favor projects that lower firm risk. This suggests that a large portion of the CEO's wealth is dependent on the value of the firm and is undiversified. Firms face difficulty replacing these risk adverse managers due to entrenchment costs (Fama and Jensen 1983), implying incumbent CEOs may become increasingly aligned with bondholders over time. Salanick and Pfeffer (1980) and Allen (1981) report a positive association between CEO ownership and tenure, indicating stock ownership and tenure may serve as proxies for risk aversion. Departing CEO age is likely to be positively related to both tenure and stock ownership and as such may be a factor in yield spreads. If bondholders recognize that the interests of new CEOs are more closely aligned with shareholder interests than departing CEOs, then expected abnormal yield spreads and incumbent CEO risk aversion proxies are likely to be positively related around turnover events. As such, I conduct cross sectional tests on the full sample and find abnormal yield spreads to be related to the age, tenure, and stock ownership of departing CEOs, although the evidence is not particularly compelling.[1]

[1] The findings are not robust to different specifications.

The presence of outside monitors may increase the likelihood of forced turnover. Denis, Denis, and Sarin (1997) document a positive relation between the presence of large blockholders and CEO turnover, while Black (1992) notes boards of firms with large institutional ownership are less tolerant of poor firm performance. If bondholders are viewed as outside monitors, then the cost of debt may be related to the likelihood of turnover for two reasons; first, if boards are concerned with the cost of debt, then boards may discipline underperforming managers as a means of lowering firms' cost of capital. I do not argue that boards explicitly act to protect bondholder interests; rather bond yields may provide boards with an additional, although less important, benchmark of firm performance. Second, a more likely explanation is that there may be an endogenity issue in that bond yields incorporate information regarding firm performance and the likelihood of default. It is well documented that poor performance is associated with an increased likelihood of CEO turnover (e.g. Kim [1996] and others). Therefore, higher levels of bond yields may be indirectly associated with an increased likelihood of forced turnover. I find that bond yield spreads are associated with increased likelihood of forced turnover, specifically, I find for every 100 basis point in yield spread over the immediate three month period, the likelihood of forced turnover increases by about 20 percent (results that are significant at the one percent level).

This study contributes to the CEO turnover literature in several ways. First, this is the first study that examines the relation between CEO turnover, firm value, and bondholder wealth using publicly traded debt. The results are provided for the full sample and when finer segmentations are provided (voluntary vs. forced; inside vs. outside replacement; within and outside industry). Second, this research contributes to the understanding of how

bondholders and stockholders assess risk when the firm's financial and investment policies are subject to change, yet firm performance is expected to improve following CEO turnover. Third, this study examines the relation between bond yield spreads and the nature of the CEO replacement decision. Fourth, this research further contributes to the understanding of the effects of corporate governance measures, of which CEO turnover is an extreme form, on bondholders.

The remainder of this study is organized as follows. Chapter 2 reviews the literature pertaining to the agency cost of debt, the effects and determinants of CEO turnover, and evidence that the cost of debt may be impacted by changes in corporate control. Chapter 3 details the hypothesis development concerning the linkage between the CEO succession event and the firm's cost of debt financing. In addition, the methods used to test the hypotheses are presented in Chapter 3. Chapter 4 details the sample generation process and provides sample statistics. Results from the study are presented in Chapter 5, Chapter 6 concludes.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

While the publicly traded corporation has a potentially unlimited life; the same cannot be said of its owners and managers. The routine and frequent changes in ownership are not usually significant events in the life of the firm; changes in top management can impact firm value. CEOs relinquish their positions for a number of reasons including death, retirement, voluntary resignation, and forced removal from office. The firm's board of directors, charged with the responsibility of monitoring and disciplining CEOs on behalf of shareholders directly initiate turnover when the CEO is forcibly removed from office. The board must then select a new CEO from either inside or outside the firm. The selection of a new CEO has important implications for the firm if the financial success of the company is a function of the chief executive's ability. In addition to managing the day to day operations of the firm, the CEO plays an important role in the firm's investment and financial policies. Therefore, the effectiveness of boards in the succession decision making process has an impact on shareholders since inadequate monitoring and evaluation of management performance can permit an inferior top manager to erode shareholder wealth. Prior research on CEO turnover can be broadly divided into three categories: 1) factors contributing to turnover, 2) immediate market reaction to the CEO turnover event, and 3) evaluation of subsequent firm performance.[2] Since boards ostensibly serve to protect shareholder interests, it is not surprising that most of the CEO turnover literature has focused on shareholder concerns. However, another class of investor may have an interest in the CEO

[2] See Furtado and Karen (1990) for a discussion of the literature concerning CEO turnover.

turnover event, namely bondholders. If the CEO turnover affects shareholders before, during, and after the announcement then it may also have consequences for bondholders during these periods as well.

The market price of corporate bonds varies in response to changes in both systematic and idiosyncratic default risk. As the risk of default increases, bond investors will require higher yield spreads above the risk free rate of interest. Although there is some disagreement with as to which type of risk, market or firm level, represents the majority of bond yield spreads, all relevant risk should be priced[3]. Bondholders react negatively (increase their required return) to external control events that increase the likelihood of default, as evidenced by the Warga and Welsh (1993) reporting of bondholder losses after leveraged buyouts. Conversely, bond investors respond favorably (reducing their required return) to those external control events seen to lower default risk. Billet, King, and Mauer (2003) find target firm bondholders react positively to takeover announcements when acquiring firms have more stable cash flows, implying target firm bondholders lower their required risk premium due to lower perceived default risk. Corporate policies, events, and governance mechanisms instituted by CEOs with board approval that affect default risk levels may be reflected in bond yields. When firms announce intentions to repurchase stock, thereby increasing leverage and default risk, bondholders react negatively (Maxwell and Stephens 2003). Bondholders lower their required return when default risk decreases as a result of anti-takeover provisions (Klock, Mansi, Maxwell 2004), the rational being entrenched CEOs have the ability to maintain excess cash reserves which serve to lower the risk of default. As noted by Smith and Warner (1979) bondholders are concerned with

[3] Vassalou and Xing (2004) and Denis and Denis (1995) find default risk is primarily systematic while Opler and Titman (1994) and Asquith, Gertner, and Sharfstein (1994) conclude firm specific factors dominate default risk premiums.

events and policies that may impact the value of their claim. If CEO turnover is related to changes in the risk of default I expect the market price of firm debt to change and these changes may be related to the preexisting level of default risk.

The remainder of the literature review is as follows; section 2.2 reviews literature supporting the notion bondholders react to changes in firm specific risk. In section 2.3, selected research concerning the causes of CEO turnover is presented. Section 2.4 reviews the considerable body of research concerning both the immediate market reaction as well as longer term measures of firm performance subsequent to the turnover announcement. Finally Section 2.5 is a discussion of literature that either directly or indirectly supports the notion that bondholders may have an interest in CEO turnover.

2.2 The Nature of the Agency Cost of Debt

Publicly owned firms exist since the managers of the firm do not necessarily possess the financial capital to fund required investments, in which case it becomes necessary to obtain the needed capital from outside investors. This separation of ownership and control introduces the agency problems described by Jensen and Meckling (1976). Owners of the firm institute corporate governance mechanisms in an attempt to minimize conflicts of interest with managers. The predominant governance mechanism employed in the U.S. is the formation of a board of directors entrusted with the responsibility of monitoring management and to either initiate or ratify additional governance mechanisms.[4] Boards may utilize alternative means of financing projects in an attempt to maximize shareholder wealth. One such method is the issuance of publicly traded debt as a governance mechanism (Jensen

[4] The view of boards existing to protect and enhance shareholder wealth may not be applicable in all markets. Wymeersch (1998) notes the role of boards is not a matter of law in many countries, as such shareholder wealth maximization may not be the primary goal of boards in those markets.

1980). Debt may serve to restrict managers from pursuing projects with negative net present values, which, while undesirable from the shareholder's perspective, are nonetheless beneficial to operate for the CEO (e.g. Demetz 1983)[5].

However, the utilization of debt introduces an additional agency cost, namely costs resulting from the conflicting interests of lenders, owners, and managers (e.g. Jensen and Meckling 1976). If the shareholders claim on a levered firm is viewed as a call option, as in Black and Scholes (1973), then increases in the variance of future firm value will increase the value of their option, with the cost of the increased risk borne by bondholders as their payoff is fixed (Fama and Miller 1972). Bondholders recognize the risk shifting incentive of equity holders and therefore demand a discount in purchasing the firm's debt. Firms seek to minimize this discount by issuing debt with restrictive covenants (Smith and Warner 1979). However, bondholders realize covenants cannot anticipate all possible future methods of wealth expropriation by equity holders. Bondholders will therefore require some discounting of the firm's debt as compensation for possible risk shifting by equity holders.[6] If the CEO turnover event, as a corporate governance mechanism, alters the established alignment of interests between the CEO, owners, and bondholders, then the realignment may be reflected in debt as well as equity prices.

There is considerable empirical evidence concerning the magnitude of the agency cost of debt resulting from firms' investment policies. Parrino (1996) investigates the 1993 Marriott spin-off and concludes shareholders expropriated significant wealth from

[5] For example, managers may seek projects that utilize specific skills of managers making it more difficult for owners to replace underperforming managers.

[6] Bondholders could demand representation on boards of directors as a mean of protecting themselves against wealth expropriation by shareholders. Banks often have representation on boards but generally only do so when the risk of default is low since board representation may place the priority of their claim in question during bankruptcy proceedings (Kroszner and Strahan 2001). Therefore, board representation may not be desired by bondholders.

bondholders, although shareholders did not reap the entire sum of bondholders' losses. Parrino reports that inefficiencies in the spin-off process and transactions costs explained much of the decline in total firm value. Maxwell and Rao (2003) conclude that significant wealth redistribution occurs on the announcement of spin-offs. Shareholders gains tend to be greater than bondholder losses, indicating not all shareholder gains come from bondholder losses. Maxwell and Rao (2003) also find firms are more likely to have their credit rating downgraded subsequent to the spin-off. Maxwell and Rao (2003) report bondholder losses are greatest when shareholder gains are large, consistent with the reasoning that the agency cost of debt can be significantly increased around important corporate investment decisions.

Warga and Welch (1993) investigate leveraged buyout offers and conclude successful leveraged buyouts from 1985 to 1989 resulted in significant negative bondholder returns. These negative returns represent only a portion of the equity holder risk adjusted gains, indicating that while wealth redistribution exists in leveraged buyouts, total firm value also tends to increase.

There is evidence of significant wealth redistribution around stock repurchase announcements (Maxwell and Stephens 2003). They report the magnitude of bondholder losses is a function of the size of the repurchase and the pre-announcement risk of debt. They also find an increase in the likelihood of a firm's debt being downgraded after a stock repurchase, further evidence of wealth expropriation.

Not all new corporate investment decisions result in bondholder losses and shareholder gains. Billet, King, and Mauer (2003) document the wealth effects of mergers and acquisitions on target and acquirer firms during the period of 1979 to 1997. They do

not find evidence of wealth transfer between the different classes of investors, but do report significantly positive target bondholder returns when the acquirer firm has more stable cash flows than the target firm. The implication being bondholders are concerned with the stability of future cash flows to the firm in light of the change in human capital available to the firm.

The informational content or signaling hypothesis states that the returns of equity and debt holders around unexpected corporate events should be positively correlated. These corporate events contain information that both classes of claimants view favorably. The informational content hypothesis has been examined for bond prices around dividend announcements (Handjinicolaou and Kalay 1984) and share repurchases (Maxwell and Stephens 2003). The agency cost or wealth redistribution and informational content hypothesis are not mutually exclusive as the observed reaction in stock and bond prices may reflect both effects during significant corporate events. In the context of CEO turnover, bondholders may be concerned with the new investment policies of the firm with a new CEO. Simultaneously, they may recognize higher quality management may improve firm performance, thereby reducing the likelihood of default.

2.3 Determinants of CEO Turnover

Shareholders in the publicly traded corporation elect a board of directors to manage the firm in their best interests. The board most often delegates the actual day to day management of the firm to a chief executive officer or to a group of managers and devotes its energies to the monitoring and disciplining of these managers. Inadequate monitoring of an underperforming CEO may result in a reduction of shareholder wealth; therefore

shareholders have an interest in effective board monitoring. Likewise, bondholders have an interest in effective board monitoring of management. However, CEOs may become entrenched over time by appointing board members who are corporate employees, these insiders are essentially subordinates of the CEO they are charged with monitoring. These inside board members may not always act in the best interests of shareholders as their employment status is controlled by the CEO. One often cited remedy for this conflict of interest is the creation of boards dominated by independent directors and the appointed of these outsiders to committees given responsibility of monitoring firm performance.[7] Shareholders and bondholders alike appear to benefit from independent monitoring as evidenced by Anderson, Mansi, and Reeb (2004) who report lower costs of debt for firms with independent audit committees. While independent boards may not be associated with superior share price performance, the empirical evidence seems to suggest independent boards provide superior monitoring with regards to investment and control (the hiring, firing, and compensation of top executives) policies (Hermalin and Weisbach 2001). Weisbach (1988) reports CEO turnover is more sensitive to firm performance when outsiders dominate the board. The number of monitors (size of board) may also be a determinant in CEO turnover. Yermack (1996) and Wu (2000) report an increased likelihood of CEO turnover for smaller boards, consistent with Lipton and Lorsch (1992) and Jensen (1993) arguments that agency costs and myopia increase with board size. Conversely, Anderson et al. (2004) report lower costs of debt are associated with larger boards. In general, internal or board monitoring appears to benefit both equity and bondholders when the monitoring results in decreased information asymmetry and CEO

[7] See Hermalin and Weisbach's (2003) review of the board of director's literature for a more detailed discussion of board monitoring and managerial entrenchment.

opportunism. However, when monitoring attributes serve to mitigate shareholder-manager agency costs at the expense of debtholders, bond yield spreads may increase.

Poor prior stock return performance is associated with increased probability of CEO turnover, suggesting boards react to protect shareholder wealth (Weisbach 1988;Bonnier and Bruner 1989;Furtado and Rozeff 1987). Kwan (1996) reports stock returns are negatively related to bond yields, implying a positive relation between CEO turnover and yield spreads. Jensen (1989) argues that the boards of levered firms have incentives to react promptly to declines in firm value since even small declines can increase the probability of default. Gilson (1989) reports an increased incidence in CEO turnover as default risk increases and that many turnovers are initiated by debt holders. Additionally, Harris and Raviv (1990) imply the threat of default increases the likelihood of management turnover. Since default risk is included in corporate bond yield spreads, I expect higher preannouncement yield spreads to be associated with the likelihood of forced turnover.

As firm size increases, the pool of qualified managers shrink and the likelihood of forced turnover decreases (Parrino 1997). These larger firms are also more likely to have an executive development plan and are therefore less willing to not only terminate a poorly performing CEO, they are also less likely to seek a replacement CEO from outside the firm since doing so would incur incentive costs (Dalton and Kesner 1985). Larger firms will also tend to have investments in different industries. These diversified firms face a restricted pool of qualified CEO candidates due to the more complex nature of the diversified firms and the increased managerial ability required. Entrenchment costs tend to be higher in these larger, diversified firms (Berry et al. 2003). Therefore, firm size not only has a negative relation with the likelihood of CEO turnover, but it also has a negative relation with the

probability of outside succession. Ravenscraft and Scherer (1987), using line of business data, document the probability of selling off lines of business increases in the aftermath of top management turnover. These larger, more diversified firms are more likely to divest of underperforming assets in the aftermath of the CEO turnover event.

The industry in which the firm operates has an impact on the succession event. Firms with membership in homogenous industries, such as mining and air transportation firms, will experience greater frequency of CEO turnover (Parrino 1997). This is because boards can more easily identify poorly performing CEOs since other firms in the same industry provide a more reliable measure of firm performance and therefore managerial ability. Parrino (1997) finds there is also a greater probability of forced turnover in homogenous industries. Since the boards in homogenous industries have a greater ability to evaluate CEO quality, the market reaction to the turnover announcement tends to exhibit lower excess returns as poorly performing CEOs have less opportunity to erode firm value. The better board monitoring of CEOs in homogenous industries results in more frequent CEO turnover and limits the magnitude of gains from improved managerial quality. Firms in less homogenous industries find it more difficult to determine CEO performance and will only replace a CEO who is clearly underperforming and there is a greater potential for gains from a newly appointed CEO. Weisbach (1988) shows that a measure of industry adjusted firm earnings is negatively related to top management turnover.

Outside monitoring of the firm by large blockholders and institutions forces boards to more effectively monitor the ability of CEOs. Denis, Denis and Sarin (1997) provide evidence that the likelihood of top management turnover is positively related to the presence of large block holders. Black (1992) and Pound (1992) contend that institutional

shareholders also perform a monitoring function similar to large block holders. However, Denis and Sereno (1996) find no evidence that institutional ownership results in increased board monitoring as measured by increased likelihood of CEO turnover.

Corporate takeovers play an important role in the disciplining of top management in poorly performing firms. Martin and McConnell (1991), report that the turnover rate for top management is significantly higher following completion of a takeover. They also find that prior to the takeover attempt; the targets were under performing their respective industries. Thus, the existence of a takeover market serves to increase the likelihood that poor performing CEOs will be fired. Klock, Mansi, and Maxwell (2003) suggest firms with higher anti-takeover provisions serve to limit shareholder opportunism and possible wealth expropriation from bondholders by new management. This evidence indicates bondholders regard CEO turnover as an important corporate event. The anti-takeover provisions allow managers to maintain excess cash reserves (the underinvestment problem as in Jensen and Meckling 1976) which can be used to insulate bondholders from the risk of default even with the acceptance of negative net present value projects.[8]

Morck and Nakamura (1989) find that turnover is less likely among founding family members. Parrino (1997) finds similar results. These findings are consistent with the notion that large blocks of stock are controlled by the founding family members. These large blocks of control enable them to retain their positions longer. Interestingly, Parrino reports that the reduced likelihood of CEO turnover for founding family members is significant for both voluntary and forced turnovers. Anderson, Mansi, and Reeb (2003) provide evidence that firms with significant founding family control behave in such a manner as to lower the cost of debt.

[8] See also Jensen (1986)

2.4 CEO Turnover and Firm Performance

Clayton, Hartzell, and Rosenberg (2005) list three major explanations regarding investor reaction to the CEO turnover event and subsequent firm performance. The improved management hypothesis states that forced management turnover tends to increase the quality of managerial talent and therefore subsequent firm performance; while a voluntary turnover event indicates the board has determined the performance of the existing CEO was at least adequate and will tend to choose a successor likely to behave in the same manner as the departing CEO (Denis and Denis 1995). Since there are fewer costs associated in determining the abilities of within firm candidates, the replacements are generally chosen from within the firm (Weisbach 1988). The strategy hypothesis states that the board will appoint a new CEO when it wishes to pursue a different business strategy requiring a different set of managerial skills than those possessed by the current CEO. In this case, the forced or outside replacement CEO turnover event can be viewed as a signal that the firm will pursue a different investment strategy (Clayton et al. 2005). The scapegoat hypothesis holds that all management is of equal ability and changes in firm performance are simply matters of chance (Holmstrom 1979). Researchers have relied on the market's response to the turnover announcement to determine which hypothesis dominates.

The improved management hypothesis suggests that the forced removal of a CEO indicates the firm's board has determined, through its monitoring function that the departing CEO is underperforming. The successor CEO's expected performance is considered at least average and markets rationally conclude firm performance will likely improve. Voluntary turnover is an indication the board is satisfied with the performance of the outgoing CEO

and chooses a replacement likely to perform similar to the departing CEO. Fee and Hadlock (2003) find that successor CEOs chosen from outside the firm tend to be selected from firms with above normal returns, perhaps giving investors expectations of improved future firm performance. Weisbach (1988), Bonnier and Bruner (1989), Furtado and Rozeff (1987), Denis and Denis (1995) and others find significant and positive stock price reaction to the turnover announcement. Huson, Parrino, and Starks (2001) find the excess returns on the announcement are greater when the turnover is forced. Ang, Lauterbach, and Vu (2003) further find firms with newly appointed CEOs receiving pay premiums ex-ante are accompanied by an immediate revaluation of their stock prices. The implication being that better quality CEOs are likely to receive higher compensation.

The strategy hypothesis developed by Clayton et al. (2005) holds that when the replacement CEO is chosen from outside the firm the board is seeking to make significant strategic changes (operations, investment, and financial). The successor will be chosen from outside the firm when the board is dissatisfied with the current strategy. The board will forcibly remove the current CEO if the perceived benefits of the succession and resulting strategic changes outweigh the cost of removing the current CEO. Perhaps the strongest signal of board intentions occurs during a forced turnover event where the replacement CEO is selected from outside the firm. Huson et al. (2001), Denis and Denis (1995), and others find large positive abnormal returns associated with the announcement of a forced turnover event with outside replacement. Inside successions are not as likely to result in significant strategic changes since the inside successor may be reluctant to change the current investment set of the firm. Evidence of insignificant reaction to inside succession events is provided by Reinganum (1985) and Weisbach (1988). The inside successor may have played

a large role in the development and implementation of the current strategy. The inside successor is also likely to have been mentored by the outgoing CEO. Therefore it is likely the board will choose a new CEO from within the firm when it is satisfied with the current business strategy.

The scapegoat hypothesis holds that all management is of equal ability and changes in firm performance are simply matters of chance. Boards simply terminate the chief executive as a signal to investors of underperforming firms that the board is effective in its monitoring role and performance will improve. Khanna and Poulson (1995) do not find positive reaction to turnover to CEO turnover announcements whether the successor is from outside or inside the company. Khanna and Poulson (1995) report that a sample of managers of financially distressed firms and managers of a corresponding sample of control firms make very similar decisions and that neither group of managers on average take value reducing actions. They conclude that when managers are blamed for financial distress, they are serving as scapegoats. It is difficult to determine the implications of their study since their sample consists of only firms in Chapter 11 protection. In contract to Khanna and Poulson (1995), Reinganum (1985) and Warner, Watts and Wruck (1988) report economically small and insignificant positive price movements in conjunction with the announcement.

Investment policy changes occurring as a result of the turnover event may also help to explain shareholder reaction. The CEO turnover event may contain information about the likelihood of future changes in corporate decision making, including the reversal of prior investment errors. The CEO turnover event is typically followed by a period with increased changes in asset structure (Weisbach 1995; Denis and Denis 1995). The outgoing CEO may

have made suboptimal investment decisions during his tenure and the CEO turnover event is an opportunity to reverse those investment errors. The outgoing CEO may have overestimated his or her ability to manage certain investments and subsequently the projects' returns are lower than anticipated (Roll 1986). In such a case the firm's portfolio of projects is likely to contain several such underperforming projects undertaken during the tenure of the outgoing CEO. The departing CEO may have taken personal preferences into account during the investment decision and subsequently invested in projects that were satisfying for the CEO, but nevertheless are poor performers from the perspective of the firm's shareholders (Demetz 1983). The outgoing CEO may also be motivated to increase the value of his human capital in the investment decision making process. Shleifler and Vishny (1989) argue that managers have an incentive to invest in projects which complement their own skill set and thereby increase their bargaining power with the board. Since CEO compensation is commonly a function of the firm's overall size, Jensen (1989) notes that without effective monitoring CEOs may acquire assets simply as a means to increase pay.

It is often difficult to determine if a given turnover event is forced or voluntary as firms may be hesitant to publicly announce a termination. Boards may fear such an announcement is an implicit acknowledgement that an error was made in either the initial CEO placement decision or in the board's subsequent monitoring role. One of the complexities in empirical studies is that it is very difficult, if not impossible in some cases, to determine if a given resignation is voluntary or forced, since many companies are reluctant to publicly state when a CEO is terminated. The empirical studies have handled the issue in a number of ways. Some studies have ignored the issue; some have listed a turnover as forced only when there is an explicit mention of such in the press, while others have developed

filters to determine when a forced resignation occurs, and some studies use CEO age as a proxy for voluntary retirement and forced resignation. In the latter two methods, a CEO is assumed to retire voluntarily if he is between the ages of, say 64 and 65 for example. A CEO turnover event occurring when the departing CEO reaches the firm's mandatory retirement age may not be informative since the turnover may be driven by policy and not performance issues. Further confounding the retirement issue is that firms may find it less costly to allow a poor performing CEO to retire as significant costs may be incurred in the case of forced retirement.

Warner, Watts and Wruck (1988) report the median age of replaced CEOs who are reported by the firm to be retiring is 65.4 years. Departing CEOs not described as retiring have a median age of 59 years. These differences are significant and imply firms on average are truthful in retirement announcements. There is also the implication that younger CEOs are more likely to be terminated. The justification is that it may be less costly to retain a poorly performing CEO who is near retirement than to force the resignation. Parrino (1997) confirms that the likelihood of forced resignations of CEOs older than 64 years, while significant is very small. He also reports the median CEO age when turnover is voluntary is 64 years with a median tenure of 7.4 years. The median age of a CEO who is forced out is 55 years with a median tenure is 5.1 years. A possible explanation for the difference in ages of forced and voluntary turnovers is the younger CEOs were not as well qualified when they were first appointed CEO.

Weisbach (1988) does not attempt to determine the nature of the CEO turnover event in a sample of 153 NYSE firms. Weisbach reports significant and positive excess returns around the turnover event when departing CEOs are not between the ages of 64 and

66 years. Furtado and Rozeff (1987) do not classify the turnover event as voluntary or forced and find significant and positive excess returns around the CEO turnover announcement date. Bonnier and Bruner (1989) report significantly positive and economically important excess returns around the succession announcement date with a sample of 70 NYSE financially underperforming firms. Since it is well established that the boards of poorly performing firms are more likely to replace executives (e.g. Coughlin and Schmit 1985, Warner et al. 1988, Jensen and Murphy 1990, Denis and Denis 1995, and Kim 1996), the sample of Bonnier and Bruner (1989) is biased towards CEOs who are likely to have been forcibly removed, thereby possibly negating any requirement to classify the nature of the CEO turnover.

More recent studies have used filter rules to determine if a particular turnover event is forced or voluntary. Denis and Denis (1995) classify a top management change as forced if either it is reported as such in the Wall Street Journal, or the turnover shares certain characteristics with known forced turnover events. Denis and Denis classify a turnover as forced if the event involves an external appointment and the departing manager leaves the firm and the departing manager is not between the ages of 64 and 66. Denis and Denis report significantly positive abnormal returns upon the announcement of forced turnover. Huson, Parrino, and Starks (2001) use a similar filter rule to identify forced turnover events and report results consistent with the improved management and strategy hypotheses.

Khanna and Poulson (1995) provide evidence in support of the scapegoat hypothesis; however no distinction is made regarding the classification of the turnover event as either forced or voluntary. Warner, Watts, and Wruck (1988) use a filter rule to identify forced turnover, classifying turnover events as forced if the announcement a) does not state

retirement as the cause for turnover, b) the departing manager does not assume another position within the firm, c) there is no block transfer of stock indicating a control change, and d) does not state illness or the death of the departing manager. Reinganum (1985) only classifies top management turnover by internal and external appointments and does not attempt to identify forced turnovers, although there is considerable evidence that outside appointments are more likely to be forced turnover events.

The issue of forced turnover has greater implications for stock price returns than voluntary turnover. It has been widely reported that the stock price reaction to forced CEO turnover announcements is higher than the voluntary turnover reaction. Huson, Parrino and Starks (2001), Furtado and Rozeff (1987), and others report significant positive reactions to forced turnover relative to voluntary turnover. Furthermore, these studies show the positive stock price reaction is largest when the replacement CEO is an outsider. Since firms resorting to forced turnover are most likely suffering from prior poor performance, it is not surprising rational investors anticipate better future performance. Denis and Denis (1995) find significantly positive changes in subsequent operating income for firms with forced turnover

The majority of empirical work tends to favor the improved management and strategy hypotheses. Forced turnovers are generally seen to result in significantly positive excess returns around the announcement date while voluntary turnover generally results in no significant excess returns. Studies using more stringent filter rules to identify forced turnover events generally find greater excess returns around the succession announcement.

The results of these event studies suggest that effective internal governance mechanisms can create value, but the evidence is not conclusive. This is perhaps because

measuring stock price reactions surrounding the succession announcement reflects only the rational expectations of investors and tells little of the actual results of the succession decision. Weisbach (1995) finds CEO turnover tends to be followed by a divesture of underperforming assets; the market seems to anticipate these actions as Weisbach (1995) reports a positive reaction for all announcements of CEO turnover, although the effect is largest in the case of forced turnover. Denis and Denis (1995) study operating performance following turnover and find subsequent accounting measures of performance improve, measured by operating return on assets, but continuing low stock returns for at least the short term, although they also find positive significant stock returns during a 2-day event window. Likewise, Huson, Malatesta and Parrino (2001) find turnover announcement abnormal stock returns are positively related to subsequent changes in accounting measures of performance.

In the case of planned succession, with the replacement CEO coming from within the company, stockholders may be indifferent to the succession event, as they may not expect significant changes in the investment policies of the firm. In this case, any stock price movement tends to be economically small, although it may still be significant. Several researchers have documented these small price changes associated with voluntary, planned succession including Warner, Watts and Wruck (1988), Furtado and Rozeff (1987) and others.

When the replacement CEO is selected from outside the company and succession is voluntary, the magnitude and significance of the reaction is dependent upon the prior industry affiliation of the successor (Parrino 1997). In order to understand why there might be a different reaction to inside versus outside planned succession it is necessary to consider

the labor market for executives. An outside potential CEO faces major disadvantages when competing with executives from within the firm (Lazear and Rosen 1981). First, the internal candidates possess greater firm-specific human capital and the firm can earn a return on that capital. Second, there is less uncertainty regarding the capability of the internal candidate and it may be costly to obtain a similar level of certainty concerning the external candidate. Finally, the firm may have a preference to hire internally to provide incentive to lower level executives. When selecting a CEO successor from outside the company, the firm implicitly states the outside CEO has superior capability. Investors may then recognize the added value created by the board's selection. If the successor is chosen from outside the industry, shareholders, in addition to anticipating divesture of underperforming assets, would also anticipate benefiting from any new projects undertaken by the new CEO as a result of the different human capital now available to the firm.

Further evidence that shareholders evaluate human capital is presented by Johnson, Nagarajan, and Newman (1985), who report that stock prices tend to decrease upon the unexpected announcement of a CEO death. The inference is that the market has judged these CEOs to be of good ability or else they would have been replaced. However, they find the market reaction is just the opposite; it actually tends to react positively, upon the announcement of the death of a CEO who is a member of the founding family. The implication is the market perceives founding family CEOs to be less competent than CEOs who attained the position without benefit of founding family status. The market anticipates superior future performance with the appointment of a new CEO.

2.5 CEO Turnover and the Cost of Debt

There is increased uncertainty regarding firm prospects surrounding the CEO turnover event. Investors may have questions regarding the newly appointed CEO's ability to profitably operate the firm's assets. The new CEO may change the investment policies of the firm, divesting some assets while acquiring others (Weisbach 1995), these changes may result in a change in firm size (Denis and Denis 1995) and the degree of financial leverage (Ofek 1993). This uncertainty is reflected by the higher volatility of future equity returns (Clayton et al. 2005). Firm specific equity volatility is an important factor to bondholders in assessing their required return and can explain variation in bond yield spreads as well as credit ratings (Campbell and Taksler 2003). The importance of equity volatility in the pricing of corporate debt becomes clearer by considering Merton's (1974) model of equating bondholders' claims to a risk free bond and a put option issued to the firm's shareholders. Since equity volatility is a component in the Black-Scholes options pricing model then equity volatility may be important to bondholders. The volatility of interest in pricing options is total volatility, including both systematic and firm specific volatility, so the increased volatility surrounding CEO turnover may be priced by bondholders. Alternatively, if equity volatility is associated with asset volatility then as asset volatility increases there is an increasing likelihood that the value of assets will not exceed the value of liabilities, the firm could then be in default. Denis and Denis (1995) find that significant asset restructuring occurs following CEO turnover, and the effect is greatest for forced turnover. Weisbach (1995) finds increased asset divestiture following CEO turnover. The cost of debt increases with the probability of default, implying the CEO turnover event may be significant for debt holders as well as equity holders.

Stock market reaction to the CEO turnover is dependent on whether the turnover is forced or voluntary. Huson, Parrino, and Starks (2001) and Furtado and Rozeff (1987) and others find positive and significant stock price reaction to forced turnover announcements. Additionally, it is well documented that poor prior stock performance is positively related to the probability of forced CEO turnover.[9] As such investors react positively, although with some degree of uncertainty, to expected business strategy changes. Clayton et al. (2005) find no abnormal return or increased volatility on the announcement of voluntary turnover and reasons this is due to investors not expecting significant strategic policy changes. However, Clayton et al. do report increased future equity volatility indicating increased uncertainty following forced turnover announcements. Likewise, outside firm and industry replacements decisions are generally associated with increased stock price reaction and volatility (Clayton et al. 2005: Huson, Parrino, and Starks 2001), the implication being shareholders expect significant changes in investment, financial, and operational policies. The increased equity volatility surrounding forced and outside turnover events, while possibly beneficial to equity holders, may induce bondholders to reevaluate their required returns.

If the board desires a different business strategy then it seems reasonable the existing CEO would pursue such a strategy in order to protect his or her position. The investment policy differences between the outgoing and newly appointed CEOs may be partially explained by managerial entrenchment and compensation. If managers prefer to select projects and effort levels to benefit themselves rather than shareholders, it may be optimal

[9] For example, Coughlin and Schmit (1985), Jensen and Murphy (1990), Barro and Barro (1990), Kaplan (1994), Brickley and Van Horn (2000), and others.

for investors to provide incentives to align manager and investor interests (e.g. Jensen and Meckling 1976). Equity ownership by top managers may serve to align manager and shareholder interests by providing incentives to exert effort and pursue riskier projects (Agrewal and Mandelker 1987), in which case I would expect a positive relation between cost of debt and incumbent CEO ownership.

Alternatively, Parrino, Poteshman, and Weisbach (2003) and Shleifer and Vishney (1997) contend a CEO who receives higher amounts of equity based compensation is likely to favor projects that lower firm risk, the notion being that a large portion of the CEOs wealth is dependent on the value of the firm and is undiversified. Firms face difficulty replacing these risk adverse managers due to entrenchment costs (Berry et al. 2003), implying incumbent CEOs may become increasingly aligned with bondholders over time. Support for this hypothesis is found in Anderson, Mansi, and Reeb (2003), where it is reported that increased levels of CEO equity based compensation are associated with lower costs of debt. The conclusion that the CEO turnover event can be a significant source of wealth redistribution becomes clearer by recognizing newly appointed CEOs are unlikely to have the same high ownership levels as the outgoing CEOs. Managerial entrenchment and share ownership are likely to increase with time, so the new CEO will be more closely aligned with shareholders initially.[10] Additionally, Berger, Ofek, and Yermack (1997) report entrenched managers seek to avoid debt and firm leverage tends to increase following turnover, indicating there may be a relation between CEO turnover and yield spreads. The higher leverage ratios of firms after turnover may increase the riskiness of existing debt, leading to

[10] Salanik and Pfeffer (1980) and Allen (1981) note a positive relation between tenure and ownership, indicating tenure may provide information on the level of CEO entrenchment similar to ownership. See Furtado and Karen (1990) and Hermalin and Weisbach (2003) for a discussion of the literature concerning new CEOs and shareholder interests.

subsequent credit downgrades. Klock, Mansi, and Maxwell (2004) report lower debt costs for firms with anti-takeover provisions, suggesting bondholder and incumbent CEO share at least some interests. The realignment of CEO and shareholder interest via turnover, while benefiting shareholders may be viewed negatively by bondholders, and I expect announcement yield spreads to be positively related to incumbent CEO risk aversion proxies such as age, tenure, and stock ownership.

CHAPTER III

RESEARCH QUESTIONS

CEO turnover is a major corporate governance event that may have a large impact on the direction of the firm and its subsequent performance. While the board of directors may not always initiate CEO turnover, it is responsible for selecting the successor CEO. Previous literature has focused on the turnover event from the perspective of shareholders. This study focuses on the impact of CEO turnover on bond market participants. Broadly, the questions addressed in this research are;

(i) Is there a relation between CEO turnover events and the cost of debt financing?

   a. Does this relation differ when the turnover is forced vs voluntary?

   b. Does this relation differ when the incumbent CEO is replaced by an inside vs an outside candidate?

   c. Does it matter if the replacement is from within the industry or a different industry?

   d. Is this relation more pronounced in the investment or the non-investment grade debt market?

(ii) What is the impact of CEO turnover on the probability of a change in credit ratings?

(iii) Are yield spread levels related to the likelihood of CEO turnover?

(iv) Are incumbent CEOs risk aversion levels, proxied by CEO age, tenure, and holdings, related to changes in the cost of debt?

To the best of my knowledge, this is the first study that examines the relation of CEO turnover and the cost of debt financing using publicly traded non-provisional corporate debt.

3.1 Motivation

The strategic business policies (operations, investment, and financing) of the firm are generally developed and implemented by the CEO with the approval of the firm's board of directors (Fama and Jensen 1983). These strategic policies are affected by the CEO turnover event as the new CEO will develop and implement projects differently than the departed CEO. Weisbach (1995) and Denis and Denis (1995) provide evidence that significant investment policy changes occur following the CEO succession event. The board evaluates the current strategic business policies of the firm based on the firm's performance (Clayton et al. 2005) and decides whether to continue with the current policies or implement different policies. When the firm is performing well relative to some performance benchmark of interest to the firm, the board is not likely to desire change in the strategic policies. However, when the firm performs poorly, the board will be inclined to seek a different strategic policy.

If the firm is performing well, the board will likely choose a successor who will continue the current strategic policies. If the firm is underperforming, the board is more likely to select a successor CEO who it believes capable of implementing and executing new strategic policies. The new CEO can affect firm performance in two broad ways; by implementing new policies and by executing existing policies better than the predecessor. When a new CEO is appointed there is uncertainty concerning the level of investment policy

changes. This uncertainty continues as investors learn both the magnitude of the changes likely to occur as a result of the appointment of a new CEO and the ability of the new CEO.

The increased uncertainty concerning the level of future cash flows resulting from the CEO turnover event will likely increase the volatility of the firm's asset values. This increased uncertainty in the firm's future performance and cash flows and the resulting stock price volatility may be meaningful for various stakeholders. The increases in the variance of future firm value can increase the value of the shareholder claim if that claim on the levered firm is viewed as a call option as in Black and Scholes (1973). Fama and Miller (1972) argue the increased risk will be borne by the firm's bondholders as their payoff is fixed. Recognizing that bond covenants cannot completely protect their interests from the risk shifting incentives of shareholders (Smith and Warner 1979), investors will require a discount in purchasing the firm's public debt. Therefore, the CEO turnover event may represent an increase in the agency cost of debt described by Jensen and Meckling (1976).

The increased volatility surrounding the CEO turnover event may lead to a greater probability of financial distress. Merton (1974) argues that increased stock price volatility is associated with greater asset volatility. This argument implies that as the volatility of asset values increases, there is an increased probability that the firm's assets will not cover liabilities, and a subsequent increase in the likelihood of insolvency. The increased likelihood of insolvency can result in the downgrading of the firm's debt rating and a lowering in the valuation of publicly held debt after the CEO turnover event.

The remainder of this chapter details the hypothesis development and empirical methods as follows; in Section 3.2 the hypotheses relating to the immediate market reaction (event study) of bondholders is discussed. Section 3.3 discusses the motivation and cross

sectional methods concerning the impact of CEO turnover on credit ratings. Section 3.4 develops the hypothesis that bond yield spreads contain information regarding the likelihood of CEO turnover. Finally, section 3.5 examines the notion that certain CEO characteristics are related to the cost of debt financing, section 3.6 concludes.

3.2 The Cost of Debt and CEO Turnover

This section details the hypotheses concerning bond market reaction to the CEO turnover event. Specific motivation as to why certain CEO turnover events may be viewed from different perspectives by bondholders and stockholders is also provided. Finally, the event study method used to test the bondholder and stockholder reaction as well as changes in firm value are also presented.

3.2.1 The Cost of Debt and Forced CEO Turnover

Evidence indicates that forced and voluntary turnover have different implications for the firm's stakeholders. When the board is satisfied with the firm's performance, it will likely choose a replacement CEO capable of executing the current strategic policies. The board of a well performing firm may recognize a need to implement new strategic policies, however, any such changes in the firm's investment policies will tend to be small relative to those of the underperforming firm. If the firm is underperforming, the board is inclined to choose a successor CEO who is more likely to implement and execute new investment policies (Clayton et al. 2005). Voluntary turnover events usually result in insignificant stock prices reactions, while the announcements of forced turnover generally are associated with positive

and significant stock price reactions.[11] The positive stock price reaction to the forced turnover announcement may be the result of investors anticipating better firm performance as a result of improved managerial ability and or anticipation of new strategic policies.

When the board terminates a CEO it is likely indicating the current strategic polices are inadequate. Denis and Denis (1995) find increased asset restructuring after forced CEO turnover announcements, consistent with the notion that boards forcibly remove CEOs when they believe new strategic policies are required. Uncertainty regarding the firm's future cash flows increases thereby resulting in increased stock price volatility (Clayton et al. 2005). The increased variance of the firm's future cash flow following the announcement of forced CEO turnover may increase the value of stockholder's claim on the levered firm. This increased volatility following the CEO turnover event may result in the downgrading of the firm's publicly traded debt. Investors recognize the increased risk associated with holding the firm's debt and will discount the value of the firm's debt. The hypotheses to be investigated are whether the increased uncertainty of investors regarding the firm's future strategic policies and performance is reflected in an increased volatility in the cost of debt and a subsequent increase in the cost of debt. That is;

Hypothesis 1: The cost of debt increases on the CEO turnover announcement.

Hypothesis 2: The cost of debt increases on the forced CEO turnover announcement.

Hypothesis 3: The cost of debt increases more for forced versus voluntary CEO turnover announcements.

3.2.2 The Cost of Debt and the Outside Replacement Decision

[11] Huson, Parrino, and Starks (2001), Denis and Denis (1995), and Furtado and Karan (1990) are among the many studies finding forced turnover announcements result in significant and economically important positive stock price reactions.

The CEO turnover event presents the board with the option to choose a successor CEO from either inside or outside the company. The board's determination regarding the adequacy of the current investment strategies is a factor when deciding between an inside or outside replacement CEO. If the firm is performing well, the board will be inclined to choose a successor it believes capable of executing the current strategic policies. When the board decides to continue with the current strategies, an insider is likely to be appointed CEO. Although the operational, investment, and financial policy preferences of the insider candidate will not be identical to those of the outgoing CEO, there is reason to expect the differences will be small relative to an outside candidate. The insider candidate is more familiar with the assets employed by the firm and likely contributed to the current investment policies of the firm. The board, due to its monitoring function, has more complete information regarding abilities of the inside candidate.

The outside CEO candidate faces significant disadvantages relative to the inside replacement candidate (Lazear and Rosen 1981). First, the firm may incur significant incentive costs by not selecting the new CEO internally. Secondly, the board is more uncertain regarding the abilities of the outside candidate. Finally, the outside CEO candidate has less firm specific knowledge than the inside candidate. If the board determines the current strategies are inadequate, it may seek outside candidates to implement and execute new strategic policies. Helmich (1974) finds the rate of firm asset growth is greatest following outside replacement. Clayton et al. (2005) reports a decrease in total assets and an increase in stock price volatility following the appointment of outsiders to the CEO position. Choosing an outside replacement CEO from another industry may also signal the firm desires even greater changes in strategic policies. However, Parrino (1997) argues boards

choose CEOs from outside the firms' industry to acquire specific skills and not general management expertise, in which case it is difficult to make predictions concerning the firm's cost of debt and is largely an empirical question. The increased volatility surrounding outside replacement decisions is consistent with the notion that boards desire significant changes in strategic policies when selecting CEOs from outside the firm. The increased likelihood that the variance in firm assets may not cover liabilities, thereby increasing the probability of insolvency, results in an increased cost of debt. The hypotheses of interest regarding investor uncertainty concerning the outside appointed CEO and the subsequent increases in the firm's cost of debt are;

Hypothesis 4: The cost of debt increases on the outside firm CEO turnover announcement.

Hypothesis 5: The cost of debt increases on the outside industry CEO turnover announcement.

3.2.3 Forced Turnover with Outside Replacement and the Firm' Cost of Debt

One of the clearest indications that the board desires significant changes in the strategic policies of the firm is the forced removal of the current CEO and the subsequent appointment of an outsider. The implication is the board has determined the current CEO is not capable of implementing new strategic policies to benefit the shareholders and the desired strategic changes are of such a magnitude as to exclude internal candidates from consideration (the internal candidates may have vested interests in the current policies of the firm and may be reluctant to abandon them). Huson et al. (2001) report significant positive stock price reaction to the announcement of forced turnover with outside replacement. Viewed in an option framework, boards of levered firms have an incentive to increase the variance of future cash flows. The increased variance increases the value of the

shareholder's option on the levered firm and increases the risk to bondholders. Since investor's recognize the risk shifting incentives of residual claimants, the increased uncertainty surrounding the forced and outside replacement CEO announcement increases the firm's cost of debt. Therefore, the hypothesis concerning the cost of a firm's debt with respect to external replacement is explicitly;

Hypothesis 6: The cost of debt increases on the forced CEO turnover announcement with outside replacement.

3.2.4 Debt and CEO Turnover Relations for Non-Investment and Investment Bond Markets

The margins by which a firm can satisfy the cash flow requirements of its debt obligations are important in determining default risk. In other words, firms with higher free cash flow are less likely to default on their debt than firms with lower levels of free cash flow for a given change in risk. The CEO turnover event, as a firm specific risk factor, should be reflected more in bond yields as when the likelihood of financial distress is high. Segmenting the data into investment and non-investment grades of debt permits the examination of the idea that preexisting levels of risk effect bondholder reaction to CEO turnover. The hypothesis of interest is therefore;

Hypothesis 7: The effect of CEO turnover on the absolute change in yield spreads is greater for non-investment versus investment grade debt.

3.3 Event Study Methods

I use standard event study methods to estimate abnormal yield spreads, abnormal stock returns, and abnormal changes in firm value around the CEO turnover announcement. Although there is an expectation from prior research that stock returns increase upon the announcement of a CEO turnover, there is no prior theoretical or empirical evidence as to what the relation between yield spreads and turnover events will be for bonds. The methods used to obtain the changes in stock return, changes in bond return, and overall changes in firm value are shown below.

3.3.1 Abnormal Yield Spreads

To compute abnormal yield spreads, I use a monthly mean-adjusted model similar to Brown and Warner (1980) accounting for changes in term structure effects (such as duration and convexity). The Lehman Brothers Fixed Income (LBFI) database covers the majority of the sample period 1973 to 1998, and contains monthly bond price data. Bond pricing data for the sample period 1998 to 2000 are obtained from Bloomberg Data Service. While the use of daily data would be preferable, it is difficult to obtain daily bond data and a portion of the corporate bond market does not trade on a daily basis because of illiquidity. Maxwell and Stephens (2003) point out that the use of monthly yield spreads biases the results against finding significant effects.

The bond yield spread ($YS_{i,t}$) is defined as the difference between the yield to maturity on a corporate bond for month *t* of bond *i* and its duration matched Treasury security (MT_t). That is

$$YS_{i,t} = YTM_{i,t} - YTM_{MT} \quad (1)$$

The mean expected yield spread ($EYS_{i,t}$) for bond *i* at the announcement month *t* is estimated as the average yield spread prior to the announcement over the estimation period *T* (in this case three months prior to the event). That is

$$EYS_{i,t} = \frac{1}{T}\sum_{t=-1}^{-T} YS_{i,t} \quad (2)$$

The abnormal yield spread during the announcement month *t* is calculated as the difference between the observed yield spread for bond *i*, $YS_{i,t}$, and the expected yield spread, $EYS_{i,t}$. That is

$$AYS_{i,t} = YS_{i,t} - EYS_{i,t} \quad (3)$$

Since many firms in the sample have multiple bonds outstanding, the abnormal yield spread reported for a given firm is the summation of the weighted average of the abnormal yield to maturity of all bonds, with the weight being the total face value amount outstanding for each bond divided by the total amount outstanding for all traded bonds.[12] This method removes any bias introduced by treating each bond for a firm separately, which in turn could inflate the *t* statistics due to high correlation between bonds of the same firm. The weighted

[12] A concern with using the weighted average yield spread method is some bonds may enter and exit the sample throughout the estimation and event periods. As an alternative specification, a sample is created with the requirement that individual bonds in the sample have observations in each of the estimation months as well as the event month. This specification results in the omission of 10 firm observations from the sample, but has little effect on the results and are not reported.

average approach overestimates the standard error and biases the t-statistics downward since a firm's bonds are not perfectly correlated.[13]

Under the assumption that monthly abnormal yield spreads are normally distributed and cross sectionally independent, it is possible to determine whether the abnormal bond yield spreads are significantly different from zero using a simple *t* test.[14] The test statistic is then

$$t = \frac{\overline{AYS}}{S} \tag{4}$$

and is student-*t* distributed with N-1 degrees of freedom, where N is the number of firm observations. $\overline{AYS}$ is the mean abnormal yield spread observed during the announcement month and S is the standard deviation of the abnormal yield spreads computed as

$$S = \sqrt{\frac{1}{N-1}\left(\sum_{i=1}^{N}\left(AYS_i - \overline{AYS}\right)^2\right)} \tag{5}$$

While it would be preferable to use the estimation period variance to compute the test statistics as in Brown and Warner (1980) and Handjinicolaou and Kalay (1984), the short estimation period, three months, is problematic for a number of reasons. First, any estimate of the true variance in yield spreads is questionable given the short estimation period. Second, the standardized abnormal yield spreads are student-t distributed with T-1 degrees of freedom, where T is the length of the estimation period. From the properties of the student-t distribution the variance is

[13] I also perform the same tests using the all bond non-weighted average sample and find similar results.
[14] Distributional plots of the observed abnormal yield spreads indicate normally to be a reasonable assumption although the distribution is somewhat fat-tailed.

$\frac{v}{v-2}$ for $v > 2$, where v is the degrees of freedom.

Therefore, the three month estimation period implies that the standardized abnormal yield spreads will have increased variance and very fat tails. Implicit in mean adjusted event study methods of Brown and Warner (1980) and Handjinicolaou and Kalay (1984) is that the estimation period must be sufficiently long, say T>30, so that when the standardized abnormal yield spreads are combined into equally weighted portfolios the central limit theorem applies. The portfolio yield spreads can then be assumed to be normally distributed with a mean of zero and variance of 1/N so that testing consists of determining if the abnormal yield spreads are significantly different from zero. However, if the portfolio variance is greater than 1/N, then the resulting test statistics will be biased upwards leading to an increased incidence of Type I errors (rejecting the null hypothesis of zero mean abnormal yield spreads too often). As a robustness measure however, I report the results using the methodology of Handjinicolaou and Kalay (1984) in Appendix 2 along with results from non-parametric testing.

3.3.2 Abnormal Stock Returns

I next estimate shareholder reaction to the CEO turnover event using standard event study methods. The idea being if CEO turnover represents a realignment of interests between owners and mangers, then CEO turnover may be viewed positively by stockholders. If this realignment of interests is detrimental to bondholders then reaction to the turnover announcement may be different for stockholders and bondholders (e.g. the

agency cost of debt as in Jensen and Meckling 1976). In order to limit the influence of confounding events and to more accurately measure the immediate market response, I report abnormal stock returns on a daily basis. Additionally, I perform monthly estimations of abnormal stock returns[15]. The market model as in Brown and Warner (1985) is used and the CRSP equally weighted index serves as a proxy for the market portfolio. The estimation period for the daily market coefficients is comprised of 255 trading days, ending 31 days before the announcement date. Cumulative abnormal stock returns (CARs) over a three-day window of (-1,1) are tabulated and reported in the empirical section.

3.3.3 Changes in Firm Value

I also consider how CEO turnover announcements impact firm value. By investigating changes in firm value around CEO turnover events it is possible to quantify the scope of bondholder gains (or losses) relative to equity holders. This in turn will shed light on whether there is a wealth redistribution effect between the two cash flow claimants. The abnormal change in firm value is a function of both equity and debt valuations and is computed as follows:

$$\Delta V_i = \left(\left(ASR_i \times E_{i,t-1}\right) + \left(ABS_i \times D_{i,t-1}\right)\right) / \left(E_{i,t-1} + D_{i,t-1}\right) \quad (8)$$

where ΔV_i represents the abnormal change in firm value due to abnormal changes in both equity and debt value. The abnormal change in the equity value is the product of the

[15] See Appendix 3. In general, I find the monthly stock price reaction to CEO turnover announcements is not statistically significant. In contrast, the daily abnormal stock returns tend to be statistically significant. One explanation is that monthly returns incorporate other information about the firm that is not reflected in the daily returns.

abnormal stock return, ASR_i, and the firm's market capitalization in the month prior to the turnover announcement, $E_{i,t-1}$. The abnormal change in the debt value is the bond spreads, ABS_i, multiplied by the market value of debt in the month preceding the turnover announcement. The variable ABS_i is computed as the percentage change in the debt value derived from the firm's weighted average abnormal yield spread and duration (multiplied by -1). Note that the sign on duration is negative because price and yield are inversely related. The change in the traded value of the firm is the summation of the changes in the equity and traded debt values divided by the market capitalization of both debt and equity. Assuming both stock returns and yield spreads are normally distributed, the event period variance is used to compute *t* statistics[16].

The nonparametric signed rank test is used to check the robustness of the parametric methods described above. The nonparametric testing methods make no assumption regarding the underlying distribution of the abnormal yield spreads, except of course that the distribution is symmetric. The results are segmented to investigate the effects of CEO turnover on yield spreads, stock returns, and changes in firm value. These segmentations include forced vs. voluntary, inside vs. outside firm replacements, inside vs. outside industry replacements, and non-investment vs. investment grade debt. Finer segmentation using differing combinations of above segmentations are also examined (e.g. forced and outside replacement announcements). By segmenting the data by the nature of CEO turnover bondholder reaction to changes in differing levels of firm specific risk can be assessed.

[16] While it would be preferable to use the estimation period to compute the standard error and therefore the t-statistic, however this approach is problematic due to the different estimation periods and specifications of each security class.

3.4 Impact of CEO Turnover on Probability of Change in Credit Ratings

The probability of default for a bond is embedded in the yield spread. Since firm specific risk factors are related to the probability of bankruptcy (e.g. Opler and Titman 1994; Asquith, Gertner, and Sharfstein 1994), CEO turnover events may be related to the likelihood of default if these events affect firm specific risk. Clayton et al. (2005) note increased future equity volatility, and therefore increased risk, for forced, outside firm, and outside industry replacements relative to voluntary, inside firm, and inside industry replacements. If bondholders view the turnover event as increasing the risk of firm debt they may require additional risk premia as compensation for the increased likelihood of default. As the risk of default is an important component to the rating of bonds, then credit rating downgrades should be related to those turnover events most likely to increase the likelihood of default. Alternatively, if CEO turnover events are associated with a decreased likelihood of default via improved strategic policies, then credit rating upgrades may be more likely. Therefore, the hypothesis of interest is;

Hypothesis 7: Credit rating changes are related to forced, outside firm, and outside industry replacements.

To test the hypothesis that CEO turnover is related to the incidence of credit rating changes, the following logit model is estimated;

$$E(RatingChange_{i,t}) = \left(\begin{array}{l} 1+\exp\ (-\beta_0 - \beta_1(Size) - \beta_2(Leverage_{i,t}) - \beta_3(\mathrm{Return}_{t-6_{i,t}}) - \beta_4(Institution_{i,t}) \\ -\beta_5(BoardSize_{i,t}) - \beta_6(BoardIndependence_{i,t}) - \beta_7(Age_{i,t}) - \beta_8(Tenure_{i,t}) \\ -\beta_9(CEOownership_{i,t}) - \beta_{10}(Forced_{i,t}) - \beta_{11}(Outside_{i,t}) - \beta_{12}(OutsideIndustry_{i,t}) \\ -\sum_{y=1974}^{2000} \beta_y(Year_y) - \sum_{sic=1}^{8} \beta_{sic}(Industry_{sic})) \end{array} \right)^{-1}$$

where $RatingChange_{i,t} = 1$ if the firm's credit rating is either upgraded or downgraded in the month following the turnover announcement and 0 otherwise. The likelihood of credit rating upgrades and downgrades are estimated in separate models. The primary interest is in the *Forced, Outside Firm, and Outside Industry* indicator variables coefficient estimates. I also control for year and industry effects using dummy variables (in the above model, the $\sum_{y=1974}^{2000} \beta_y (Year_y)$ and $\sum_{sic=1}^{8} \beta_{sic} (Industry_{sic})$ notations represent year and industry dummy variables). The remaining control variables are discussed in the data description table below. A more complete discussion of the variables is provided in the data section.

Variable	**Description**
Size	Computed as the natural log of total assets as reported by Compustat in the year prior to the turnover announcement.
Leverage	The ratio of the book value of debt to the book value of total assets.
Return	Industry adjusted stock returns for the six month period preceding the turnover announcement.
Rating	Credit rating of the firm's publicly traded debt.
Duration	The sensitivity of a bond's price to a change in yield.
Convexity	Captures bond price sensitivity not explained by duration.
Liquidity	The liquidity of the debt issued proxied by the age of the debt.
Institution	The percentage of shares outstanding held by financial institutions.
Board Size	The number of board directors divided by the natural log of total assets.
Board Independence	The ratio of outside or independent board members to the number of board members.

It is possible that the weighted average sample may be affected by individual bonds of a given firm entering and exiting the sample, thereby introducing an unknown bias. To preclude the possibility of differing bonds in the event month and post event month, the logit models are estimated with the all bond sample.[17] Various other control measures are introduced to the primary specifications and similar results are obtained.[18]

If forced, outside and outside industry replacement decisions are associated with increased risk of default, then the predicted sign on the *Forced, Outside, and Outside Industry* coefficient estimates is positive for the downgrade model ($RatingChange_{i,t}$= 1 when an issue is downgraded in the month following the turnover announcement). Since firms experiencing CEO turnover are associated with poor performance, I have no prior expectation of a significant relationship between forced, outside, and outside turnover events and the likelihood of credit rating upgrades.

3.5 CEO Turnover Likelihood and Yield Spreads

Outside monitors may force boards to more effectively discipline top managers. The presence of large blockholders (Denis, Denis, and Sarin 1999) and institutions (Black 1992) increase the likelihood of CEO turnover. If boards are concerned with the cost of debt financing, then it is plausible that they may consider the market price of debt in the replacement decision. There is anecdotal evidence that bondholders have actively lobbied boards to remove poorly performing CEOs (Forbes, February 2, 2004, pages 60-61). Of

[17] I also estimate the logit models using the weighted average sample and find qualitatively similar results.
[18] For example, the lag yield spread to measure overall spread levels, change in yield spreads prior to the announcement, prior credit rating changes, and yield spread volatility all are investigated and do not dramatically affect the results. These variables are not included in the primary specification in the interest of parsimony.

course, there may be an endogenity issue in that yield spreads tend to increase as firm performance decreases. The hypothesis of interest is therefore;

Hypothesis 8: The cost of debt, measured as the mean yield spread prior to the turnover announcement, is positively related to the likelihood of CEO turnover after controlling for firm performance.

A logit model is estimated on the weighted average sample to test the hypothesis that yield spreads are associated with the likelihood of forced turnover.[19] Year and industry dummy variables are included to control for year and industry effects. The model estimated is;

$$E(Forced_{i,t}) = \begin{pmatrix} 1+\exp(-\beta_0 - \beta_1(MeanYield_{i,t}) - \beta_2(NonInvestment_{i,t}) - \beta_3(MeanYieldxNonInvestment_{i,t}) \\ -\beta_4(Size) - \beta_5(Leverage_{i,t}) - \beta_6(\mathrm{Re}turn_{t-6_{i,t}}) - \beta_7(Institution_{i,t}) - \beta_8(BoardSize_{i,t}) \\ -\beta_9(BoardIndependence_{i,t}) - \beta_8(Age_{i,t}) - \beta_9(Tenure_{i,t}) - \beta_{10}(CEOownership_{i,t}) \\ -\sum_{y=1974}^{2000}\beta_y(Year_y) - \sum_{sic=1}^{8}\beta_{sic}(Industry_{sic})) \end{pmatrix}^{-1}$$

where the binary variable, $Forced_{i,t}$ equals 1 is the incumbent CEO is forcibly removed and zero otherwise for firm *i* at time *t*. The primary interests are the cost of debt variables. $MeanYield_{i,t}$ is the mean yield spread during the three months prior to the turnover announcement, $NonInvestment_{i,t}$ is a binary variable taking the value of one for non-investment grade debt and zero for investment grade, and $MeanYieldxNonInvestment_{i,t}$ an interaction term between mean yield spread and investment grade. If the cost of debt is related to CEO turnover then the $MeanYield_{i,t}$ and $NonInvestment_{i,t}$ coefficient estimates are predicted to be positive. As in the likelihood of credit rating downgrade model, the

[19] As a robustness check I also conduct the analysis by using the all bond, non-weighted sample and find similar results.

remaining items in the model are described briefly below and serve as control variables. A more complete description of the variables is provided in the data section.

Variable	Description
Size	Computed as the natural log of total assets as reported by Compustat in the year prior to the turnover announcement.
Leverage	The ratio of the book value of debt to the book value of total assets.
Return	Industry adjusted stock returns for the six month period preceding the turnover announcement.
Rating	Credit rating of the firm's publicly traded debt.
Institution	The percentage of shares outstanding held by financial institutions.
Board Size	The number of board directors divided by the natural log of total assets.
Board Independence	The ratio of outside or independent board members to the number of board members.
Age	An indicator variable assigned a value of 1 for incumbent CEOs whose age at the announcement greater than 60 years and zero otherwise.
Tenure	The tenure of the outgoing CEO defined as the number years since being appointed to the CEO position.
CEOownership	The percentage of shares outstanding owned by the incumbent CEO prior to the announcement.

3.6 CEO Characteristics and the Cost of Debt Financing

Changes in a firm's cost of debt financing may also be affected by incumbent CEO characteristics. Previous research has documented positive correlations between certain incumbent CEO characteristics and the likelihood of turnover. The incumbent CEO's age, tenure, and stock ownership are likely to contain information of the incumbent's level of

alignment with shareholders. Parrino, Poteshman, and Weisbach (2003) contend managers with increased levels of equity based compensation will tend to pursue lower risk projects. As equity ownership is likely to increase with tenure and age, the cost of debt may be negatively related to incumbent CEO characteristics that proxy for risk aversion. The hypotheses of interest are therefore;

Hypothesis 9: The cost of debt is negatively related to incumbent CEO age.

Hypothesis 10: The cost of debt is negatively related to incumbent CEO tenure.

Hypothesis 11: The cost of debt is negatively related to incumbent CEO stock ownership.

In order to test the hypothesizes relating abnormal changes in the cost of debt financing, I regress weighted yield spread ratios (*YSR*), computed as the ratio of raw yield spread to the mean of raw yield spreads for the previous three months, obtained from the event study against incumbent CEO characteristics and control for firm and monitoring specific information.[20] The yield spread ratio is used rather than the abnormal yield spread since a given abnormal yield spread may have different implications as the overall level of yield spreads change (e.g. a 20 basis point abnormal yield spread may be more meaningful if the level of raw yield spreads is 25 basis points versus 250 basis points).

I also control for year and industry effects using dummy variables. The primary regression is

$$YSR_{i,t} = A_0 + A_1(Size_{i,t}) + A_2(Leverage_{i,t}) + A_3(Return_{t-6,t}) + A_4(Rating_{i,t}) + A_5(Duration_{i,t}) + A_6(Convexity_{i,t}) + A_7(Liquidity_{i,t}) + A_8(Institution_{i,t}) + A_9(Board_Size_{i,t}) + A_{10}(Independence_{i,t}) + A_{11}(CEO_Age_{i,t})$$

[20] As an alternative specification, I also use the natural log of the abnormal yield spread (AYS) as the dependent variable and find similar results.

$$+ A_{12}(Tenure_{i,t}) + A_{13}(Ownership_{i,t}) + A_{14}(Own*Tenure_{i,t})$$

$$+ \sum_{y=1974}^{2000} A_y(Year_y) + \sum_{sic=1}^{8} A_{sic}(Industry_{sic}) + \varepsilon_{k,t} \quad (9)$$

As a secondary specification, I estimate the above model incorporating random firm, year and industry effects using the all bond (non-weighted average) sample consisting of 3398 observations. Additionally, student-t error model maximum likelihood parameter estimates are computed as the overall yield spread distribution is heavy tailed due the presence of several extreme observations. The presence of these outliers could possibly bias the ordinary least squares parameter estimates therefore non-linear estimates are more likely to accurately reflect the underlying relationships of interests. The specification is

$$\begin{aligned} YSR_{i,t} = F\{&A_1(Size_{i,t}), A_2(Leverage_{i,t}), ,A_3(Return_{t-6,t}), A_4(Rating_{i,t}),\\ &A_5(Duration_{i,t}) ,A_6(Convexity_{i,t}) , A_7(Liquidity_{i,t}) , A_8(Institution_{i,t}),\\ &A_9(BoardSize_{i,t}), A_{10}(BoardIndependence_{i,t}), A_{11}(CEO_Age_{i,t})\\ &A_{12}(Tenure_{i,t}), A_{13}(Ownership_{i,t}), A_{14}(Own*Tenure_{i,t})\} + \varepsilon_{i,t} \end{aligned} \quad (9)$$

where ($YSR_{i,t}$) is the yield spread ratio for bond *i* at time *t*, computed as the yield spread for each individual bond in the announcement month divided by the mean yield spread for the previous three months (the expected yield spread in the event study).

The primary interests are the CEO characteristic coefficient estimates on age (A_{11}), coefficient on CEO tenure (A_{12}), and the coefficient on CEO stock ownership (A_{13}). In the above specifications, I expect the coefficients on CEO age, tenure, and stock ownership to be positive. The above models also include an interaction term, Own*Tenure to capture the likely relation between CEO equity ownership and tenure. The remaining variables are

briefly discussed below, while a more detailed discussion of the variables is located in the data section.

Variable	Description
Size	Computed as the natural log of total assets as reported by Compustat in the year prior to the turnover announcement.
Leverage	The ratio of the book value of debt to the book value of total assets.
Return	Industry adjusted stock returns for the six month period preceding the turnover announcement.
Rating	Credit rating of the firm's publicly traded debt.
Duration	The sensitivity of a bond's price to a change in yield.
Convexity	Captures bond price sensitivity not explained by duration.
Liquidity	The liquidity of the debt issued proxied by the age of the debt.
Institution	The percentage of shares outstanding held by financial institutions.
Board Size	The number of board directors divided by the natural log of total assets.
Board Independence	The ratio of outside or independent board members to the number of board members.
Age	An indicator variable assigned a value of 1 for incumbent CEOs whose age at the announcement greater than 60 years and zero otherwise.
Tenure	The tenure of the outgoing CEO.
CEOownership	The percentage of shares outstanding owned by the incumbent CEO prior to the announcement.

3.7 Conclusions

The hypotheses regarding the volatility and subsequent increases in the firm's cost of debt are based on the premise that no two managers are likely to perform in exactly the same manner. As such, each CEO will have different strategic preferences, incentives, and innate abilities. CEO turnover is an important governance device by which the board not only disciplines poorly performing managers, but also presents an opportunity to realign top

management and shareholder interests. CEO turnover may provide insight as to whether significant strategic policy changes are desired by the board. The nature of succession (forced vs. voluntary and outside vs. inside) may provide additional information concerning the likelihood of significant strategic policy changes. Shareholders react significantly and positively to forced and outside turnover announcements, anticipating improvements in firm performance. Future increased equity volatility for firms following CEO turnover implies greater firm specific risk. The increased likelihood of default following some turnover events has implications for bondholders. This increased risk may be beneficial to equity holders while simultaneously increasing the firm's cost of debt. This dissertation seeks to examine whether at least some of the gains enjoyed by shareholders comes at the expense of the firm's bondholders in the form of risk shifting. Additionally, this research investigates how bondholders react to CEO turnover and what factors influence their reaction.

CHAPER IV

DATA DESCRIPTION

This Chapter details the sample generation process for the 674 observations of CEO turnover events occurring from 1973 to 2000. Section 4.1 highlights the data sources used to create the sample and identifies variables to be used in the analysis. Section 4.2 details how the cost of debt is measured while Section 4.3 introduces additional variables and motivation for their inclusion in the study. Descriptive statistics for the data employed in the analysis are presented in Section 4.4. I investigate security volatility for both stocks and bonds around the CEO turnover event in Section 4.5. Finally, in Section 4.6 the methods used to account for missing variables is introduced.

4.1 Data Sources

This study utilizes five databases; The Lehman Brothers Fixed Income (LBFI) database, Parrino's (1997) database identifying those CEOs listed in the Forbes annual compensation survey who have held their position for one year or less, the Compustat database for financial and firm specific information, the CRSP database for equity pricing information, and the Bloomberg financial database which contains more recent bond pricing data than currently available in the LBFI database. The LBFI database contains month-end security specific information such as bid price, coupon, yield, credit ratings from Moody's and S&P, duration, convexity, and quote, issue, and maturity dates on nonconvertible bonds that are used in the Lehman Brothers Bond Indexes. Securities are included in various Lehman Brother Bond Indexes based on firm size, security liquidity, credit ratings, maturity,

and trading frequency. The latest version of the LBFI covers the period from January 1973 to March 1998. The LBFI is commonly used in the fixed income literature and Elton, Gruber, Agrawal, and Mann (2001) argue the LBFI accuracy is comparable to CRSP data.[21] While the LBFI does not contain every fixed income security issued by U.S. firms, Klock, Mansi, and Maxwell (2003) argue there is no reason to suspect any systematic bias.

The Parrino (1997) database includes CEO turnover related information on 1,339 events occurring from December 1969 to January 1995. CEO turnover events are identified by noting those CEOs on Forbes annual survey of the approximately 800 highest compensated executives of U.S. firms. The Forbes survey is then examined to identify instances where the current year CEO differs from the previous year's CEO. The incumbent and replacement CEOs' age, employment history, tenure with the firm, and tenure in office are obtained from proxy statements, the Forbes surveys, and press reports. The Wall Street Journal is used to obtain the announcement date of the turnover event and to gather information concerning the circumstances of the event. Succession events are deemed to be forced under the following criteria; 1) the announcement in the Wall Street Journal explicitly states the turnover event as forced or the incumbent CEO is departing for unspecified policy differences; 2) in the case of the incumbent CEO departing is 60 years of age or less, the Wall Street Journal Announcements are reviewed and the turnover event is deemed forced if a) no mention of death, poor health, or the acceptance of another position, or b) stated reason for turnover is retirement but no prior retirement announcement at least 6 months prior to the turnover event is observed. A CEO is considered an outsider if he or she has been with the firm less than 1 year prior to the announcement date. CEO

[21] The Lehman Brothers Fixed Income database has been utilized in Anderson, Mansi, and Reeb (2003), Maxwell and Stephens (2003) and Billett, King, and Mauer (2004) and other studies of fixed income securities.

ownership data is obtained from either the Standard and Poor's Execucomp database or through proxy statements. In either case, the reported ownership level is the percentage of outstanding shares held by the departing CEO in the latest period prior to the succession announcement. Additionally, the Wall Street Journal is reviewed around the turnover event for any indication of takeover pressure. Firms under takeover pressure are removed from the sample.

The Standard and Poor's Compustat database is used to gather financial and firm specific information. The Compustat database includes data found in balance sheets, income statements, sources and uses of funds, fiscal periods, and industry classification for over 24,000 U.S. firms and for most variables of interest the data is available from 1973 through 2000. Mergent Industrial, Utilities, and Banking and Financial Bond Records are used to obtain accounting information for firms not covered by Compustat. Institutional ownership data however, is only available for the most current year in Compustat. The Standard and Poor's Year End Security Owner's Stock Guide is used to obtain institutional ownership, computed as the percentage of outstanding shares held by institutions, for the 1972 to 2000 time period. Net income, total assets, operating income, interest expense, depreciation and amortization expense, book value of long term debt, and firm sales for all companies are expressed in U.S. dollars. The Center for Research in Security Prices (CRSP) database provides equity pricing data for most publicly traded corporations. The CRSP database is used to gather daily and monthly dividend adjusted stock returns for the 1971 through 2000 period.

In order to include more recent data from the late 1990s, this study uses the methods of Parrino (1997) to cover the 1995 to 2000 period, yielding an additional 329 instances of

CEO turnover.[22] CEO ownership data for this extended period is obtained from the companies' annual proxy statements. Likewise, bond data is gathered from the Bloomberg Financial database from January 1998 to December 2000 for those firms identified as experiencing CEO turnover during that period. The Bloomberg Financial database provides month-end issue, quote, and maturity dates, bid prices, coupon, yield, and issues outstanding for over 5,000 securities from a variety of sources including bond dealers and exchanges. Historical credit rating information is not universally available via Bloomberg and therefore the Mergent Bond Record is used to obtain historical credit ratings not reported by Bloomberg. Likewise, Bloomberg does not consistently report historical bond amount outstanding information; in which case the Mergent Bond Record is used to obtain issues outstanding data. The LBFI, Parrino (1997), Bloomberg, CRSP, Compustat, and the 1995 to 2000 extension of the Parrino (1997) databases are merged to obtain the sample. The final sample consists of 674 observations of CEO turnover from 415 unique firms during the January 1973 to December 2000 time period.[23]

4.2 Measuring the Cost of Debt Financing around CEO Turnover

A bond's yield spread is used to measure the cost of debt financing. The yield spread is defined as the difference between the bond's weighted average yield to maturity and that of a corresponding Treasury matched on duration and is commonly used in the fixed income

[22] Regulation FD, fair disclosure, was implemented in November, 2000. One result of Regulation FD was to give credit rating agencies an informational advantage relative to equity analysts. To avoid complications arising from different monitoring regimes, turnover events occurring after October 31, 2000 are not included in the sample.

[23] The sample generation process actually yields 679 observations, however 5 observations have yield spreads that are so extreme as to question their validity. As such, they are deleted from the sample. A detailed description of the suspect observations is provided in Appendix A.1

literature as a measure of a bond's risk premium.[24] A bond's yield is the discount rate that equates future coupon and maturity cash flows to its current price. Since many of the firms in the sample have multiple issues outstanding, yield spreads are calculated using a weighted average based on the number of bonds outstanding for each issue. If there is no corresponding Treasury for a given duration, the yield spread is calculated using interpolation based on the Nelson and Siegel (1987) functional form as in Anderson et al. (2003).

4.3 Additional CEO, Firm, and Security Measures

In order to account for changing yield spreads as a result of differing CEO, firm, and security characteristics several control variables are implemented in the event study and cross sectional analyses.[25] Incumbent CEO age is associated with increased likelihood of CEO turnover, (Parrino 1997), and a binomial variable (*Old*) is assigned a value of 1 of the incumbent CEO is older than 60 years and zero otherwise. The incumbent CEOs tenure (*Tenure*) may influence the board's decision to discipline poor performers (Allgood and Farrell 2000). Tenure is defined as the time in years the incumbent has held her position as of the turnover date. CEO ownership (*Ownership*) is positively related to tenure (Allen 1981) and Anderson, Mansi, and Reeb (2003) report stock ownership is inversely related to the firm's cost of debt. CEO ownership is computed as the percentage of shares outstanding held by the incumbent CEO in the year prior to the turnover event.

[24] See, for example Duffie (1998), Klock, Mansi, and Maxwell (2003), and Anderson, Mansi, and Reeb (2003).

[25] There is evidence founding family status of the incumbent CEO lowers the sensitivity of CEO turnover to firm performance (Parrino 1997) and founding family ownership is inversely related to the cost of debt (Anderson, Mansi, and Reeb 2002). However, for the 1973 to 1995 period the sample contains only 37 founding family incumbent CEOs. Of the founding family CEO turnover events only one was forced and only five were replaced with CEOs from outside the firm; therefore founding family status is not considered.

It has been noted that equity prices of larger firms are more sensitive to forced and outside turnover event than are their smaller cohorts (Reinganum 1985, Berry et al. 2003 and others). The natural log of the firm's total assets (*Size*) is used to control for the influence of firm size, where total assets is the book value of the firm. An alternative measure of firm size, the total sales of the firm, could be used but our sample includes financial firms and such a measure would necessarily exclude those firms from study. Differences in capital structure across firms are controlled by the inclusion of firm leverage in cross sectional analysis. Leverage is the ratio of the book value of long term debt to the book value of total assets. Firm performance is measured by industry adjusted stock returns (*Return*) over the preceding six months beginning one month prior to the announcement. Stock returns are adjusted to account for any industry effects or mean reversion by subtracting the industry mean return for six months prior to the announcement[26]. A firm's industry classification is determined by its two digit Standard Industrial Classification code. Clark (1989) finds that two digit SIC code classifications capture group characteristics as well as three or four digit SIC codes. Outside blockholders may perform a monitoring function similar to boards (Black 1992) and Denis, Denis, and Sereno (1996) provide evidence that the likelihood of top management turnover is positively related to the presence of large blockholders. To control for outside monitoring institutional ownership, *Institution* is calculated as the percentage of shares outstanding held by institutions as reported in the Standard and Poor's Year End Security Owner's Stock Guide for the year prior to the turnover announcement.

There is considerable evidence that outside dominated or independent boards are more effective monitors of firm and CEO performance. For example, Weisbach (1988) reports

[26] Various other periods are considered to control for firm performance. I estimate all models using 6, 12, and 18 month prior stock performance and find similar results.

CEO turnover is more responsive to firm performance as outsider board representation increases. Similarly, Borokhovich, Parrino, and Trapani (1996) and Huson, Malatesta, and Parrino (2004) find outside dominated boards are more likely to choose outside candidates in the CEO replacement decision. Additionally, Anderson, Mansi, and Reeb (2004) report lower debt costs for outside dominated boards. Therefore, to evaluate the effects of board structure, I use two proxies from the literature, board size and board independence. Although it is common to use the natural log of the number of board members as a proxy for board size, the ratio of the number of board members divided by the natural log of total assets may be a better proxy. The rationale is that board size and firm size exhibit large correlations with one another. As such, scaling board size by firm size mitigates this concern.[27] Board independence is computed as the ratio of outside, or independent, board members to total board members.[28] I expect board structure to be significantly related to bond pricing and to the cost of debt financing. Control variables specific to the debt issue include liquidity, duration, convexity, and credit ratings. Green and Odegaard (1997) find liquidity is positively priced in the debt market as more recent issues are traded more frequently than older ones. Debt age (*Age*) is used as a proxy for liquidity and is computed as the time in months elapsed from the issuance date of the bond until the end of the month in which a turnover event occurs. Differences in default risk are measured by bond credit ratings (*Rating*), obtained from either Moody's or Standard and Poor's credit rating services. The average rating from both services is given when available; otherwise the rating is

[27] Performing the tests using the number of board members or the natural log of members yields similar results.

[28] Huson et al.. (2001) report increased frequency of CEO turnover during the late 1980s and 1990s, coinciding with increased incentive pay for board members. I investigate abnormal yield spread around CEO turnover using an indicator variable with the value of one for turnover events occurring after December 31, 1988 and find similar results.

obtained from either service. Each rating services letter score is converted to a numerical value with D Rated bonds receiving a 1 numerical score, and the highest rated bonds are given a numerical value of 23. Duration (*Duration*) and Convexity (*Convexity*) are used to control for term structure effects. Since many of the firms in the sample have multiple issues outstanding, bond characteristics are calculated using a weighted average based on the number of bonds outstanding for each issue.

4.4 Sample Description

Basic descriptive statistics for the full, forced, and outside firm samples are shown in Tables 4.1, 4.2, and 4.33 respectively. The mean (median) incumbent CEO age at the time of the replacement announcement is about 62(63) years. As noted in previous studies the incumbent CEO who is forcibly removed tends to be younger, indicating a possible lack of experience and or ability when appointed. Table 4.2 shows the mean (median) age of the incumbent CEO experiencing forced turnover is 56 (56) years, consistent with other studies. Table 4.3 reports the mean (median) incumbent CEO age is 60(61) years, the finding of greater incumbent age for the outside replacements relative to forced is not surprising since many outside replacements, but not all, are also forced. The successor mean (median) age of 54(54) is similar for all types of turnover in the sample, although the forced and outside replacement firms report slightly younger successor CEOs, 54(53) years and 53(52) years respectively. Not surprisingly, incumbent CEO age exhibits slight negative skewness attributable to normal retirement occurring at age 65 years. However, the forced turnover sample exhibits slight positive skewness, again attributable to forced turnover CEOs not reaching normal retirement age. Due to the normal retirement age of around 65 years, the

overall sample exhibits some positive kurtosis as well, in fact about 44 percent of all turnovers occur from age 64 to 66 years.

The departing CEO has a mean (median) tenure of 9.3(7.8) years. As expected, the mean (median) tenure for forcibly removed CEOs is shorter, 6.2(5.1) years. Given that many turnovers are combinations of forced and outside replacement, the mean (median) tenure for outside replacement firms of 7.7(6.5) years is not surprising. CEO stock ownership is similar across all types of CEO turnover. The mean (median) CEO stock ownership as a percentage of shares outstanding is 0.83(0.18) percent with forced and outside replacement CEOs have mean (median) ownership levels of 0.82 (0.17) percent and 0.88 (0.16) percent respectively.

The mean (median) reported total assets for the full sample is $13,809.498 (4,262.500) million, while the total assets for forced and outside replacement firms are $10,554.101 (3,862.400) million and $17,595.670 (5,114.370) respectively. The larger size of outside replacement firms appears contradictory to Berry et al. (2003) and Parrino (1997) who find a negative relation between firm size and the likelihood of outside replacement. However, the outside replacement firms have a larger standard deviation of total assets indicating the possibility of a few very large firms influencing the mean firm size. For example, in 1998 and 2000 Ford Motor Company and Bank One replaced their CEOs from outside; these two firms have totals assets of over $409 and $269 billion respectively.

Tables 4.1, 4.2 and 4.3 also report the leverage for the full sample, forced turnover, and outside replacement firms. The reported median leverage for all types of turnover is approximately 21% and there does not seem to be any indication forced turnover or outside replacement firms have any higher degree of leverage than voluntary or inside replacement

firms. Forced turnover and outside replacement firms do tend to under perform the voluntary and inside replacement firms from both an accounting and stock return perspective, consistent with the notion that boards discipline managers for poor firm performance. The full sample reports a mean (median) ROA of 3.32 (3.74) percent versus a lower ROA of 0.15(1.13) percent for the forced CEO turnover sample. The outside replacement sample has a mean (median) ROA of 1.24(1.78) percent an indication boards of poorly performing firms seek outside CEOs to change the failed strategic policies of the firm. Likewise, forced and outside replacement firms are associated with lower industry adjusted six month stock return prior to the announcement. The overall sample experiences a –0.64 percent industry adjusted return compared to –2.69% and –1.65% industry adjusted returns for forced and outside replacement firms. In general, accounting and stock return measures of performance presented in Tables 4.1, 4.2, and 4.3 are consistent with prior literature documenting the relation between poor performance and CEO turnover.

The mean (median) level of institutional ownership for the full sample of firms is 42.97(45.46) percent. Interestingly, the forced replacement sample has a slightly higher mean (median) level of institutional ownership of 43.22(45.84) percent. Likewise, the outside replacement firms have mean (median) intuitional ownership levels of 43.82(45.91) percent. The reported institutional ownership levels of the sample do not seem to indicate institutional investors avoid poorly performing firms who have an increased likelihood of forced turnover. Board structure also appears to be consistent across categories with a mean overall board size of 16.23 members and marginally independent with about 64% of members selected from outside the firm.

The yield spreads for the full sample are also reported in Table 4.1. The mean (median) yield spread for the 674 observations of CEO turnover is approximately 172(117) basis points. The yield spread for forced turnover events reflect the greater uncertainty about future cash flows and the relative poor performance of the firms. The mean (median) yield spread for the forced turnover sample is 339(187) basis points. Similarly, the mean (median) yield spread for the outside replacement firms is 251(165) basis points.

There is some difference between the full sample and the classifications of CEO turnover with regard to the firms' age and duration of debt. The full sample has mean values of age of debt and duration of 5.4 years and 6.6 years respectively (Table 4.1). Forced and outside replacement firms report somewhat shorter age and duration values in Tables 4.2 and 4.3.

Table 4.1 also shows the mean and median credit rating for the full sample. The numerical assignment for credit ratings assigns a value of 1 for D rated bonds and 23 for the highest rated bonds. The full sample has a mean (median) credit rating of about 16.7(17.0) which correspond to a median rating of A3 from Moody's Investor Services and A- from Standard and Poor's. The mean (median) credit ratings for forced CEO succession are reported in Table 4.2 as 14.4(15.1). The median credit rating for forced turnover firms is equivalent to a Baa2 from Moody's and BBB from Standard and Poor's, thereby classifying the firms debt as lower medium investment grade. Outside replacement firms have a median debt credit rating of BBB+ from Standard and Poor's (Table 4.3).

The convexity measure for the full sample has a mean (median) value of 0.744 (0.674). Table 4.2 shows the forced turnover sample has a mean (median) convexity measure of

0.667 (0.591). The outside CEO replacement firms in the sample have a mean (median) convexity of 0.670 (0.506).

Panel A of Table 4.4 provides the number of CEO turnovers in the sample by period (1973-1979, 1980-1989, and 1990-2000) and for the full sample period. The sample covers 674 CEO turnover events over the period from 1973 to 2000 segmented by turnover announcement into all turnovers, voluntary turnovers, and forced turnovers. The results show that 85% of the sample had voluntary turnovers vs 15% forced turnovers; 80% of CEOs were replaced by an insider of the firm vs 20% from outside the firm; and 90% of all replacements occurred from the same industry. These results are similar to the sample not matched by the availability of bond pricing data (in this larger sample of 1668 turnover events from 1970 though 2000 approximately 17% and 22% of all turnovers are identified as forced and outside replacement events respectively). Most of the turnovers occurred in the 1990s (41%) and 1980s (38%). Segmenting the data into firms with investment and non-investment grade debt, I find that 87% of the sample had investment grade debt vs 13% non-investment grade debt. This is expected since the Lehman Brothers database started compiling non-investment grade debt predominantly after 1992.

The sample generation process, whereby turnover events are identified using the Forbes annual compensation surveys may introduce a bias by weighting some industries more so than others. This bias could make the results applicable only to certain industries. Panel B of Table 4.4 lists the frequency of turnover by industry membership using one digit SIC codes. Table 4.4 also lists the frequency of forced and outside replacement decisions. Manufacturing and financial industries (SIC codes 2, 3, and 6) represent approximately two thirds of all turnover events, including forced and outside replacements. Since these single

digit SIC codes also represent about two thirds of all firms[29], it seems unlikely there is any bias in the sample arising from the over or under representation of any single industry.

4.5 Security Volatility around CEO Turnover Events

A change in the volatility of security returns has different implications for various claimants in the levered firm. Viewed in an options framework, an increase in volatility increases the value of the call option to the residual claimants (equity holders) to the detriment of bondholders. If the risk of the firm increases, bondholders suffer a loss in the value of their claims because of a possible increase in the cost of debt financing. To assess whether CEO turnover events are associated with an increase in future equity and debt volatility, I compute standard deviations of stock and bond returns around CEO turnover announcements.

Table 4.5 provides the pre-turnover, post-turnover, and change in stock and bond return volatility results for all turnovers, voluntary and forced turnovers, inside and outside replacement turnovers, and investment and non-investment grade debt firms. In addition, tests for statistical significance of volatility changes for both stocks and bonds are provided. In doing so, I calculate the annualized standard deviation of daily stock returns for the two year (500 days) period preceding the turnover announcement. I then compute the annualized standard deviation of monthly bond returns for the two year pre-turnover period. Likewise, I compute the annualized standard deviations of both stock and bond returns for the one year period following the turnover announcement. The change in equity and debt volatility around CEO turnover events is computed as the natural log of the ratio of post-

[29] Verified by the proportion of firms in each single digit SIC code from January 1973 to December 2000 using the CRSP database.

turnover volatility to pre-turnover volatility.[30] Consistent with the hypothesis that turnover announcements are associated with increased future security volatility (Clayton et al., 2005), I find that firms in the sample experience higher variance in stock and bond returns following the announcement of a CEO turnover (31% vs 18% in the post turnover announcement for stock and bonds, respectively). I also find that ratio of post to pre turnover volatility is greater for bonds than for stocks For the full sample the ratio of post to pre-event volatility is around 4% for stock returns and approximately 19% for bond returns. These results are significant at the five percent and one percent level for stock and bond returns respectively.

More statistically and economically significant results are observed when the incumbent CEO is forced out (log ratio of about 15% for stocks and 51% for bonds), when the replacement is from outside the firm (around 10% for stocks and 31% for bonds), and when the firm has non-investment grade debt (about 19% for stocks and 51% for bonds). The results presented in Table 4.5 provide support for the hypothesis that bondholders and stockholders may react differently to CEO turnover.

4.6 Missing Variable Estimation

The sample generation process results in 674 observations of CEO turnover with matched bond pricing data. Accounting and stock return information is then matched to obtain the sample used for cross sectional analysis of the firm's cost of debt around the CEO turnover event. One difficulty encountered by most financial studies concerns missing variables. Many studies exclude observations with any missing variables from the analysis. If the explanation for the missing variable is unrelated to the object of the study, here

[30] Similar results are found using different pre and post announcement periods.

changing yield spreads as a result of CEO turnover, then omitting the observations with missing variables is not likely to lead to improper inferences. Since this study includes a considerable number of firms under some degree of financial distress, it is possible the reason certain data is missing may be related to yield spreads. For example, a firm may be included in financial databases in some periods and not others as a result of changes in firm size which are related to firm performance. While analyzing only observations with complete information is commonly done and has the advantage of simplicity, the information contained in observations with missing variables is lost. Omitting observations with missing variables also ignores possible systematic differences between observations with no missing variables and those that contain missing variables. The resulting inferences from the analysis using only complete observations may not be applicable to the all firms experiencing CEO turnover, the possibility of improper inference increases as the number of omitted observations increase. To improve efficiency, the method of multiple imputation (Rubin 1976;1987), used in Frank and Goyal (2003) is used to guard against improper inferences resulting from the exclusion of observations with incomplete information. [31]

As stated in the SAS documentation of the multiple imputation procedure,

"Another strategy for handling missing data is simple imputation, which substitutes a value for each missing value. Standard statistical procedures for complete data analysis can then be used with the data set with estimated values for missing data. For example, each missing value can be imputed with the variable mean of the complete cases, or it can be imputed with the mean conditional on observed values of other variables. This approach treats missing values as if they were known in the complete-data analysis. However, single imputation does not reflect the uncertainty about the predictions of the unknown missing values, and the

[31] For a more complete discussion of the Multiple Imputation method see the SAS document 'The MI Procedure' @ support.sas.com/rnd/app/papers/miv802.pdf.

resulting estimated variances of the parameter estimates will be biased toward zero (Rubin 1987, p. 13). Multiple imputation (MI) instead replaces each missing value with a set of plausible values that represent the uncertainty about the right value to impute. The multiply imputed data sets are then analyzed by using standard procedures for complete data and combing the results from these analyses.

MI does not attempt to estimate each missing value through simulated values but rather to represent a random sample of the missing values. This process results in valid statistical inferences that properly reflect the uncertainty due to missing values; for example, confidence intervals with the correct probability coverage."

The use of MI to utilize all the information in the data set of CEO turnover used in this research involves three steps; first, multiple data sets are created by assigning random values to missing variables. Second, the multiple complete data sets are analyzed and repetitive measures are used until a plausible distribution for the missing values is obtained. And third, the results from the multiple complete data sets are combined and statistical inference is made concerning the possible coefficient values.

Multiple imputation technique selection varies according to the pattern of the missing variables. Missing data is assumed to follow one of two patterns, monotone or arbitrary. The missing variables in this study do not exhibit a monotone pattern. A monotone missing pattern is one in which there appears to be a pattern of variables with non missing values followed by a series of missing values. The missing variables in this data set exhibit a more arbitrary distribution, therefore a Markov Chain Monte Carlo (MCMC) method (Schafer 1997) that assumes multivariate normality is used to impute all missing values. All cross sectional analyses are conducted using both traditional methods of omitting observations with incomplete data as well as the Markov Chain Monte Carlo method.

Table 4.1 presents descriptive statistics for the full sample of 674 turnover events as well as the number of observations for each variable. The departing CEO stock ownership variable has the greatest incidence of missing observations in the full sample with only 547 observations. Prior to 1980 firms were not required to disclose the stock ownership of executives, as a result most of the missing CEO stock ownership data is from the 1970s. The next sets of variables with substantial missing data, approximately 6% of the full sample, are the board size and independence variables. The sample also does not have complete information on institutional ownership for about 27 firms (about 4% of the sample) primarily due to lack of coverage by the Standard and Poor's Year End Securities Owner's Guide. Table 4.1 also notes that annual sales data is not available for 71 firms or about 11 percent of the sample. However, firm sales are presented in Table 4.1 as a measure of firm size and are not included in any other analysis.

CHAPTER V

RESULTS

The empirical investigation of the relationship between CEO turnover and the firm's cost of publicly traded, non-provisional debt begins with an analysis of bondholder reaction to the announcement of the board's replacement decision in Section 5.1. In Section 5.2 I examine the notion bond yield spreads contain information concerning the likelihood of CEO turnover in the cross section. In Section 5.3 I test the hypothesis that CEO turnover provides information concerning the likelihood of default. Finally, in Section 5.4 I investigate the hypothesis that CEO risk aversion proxies impact the cost of debt.

5.1 Bond Market Reaction to CEO Turnover

5.1.2 Segmentation by Nature of Turnover and Origin of Successor

CEO turnover represents a shift in the firm's operational, investment, and financial strategies and should be priced. Characteristics of both the actual turnover event and the replacement CEO are likely to influence the magnitude of any market price reaction in the firm's securities. Table 4.5 documents increased volatility of stock and bond returns around the turnover announcement. Merton (1974) predicts increased stock prices and falling bond prices are associated with an increase in firm volatility, as such I expect bond yield spreads to increase on the announcement of CEO turnover and stock returns to increase. Furthermore, the magnitude of these reactions should increase in turnover events with

increased uncertainty and volatility, e.g. forced and outside replacement announcements. This section relates to the following hypotheses:

Hypothesis 1: The cost of debt increases on the CEO turnover announcement.

Hypothesis 2: The cost of debt increases on the forced CEO turnover announcement.

Hypothesis 3: The cost of debt increases more for forced versus voluntary CEO turnover announcements.

Hypothesis 4: The cost of debt increases on the outside firm CEO turnover announcement.

Hypothesis 5: The cost of debt increases on the outside industry CEO turnover announcement.

Hypothesis 6: The cost of debt increases on the forced CEO turnover announcement with outside replacement.

Table 5.1 provides raw yield spreads, mean and median abnormal yield spreads, abnormal stock returns, and changes in firm value for the overall sample. Segmentations based on the nature of the CEO turnover event (voluntary and forced), origin of successor (inside or outside firm), and whether outsider selection is from within or outside the firm's industry, along with finer combinations of forced, voluntary, inside, and outside replacement decisions are included. Consistent with prior research (e.g., Furtado and Rozeff 1987; Denis and Denis 1995; and Huson, Parrino, and Starks 2001), I find that, in general, CEO turnover events are associated with increased stock returns, with forced and outside turnover events being the largest increases. Table 5.1 reports, consistent with prior research, insignificant stock price reaction to inside replacements (Reinganum 1985; Weisbach 1988). However, when examining the impact of CEO turnover events on bondholders, the opposite occurs. It appears that turnover events are value decreasing to bondholders and are associated with higher yield spreads in most categories, with the largest impact occurring in the forced,

outside replacement, and outside industry replacement announcements. The results are all statistically and economically significant.

For the all turnover sample, Table 5.1 shows a mean abnormal yield spread of about 7 basis points, compared to abnormal stock returns of about 0.6% (both significant at the one percent level). The abnormal change in firm value of about 0.5% indicates that overall firm value increases on the turnover announcements, however given the average leverage in the sample of about 21%, the results are not surprising. A large portion of the change in the value of the firm is based on change in equity value. In addition, I find that bondholders react more negatively to forced (about 28 basis points) versus voluntary turnover (about 3 basis points), with the reaction to forced turnover significant at the five percent level. Similarly, equity holder's positive reaction is greater for forced relative to voluntary turnover (significant at the one and five percent levels respectively). However, the mean abnormal change in firm value of about 2.1% is only significant for forced turnover events. Table 5.1 also reports the differences in mean abnormal yield spreads, stock returns, and firm values for voluntary versus forced turnovers are all significant at the one percent level.

The magnitude of negative bondholder reaction to outside replacement announcements is considerably larger than for inside replacements (about 11 versus 6 basis points, however, only the inside reaction is statistically different from zero under means testing while only outside replacement announcements are significant under median testing). On the equity side, positive abnormal stock returns are highly significant and much larger for outside replacements (about 2.4%) than the insignificant inside reaction (about 0.15%). Similarly, outside industry replacement decisions are associated with higher abnormal yield spreads (about 10 basis points) relative to inside replacement decisions (about 6 basis

points), however neither are significant under median testing. Abnormal stock returns are also higher for outside versus inside replacements (mean levels of about 1.4% and 0.5% respectively). However, although the abnormal change in firm value is approximately twice as large for outside replacements than for inside replacements, the abnormal change in firm value is not significant for outside industry replacements. Additionally, Table 5.1 does not report a significant difference in mean abnormal yield spreads for inside versus outside replacements (t-stat of 0.80), although the difference in stock returns and firm values are statistically significant at the five percent level.

Next, the full sample is segmented to consider combinations of voluntary and forced turnovers with both inside and outside replacements. The sample size under the voluntary turnover with outside replacement and under forced turnovers drops down dramatically (78 observations for voluntary with outside replacement vs 104 observations for all forced turnovers). Table 5.1 reports that forced turnover replacements with inside and outside replacements are associated with greater abnormal yield spreads relative to voluntary inside and outside replacements. Additionally, the abnormal change in firm value is significant only for the forced and voluntary outside replacements.

Overall, the results seem to favor the strategy hypothesis as bondholders tend to react negatively to CEO turnover events while stockholders react positively. If the scapegoat hypothesis holds, where all CEOs have the same ability and boards only discipline to provide incentives to lower level managers, I would expect little reaction from either bond or stock market participants. If the turnover event is associated with subsequent improved managerial ability, I would then expect debt and equity returns to be positively correlated. While bondholders may expect managerial ability and long run performance to increase

following CEO turnover, the results indicate they still view CEO turnover negatively, consistent with the notion that CEO turnover represents a shift in the firm's strategic policies. Their claims having a shorter duration than those of equity holders, bondholders appear to view the risks and greater uncertainty associated with changing investment and financing polices as outweighing the potential benefits obtained from the expected increases in the operational ability of the replacement CEO.

5.1.3 Segmentation by Default Risk

Following CEO turnover events, bondholders reevaluate their required return for holding risky debt in response to anticipated increases in future firm volatility. Therefore, I expect higher abnormal bond yield spreads as the likelihood of default prior to the turnover announcement increases. Similarly, equity holders of levered firms value the increased future equity volatility subsequent to the turnover announcement, and therefore I anticipate increased stock price reaction for firms with increased likelihood of default. To evaluate the notion that bond and stock reactions vary with default risk, I provide additional results based on the debt grade status of firm's traded debt. This section relates to the following hypotheses:

Hypothesis 7: The effect of CEO turnover on the absolute change in yield spreads is greater for non-investment versus investment grade debt.

Table 5.2 provides the results when segmenting the full sample by debt grade. Table 5.2 shows results for the two investment categories based on all, voluntary, forced, inside replacement, and outside replacement turnovers. Overall, I find in all categories that firms with non-investment grade debt have higher abnormal yield spreads than those in the

investment grade debt category. The firms in the sample with non-investment grade debt experience a mean abnormal yield spread of about 40 basis points (significant at the five percent level) while the mean abnormal yield spread of firms with investment grade debt is about 2 basis points (results that are not statistically significant).[32] In addition, Table 5.2 reports t-statistics for the difference in means of abnormal yield spreads, stock returns, and firm value for investment and non-investment grade debt. Mean abnormal bond yield spreads and stock returns are statistically different at the one percent for the two categories of debt (t-statistics of 5.36 and 2.73 respectively). Forced turnovers provides the most abnormal yield spreads (about 84 basis points for non-investment grade debt), while voluntary turnovers provide the least abnormal spread (about 11 basis points). Mean cumulative abnormal stock returns while significant for firms with investment grade debt do not appear to be economically large, especially when compared to those of non-investment grade debt firms. Also, inside and outside replacement announcements tend to be equally valuable in the non-investment grade debt category. The increased abnormal yield spreads are not predominantly a function of the higher raw mean yield spreads for non-investment grade firms relative to those firms with investment grade debt. In fact, the abnormal yield spreads of non-investment grade debt firms represents about 7.6% of the mean raw yield spread as compared to only 1.4% for the investment grade sample. The positive reaction by stockholders to the turnover announcement is also larger (mean cumulative abnormal returns of about 2%, significant at the one percent level) than that of equity holders of firms with investment grade debt (mean cumulative abnormal returns of about 0.4%, significant at the one percent level). Similarly, abnormal changes in firm value are larger and more

[32] See Appendix 2 for t-stats based on the estimation period standard deviation.

significant in firms with non-investment grade debt relative to firms with investment grade debt (about 1.7% and 0.3% respectively).

It is interesting to note that although the negative bondholder and positive stockholder reactions to outside replacements are much larger for non-investment grade debt (about 38 basis points and 3.5% respectively), relative to firms with investment grade debt (about 1.2 basis points and 2%), the reported abnormal yield spreads for inside replacement with non-investment grade debt are slightly higher (and statistically significant at the five percent level) than outside replacement with non-investment grade debt (which is not statistically significant). This may be attributed to the small turnover sample for inside and outside replacement (51 announcements for inside vs 35 for outside) However, the mean cumulative abnormal stock returns are not significant for inside replacement with either debt category, nor are the abnormal changes in firm value. Both investment and non-investment grade debt firms experience significant increases in abnormal firm value around outside turnover events and the increase is largest for firms with non-investment grade (about 3.1% for non-investment vs 1.8% for investment grade).

The results presented in Table 5.2 are consistent with the idea that bondholders become more concerned with CEO turnover as the likelihood of default increases prior to the announcement. Furthermore, stockholders appear to value the expected increased in equity volatility subsequent to CEO turnover more as the risk of default increases. An alternative explanation is that stockholders lower their expected return more when the pre-existing default risk is high in anticipation of increased managerial ability afforded by the CEO turnover event. However, such an explanation does not fully explain the increased risk

premia required by bondholders for holding non-investment grade debt around the turnover decision.

5.2 Yield Spreads and the Likelihood of CEO Turnover

It is well documented that stock returns and the likelihood of CEO turnover are negatively correlated. If stock and bond markets are integrated then information concerning the likelihood of turnover may be imbedded in bond yield spreads. Additionally, if boards are concerned with the cost of debt financing then bond markets may provide additional information concerning the likelihood of forced turnover decisions. I investigate this notion by evaluating the role of bond markets on the likelihood of forced CEO turnover while controlling for firm characteristics, including stock price performance, and CEO characteristics using the weighted average firm sample.[33] The hypothesis of interest is then:

Hypothesis 8: The cost of debt, measured as the mean yield spread prior to the turnover announcement, is positively related to the likelihood of CEO turnover after controlling for firm performance.

Table 5.3 presents results from logit analysis of the forced turnover event, multiple imputation technique results are also shown as evidence of robustness to missing data. The mean yield spread for the three-month period prior to the turnover event (Mean Spread) is used as a risk measure. Additionally, a binomial classification scheme is used to indicate whether the firm's average debt issue is non-investment grade. Finally, to correct for the likely interaction between mean yield spreads and credit ratings, an interaction term (InvestSpread) is implemented.

[33] I also estimate the model using the all bond, non-weighted average sample and find similar results. Furthermore, I also estimate the model by utilizing the raw or untransformed 3 month prior mean yield spread, again finding similar results.

Columns one and two of Table 5.3 show the results for model one, where the binomial forced turnover variable is regressed against the level of yield spreads (Mean Log Spread) and several firm and CEO control variables. Mean Log Spread is positively significant (p-value of 0.00) with a coefficient of about 0.898 (column 2). Prior firm performance as measured by the industry adjusted six month holding period return prior to the announcement month (Return) is negatively and significantly related to the likelihood of forced turnover, consistent with prior research (coefficient of –14.633 with a p-value of 0.00). Likewise, firm leverage is found to be negatively related to the likelihood of forced turnover, suggesting poorly performing firms that are candidates for forced turnover are not able to obtain higher leverage values. The other firm characteristics: size, the size of the firm's board scaled by assets, board independence, and institutional ownership, are not found to be significant in model 1. However, incumbent CEO age is negatively and significantly related to the likelihood of CEO turnover, again consistent with the prior literature[34]. Incumbent CEO age (Age) is a binomial variable taking the value of 1 if the incumbent CEO is greater than 60 years at the time of the succession announcement. Age has a negative coefficient of about –2.438 and is significant at the 0.1 percent level. The negative relation between the likelihood of forced turnover and incumbent CEO entrenchment proxies are consistent with previous research. Table 5.3 also indicates the results based on the omission of observations and the results from multiple imputation are similar, with incumbent CEO tenure also negatively and significantly related to the likelihood of turnover (significant at the one percent level). Model one reports pseudo R^2 values of

[34] Incumbent CEO age, tenure, and stock ownership are likely to be highly correlated. Therefore, the reader is warned against assuming incumbent CEO stock ownership is not a significant factor in the likelihood of forced turnover, based on the results shown here.

0.280 and 0.233 for the results deleting missing observations and multiple imputations, respectively.

Similar results are obtained by modeling the effects of a firm having non-investment grade debt. Table 5.3 reports non-investment grade debt is positively and significantly associated with forced turnover (column 4 reports an estimated coefficient of about 1.604 with a p value of 0.00). Similar results are found in model three where an interaction term (InvestSpread) is utilized to account for interaction effects between mean yield spreads and investment grade status. The three models have similar pseudo R^2 values, and the coefficient and p values are consistent.

The findings listed in Table 5.3 support the notion that increased risk of default prior to the CEO succession decision, measured by investment grade status and pre-event yield spreads, is associated with increased likelihood of forced CEO turnover. These findings are robust to several firm specific control variables, most notably industry adjusted stock returns, indicating boards may consider the cost of debt in the forced turnover decision. Furthermore, the CEO entrenchment proxies' age, tenure, and stock ownership are all negatively related to the likelihood of forced turnover, findings which are consistent with previous research.

5.3 CEO Turnover and the Likelihood of Default

Opler and Titman (1994) and Asquith, Gertner, and Sharfstein (1994) document firm specific risk factors are related to the probability of bankruptcy. CEO turnover events may be related to the likelihood of default if these events affect firm specific risk. Clayton et al.

(2005) note increased future equity volatility, and therefore increased risk, for forced, outside firm, and outside industry replacements relative to voluntary, inside firm, and inside industry replacements. Table 4.5 documents increased bond return volatility following CEO turnover and similar to stock returns, and that the increases are greatest for forced and outside firm replacements. If bondholders view the turnover event as increasing the risk of firm debt they may require additional risk premia as compensation for the increased likelihood of default. Alternatively, if CEO turnover events are associated with a decreased likelihood of default via improved strategic policies then credit rating upgrades may be more likely. My expectations are that credit ratings, as measures of fault risk, change subsequent to the turnover announcement. Therefore, the hypothesis of interest is;

Hypothesis 7: Credit rating changes are related to forced, outside firm, and outside industry replacements.

Table 5.4 documents the relation between the forced, outside firm, and outside industry CEO replacement decisions and the likelihood of a change in credit ratings. I regress indicator variables (0,1) that identify credit rating downgrades and upgrades in two separate models (with a value of zero assigned where no change in ratings occur) on the forced, outside firm, and outside industry indicator variables while controlling for debt, firm, and monitoring factors using the entire bond sample of firms. Credit rating changes are identified by noting those bonds with different ratings in the month of turnover and the following month. I use the all bond sample consisting of 3,420 bonds from 674 unique firms rather than a weighted average sample to ensure the results are not biased by bonds entering or exiting the sample during the comparison period.[35]

[35] I also perform the regressions using the weighted average sample and find qualitatively similar results.

The first three columns of Table 5.4 list the Logit regression coefficient estimates for the sample that includes 911 bonds that are downgraded following CEO turnover announcements. My primary interest lies in the forced, outside firm, and outside industry coefficient estimates. The forced turnover coefficient is positive and significant at the one percent level, representing an increased likelihood of credit rating downgrades following forced turnover announcements. The estimated coefficients for outside firm and outside industry replacements are likewise positive and significant (at the one percent and 10 percent levels, respectively). The next 3 columns of Table 5.4 present the estimated coefficients for credit rating upgrade models. The forced, outside firm, and outside industry replacement coefficients are negative but insignificant, indicating these less common turnover types are not important factors in credit rating upgrades.

The results presented in Table 5.4 support the hypothesis that forced and outside firm CEO turnover events are associated with increased risk of default as measured by subsequent credit rating downgrades even after controlling for prior firm performance. This is consistent with the findings reported in Table 6 of negative bondholder reaction to the turnover announcement and the more extreme negative bondholder reaction to forced, outside firm, and outside industry replacement announcements.

5.4 Yield Spread Ratios and CEO Risk Aversion Proxies

In this section I examine how changes in a firm's cost of debt financing may also be affected by departing CEO characteristics. The departing CEO's age, tenure, and stock ownership are likely to contain information of the incumbent's level of alignment with

shareholders. Top managers with increased levels of equity based compensation may tend to pursue lower risk projects (Parrino, Poteshman, and Weisbach 2003). As equity ownership is likely to increase with tenure and age, I expect the cost of debt to be negatively related to incumbent CEO characteristics that proxy for risk aversion. The hypotheses of interest are therefore;

Hypothesis 9: The cost of debt is negatively related to incumbent CEO age.

Hypothesis 10: The cost of debt is negatively related to incumbent CEO tenure.

Hypothesis 11: The cost of debt is negatively related to incumbent CEO stock ownership.

Panels A, B, and C of Table 5.5 present results from OLS, Random effects, and maximum likelihood specifications respectively. I compute three separate models due to the presence of outliers. While the t-error maximum likelihood estimates are less affected by outliers, it is not possible to easily model random firm, year, and industry effects with t-error maximum likelihood techniques. Therefore, the goal of the three specification approach is to identify coefficient estimates that are consistent across the three models. Column 1 of each panel reports the results for the overall sample of 674 firms representing 3,398 individual bonds. Columns 2 and 3 report results for the voluntary and forced samples respectively while columns 4 and 5 report results based on samples segmented by the origin or the successor, that is whether the replacement CEO is selected from within or outside the firm. The weighted average or firm sample of 674 observations is utilized in Panel A while the full or individual bond sample is used in Panels B and C. The remaining columns report coefficient estimates for sample segmentations based on the nature of CEO turnover, whether the turnover is voluntary or forced, as well as segmentations based on the origin of the successor CEO (chosen from either inside or outside the firm).

The results presented in Panel A indicate that only the intercept and duration coefficients are significant for the weighted average OLS model. Interestingly, the random effects and t-error maximum likelihood specifications reported in column 1 of Panels B and C respectively both indicate statistical significance for the credit rating (coefficient estimates of -0.009 and -0.008 and t-statistics of -2.35 and -4.39 for random effects and maximum likelihood specifications respectively) and incumbent CEO ownership (coefficient estimates of -0.010 and -0.007 with t-statistics of -1.74 and -2.38 for Panels B and C respectively) in addition to the statistical significance found for the intercept and duration estimates in the OLS specification. These findings appear to indicate that bondholders are less concerned with turnover when incumbent CEOs have higher stock ownership levels, one possible explanation being incumbent CEOs with higher ownership levels are less likely to be forcibly removed (see Table 5.3) and are likely to have played an important role in the selection of the successor.

Similarly, incumbent CEO age coefficients estimates are positively significant for the OLS (0.218 with t-statistic of 1.94) and the t-error maximum likelihood (0.060 with t-statistic of 2.42) specifications for the forced turnover sample in column 2. The random effects model (Panel B) incumbent CEO age coefficient estimate for the forced turnover sub sample, while positive is not statistically significant.

Overall, the results presented in Table 5.5 are consistent with the idea that bondholders are concerned with changing CEO risk aversion levels that occur as a result of CEO turnover events. The incoming CEO is expected to be more aligned with shareholders interests than the departing CEO. This reduction in agency costs while beneficial to shareholders comes at the expense of bondholders, who readjust their required risk premia

for holding the firm's debt on the turnover announcement. The incoming CEO, more closely aligned with shareholders, is more likely to undertake risky projects than her predecessor, thereby increasing future equity and asset volatility and potentially increasing the likelihood of default. However, given the disparity of results for each of the three specifications (OLS, random effects, and maximum likelihood) the findings are inconclusive.

CHAPTER 6

CONCLUSION

This study investigates the relationship between top executive changes and firms' cost of publicly traded debt. A sample consisting of 674 observations of CEO turnover announcements from 1973 through 2000 is used to test the notion that bondholders are concerned with changes in CEOs. Overall, I find bond yield spreads increase on the announcement of CEO turnover, although the effect is largest when boards forcibly remove incumbents from office (about 7 basis points for the overall sample and about 28 basis points for the forced sample). I also report outside firm and outside industry replacement CEO announcements are likewise associated with higher costs of debt financing, although the difference between inside and outside replacements is not statistically significant. This study also documents an increase in bond return volatility following CEO turnover with the greatest increases occurring around forced and outside replacements. These results are consistent with Clayton et al.'s (2005) assertion that increased uncertainty regarding future firm policies following CEO turnover, most notably forced and outside replacements, increases the likelihood of default as in Merton (1974). Bondholders appear to view the CEO turnover event as a firm specific risk factor and reevaluate their required return upon learning of succession decisions. The findings presented in this study do suffer from the lack of daily bond pricing data over the majority of the sample period. The use of monthly bond pricing data increases the likelihood that other events occurring around CEO turnover announcements may be driving the results. Alternatively, the use of monthly data may underestimate the affect of CEO turnover on bond prices (e.g. Maxwell and Stephens,

2003). An area of possible future research would be to revisit the issue as daily bond pricing data becomes more universally available.

If the increased equity volatility surrounding the CEO turnover event is associated with increased likelihood of default as implied in Merton (1974), then bondholders may be more concerned when the risk of default is relatively high. This study finds bondholders' reaction to CEO turnover announcements at firms with non-investment grade is much more negative than at firms with investment grade debt. The discrepancy between median abnormal yield spreads for non-investment versus investment grade debt increases to more than fourfold for forced turnover events. These results are consistent with the notion bondholders view board initiated CEO turnover as increasing the risk of holding firm debt and the risk is greater when the prospects for default are higher. I further report forced CEO turnover is positively and significantly related to subsequent credit rating downgrades, further evidence that changes in top management are important events for bondholders. Again, this study in limited by the availability of bond pricing data, in this case the lack of non-investment grade data for much of the sample period. As daily bond pricing data becomes more readily available it would be interesting to see if the conclusions reached in this study at still valid.

Additionally, this dissertation provides evidence that CEO turnover, as a corporate governance mechanism, serves to realign shareholder and manager interests at the expense of bondholders. A large portion of CEOs' wealth is concentrated in the firm. If incumbent CEOs seek to minimize firm risk as a means to protect this undiversified stake, then bondholders may indirectly benefit from incumbent CEO risk aversion. If so, then part of the abnormal yield spreads observed around turnover may be explained by the different risk

aversion levels of new and old CEOs. Incumbent CEO risk aversion proxies, including age and stock ownership, are found to be significantly related to yield spreads observed on the succession announcements although the evidence is mixed. Overall, the evidence reported here supports the idea that some of the gains enjoyed by shareholders during CEO turnover come at the expense of bondholders. For forced turnover announcements, the average loss to bondholders is about $13.2 million while the average gain to shareholders is approximately $57.7 million.

Finally, I examine whether bond yield spreads provide any information as to the likelihood of forced CEO turnover. I report pre-announcement yield spreads are positively and significantly related to the likelihood of forced turnover, even after controlling for industry adjusted stock returns, indicating that an increase of 100 basis points in the cost of debt is associated with about a 14% increase in the likelihood of forced turnover. An important factor relating to the likelihood of CEO turnover has not been addressed in this dissertation, namely the case were the CEO also serves as Chair of the firm's board of directors. Goyal and Park (2002) note a decreased likelihood of forced turnover when the same person holds both the CEO and Chair titles. To the best of my knowledge how CEO duality affects the cost of debt has not been explored in the literature and is a possible topic for future research.

The tests show the importance of the CEO turnover event to bondholders. While previous studies have examined CEO turnover from the perspective of shareholders, to the best of my knowledge, this is the first study to empirically examine bond market participant's reaction to changes in top management. I find bondholders' negative reaction to turnover

events are both economically and statistically significant, and the significance increases with forced and outside replacements.

This study raises several interesting issues that are not specifically addressed. First, several corporate governance trends have occurred over the sample period including increased use of stock options for managers as a means of minimizing manger-shareholder agency costs, as well as board of directors composition and compensation. Also during the sample period the intensity of the takeover market has fluctuated considerably. Further analysis of the CEO turnover sample used in this study may yield interesting evidence as to the relation between turnover and the cost of publicly traded debt under different monitoring regimes throughout the 1973 though 2000 period.

REFERENCES

Agrawal, R. and G. Mandelker, 1987, Managerial incentives and corporate investment and financing decisions, Jo*urnal of Finance*, 42,823-837

Allen, M.P., 1981, Managerial power and tenure in the large corporation, *Social Forces*, 482-494

Anderson, M., S. Mansi, and D. Reeb, 2003, Founding family ownership and the agency cost of debt, *Journal of Financial Economics* 68, 263-285

Anderson, M., S. Mansi, and D. Reeb, 2004, Board characteristics, accounting report integrity, and the cost of debt, *Journal of Accounting and Economics* 37, 315-342

Ang, J., B. Lauterbach, and J. Vu, 2003, Efficient labor and capital markets: evidence from CEO appointments, *Financial Management*, Summer, 27-52

Ashbaugh, H., D. Collins, and R. LaFond, 2004. The effects of corporate governance on firms' credit ratings. *Working paper*, University of Wisconsin-Madison

Asquith, P., R. Gertner, and D. Sharfstein, 1994, Anatomy of financial distress: an examination of junk bond issuers, *Quarterly Journal of Economics*, 109, 625-658

Barro,R. and J. Barro, 1990, Pay, performance, and turnover of bank CEOs, *Journal of Labor Economics,* 8, 448-481

Berger, P., E. Ofek, and D. Yermack, 1997, Managerial entrenchment and capital structure decisions, *Journal of Finance*, 52, 1411-1438

Berry, T.K., J. M. Bizjak, M.L. Lemmon, and L. Naveen, 2003, CEO turnover and firm diversification, *Working paper*, Texas A&M University

Billet, M., T. King, and D. Mauer, 2004, Bondholder wealth effects in mergers and acquisitions: New evidence from the 1980s and 1990s, *Journal of Finance,* 59, 107-135

Black, B.S., 1992, Institutional investors and corporate governance: The case for institutional voice, Journal of Applied Corporate Finance, 5, 19-32

Black, F. and M. Scholes, 1973, The valuation of options contracts and a test of market efficiency, *Journal of Finance*, 27, 399-418

Bonnier, K.A. and R.F. Bruner, 1989, An analysis of stock price reaction to management change in distressed firms, *Journal of Accounting and Economics*, 11, 95-106

Brickley, J.A., J. Coles, G. Jarrell, 1997, Leadership structure: separating the CEO and chairman of the board, *Journal of Corporate Finance*, 3,189-220

Brickley, J. and R.L. Van Horn, 2000, Incentives in Non-profit organizations: evidence from hospitals, *Working Paper*, University of Rochester

Borokovich, K.,R. Parrino and T. Trapani, 1996, Outside directors and CEO selection, *Journal of Financial and Quantitative Analysis*, 31, 371-355

Campbell, J.Y. and G.B. Taksler, 2003, Equity volatility and corporate bond yields, *Journal of Finance*, 58, 2321-2349

Clayton, M.J., J.C. Hartzell, and J. Rosenburg, 2005, The impact of CEO turnover on firm volatility, *Journal of Business*, Forthcoming

Coughlan, A.T. and R.M. Schmidt, 1985, Executive compensation, management turnover and firm performance: An empirical investigation, *Journal of Accounting and Economics*, 7, 43-66

Dalton, D. and I. Kesner, 1985, Organizational performance as an antecedent of inside/outside chief executive succession: An empirical assessment, *Academy of Management Journal*, 28, 749-762

Demsetz, H., 1983, The structure of ownership and the theory of the firm, *Journal of Law and Economics*, 26, 375-390

Denis, D.J and D.K. Denis, 1995, Performance changes following top management Dismissals, *Journal of Finance*, 50, 1029-1057

Denis, D., D. Denis and A. Sarin, 1999, Ownership and board structures in publicly traded corporations, *Journal of Financial Economics*, 52, 187-224

Denis, D., and J. Serano, 1996, Active investors and management turnover following unsuccessful control contests, *Journal of Financial Economics*, 40, 239-266

Fama, E.F. and Jensen, M.C., 1983, Separation of ownership and control, *Journal of Law and Economics*, 26,301-325

Fama, E.F. and M. Miller, 1972, The theory of finance, Hinsdale, IL, *Dryden Press*

Fee, E. and C. Hadlock, 2003, Raids, rewards, and reputation in the market for CEO talent, *Review of Financial Studies*, forthcoming

Frank, M.Z. and V.K. Goyal, 2003, Capital structure decisions, *Working paper*, University of British Columbia

Furtado, E.P and M.S. Rozeff, 1987, The wealth effects of company initiated management changes, *Journal of Financial Economics*, 18, 147-160

Gilson, S., 1989, Management turnover and financial distress, *Journal of Financial Economics*, 25, 241-262

Goyal, V. and C. Park, 2002, Board leadership structure and CEO turnover, *Journal of Corporate Finance*, 8, 49-66

Hand, J., R. Holthausen, and R. Leftwich, 1992, The effect of bond rating agency announcements on bond and stock prices, *Journal of Finance*, 47, 733-752

Handjinicolaou, G. and A. Kalay, 1984, Wealth redistributions or changes in firm value; An analysis of returns to bondholders and stockholders around dividend announcements, *Journal of Financial Economics*, 13, 35-63

Harris, M. and A. Raviv, 1990, Capital structure and the informational role of debt, *Journal of Finance*, 45, 297-356

Helmich, D.L., 1974, Organizational growth and succession patterns, *Academy of Management Journal*, 771-775

Hermalin, B.E. and M.S. Weisbach, 2000, Boards of directors as an endogenously determined institution: a survey of the economic literature, *NBER Working Paper Series*, no.8161

Holmstrom, B. 1979, Moral hazard and observability, *Bell Journal of Economics,* 10, 74-86

Hotchkiss, E.S. and T. Ronen, 2001, The informational efficiency of the corporate bond market: an intraday analysis, *Review of Financial Studies*, 15, 1325-1354

Huson, M.R, R. Parrino and L. Starks, 2001, Internal monitoring mechanisms and CEO turnover; A long-term perspective*, Journal of Finance*, 56, 2265-2297

Huson, M., P. Malatesta and R.Parrino, 2004, Managerial succession and firm performance, *Journal of Financial Economics,* 74, 237-275

Jensen, M., 1993, The modern industrial revolution, exit, and the failure of internal control systems, *Journal of Finance*, 48, 831-880

Jensen, M., 1989, The eclipse of the public corporation, *Harvard Business Review*, 67, 61-74

Jensen, M. and W. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics*, 3, 305-360

Jensen, M. and K. Murphy, 1990, Performance pay and top management incentives, *Journal of Political Economy*, 102, 510-546

Johnson, B., R. Magee, N. Nagarajan and H. Newman, 1985, An analysis of the stock price reaction to executive deaths: implications for the management labor market, *Journal of Accounting and Economics*, 7, 151-174

Kaplan, S.N., 1994, Top executives, turnover, and firm performance in Germany, *Journal of Law, Economics, and Organization*, 10, 142-159

Khanna, N. and A. Poulson, 1995, Managers of financially distressed firms: Villains or scapegoats? *Journal of Finance*, 50, 919-940;

Kim, Y, 1996, Long-term performance and chief executive turnover: An empirical study of the dynamics, *Journal of Law, Economics & Organization*, 12, 480-496

Klock, M., S. Mansi, and W. Maxwell, 2005, Does corporate governance matter to bondholders? *Journal of Financial and Quantitative Analysis*, Forthcoming

Kroszner, R.S. and Strahan, P.E., 2001, Bankers on boards: monitoring, conflicts of interest, and lender liability, *Journal of Financial Economics*, 62, 3, 415-52

Kwan, S.H., 1996, Firm-specific information and the correlation between individual stocks and bonds, *Journal of Financial Economics*, 40, 63-80

Lazear, E.P. and S. Rosen, 1981, Rank-order tournaments as optimum labor contracts, *Journal of Political Economy*, 89, 841-864

Lipton, L., and J. Lorsch, 1992, A modest proposal for improved corporate governance, *The Business Lawyer*, 48, 59-77

Martin, K. and J. McConnell, 1991, Corporate performance, corporate takeovers, and management turnover, *Journal of Finance*, 46, 2, 671-687

Maxwell, W., and R. Rao, 2003, Do spin-offs expropriate wealth from bondholders? *Journal of Finance*, 58, 2097-2108

Maxwell, W., and C. Stephens, 2003, The wealth effects of repurchases on bondholders, *Journal of Finance,* 58, 895-920

Merton, R.C., 1974, On the pricing of corporate debt: the risk structure of interest rates, *Journal of Finance*, 29, 449-470

Morck, R. and Nakamura, 1999, Banks and corporate control in Japan, *Journal of Finance*, 54, 319-340

Nelson C. and A. Siegel, 1987, Parsimonious modeling of yield curves, *Journal of Business,* 6, 473-489

Ofek, E., 1991, Monitoring and the firm's capital structure: a theoretical and empirical investigation, *Unpublished Dissertation, University of Chicago*

Ofek, E., 1993, Capital structure and firm response to poor performance: an empirical analysis, *Journal of Financial Economics*, 34, 3-30

Opler, T. and S. Titman, 1994, Financial distress and corporate performance, *Journal of Finance*, 47, 3-42

Parrino, R., 1997, Spinoffs and wealth transfers: The Marriott case, *Journal of Financial Economics,* 43, 241-274

Parrino, R., 1997, CEO turnover and outside succession: A cross-sectional analysis, *Journal of Financial Economics*, 46, 165-197

Parrino, R., A. Poteshman, and M. Weisbach, 2001, Measuring investment distortions when risk-averse managers decide whether to undertake risky projects, *Working paper, University of Texas*

Perry, T., 2000, Incentive compensation for outside directors and CEO turnover, *Working paper, Arizona State University*

Pound, J., 1992, Raiders, targets, and politics: The history and future of American corporate control, *Journal of Applied Corporate Finance*, 5, 6-18

Ravenscraft, D. and F. Scherer, 1987, Mergers, sell offs, and economic efficiency, *Brookings Institution*

Reinganum, M.R., 1985, The effect of executive succession on stockholder wealth, *Administrative Science Quarterly,* 30, 46-60

Roll, R., 1986, The hubris hypothesis of corporate takeovers, *Journal of Business*, 59, 197-216

Rubin, D.B., 1976, Inference and missing data, *Biometrika*, 63, 581 -592

Rubin, D.B.,1987, Multiple imputation for nonresponse in surveys, New York: *John Wiley & Sons, Inc.*

Schafer, J.L., 1997, Analysis of incomplete multivariate data, *New York: Chapman and Hall.*

Salanick, G.R. and J. Pfeffer, 1980, Effects of ownership and performance on executive tenure in U.S. corporations, *Academy of Management Journal*, 422-437

Shliefer, A., and R. Vishny, 1990, Managerial entrenchment: The case of firm specific assets, *Journal of Financial Economics,* 25, 123-139

Shleifer, A. and R. Vishny, 1997, A survey of corporate governance, *Journal of Finance,* 52, 737-783

Smith, C. and J. Warner, 1979, On financial contracting: An analysis of bond covenants, *Journal of Financial Economics,* 7, 117-130

Vassalou, M. and Y. Xing, 2004, Default risk in equity returns, *Journal of Finance*, 59, 831-868

Warga, A. and I. Welsh, 1993, Bondholder losses in leverage buyouts, *Review of Financial Studies,* 6, 959-982

Warner, J.B, R.L. Watts and K.H. Wruck, 1988, Stock prices and top management changes, *Journal of Financial Economics*, 20, 461-492

Weisbach, M., 1988, Outside directors and CEO Turnover, *Journal of Financial Economics*, 20,431-460

Weisbach, M., 1995, CEO turnover and the firm's investment decisions, *Journal of Financial Economics*, 37, 159-188

Wymeersch, E., 1998, A status report on corporate governance rules and practices in some continental European states, Oxford and New York: *Oxford University Press*, Clarendon Press, 1045-1199

Wu, Y., 2000, Honey, Calpers shrunk the board, *Working paper series*, University of Chicago Graduate School of Business.

Yermack, D., 1996, Higher market valuation of companies with a small board of directors, *Journal of Financial Economics*, 40, 185-212

Table 4.1
Descriptive Statistics of CEO Succession Events

	Obs.	Mean	Median	Std Dev	Skewness	Kurtosis	Minimum	Maximum
Panel A: CEO Characteristics								
Incumbent CEO Age	671	61.814	63.000	5.229	-0.567	2.339	44.000	91.000
Successor CEO Age	674	53.695	54.000	5.873	-0.046	0.220	35.000	74.000
Incumbent CEO Tenure	670	9.307	7.833	6.505	1.518	2.831	0.247	37.917
Incumbent CEO Stock Ownership (Percent)	547	0.828	0.176	2.854	9.312	119.478	0.000	45.300
Panel B: Firm Characteristics								
Firm Sales (Millions)	603	7,590.903	3,217.140	14,671.878	16.505	302.648	13.606	925,212.000
Total Assets (Millions)	673	13,809.498	4,262.500	28,111.150	6.048	50.187	6.982	409,435.000
Leverage	671	0.216	0.196	0.152	1.403	4.860	0.000	1.144
ROA (Percent)	673	3.319	3.741	7.022	-4.087	45.917	-87.251	33.586
Industry Adjusted Return (Percent)	662	-0.642	-0.403	3.359	-1.432	6.705	-25.192	9.035
Institutional Ownership (Percent)	647	42.970	45.455	23.568	-0.075	-1.051	0.038	96.950
Board Size	636	16.234	16.000	5.249	0.900	1.727	3.000	39.000
Board Independence (Percent)	636	64.819	65.000	13.584	-0.273	-0.176	23.077	96.774
Panel C: Bond Characteristics								
Yield Spread	674	172.532	116.100	278.665	9.657	124.210	2.284	4,624.386
Debt Age	674	5.445	4.193	4.062	1.630	3.517	0.071	25.493

Bond Rating (NR=0,D=1,…AAA=23)	674	16.479	17.000	3.588	-1.150	2.236	0.000	22.000
Duration	674	6.649	6.608	2.350	0.014	-0.033	0.125	15.246
Convexity	674	0.744	0.674	0.564	4.006	46.203	0.001	8.255

CEO succession events identified by the change in CEO in the Forbes annual compensation survey from 1973 to 2001 that have available bond pricing information on either the Lehman Brothers Fixed Income Database or Bloomberg. An outside event is defined where the new CEO has been employed by the firm for less than 1 year prior the appointment announcement. Incumbent CEO stock ownership is the percentage of outstanding shares held by the incumbent CEO prior to the turnover announcement and is obtained from either proxy statements or the Standard and Poor's Execucomp Database. Total Assets, Sales, and the Debt are for the fiscal year end during which the CEO turnover announcement occurred. ROA is defined as the ratio of Net Income to Total Assets. Leverage is defined as the ratio of the book value of Debt to Total Assets. Bond Characteristics are the weighted average of statistics by the total amount of outstanding bonds for the announcement month. Yield spread is the difference between a bond's stated yield and that of a corresponding Treasury matched on Duration.

Table 4.2
Descriptive Statistics of Forced CEO Succession Events

	Obs.	Mean	Median	Std Dev	Skewness	Kurtosis	Minimum	Maximum
Panel A: CEO Characteristics								
Incumbent CEO Age	103	56.000	56.000	5.606	0.377	0.920	44.000	78.000
Successor CEO Age	104	53.673	53.000	7.916	0.441	0.003	36.000	74.000
Incumbent CEO Tenure	103	6.246	5.083	4.764	1.831	5.820	0.250	30.000
Incumbent CEO Stock Ownership (Percent)	86	0.824	0.172	2.191	4.053	16.556	0.000	12.256
Panel B: Firm Characteristics								
Firm Sales (Millions)	100	6,851.673	3,099.996	15,320.325	6.225	45.451	27.575	130,590.000
Total Assets (Millions)	104	10,554.101	3,862.400	23,110.395	5.712	38.968	29.210	191,012.000
Leverage	103	0.211	0.202	0.136	0.455	-0.197	0.008	0.639
ROA (Percent)	104	0.150	1.134	7.714	-1.509	4.455	-29.717	17.723
Industry Adjusted Return (Percent)	101	-2.658	-1.957	5.204	-1.177	2.673	-25.192	6.524
Institutional Ownership (Percent)	102	43.220	45.835	25.072	-0.070	-0.992	0.774	92.810
Board Size	97	16.299	16.000	5.364	0.705	0.586	5.000	31.000
Board Independence (Percent)	97	64.920	66.667	13.093	-0.242	0.028	33.333	96.774
Panel C: Bond Characteristics								
Yield Spread	104	339.066	187.341	577.096	5.184	32.386	12.043	4,624.386
Debt Age	104	6.346	3.983	4.269	1.660	2.888	0.101	20.088
Bond Rating (NR=0,D=1,…AAA=23)	104	14.406	15.083	4.015	-0.253	-0.646	5.000	22.000

Duration	104	6.224	6.073	2.282	0.144	0.065	0.125	12.503
Convexity	104	0.667	0.591	0.471	1.109	1.302	0.001	2.416

Table 4.3
Descriptive Statistics of Outside CEO Succession Events

	Obs.	Mean	Median	Std Dev	Skewness	Kurtosis	Minimum	Maximum
Panel A: CEO Characteristics								
Incumbent CEO Age	132	59.530	61.000	6.190	-0.454	-0.420	44.000	75.000
Successor CEO Age	135	52.667	52.000	6.090	0.250	0.053	36.000	69.000
Incumbent CEO Tenure	132	7.650	6.458	6.724	1.968	5.350	0.247	37.000
Incumbent CEO Stock Ownership (Percent)	119	0.875	0.163	2.351	4.443	21.140	0.000	15.700
Panel B: Firm Characteristics								
Firm Sales (Millions)	132	7,266.936	3,160.800	15,137.804	6.484	53.124	27.575	144,416.000
Total Assets (Millions)	135	17,595.670	5,114.370	38,001.379	4.438	22.961	29.210	269,300.000
Leverage	134	0.208	0.198	0.148	0.771	1.321	0.006	0.847
ROA (Percent)	135	1.240	1.778	7.500	-0.847	5.721	-29.717	32.937
Industry Adjusted Return (Percent)	133	-1.646	-1.037	4.878	-1.529	4.508	-25.192	8.831
Institutional Ownership (Percent)	131	43.823	45.905	23.640	-0.162	-0.933	0.773	91.164
Board Size	121	15.661	15.000	4.833	0.712	0.854	3.000	31.000
Board Independence (Percent)	121	66.409	66.667	13.720	-0.210	-0.336	33.333	96.774
Panel C: Bond Characteristics								
Yield Spread	135	250.774	164.666	469.652	7.175	60.496	19.333	4,624.386
Debt Age	135	4.924	3.937	3.775	1.815	14.253	0.089	20.723

Bond Rating (NR=0,D=1,…AAA=23)	135	14.983	15.500	3.706	-0.407	-0.315	5.000	22.000
Duration	135	6.134	6.014	2.541	0.210	-0.103	0.125	12.231
Convexity	135	0.670	0.506	0.806	6.471	58.642	0.001	8.255

Table 4.4
CEO Turnover Frequencies

Panel A: Incidence of CEO Turnover

Turnover Announcements	1973-2000	1973-1979	1980-1989	1990-2000
All Turnover Announcements	**674**	**141**	**258**	**275**
Voluntary Announcements	570	124	225	221
Forced Announcements	104	17	33	54
Inside Replacement	539	124	221	194
Outside Replacement	135	17	37	81
Inside Industry Replacement	609	128	244	237
Outside Industry Replacement	65	13	14	38
Investment Grade Debt	588	133	222	233
Non-Investment Grade Debt	86	8	36	42
Voluntary Turnover Announcements	**570**	**124**	**225**	**221**
Inside Replacement	492	112	207	173
Outside Replacement	78	12	18	48
Investment Grade Debt	518	120	202	196
Non-Investment Grade Debt	52	4	23	25
Forced Turnover Announcements	**104**	**17**	**33**	**54**
Inside Replacement	47	12	14	21
Outside Replacement	57	5	19	33
Investment Grade Debt	70	13	20	37
Non-Investment Grade Debt	34	4	13	17

Panel A provides the number of various incidences of CEO Turnover by period: 1973-1979, 1980-1989, 1990-2000, and for all years 1973-2000. The data set is comprised of 674 CEO turnover events representing 415 firms for the period from 1973 to 2000. CEO turnover categories include: all, voluntary, and forced turnovers. Finer categories of turnovers including: insider and outside replacement, inside and outside industry replacement, and investment and non-investment grade debt are also included.

Panel B: CEO Turnover by Industry

SIC Code	Industry Titles	All Turnovers (% of Total)	Forced Turnovers (% of Total)	Outside Replacement (% of Total)
1	Mining and Construction	2.82%	6.73%	6.67%
2	Manufacturing (Food-Petroleum)	26.11%	21.15%	19.26%
3	Manufacturing (Plastics-Electronics)	22.70%	21.15%	23.70%
4	Transportation	15.73%	13.46%	17.78%
5	Wholesale and Retail Trade	7.42%	7.69%	3.70%
6	Finance, Insurance and Real Estate	21.96%	25.96%	25.93%
7	Services (Hotels-Recreation)	1.04%	3.85%	1.48%
8	Services (Health-Private Household)	0.45%	0.00%	0.74%
9	Other	1.78%	0.01%	0.74%
	Observations	674	104	135
	(%)	(100%)	(15.43%)	(20.03%)

Panel B provides the percentage of CEO turnover events (total turnover, forced turnover, and CEO outside replacement) by industry SIC codes. The data set is comprised of 674 CEO turnover events representing 415 firms, for the period from 1973 to 2000.

Table 4.5
Volatility Statistics for the Sample of CEO Turnovers

	Stock Volatility			Bond Volatility		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Pre-Turnover Standard Deviation						
All Turnover Announcements	28.85	26.62	10.89	7.15	5.60	7.15
Voluntary Announcements	27.26	25.91	8.95	6.70	5.42	8.13
Forced Announcements	37.69	33.02	15.57	9.55	6.94	8.14
Inside Replacements	27.45	26.24	9.08	6.78	5.55	6.80
Outside Replacements	35.48	31.64	15.46	8.91	6.18	8.43
Investment Grade	26.96	25.77	8.63	6.13	5.38	3.98
Non-Investment Grade	40.94	36.22	15.34	13.35	8.94	14.90
Post-Turnover Standard Deviation						
All Turnover Announcements	31.49	27.11	19.93	17.90	6.28	81.34
Voluntary Announcements	28.35	26.17	13.16	15.09	5.63	81.31
Forced Announcements	49.20	36.96	36.09	33.89	10.96	80.18
Inside Replacements	29.20	26.38	16.42	16.07	5.86	82.36
Outside Replacements	42.36	32.36	29.46	26.76	8.49	76.04
Investment Grade	28.10	26.35	12.07	14.15	5.52	79.23
Non-Investment Grade	56.85	44.69	44.47	41.90	13.63	90.75
Log(Post-Turnover Volatility/Pre-Turnover Volatility)						
All Turnover Announcements	3.64	2.35	33.85	18.68	8.25	105.93
Voluntary Announcements	1.55	0.85	32.31	12.69	2.57	102.81
Forced Announcements	15.37	7.71	39.63	51.14	41.03	116.84
Inside Replacements	2.20	0.78	32.47	16.21	5.31	99.93
Outside Replacements	10.44	7.37	39.20	30.57	27.30	131.04
Investment Grade	1.24	0.35	31.84	13.27	1.34	102.85
Non-Investment Grade	19.00	8.51	41.67	51.37	44.25	118.48

Tests for Differences between Pre-Turnover and Post-Turnover Samples for Stocks and Bonds

	Stocks t-statistic	Bonds t-statistics
All Turnover Announcements	2.55[b]	3.94[a]
Voluntary Announcements	1.05	2.53[b]
Forced Announcements	3.57[a]	3.87[a]
Inside Replacements	1.46	3.30[a]
Outside Replacements	2.64[a]	2.16[b]
Investment Grade	0.86	3.65[a]
Non-Investment Grade	3.98[a]	2.67[a]

This table presents data on bond and stock return volatility around CEO turnovers. The sample consists of 563 turnover events over the 1973 through 1995 period. The change in volatility around the turnover event is computed as the natural log of the ratio of post-turnover volatility to pre-turnover volatility. The annualized daily stock return and annualized monthly bond return standard

deviations are computed for the 2 year period before (pre-turnover) and the 1 year period after (post turnover) the CEO turnover event. Test statistics are presented in parentheses below the mean log. The mean difference between log ratios for the turnover and matched samples are presented with test statistics below. The notation a, b, c denotes significance at the 1%, 5%, and 10%, respectively.

Table 5.1
Yield Spreads, Stock Returns, and Changes in Firm Value on the Announcement of a CEO Turnover

Turnover Event	Obs.	Mean Raw Yield Spread	Mean Abnormal Spread	Median Abnormal Yield Spread	Mean Cumulative Abnormal Stock Returns	Abnormal Change in Total Firm Value
All Turnover Announcements	674	172.532	6.552[a] (2.63)	1.781[b] (1.96)	0.602[a] (3.67)	0.522[a] (2.68)
Voluntary Announcements	570	142.147	2.571 (1.53)	0.959 (1.15)	0.270[b] (2.35)	0.241 (1.14)
Forced Announcements	104	339.066	28.368[b] (2.16)	4.744[b] (2.20)	2.427[a] (3.84)	2.060[a] (4.15)
Inside Replacement	539	152.934	5.499[b] (2.56)	1.516 (1.26)	0.148 (0.68)	0.117 (0.54)
Outside Replacement	135	250.774	10.756 (1.19)	4.508[c] (1.76)	2.419[a] (6.83)	2.139[a] (4.92)
Inside Industry Replacement	609	164.678	6.170[b] (2.52)	0.961 (1.04)	0.521[a] (2.62)	0.474[b] (2.31)
Outside Industry Replacement	65	246.115	10.133 (0.84)	0.646 (0.50)	1.364[a] (3.79)	0.980 (1.56)
Voluntary Turnover Announcements						
Inside Replacement	492	141.991	3.297[c] (1.88)	2.987 (0.88)	0.106 (0.85)	0.083 (0.37)
Outside Replacement	78	143.129	-2.004 (-0.38)	8.266[b] (1.99)	1.301[a] (4.22)	1.238[b] (2.16)
Forced Turnover Announcements						
Inside Replacement	47	267.498	28.551[c] (1.76)	0.961 (1.24)	0.583 (0.43)	0.467 (0.63)
Outside Replacement	57	398.079	28.218 (1.41)	8.479[b] (2.51)	3.948[a] (5.59)	3.373[a] (5.04)

T-statistics for Differences in Means (Medians)

	Abnormal Bond Yield Spread	Abnormal Stock Return	Abnormal Change in Firm Value
Voluntary vs. Forced	3.73[a] (1.41)	3.84[a] (1.60)	3.40[a] (1.41)
Inside vs. Outside Firm	0.80 (1.12)	4.49[a] (3.30)[a]	4.21[a] (3.30)[a]
Inside vs. Outside Industry	0.48 (1.98)[b]	1.21 (1.80)[c]	0.77 (1.59)
Voluntary (Inside vs. Outside)	1.09 (0.19)	2.40[b] (2.00)[b]	2.43[b] (2.20)[b]
Forced (Inside vs. Outside)	0.04 (0.88)	1.84[c] (2.08)[b]	1.67[c] (1.95)[c]

This table provides abnormal bond yield spreads in basis points, abnormal stock returns, and abnormal changes in firm value. The data covers the period 1973 through 2000. Mean abnormal spread is calculated for the (0,0) month event window and the t statistics are obtained from the difference in event and estimation period (-3,-1). Median abnormal yield spreads are shown with t statistics derived from the Wilcoxon signed rank test in parentheses. Mean cumulative stock abnormal returns are for the (-1,1) three day event window. Parameters are estimated over 255 days ending 31 days prior to the CEO succession announcement using standard market model methods. The p-values for the mean cumulative abnormal stock returns and abnormal change in firm value

are derived from the Z score. Test statistics for the differences in means are from the t test, while t-statistics for the difference in medians are from the Wilcoxon two sample tests. All yield spreads are expressed in basis points, all stock returns are expressed in percentages, and t-values in parentheses. The notation [a, b, c] denotes significance at the 1%, 5%, and 10%, respectively.

Table 5.2
Yield Spreads, Stock Returns, and Changes in Firm Value on the Announcement of a CEO Turnover by Debt Grade Type

Turnover Announcements	Obs.	Mean Raw Yield Spread	Mean Abnormal Yield Spread	Median Abnormal Yield Spread	Mean Cumulative Abnormal Stock Returns	Change in Total Firm Value
Investment Grade Debt						
All Turnovers	588	121.151	1.658 (1.10)	1.720[c] (1.70)	0.402[a] (2.56)	0.347[c] (1.66)
Voluntary Turnovers	518	116.977	1.715 (1.12)	0.959 (1.31)	0.235[b] (2.06)	0.214 (0.96)
Forced Turnovers	70	152.037	1.232 (0.22)	4.130 (1.29)	1.641[c] (1.83)	1.334[b] (2.21)
Inside Replacement	488	118.772	1.755 (1.22)	0.850 (0.88)	0.068 (0.39)	0.046 (0.20)
Outside Replacement	100	132.759	1.181 (0.17)	4.508[c] (1.71)	2.035[a] (5.36)	1.813[a] (3.59)
Non-Investment Grade Debt						
All Turnovers	86	523.832	40.013[b] (2.46)	3.267 (1.26)	1.972[a] (3.56)	1.719[a] (3.15)
Voluntary Turnovers	52	392.871	11.098 (1.05)	1.707 (0.16)	0.616 (1.27)	0.519 (0.74)
Forced Turnovers	34	724.126	84.237[b] (2.28)	16.517[b] (2.14)	4.045[a] (4.09)	3.554[a] (4.10)
Inside Replacement	51	479.822	41.316[b] (2.37)	8.745 (1.46)	0.913 (1.11)	0.792 (1.12)
Outside Replacement	35	587.962	38.118 (1.23)	4.365 (0.95)	3.515[a] (4.37)	3.072[a] (3.59)

T-statistics for Differences in Means (Medians)

	Abnormal Bond Yield Spread	Abnormal Stock Return	Abnormal Change in Firm Value
Investment vs. Non-Investment	5.36[a] (1.32)	2.73[a] (0.98)	2.51[b] (1.01)
Investment (Voluntary vs. Forced)	0.20 (0.82)	2.47[b] (0.49)	2.07[b] (0.22)
Investment (Inside vs. Outside)	0.33 (1.14)	3.85[a] (2.64[a])	3.64[a] (2.63[a])
Non-Investment (Voluntary vs. Forced)	2.18[b] (1.07)	1.67[c] (1.65)	1.55 (1.75[c])
Non-Investment (Inside vs. Outside)	0.03 (0.07)	1.46 (1.61)	1.34 (1.59)

This table provides abnormal bond yield spreads, abnormal stock returns, and abnormal changes in firm value segmented by the investment grade type. The data covers the period 1973 through 2000. Mean abnormal spread is calculated for the (0,0) month event window and the t statistics are obtained from the difference in event and estimation period (-3,-1). Median abnormal yield spreads are shown with t statistics derived from the Wilcoxon signed rank test in parentheses. Mean cumulative stock abnormal returns are for the (-1,1) three day event window. Parameters are estimated over 255 days ending 31 days prior to the CEO succession announcement using standard market model methods. The p-values for the mean cumulative abnormal stock returns and abnormal change in firm value are derived from the Z score. All yield spreads are expressed in basis

points, all stock returns are expressed in percentages, and t-values in parentheses. Test statistics for the differences in means are from the t test, while t-statistics for the difference in medians are from the Wilcoxon two sample tests. All The notation a, b, c denotes significance at the 1%, 5%, and 10%, respectively.

Table 5.3
Yield Spreads and Forced Turnover

	Model 1		Model 2		Model 3	
Variables	Delete Obs w/ Missing Variables (1)	Multiple Imputation (2)	Delete Obs w/ Missing Variables (3)	Multiple Imputation (4)	Delete Obs w/ Missing Variables (5)	Multiple Imputation (6)
Intercept	-1.600	-4.436	2.318	-0.697	-2.196	-4.924[c]
	(-0.61)	(-1.59)	(1.08)	(-0.27)	(-0.77)	(-1.65)
Bond Characteristics						
Mean Log Spread	0.958[a]	0.898[a]			1.066[a]	0.953[a]
	(3.46)	(3.85)			(2.59)	(2.86)
Non Investment Grade			1.356[a]	1.604[a]	4.846	6.452[b]
			(2.89)	(3.98)	(1.44)	(2.36)
Invest Spread					-0.775	-0.995[b]
					(-1.26)	(-1.99)
Firm Characteristics						
Size	-0.123	-0.090	-0.123	-0.070	-0.099	-0.065
	(-0.78)	(-0.66)	(-0.79)	(-0.51)	(-0.62)	(-0.47)
Leverage	-3.156[b]	-2.894[b]	-3.099[b]	-2.741[b]	-3.298[b]	-2.940[b]
	(-2.20)	(-2.37)	(-2.27)	(-2.40)	(-2.34)	(-2.51)
Return	-14.633[a]	-12.066[a]	-15.982[a]	-12.643[a]	-16.084[a]	-12.864[a]
	(-3.07)	(-2.93)	(-3.32)	(-3.05)	(-3.23)	(-3.06)
Institutional Ownership	-0.007	-0.011	-0.008	-0.009	-0.007	-0.009
	(-0.72)	(-1.15)	(-0.77)	(-1.01)	(-0.66)	(-0.95)
Board Size	-0.127	0.001	-0.088	0.025	-0.120	0.001
	(-0.51)	(0.00)	(-0.36)	(0.12)	(-0.47)	(0.00)
Board Independence	1.181	0.518	1.348	0.898	1.149	0.524
	(0.83)	(0.44)	(-0.35)	(0.75)	(0.80)	(0.43)
CEO Characteristics						
Age	-2.438[a]	-2.513[a]	-2.489[a]	-2.559[a]	-2.464[a]	-2.564[a]
	(-6.44)	(-7.74)	(-6.59)	(-7.86)	(-6.40)	(-7.73)
Tenure	-0.056	-0.078[a]	-0.057[c]	-0.077[b]	-0.055	-0.078[b]
	(-1.64)	(-2.54)	(-1.66)	(-2.46)	(-1.62)	(-2.51)
Ownership	-0.161	-0.065	-0.109	-0.061	-0.132	-0.068
	(-1.09)	(-0.86)	(-0.88)	(-0.76)	(-0.97)	(-0.89)

Note: Year and dummy values reported on next page

	Model 1		Model 2		Model 3	
Variables	Delete Obs w/ Missing Variables (1)	Multiple Imputation (2)	Delete Obs w/ Missing Variables (3)	Multiple Imputation (4)	Delete Obs w/ Missing Variables (5)	Multiple Imputation (6)
Dummy Variables						
Dum1974		2.164		1.894		2.054
		(0.48)		(0.40)		(0.45)
Dum1975		1.264		1.464		1.323
		(0.69)		(0.77)		(0.69)
Dum1976		2.652		2.346		2.610
		(0.56)		(0.47)		(0.54)
Dum1977		1.339		1.067		1.279
		(0.68)		(0.53)		(0.54)
Dum1978		2.486		2.217		2.578
		(1.11)		(0.96)		(1.11)
Dum1979	-0.404	2.687	-0.470	2.370	-0.530	2.681
	(-0.29)	(1.20)	(-0.35)	(1.01)	(-0.38)	(1.15)
Dum1980	-0.932	1.723	-0.711	1.616	-0.961	1.781
	(-0.73)	(0.76)	(-0.58)	(0.69)	(-0.74)	(0.76)
Dum1981	-0.393	3.072	0.011	2.864	-0.432	2.898
	(-0.32)	(1.39)	(0.01)	(1.24)	(-0.34)	(1.26)
Dum1982	-0.481	2.604	0.191	2.802	-0.501	2.691
	(-0.31)	(1.08)	(0.13)	(1.12)	(-0.33)	(1.08)
Dum1983	-13.452	-11.196	-13.070	-11.360[a]	-13.606	-11.391
	(-0.04)	(-0.02)	(-0.04)	(-0.02)	(-0.04)	(-0.02
Dum1984	-0.422	2.693	-0.224	2.450	-0.463	2.641
	(-0.34)	(1.21)	(-0.19)	(1.06)	(-0.37)	(1.15
Dum1985	-0.109	2.970	0.165	2.785	-0.193	2.906
	(-0.09)	(1.34)	(0.14)	(1.20)	(-0.16)	(1.26)
Dum1986	-0.884	2.292	-0.423	2.178	-1.222	1.913
	(-0.68)	(1.03)	(-0.34)	(0.93)	(-0.92)	(0.82
Dum1987	-0.184	3.011	0.616	3.300	-0.288	2.989
	(-0.14)	(1.33)	(0.50)	(1.39)	(-0.22)	(1.27)
Dum1988	-0.304	2.949	0.441	3.178	-0.302	3.045
	(-0.23)	(1.32)	(0.36)	(1.35)	(-0.23)	(1.31)
Dum1989	-0.085	3.172	0.656	3.322	-0.291	2.979
	(-0.06)	(1.38)	(0.50)	(1.37)	(-0.21)	(1.25)
Dum1990	0.255	3.591	0.915	3.708	0.123	3.540
	(0.20)	(1.59)	(0.78)	(1.57)	(0.10)	(1.51)
Dum1991	0.853	4.218[c]	1.493	4.266[c]	0.777	4.167[c]
	(0.69)	(1.87)	(1.29)	(1.81)	(0.63)	(1.78)
Dum1992	0.213	3.379	0.909	3.563	0.064	3.308
	(0.16)	(1.45)	(0.70)	(1.46)	(0.05)	(1.37)
Dum1993	-0.446	2.692	0.060	2.667	-0.616	2.551
	(-0.36)	(1.19)	(0.05)	(1.12)	(-0.48)	(1.08)
Dum1994	-0.532	2.453	-0.071	2.410	-0.711	2.298
	(-0.41)	(1.09)	(-0.06)	(1.02)	(-0.54)	(0.98)
Dum1995	0.680	4.087[c]	0.782	3.790	0.623	4.074[c]
	(0.47)	(1.74)	(0.56)	(1.55)	(0.43)	(1.68)
Dum1996	1.115	4.074[c]	1.2393	3.708	0.994	3.981[c]
	(0.86)	(1.79)	(1.00)	(1.56)	(0.76)	(1.69)
Dum1997	-0.981	2.195	-1.160	1.496	-1.288	1.849
	(-0.69)	(0.97)	(-0.84)	(0.63)	(-0.87)	(0.78)
Dum1998	-12.603	-10.187[a]	-12.660	-10.502	-12.596	-10.218
	(-0.01)	(-0.02)	(-0.01)	(-0.02)	(-0.01)	(-0.02)

	Model 1		Model 2		Model 3	
Dummy Variables	Delete Obs w/ Missing Variables (1)	Multiple Imputation (2)	Delete Obs w/ Missing Variables (3)	Multiple Imputation (4)	Delete Obs w/ Missing Variables (5)	Multiple Imputation (6)
Dum1999	2.065	1.837	2.880	2.213	2.014	1.759
	(1.00)	(0.75)	(1.49)	(0.87)	(0.95)	(0.69)
Dum2000	-13.260	3.658	-12.181	3.680	-13.462	3.584
	(-0.01)	(1.51)	(-0.01)	(1.46)	(-0.01)	(1.44)
Dumsic1	1.344	0.932	1.182	0.665	1.158	0.770
	(1.02)	(0.78)	(0.94)	(0.58)	(0.89)	(0.65)
Dumsic2	-0.818	-0.683	-0.955	-0.878	-0.817	-0.671
	(-0.75)	(-0.66)	(-0.91)	(-0.89)	(-0.74)	(-0.64)
Dumsic3	-1.375	-1.157	-1.485	-1.291	-1.519	-1.327
	(-1.23)	(-1.10)	(-1.39)	(-1.27)	(-1.35)	(-1.25)
Dumsic4	-1.308	-1.088	-1.368	-1.181	-1.472	-1.306
	(-1.14)	(-1.02)	(-1.25)	(-1.15)	(-1.27)	(-1.21)
Dumsic5	-1.137	-0.780	-1.152	-0.918	-1.214	-0.946
	(-0.94)	(-0.70)	(-1.00)	(-0.86)	(0-1.01)	(-0.85)
Dumsic6	-1.820	-1.789	-1.765	-1.776	-1.930	-1.859[c]
	(-1.47)	(-1.58)	(-1.48)	(-1.63)	(-1.55)	(-1.63)
Number	495	674	495	674	495	674
Pseudo R^2	0.280	0.233	0.272	0.278	0.284	0.293

Note: χ^2 for year and industry variables are 20.32 and 15.93 with p-values of 0.82 and 0.03 respectively for Model 3 in column 6.

This table presents Logit regressions modeling the likelihood of forced CEO turnover while controlling for bond structure, firm specific, and security specific factors. The data covers the period 1973-2000. The dependent variable is assigned a value of 1 if the turnover is forced and 0 otherwise. Independent variables include: mean of the natural log of yield spreads for each month in the 3 month period prior to the announcement (Mean Log Spread), a Non-Investment debt grade indicator, an interaction term (Invest Spread) computed as the product of Mean Spread and the Non-investment grade indicator variable, firm size (Size), firm leverage (Leverage), Pre 6 month industry adjusted returns using a two digit SIC equally weighted index ($Return_{t-1}$), the percentage of shares held by institution (Institution), the ratio of the number of directors to the natural log of total assets (Board Size), the ratio of outside directors to the total number of board members (board independence), a binary variable that takes a value of 1 if the incumbent CEO is over 60 years of age (Age), the number of years the incumbent has held the CEO title (Tenure), and the percentage of shares outstanding held by the incumbent CEO (Ownership). All models include year and industry dummy variables. Multiple imputations are employed to increase model efficiency. The notation [a, b, c] represents significance at the 1%, 5 %, and 10%, respectively. T-statistics are in parentheses.

Table 5.4
Credit Rating Changes and CEO Turnover Announcements

	Downgrades (n=911)			Upgrades (n=562)		
Variable	Forced	Outside	Outside Industry	Forced	Outside	Outside Industry
Intercept	-3.536[b]	-3.818[a]	-3.281[c]	-1.609	-1.767	-1.906
	(-2.01)	(-2.13)	(-1.85)	(-0.98)	(-1.09)	(-1.18)
Size	0.191[c]	0.191[c]	0.180[c]	0.184	0.187	0.190
	(1.93)	(1.92)	(1.82)	(1.51)	(1.55)	(1.57)
Leverage	1.032	1.043	0.660	0.036	0.138	0.239
	(1.26)	(1.27)	(0.83)	(0.04)	(0.15)	(0.26)
$Return_{t-1}$	-15.412[a]	-16.881[a]	-17.269[a]	18.963[a]	19.881[a]	20.110[a]
	(-4.29)	(-4.73)	(-4.93)	(3.81)	(4.10)	(4.15)
Rating	-0.026	-0.026	-0.045	-0.162[a]	-0.157[a]	-0.149[a]
	(-0.73)	(-0.73)	(-1.30)	(-3.74)	(-3.66)	(-3.56)
Duration	-0.120	-0.142	-0.132	-0.009	-0.014	0.012
	(-1.31)	(-1.53)	(-1.43)	(-0.10)	(-0.15)	(0.13)
Convexity	0.610	0.710	0.660	-0.041	-0.069	-0.054
	(1.34)	(1.54)	(1.44)	(-0.10)	(-0.16)	(-0.13)
Liquidity	-0.015	-0.013	-0.014	-0.012	-0.013	-0.014
	(-0.76)	(-0.67)	(-0.69)	(-0.50)	(-0.55)	(-0.55)
Institution	0.003	0.004	0.003	0.010	0.009	0.009
	(0.44)	(0.55)	(0.38)	(1.15)	(1.03)	(1.12)
Board Size	0.252[c]	0.264[b]	0.242[c]	0.212	0.203	0.210
	(1.94)	(2.00)	(1.85)	(1.18)	(1.12)	(1.16)
Board Independence	1.531[c]	1.521	1.675[c]	-1.176	-1.161	-1.235
	(1.65)	(1.63)	(1.81)	(-1.02)	(-1.01)	(-1.08)
Forced	0.919[a]			-0.693		
	(3.22)			(-1.56)		
Outside		0.930[a]			-0.388	
		(3.47)			(-1.06)	
Outside Industry			0.616[c]			-0.198
			(1.76)			(-0.41)
Dummy Variables						
Dum1974	-1.074	-0.809	-0.935			
	(-0.71)	(-0.54)	(-1.30)			
Dum1975	-0.427	-0.094	-0.110			
	(-0.32)	(-0.07)	(-1.43)			
Dum1976	-14.709	-14.587	-14.592			
	(-0.02)	(-0.02)	(1.44)			
	Downgrades (n=911)			Upgrades (n=562)		
Variable	Forced	Outside	Outside Industry	Forced	Outside	Outside Industry
Dum1977	0.005	0.105	0.112			
	(0.01)	(0.08)	(-0.69)			
Dum1978	0.291	0.375	0.473	-14.628	-14.570	-14.617
	(0.24)	(0.31)	(0.38)	(-0.02)	(-0.02)	(-0.02)

Dum1979	0.868	0.875	0.869[c]	-0.945	-0.891	-0.890
	(0.75)	(0.75)	(1.85)	(-0.79)	(-0.75)	(-0.76)
Dum1980	0.713	0.752	0.852[c]	0.966	1.044	0.994
	(0.61)	(0.64)	(1.81)	(1.29)	(1.40)	(1.33)
Dum1981	1.329	1.405	1.504[c]	1.223	1.276[c]	1.212[c]
	(1.13)	(1.19)	(1.76)	(1.70)	(1.77)	(1.69)
Dum1982	1.309	1.457	1.458	0.716	0.764	0.727
	(1.08)	(1.20)	(-0.62)	(0.86)	(0.92)	(0.87)
Dum1983	0.147	0.264	0.171	0.403	0.484	0.495
	(0.12)	(0.21)	(-0.08)	(0.49)	(0.60)	(0.61)
Dum1984	1.422	1.592	1.597	1.433	1.461[b]	1.424[b]
	(1.20)	(1.34)	(-0.02)	(2.02)	(2.06)	(2.01)
Dum1985	1.416	1.538	1.642	0.259	0.285	0.215
	(1.20)	(1.30)	(0.09)	(0.31)	(0.35)	(0.26)
Dum1986	0.875	1.052	1.025	-1.101	-1.065	-1.083
	(0.74)	(0.88)	(0.39)	(-1.13)	(-1.10)	(-1.12)
Dum1987	0.658	0.744	0.799	0.911	0.976	0.928
	(0.55)	(0.62)	(0.74)	(1.23)	(1.32)	(1.26)
Dum1988	1.128	1.231	1.326	-0.169	-0.086	-0.144
	(0.96)	(1.05)	(0.73)	(-0.21)	(-0.11)	(-0.18)
Dum1989	1.399	1.409	1.589	0.044	0.122	0.056
	(1.15)	(1.15)	(1.28)	(0.05)	(0.13)	(0.06)
Dum1990	1.272	1.381	1.452	0.200	0.232	0.177
	(1.08)	(1.17)	(1.20)	(0.25)	(0.29)	(0.22)
Dum1991	1.102	1.187	1.331	-0.308	-0.297	-0.404
	(0.92)	(0.99)	(0.13)	(-0.34)	(-0.33)	(-0.45)
Dum1992	0.585	0.790	0.807	0.644	0.693	0.642
	(0.46)	(0.62)	(1.35)	(0.70)	(0.76)	(0.71)
Dum1993	0.474	0.458	0.576	0.519	0.592	0.528
	(0.39)	(0.38)	(1.39)	(0.65)	(0.74)	(0.66)
Dum1994	0.487	0.519	0.643	0.651	0.734	0.640
	(0.40)	(0.43)	(0.86)	(0.84)	(0.95)	(0.83)
Dum1995	-1.157	-0.952	-0.812	-0.662	-0.652	-0.728
	(-0.73)	(-0.61)	(0.67)	(-0.52)	(-0.51)	(-0.57)
Dum1996	-1.438	-1.267	-1.144	-1.707	-1.670	-1.740
	(-1.05)	(-0.93)	(1.13)	(-1.40)	(-1.37)	(-1.43)
Dum1997	-1.767	-1.984	-1.700	-0.904	-0.733	-0.860
	(-1.15)	(-1.29)	(1.31)	(-0.91)	(-0.73)	(-0.86)
Dum1998	-0.675	-0.891	-0.640	-0.473	-0.334	-0.428
	(-0.43)	(-0.57)	(1.23)	(-0.45)	(-0.31)	(-0.40)
Dum1999	0.098	0.336	0.355	0.298	0.277	0.215
	(0.07)	(0.23)	(1.12)	(0.26)	(0.24)	(0.19)
Dum2000	-15.881	-16.116	-15.742	0.051	0.083	0.001
	(-0.01)	(-0.01)	(0.64)	(0.05)	(0.09)	(0.01)

	Downgrades (n=911)			Upgrades (n=562)		
Variable	Forced	Outside	Outside Industry	Forced	Outside	Outside Industry
Dumsic1	-1.179	-1.083	-0.936	0.266	0.265	0.252
	(-1.12)	(-1.00)	(0.48)	(0.54)	(0.54)	(0.00)

Dumsic2	-1.065	-0.878	-0.934	0.467	0.486	0.462
	(-1.21)	(-0.96)	(0.53)	(1.05)	(1.10)	(0.51)
Dumsic3	-0.870	-0.739	-0.780	1.564[a]	1.551[a]	1.534
	(-0.99)	(-0.81)	(-0.52)	(3.13)	(3.12)	(0.29)
Dumsic4	-1.203	-1.091	-1.097	1.346[b]	1.308[b]	1.310[a]
	(-1.32)	(-1.15)	(-0.84)	(2.38)	(2.33)	(3.09)
Dumsic5	-1.176	-0.942	-1.001	-14.628	-14.570	-14.617[b]
	(-1.24)	(-0.96)	(-1.11)	(1.23)	(-0.02)	(2.33)
Dumsic6	-1.213	-1.050	-1.104			
	(-1.30)	(-1.08)	(-0.41)			
Pseudo R^2	0.193	0.196	0.186	0.237	0.235	0.204
Observations	196	208	108	42	74	48

Note: χ^2 for year and industry variables are 32.87 and 2.08 with p-values of 0.20 and 0.96 respectively for the forced turnover downgrade model.

This table presents Logit regressions modeling the likelihood of credit rating changes while controlling for bond structure, firm specific, and security specific factors. The data covers the period 1973-2000. Independent variables include: firm size (Size), firm leverage (Leverage), Pre 6 month industry adjusted returns using a two digit SIC equally weighted index ($Return_{t-1}$), the average of Moody's and S&P credit rating (Rating), debt age (Liquidity), debt duration (Duration), debt convexity (Convexity), the percentage of shares held by institution (Institution), the ratio of the number of directors to the natural log of total assets (Board Size), and the ratio of outside directors to the total number of board members (Board Independence). All models include year and industry dummy variables. Multiple imputations are employed to increase model efficiency. The notation [a, b, c] represents significance at the 1%, 5 %, and 10%, respectively. T-values are in parentheses.

Table 5.5
CEO Characteristics and Yield Spread Ratios

Panel A: Ordinary Least Squares Estimates using Weighted Average Sample

	Dependent Variable = Yield Spread Ratio				
Variables	All Turnovers (1)	Voluntary Turnovers (2)	Forced Turnovers (3)	Inside Replacement (4)	Outside Replacement (5)
Intercept	1.454[a] (6.24)	1.343[a] (5.16)	1.152[c] (1.69)	1.199[a] (4.36)	2.047[a] (3.51)
Size	0.021 (1.39)	0.007 (0.40)	0.109[b] (2.45)	0.013 (0.78)	0.058 (1.54)
Leverage	-0.047 (-0.36)	0.187 (1.33)	-1.135[a] (-2.76)	0.163 (1.12)	-1.148[a] (-3.19)
$Return_{t-1}$	-0.090 (-0.18)	1.010 (1.53)	-0.030 (-0.03)	0.449 (0.70)	0.344 (0.35)
Rating	-0.006 (-1.08)	0.004 (0.72)	-0.022 (-1.57)	0.001 (0.05)	-0.029[b] (-2.22)
Duration	-0.027[b] (-2.52)	-0.028[b] (-2.40)	-0.092[b] (-2.15)	-0.027 (-1.41)	-0.042[b] (-2.15)
Convexity	0.024 (0.54)	0.027 (0.58)	0.301 (1.38)	0.029 (0.32)	0.024 (0.35)
Liquidity	0.003 (0.76)	0.002 (0.51)	0.009 (0.81)	0.001 (0.18)	0.022[b] (2.01)
Institution	-0.001 (-0.45)	-0.001 (-0.42)	-0.004 (-1.56)	-0.001 (-0.77)	-0.001 (-0.38)
Board Size	0.032 (1.47)	0.018 (0.77)	0.177[a] (2.43)	0.020 (0.86)	0.106 (1.30)
Board Independence	-0.126 (-0.95)	-0.106 (-0.77)	-0.595 (-1.26)	-0.031 (-0.22)	-0.376 (-1.06)
Age	0.041 (1.07)	0.043 (0.93)	0.218[c] (1.94)	0.043 (0.94)	0.113 (1.38)
Tenure	0.001 (0.19)	0.002 (0.71)	-0.014 (-1.24)	-0.001 (0.51)	-0.001 (-0.09)
Ownership	-0.004 (-0.65)	-0.008 (-1.15)	0.013 (0.49)	-0.006 (-0.90)	-0.018 (-0.83)

	Dependent Variable = Yield Spread Ratio				
Dummy Variables	All Turnovers (1)	Voluntary Turnovers (2)	Forced Turnovers (3)	Inside Replacement (4)	Outside Replacement (5)
Dum1974	-0.055 (-0.39)	-0.077 (-0.48)	0.856 (1.48)	-0.032 (-0.21)	
Dum1975	-0.269[c] (-1.81)	-0.277[c] (-1.67)	0.245 (0.44)	-0.262[c] (-1.65)	-0.287 (-0.68)
Dum1976	0.003 (0.02)	0.006 (0.12)	0.454 (0.70)	-0.016 (-0.10)	0.189 (0.36)
Dum1977	-0.201 (-1.38)	-0.200 (-1.27)	0.578 (1.02)	-0.190 (-1.20)	-0.168 (-0.44)
Dum1978	-0.080	-0.081	0.474	-0.060	-0.264

	(-0.56)	(-0.50)	(0.87)	(-0.38)	(-0.74)
	-0.033	0.021	0.292	0.018	-0.246
Dum1979	(-0.23)	(0.18)	(0.52)	(0.12)	(-0.70)
	-0.024	-0.023	0.684	0.032	-0.516
Dum1980	(-0.17)	(-0.14)	(1.17)	(0.20)	(-1.42)
	-0.067	-0.172	0.793	-0.219	0.268
Dum1981	(-0.45)	(-1.08)	(1.43)	(-1.35)	(0.73)
	-0.212	-0.202	0.211	-0.201	-0.131
Dum1982	(-1.36)	(-1.22)	(0.30)	(-1.21)	(-0.25)
	-0.268[c]	-0.238		-0.223	
Dum1983	(-1.78)	(-1.49)		(-1.40)	
	-0.264[c]	-0.289[c]	0.417	-0.274[c]	-0.131
Dum1984	(-1.77)	(-1.80)	(0.76)	(-1.70)	(-0.32)
	-0.112	-0.062	0.191	-0.077	-0.402
Dum1985	(-0.76)	(-0.35)	(0.37)	(-0.48)	(-1.05)
	-0.003	0.018	0.453	-0.019	-0.080
Dum1986	(-0.02)	(0.18)	(0.83)	(-0.12)	(-0.19)
	-0.268[c]	-0.240	0.002	-0.224	-0.567
Dum1987	(-1.84)	(-1.51)	(0.00)	(-1.42)	(-1.51)
	-0.278[c]	-0.274[c]	0.424	-0.259	-0.448
Dum1988	(-1.94)	(-1.74)	(0.78)	(-1.63)	(-1.26)
	-0.139	-0.163	0.629	-0.083	-0.481
Dum1989	(-0.89)	(-0.92)	(1.17)	(-0.47)	(-1.30)
	-0.230	-0.262	0.393	-0.247	-0.255
Dum1990	(-1.57)	(-1.63)	(0.72)	(-1.53)	(-0.71)
	-0.250[c]	-0.217	0.163	-0.223	-0.491
Dum1991	(-1.67)	(-1.29)	(0.30)	(-1.33)	(-1.39)
	-0.365[b]	-0.385[b]	0.315	-0.294[c]	-1.094[b]
Dum1992	(-2.23)	(-2.16)	(0.54)	(-1.67)	(-2.25)
	-0.124	-0.059	0.265	-0.059	-0.250
Dum1993	(-0.85)	(-0.32)	(0.47)	(-0.36)	(-0.72)
	-0.300[b]	-0.306[c]	0.264	-0.296[c]	-0.454
Dum1994	(-2.04)	(-1.89)	(0.55)	(-1.82)	(-1.26)
	-0.357[b]	-0.413[b]	0.593	-0.350[c]	-0.401
Dum1995	(-2.11)	(-2.20)	(0.98)	(-1.91)	(-0.88)
	-0.095	0.007	0.285	-0.070	-0.288
Dum1996	(-0.63)	(0.12)	(0.50)	(-0.42)	(-.80)
	-0.185	-0.175	0.324	-0.159	-0.389
Dum1997	(-1.24)	(-1.04)	(0.56)	(-0.92)	(-1.12)
	-0.138	-0.150		-0.096	-0.284
Dum1998	(-0.84)	(-0.80)		(-0.51)	(-0.76)

	Dependent Variable = Yield Spread Ratio				
	All Turnovers	Voluntary Turnovers	Forced Turnovers	Inside Replacement	Outside Replacement
Dummy Variables	(1)	(2)	(3)	(4)	(5)
	-0.005	0.034	0.360	0.030	-0.198
Dum1999	(-0.03)	(0.23)	(0.67)	(0.15)	(-0.39)
	-0.039	-0.197	1.048[c]		-0.045
Dum2000	(-0.18)	(-0.66)	(1.78)		(-0.12)
Dumsic2	-0.100	-0.105	-0.233	0.058	-0.276

	(-1.00)	(-0.83)	(-1.15)	(0.44)	(-1.56)
	-0.180[c]	-0.190	-0.286	-0.048	-0.340[b]
Dumsic3	(-1.82)	(-1.55)	(-1.43)	(-0.36)	(-1.98)
	-0.154	-0.202	0.040	-0.072	-0.172
Dumsic4	(-1.48)	(-1.55)	(0.19)	(-0.51)	(-0.98)
	-0.163	-0.205	0.085	-0.028	-0.196
Dumsic5	(-1.48)	(-1.53)	(0.26)	(-0.20)	(-0.74)
	-0.173[c]	-0.149	-0.459[b]	-0.029	-0.492[b]
Dumsic6	(-1.67)	(-1.14)	(-2.11)	(-0.22)	(-2.38)
	-0.064	-0.134	0.137	0.066	-0.209
Dumsic7	(-0.36)	(-0.48)	(0.48)	(0.30)	(-0.60
	-0.235	-0.214		-0.036	-0.729[c]
Dumsic8	(-0.91)	(-0.80)		(-0.08)	(-1.89)
Adjusted R^2	0.03	0.04	0.24	0.02	0.17
Observations	674	570	104	539	135

Panel B: Mixed Model Estimates with Random Firm, Year, and Industry Effects

Variables	Dependent Variable = Yield Spread Ratio				
	All Turnovers (1)	Voluntary Turnovers (2)	Forced Turnovers (3)	Inside Replacement (4)	Outside Replacement (5)
Intercept	1.333[a] (9.03)	1.403[a] (8.40)	0.853[a] (2.94)	1.379[a] (7.75)	0.981 (3.39)
Size	0.005 (0.40)	-0.006 (-0.44)	0.029 (1.41)	-0.002 (-0.16)	0.005 (0.23)
Leverage	-0.070 (-0.77)	-0.128[b] (-1.28)	0.067 (0.35)	-0.042 (-0.39)	-0.085 (-0.44)
$Return_{t-1}$	0.416 (1.30)	0.933[b] (2.40)	-0.266 (-0.48)	0.999[b] (2.20)	-0.118 (-0.21)
Rating	-0.009[b] (-2.35)	-0.006 (-1.39)	-0.007 (-0.89)	-0.010[b] (-2.04)	0.008 (1.10)
Duration	-0.017[a] (-3.47)	-0.016[a] (-3.08)	-0.024 (-1.64)	-0.026[a] (-3.62)	-0.011 (-1.60)
Convexity	0.033 (1.42)	0.036 (1.46)	0.011 (0.14)	0.081[b] (2.28)	-0.009 (-0.35)
Liquidity	0.002 (1.56)	0.001 (0.86)	0.010[a] (3.06)	0.002[c] (1.77)	0.001 (0.32)
Institution	-0.001 (-1.43)	-0.001 (-1.26)	-0.001 (-0.79)	-0.001[b] (-1.98)	-0.001 (-0.55)
Board Size	-0.009 (-0.51)	-0.026 (-1.38)	0.075[c] (1.93)	-0.001 (-0.01)	0.001 (0.01)
Board Independence	0.015 (0.18)	0.014 (0.16)	0.046 (0.29)	0.100 (1.01)	0.070 (0.40)
Age	-0.023 (-0.93)	-0.032 (-1.08)	0.061 (1.21)	-0.020 (-0.66)	-0.019 (-0.41)
Tenure	-0.010 (-0.11)	0.002 (1.02)	-0.003 (-0.58)	-0.001 (-0.58)	0.002 (0.64)
Ownership	-0.010[c] (-1.74)	-0.009 (-1.49)	-0.022 (-1.36)	-0.008 (-1.23)	-0.012 (-0.99)
Observations	3398	2992	406	2886	512

Panel C: Maximum Likelihood Estimates of Yield Spread Ratio Factors

Variables	Dependent Variable = Yield Spread Ratio				
	All Turnovers (1)	Voluntary Turnovers (2)	Forced Turnovers (3)	Inside Replacement (4)	Outside Replacement (5)
Intercept	1.116[a] (17.62)	1.099[a] (13.43)	1.019[a] (6.54)	1.134[a] (14.151)	1.058[a] (6.75)
Size	0.014[a] (3.24)	0.007 (1.25)	0.054[a] (5.36)	0.009[c] (1.68)	0.034[a] (2.61)
Leverage	-0.095[a] (-2.57)	-0.076[c] (-1.80)	-0.373[a] (-3.84)	-0.070[c] (-1.69)	-0.065 (-0.68)
$Return_{t-1}$	-0.067 (-0.39)	0.246 (1.23)	-0.268 (-0.62)	0.277 (1.32)	-0.828[a] (-2.84)
Rating	-0.008[a] (-4.39)	-0.005[b] (-2.40)	-0.023[a] (-5.34)	-0.006[a] (-2.90)	-0.014[a] (-3.70)
Duration	-0.008[c] (-1.90)	-0.008 (-1.62)	-0.006 (-0.55)	-0.018[a] (-3.32)	0.003 (0.66)
Convexity	0.028 (1.46)	0.037[c] (1.69)	-0.001 (-0.02)	0.074[a] (2.87)	-0.005 (-0.32)
Liquidity	0.001 (0.64)	0.001 (1.00)	-0.001 (-0.55)	0.001 (1.50)	-0.001 (-0.57)
Institution	-0.001[a] (-5.02)	-0.001[a] (-2.87)	-0.002[a] (-4.25)	-0.001[a] (-3.85)	-0.002[a] (-2.89)
Board Size	0.005 (0.84)	0.002 (0.22)	0.056[b] (2.56)	0.006 (0.93)	0.001 (0.01)
Board Independence	-0.017 (-0.42)	-0.015 (-0.29)	0.080 (0.77)	0.005 (0.12)	-0.054 (-0.58)
Age	-0.012 (-0.96)	-0.023 (-1.49)	0.060[b] (2.42)	-0.008 (-0.54)	-0.025 (-0.99)
Tenure	0.001 (1.01)	0.002[b] (2.22)	-0.006[a] (-2.95)	0.001 (0.08)	0.003[c] (1.70)
Ownership	-0.007[b] (-2.38)	-0.005[c] (-1.97)	-0.017 (-1.48)	-0.006[b] (-1.96)	-0.019[a] (-3.15)
Degrees of Freedom	2.310[a] (18.47)	2.320[a] (13.73)	1.818[a] (7.33)	2.300[a] (14.56)	2.16[a] (6.84)
Maximum Likelihood R^2	0.02	0.01	0.23	0.01	0.09
Observations	3398	2992	406	2886	512

This table presents results of yield spread ratio models for three different specifications. Panel A presents parameter estimates using ordinary least squares during the CEO turnover announcement month against incumbent CEO characteristics, after controlling for bond, firm, and board factors. Panel B reports parameter results utilizing random firm, year, and industry effects while Panel C reports t error maximum likelihood estimates. The data covers the period 1973-2000. Independent variables include: firm size (Size), firm leverage (Leverage), Pre 6 month industry adjusted returns using a two digit SIC equally weighted index ($Return_{t-1}$), the average of Moody's and S&P credit rating (Rating), debt age (Liquidity), debt duration (Duration), debt convexity (Convexity), the percentage of shares held by institution (Institution), the ratio of the number of directors to the natural log of total assets (Board Size), the ratio of outside directors to the total number of board members (board independence), a binary variable that takes a value of 1 if the incumbent CEO is over 60 years of age (Age), the number of years the incumbent has held the CEO title (Tenure), and

the percentage of shares outstanding held by the incumbent CEO (Insider). OLS models include year and industry dummy variables. Multiple imputations are employed to increase model efficiency. The notation [a, b, c] represents significance at the 1%, 5 %, and 10%, respectively.

APPENDIX A

NOTE ON OUTLIERS

In the creation of data sets extreme outliers may occur. The data contained in these outliers may accurately represent the data, but can be of sufficient magnitude to unduly affect the overall results. These outliers may become more problematic when further segmentation is provided (e.g., nature of the CEO turnover event, the origin of the successor, and investment grade debt status). In order to ascertain whether a few observations may overstate the effect of CEO turnover on firms' cost of publicly traded debt, this section identifies possible outliers. The primary concern is outliers in both the raw and abnormal yield spreads. Appendix Figure A.1 depicts the announcement month raw and abnormal yield spread relationship. While Appendix Figure A.2 shows the abnormal yield spread and credit rating relation. Four observations appear to be outliers with respect to abnormal yield spreads. Each of these observations is more than 1,000 basis points above or below the prior three month average. Appendix Table A.1 lists observation data for each.

The four possible outliers have abnormal yield spreads that appear to be of much greater magnitude in relation to raw spreads than the overwhelming majority of the sample as shown in Figure A.1. Additionally, Figure A.2 indicates these outliers have absolute abnormal yield spreads excessive for their respective credit ratings. Merisel Inc, with a B credit rating from Standard and Poor's rating service for the observation month as well as the months before and after the turnover announcement has an abnormal yield spread of 2,747.980 basis points, more than twice the previous three month mean yield spread. Raw yield spreads also approximately double for the Bank of New England during the CEO turnover announcement month; although the firm's credit rating is dramatically lower in the subsequent month. The abnormal yield spread for Midlantic Corporation is considerably lower, about -1,090.544 basis points, despite lower subsequent credit ratings. Finally,

the Public Service Company of New Hampshire, in its 1988 announcement of CEO succession, sees a reduction in associated debt costs of approximately 1,170.649 basis points.

Overall, these findings appear too large to be caused by CEO turnover and I assume they are errors. These large outliers also have the potential to significantly affect the mean values for various data segmentations such and forced turnover with outside; therefore they are removed from the sample.

Table A.1
Outlier Analysis

Firm Name	Date	Credit Rating	Previous Month Credit Rating	Following Month Credit Rating	Previous 3 Month Mean Yield Spread	Raw Yield Spread	Abnormal Yield Spread
Merisel Inc.	19960213	8.000	8.000	8.000	1,190.797	3,938.777	2,747.980
Bank of New England	19900228	8.637	8.635	4.225	1,593.474	2,993.133	1,399.659
Midlantic Corp.	19910412	8.333	8.330	6.000	2,182.997	1092.554	-1090.544
Public Service Comp of New Hampshire	19880915	4.644	4.900	4.646	3,302.903	2,132.254	-1,170.649

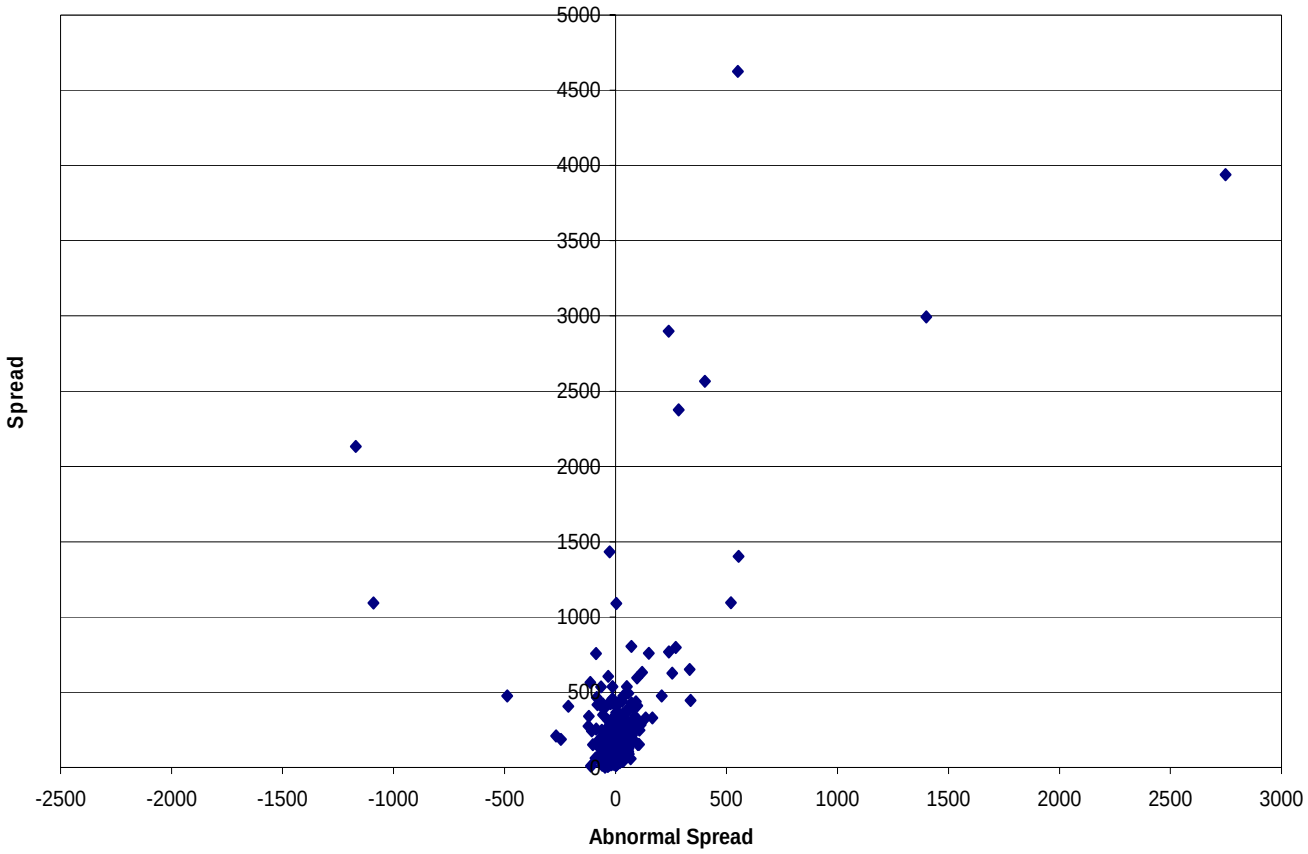

Figure A.1
Outlier Analysis: Yield Spreads

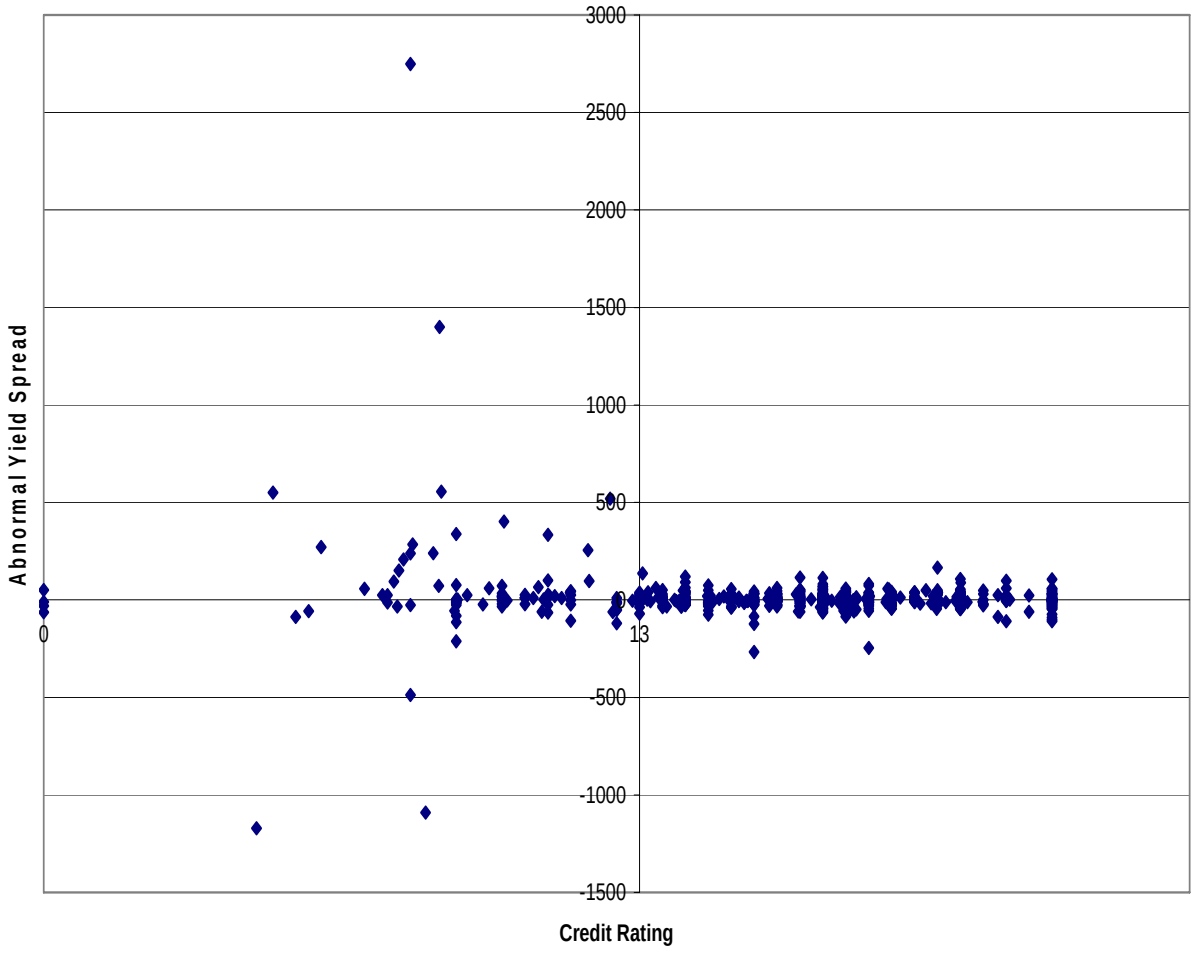

Figure A.2
Outlier Analysis: Credit Ratings

APPENDIX B

BOND YIELD SPREADS WITH ESTIMATION PERIOD RESULTS

Table B.1
Yield Spreads, Stock Returns, and Changes in Firm Value on the Announcement of a CEO Turnover using Estimation Period Standard Deviation

Turnover Event	Obs.	Mean Raw Yield Spread	Mean Abnormal Spread	Mean Cumulative Abnormal Stock Returns	Abnormal Change in Total Firm Value
			6.552[a]	0.602[a]	0.522[a]
All Turnover Announcements	674	172.532	(7.59)	(3.67)	(2.68)
			2.571[a]	0.270[b]	0.241
Voluntary Announcements	570	142.147	(5.23)	(2.35)	(1.14)
			28.368[a]	2.427[a]	2.060[a]
Forced Announcements	104	339.066	(7.02)	(3.84)	(4.15)
			5.499[a]	0.148	0.117
Inside Replacement	539	152.934	(4.93)	(0.68)	(0.54)
			10.756[a]	2.419[a]	2.139[a]
Outside Replacement	135	250.774	(7.03)	(6.83)	(4.92)
			6.170[a]	0.521[a]	0.474[b]
Inside Industry Replacement	609	164.678	(5.14)	(2.62)	(2.31)
			10.133[a]	1.364[a]	0.980
Outside Industry Replacement	65	246.115	(8.54)	(3.79)	(1.56)
Voluntary Turnover Announcements					
			3.297[a]	0.106	0.083
Inside Replacement	492	141.991	(4.46)	(0.85)	(0.37)
			2.004[a]	1.301[a]	1.238[b]
Outside Replacement	78	143.129	(2.94)	(4.22)	(2.16)
Forced Turnover Announcements					
			28.551[b]	0.583	0.467
Inside Replacement	47	267.498	(2.27)	(0.43)	(0.63)
			28.218[a]	3.948[a]	3.373[a]
Outside Replacement	57	398.079	(7.36)	(5.59)	(5.04)

This table provides abnormal bond yield spreads, abnormal stock returns, and abnormal changes in firm value. The data covers the period 1973 through 2000. The mean abnormal yield spread probabilities are calculated after standardizing the excess returns by their estimation period (-3,-1) standard deviation. Mean abnormal spread is calculated for the (0,0) month event window. Mean cumulative stock abnormal returns are for the (-1,1) three day event window. Parameters are estimated over 255 days ending 31 days prior to the CEO succession announcement using standard market model methods. The p-values for the mean cumulative abnormal stock returns and abnormal change in firm value are derived from the Z score. All yield spreads are expressed in basis points, all stock returns are expressed in percentages, and t-values computed as in Maxwell and Stevens (2003) are in parentheses. The notation [a, b, c] denotes significance at the 1%, 5%, and 10%, respectively.

APPENDIX C

BOND YIELD SPREADS WITH MONTHLY STOCK RETURNS

Table C.1
Yield Spreads, Monthly Stock Returns, and Changes in Firm Value on the Announcement of a CEO Turnover

Turnover Event	Obs.	Mean Raw Yield Spread	Mean Abnormal Spread	Median Abnormal Yield Spread	Monthly Abnormal Stock Returns	Abnormal Change in Total Firm Value
All Turnover Announcements	674	172.532	6.552[a] (2.63)	1.781[b] (1.96)	-0.216 (-0.48)	-0.285 (-0.86)
Voluntary Announcements	570	142.147	2.571 (1.53)	0.959 (1.15)	0.020 (0.08)	-0.063 (-0.20)
Forced Announcements	104	339.066	28.368[b] (2.16)	4.744[b] (2.20)	-1.503 (-1.40)	-1.495 (-1.19)
Inside Replacement	539	152.934	5.499[b] (2.56)	1.516 (1.26)	-0.491 (-1.50)	-0.508[c] (1.67)
Outside Replacement	135	250.774	10.756 (1.19)	4.508[c] (1.76)	0.884[c] (1.94)	0.605 (0.54)
Inside Industry Replacement	609	164.678	6.170[b] (2.52)	0.961 (1.04)	-0.325 (-1.03)	-0.352 (-1.09)
Outside Industry Replacement	65	246.115	10.133 (0.84)	0.646 (0.50)	0.810 (1.61)	0.354 (0.215)
Voluntary Turnover Announcements						
Inside Replacement	492	141.991	3.297[c] (1.88)	2.987 (0.88)	-0.361 (-1.06)	-0.430 (-1.41)
Outside Replacement	78	143.129	-2.004 (-0.38)	8.266[b] (1.99)	2.417[a] (2.89)	2.242[c] (1.78)
Forced Turnover Announcements						
Inside Replacement	47	267.498	28.551[c] (1.76)	0.961 (1.24)	-1.854[c] (-1.65)	-1.324 (-0.93)
Outside Replacement	57	398.079	28.218 (1.41)	8.479[b] (2.51)	-1.213 (-0.39)	-1.635 (-0.831)

This table provides abnormal bond yield spreads in basis points, abnormal stock returns, and abnormal changes in firm value. The data covers the period 1973 through 2000. Mean abnormal spread is calculated for the (0,0) month event window and the t statistics are obtained from the difference in event and estimation period (-3,-1). Median abnormal yield spreads are shown with t statistics derived from the Wilcoxon signed rank test in parentheses. Mean monthly abnormal stock returns are reported for the event month. Parameters are estimated over 60 ending one month prior to the CEO succession announcement using standard market model methods. The p-values for the mean cumulative abnormal stock returns and abnormal change in firm value are derived from the Z score. All yield spreads are expressed in basis points, all stock returns are expressed in percentages,

and t-values in parentheses. The notation [a, b, c] denotes significance at the 1%, 5%, and 10%, respectively.