Board composition and organizational resilience: Evidence from sudden CEO departures

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Abstract

A firm's ability to quickly recover from setbacks is of great importance to its stakeholders and investors. Although critics argue that inside directors decrease the monitoring effectiveness of a board, inside directors arguably possess superior firm specific experience and knowledge which could improve organizational resilience. The main purpose of this paper is to investigate whether inside directors improve organizational resilience using the context of sudden CEO departures when immediate CEO succession planning is of great importance. Using a unique data set of 351 sudden CEO departures from 1991 to 2009, we find evidence that firms with inside directors other than the CEO are more resilient. In addition, a firm's resilience after a sudden CEO departure appears to also be enhanced when its outside directors are well-connected.

*"**Resilience:** an ability to recover from or adjust easily to misfortune or change".*

-Merriam Webster Dictionary

1. Introduction

Firms can face several shocks during their life cycle. A firm's ability to quickly recover from setbacks is of great importance to its stakeholders and investors. One critical shock to a firm is the sudden departure of its CEO. The sudden loss of a CEO has the potential to throw a company into a tailspin. Consider, for example, the unanticipated resignation of Hewlett-Packard's (HP) former CEO Mark Hurd on August 6, 2010.[1] HP reported in a press release that Hurd's decision was made following an investigation surrounding a claim of sexual harassment against Hurd and HP by a former contractor to the company. Following Hurd's resignation, HP's market value fell by $10 billion, nearly a ten percent decline. It took over six months for the stock price to recover. The critical importance of being resilient when faced with a sudden CEO departure is underscored by the Security and Exchange Commission (SEC) recommendation that firms should include a CEO succession planning proposal in their proxy statements.[2]

This paper investigates whether a firm's resilience to succession shock is related to the composition of the board of directors. We examine the exogenous event of sudden CEO departures. Sudden CEO departures can arise due to death and illness or unexpected forced departures due to lawsuits and criminal investigations. It is under these circumstances that immediate CEO succession becomes a primary board responsibility and the departing CEO is not available for consultation. We examine whether non-CEO inside directors improve a firm's ability to recover from this type of sudden loss in executive leadership. Agrawal, Knoeber, and Tsoulouhas (2006) indicate that it is less costly for firms to replace a CEO with an internal candidate. Moreover, Masulis and Mobbs (2009) suggest that inside directors can become high quality internal candidates

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[1] "HP CEO Mark Hurd resigns; CFO Cathie Lesjak Appointed Interim CEO; HP Announces Preliminary Results and Raises Full-year Outlook", HP press release, August 2010.
[2] See the Security and Exchange Commission Staff Legal Bulletin 14E, 2009

for the CEO position. As inside directors possess superior firm specific knowledge and experience, their presence might help firms recover from shocks more quickly. They can provide insightful guidance to the board during the transition and they could become either a permanent replacement for the departing CEO or an interim CEO to provide stability during the search for a new permanent CEO. The literature has predominantly focused on the downside of having too many inside directors. Too many inside directors on a firm's board is often associated with ineffective boards and entrenchment. To the contrary, we focus on a potential benefit of inside directors.

We find that firms with non-CEO inside directors are associated with greater resilience in the face of sudden CEO departures. These firms incur lower disruption and transitional costs. We show that the likelihood of identifying an internal replacement is significantly greater when firms have at least one non-CEO insider on the board. Firms with non-CEO inside directors outperform firms without non-CEO inside directors by nearly 6% measured as industry-and-performance adjusted operating performance from one year before to three years after the sudden CEO departure. Finally, we show that firms with greater inside director presence are less likely to engage in large write-offs of assets, i.e., taking a big bath after the CEO departure.

Recent studies explore the social connections of directors, which is referred to as director "connectedness". Intintoli, Khale, and Zhao (2015) argue that well-connected directors create value for the firm through their social network. Coles, Daniel, and Naveen (2008), and Omer, Shelley, and Tice (2012) indicate that outside directors add value through their networks and connections. Thus, well-connected outside directors may be able to use their networks to identify highly qualified replacements to lead the recovery. In contrast, Fich and Shivdasani (2006) argue that outside directors sitting on numerous boards are too busy to effectively fulfill their responsibilities as directors. In this case, although outside directors have more connections and can quickly choose replacements through their connections, the replacements they choose may not be well qualified to lead a recovery. Empirical studies provide mixed evidence on the efficacy of outside directors' connections. Following this line of research, we examine whether outside directors with numerous

connections enhance a firm's resilience, or mitigate the costs associated with sudden CEO departures.

We find that well-connected outside directors are associated with greater resilience after sudden CEO departures, and that they play both an identification and a certification role in the replacement CEO selection process. We show that well-connected outside directors are associated with more experienced replacement CEOs. Moreover, replacement CEOs tend to be appointed within a shorter time period, are more likely to be part of an outside director's network, and are better connected themselves. In fact, firms with both non-CEO inside directors and well-connected outside directors appear to be the most resilient to sudden CEO departures; whereas firms lacking non-CEO inside directors and well-connected outside directors are least resilient. The results are robust to controlling for other factors that may influence the CEO selection process.

Our results make several unique contributions to topics in the corporate governance and accounting literatures. To our knowledge this is the first study to examine the relationship between board composition and a firm's ability to recover after a potentially disruptive shock, i.e., a sudden CEO departure. Prior literature suggests that CEO succession planning is important and costly.[3] Taylor (2010) suggests that replacing a CEO costs shareholders at least $200 million. Furthermore, Rivolta (2014) argues that a lack of CEO succession planning costs firms $136 million if the CEO departs unexpectedly. Yet little empirical evidence is shown on how firms can mitigate these costs. This paper sheds light on the important role directors, particularly inside directors, play in crisis management and enhancing organizational resilience when firms face a critical shock. In addition, consistent with the argument in Coles, Daniel and Naveen (2012), the results provide another avenue through which well-connected outside directors can add value by identifying and certifying the new CEO through their connections and networks. In fact, well-connected outside directors can

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[3] See Worrell, Davidson III, Chandy and Garrison, 1986; Behn, Dawley, Riley and Yang, 2006; Salas, 2010, and Rivolta 2014.

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be either compliments or partial substitutes to inside directors in the new CEO selection process, depending on the non-CEO inside director presence.

Second, contrary to recent literature that concentrates on the downside of having too many inside directors, we offer a potential benefit of having inside non-CEO directors on the board. Inside directors not only play important monitoring and advising roles, they also add value to firms by becoming the new CEO after a sudden CEO departure. Masulis and Mobbs (2009) theorize that certain insider directors can be high quality internal candidates for the CEO position. We empirically test and demonstrate that inside directors indeed can become qualified CEO replacement after a critical shock to the firm.

Finally we try to bridge a gap between the finance and accounting literature by showing that firms with non-CEO inside directors are less likely to engage in earning management in the form of large write-offs of assets (i.e., big bath). Moehrle (2002) and Christensen, Paik, and Stice (2008) argue that large negative special charges can be an extreme form of earnings management. In the context of sudden CEO departures, firms could take advantage of this sudden event and write off bad assets and show less adverse operating performance in subsequent years. We show that firms with inside directors are less likely to engage in big bath accounting.

Given the importance of both non-CEO inside directors and well-connected outside directors, the findings in this paper help inform the debate on uniform mandates for boards[4]. The remainder of the paper is organized as follows. Section 2 presents our hypothesis development. Section 3 describes the data and provides summary statistics. Section 4 presents univariate and multivariate results using the unexpected CEO departures. Section 5 provides robustness tests. Section 6 provides a summary and conclusion.

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[4] See the Sarbanes Oxley Act (SOX) in 2002

2. Hypothesis Development

Sudden CEO departures create an exogenous shock that tests a firm's ability to weather the sudden shift of leadership. When the departing CEO is no longer available for consultation in the new CEO selection process, directors bear the responsibility to plan for succession. The literature suggests that inside successions (new CEO drawn from within the firm) are associated with maintenance strategies, whereas outside successions are related to changes in corporate culture and resource allocation. Agrawal, et al. (2006) find that firms prefer inside succession to outside succession. Naveen (2006) argues inside successions are more common in larger, more diversified firms, and in firms in more heterogeneous industries in which the costs of information transfer is higher. Studies as early as Fama and Jensen (1983) argue that outside directors lack information on firm projects and that inside directors possess superior firm specific information relative to outside directors. Raheja (2005) suggests that high R&D intensive firms benefit from having more insiders on board, and that board size and composition is a function of the "trade-off between maximizing the incentive for insiders to reveal their private information, minimizing coordination costs among outsiders and maximizing the ability of outsiders to reject inferior projects." In a more recent study, Adams and Ferreira (2007) advocate "friendly board" structures with insiders, as they argue that insiders possess more firm specific information, and that a friendly board facilitates the transfer of information from insider to outside board members.[5]

In addition to monitoring and advising, inside directors play a third important role, which is potentially to become the new CEO. Masulis and Mobbs (2009) define inside directors holding other public board seats as certified inside directors (CIDs), and argue that the knowledge and skills possessed by these CIDs provide incentives for the current CEO to improve performance, or they may be replaced by the CIDs. Current literature has not provided much information regarding inside directors' potential as the new CEO. Given that inside directors possess firm specific knowledge,

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[5] Following Raheja (2005) and Coles et al. (2008), we use R&D intensity to proxy for the importance of firm specific knowledge.

and that they are already familiar with other board members and senior managers, we hypothesize that inside directors are able to assume the role of CEO in either a permanent role for a quick recovery or in a temporary role to provide stability during the search for a new permanent CEO. As firms with more non-CEO inside directors have a larger pool of internal candidates, and it may take less time to appoint a candidate from inside than outside the company. Our first set of hypotheses relate to the choice of an inside versus outside CEO replacement.

H1: Boards with a greater number of non-CEO inside directors or certified inside directors are more likely to appoint an insider as the new CEO after a sudden CEO departure

H2: High R&D intensity firms, where firm specific knowledge is important, are more likely to choose a new permanent CEO from inside the company.

Sudden CEO departures generate uncertainty and disruption costs during the CEO transition period. Following prior literature, we use three measures to proxy for disruption costs: (1) new CEO turnover, (2) delay in appointing a successor, and (3) change in firm operating performance around the CEO turnover. Existing literature has found that the new CEOs, especially those hired from the outside, typically have 18 months to prove their competency to shareholders (Zhang 2008, Zhang and Rajagopalan 2010). This argument is grounded in the information asymmetry theory that board of directors may have incomplete information about the CEO candidate. Hence, it is possible that the board has hired the wrong executive and subsequently fires the new CEO to correct the mistake, which leads to greater new CEO turnover. Repeated CEO turnover generates substantial cost to companies given the average severance pay that firms are providing their executives (Huang 2011). Boards with strong insider presence should have superior firm-specific information to use in selecting a new CEO. Additionally if the new CEO is an internal candidate or a non-CEO inside director, we should expect significantly lower turnover.

Behn et al. 2006 find that delay in appointing a successor is associated with worse stock returns and weaker firm operating performance around the death of the CEO. Firms with non-CEO inside directors should experience shorter delays in appointing a successor, especially if the

successor is a current board member. The shorter periods of delay and uncertainty should mitigate the negative effects on operating performance around sudden CEO departures. The hypotheses we test with respect to the transition and disruption costs are:

H3: Firms with more non-CEO inside directors or CIDs should experience lower transition and disruption costs. This should manifest in have lower new CEO turnover, shorter delays in appointing replacement CEOs, and stronger operating performance

As a result of encountering disruption costs, new CEOs might want take advantage of the sudden departure of the old CEO and engage in earnings management. Christensen et al. (2008) use large negative special items charges to proxy big bath, identified as firms reporting special charges that exceeds 10% of their total assets. Moehrle (2002) argues that "big bath" is an extreme form of earnings management. Big bath accounting has been described as firms having large write-offs in their profit and loss statement in order to create more favorable operating returns in the subsequent years (Healy 1985, Watts and Zimmerman 1986, Walsh, Craig, and Clarke 1991, Moehrle 2002). Hazarika, Karpoff and Nahata (2012) argue that corporate governance provisions and strong internal controls should constrain managers from engaging in value destroying activities such as earnings management. They find that extreme earnings management increases the likelihood of forced CEO turnover. We argue that having internal non-CEO directors on the board when a new CEO joins serves as a control to attenuate the ability of new CEOs to engage in extreme earnings management. Therefore we predict that firms with greater insider director presence are less likely to take advantage of the CEO departure and write off bad assets, i.e., taking a big bath, especially when the new CEO is brought in from outside the firm.

H4: Firms with more non-CEO inside directors are less likely to take advantage of the transition and write-off bad assets. The effect should be strongest when the new CEO is an outsider.

Our hypotheses to this point center on the value that non-CEO inside directors can bring to the table during times of crisis. However, well-connected outside directors may also act to mitigate some of the transition costs. We question whether well-connected outside directors act as

substitutes or complements to the presence of inside non-CEO directors. Omer et al. (2012) argues that well-connected directors may not be associated with lower firm performance predicted by the busy director hypothesis. These directors can be beneficial to firms with greater investment opportunities, because they facilitate the transfer of useful information. In addition, Coles et al. (2012) argue that outside director connections proxy for derived demand for their experience, expertise, and service. Firms that have greater advising needs benefit from having well-connected outside directors. Well-connected outside directors can also be exposed to a larger pool of qualified outside CEO replacement candidates. Therefore, they could enhance firm resilience via their network after a sudden CEO departure. Their roles are particularly important in firms with no non-CEO inside directors before the departure.

> *H5: Firms with more connected outside directors enhance firm resilience which should manifest through shorter delays, lower new CEO turnover and improved operating performance.*

3. Data and Sample Selection

3.1. Sample Construction

We gather data from eight different sources. We identify the initial sample of CEO departures during the period 1991-2009 from Execucomp, which covers S&P 1500 firms. CRSP and Compustat provide stock returns and accounting information. CEO successor board experience and corporate governance data are identified through the Investor Responsibility Research Center (IRRC/Risk Metrics) Director Database. For the time period not covered by IRRC (1991-1995), we use Compact Disclosure data to gather board size and independence information. Institutional ownership information is obtained through Thomson Reuters Institutional Ownership Data. We hand collect data to fill in any observations where CEO appointment date or the date they joined the company is missing in Execucomp, for the purpose of identifying CEO tenure.

The initial sample contains 2,522 CEO departures identified from Execucomp during the period of 1991-2009. We use the fiscal year as unit of time and merge the initial sample with CRSP and Compustat, then merge with IRRC Director Database by matching each annual shareholder meeting date for a firm with the fiscal year in which the meeting is held. Dual class firms and any observations where there was no actual succession were excluded. After the merging process, our sample consists of 2,300 CEO departures during the 1991-2009 period. In order to obtain information associated with sudden CEO departures, we search Factiva, Lexis Nexis and proxy statements and hand collect the following information:

1. CEO successor origin. We follow Parrino's (1997) definition on insider versus outsiders. Insiders are successors that have been with the company for at least one year prior to becoming CEO; and outsiders are successors that have been with the company for less than a year prior to becoming CEO.
2. Interim CEO Status. Whether the news release states that the successor is an interim or permanent CEO.
3. Cause of departure. We categorize the departure of the CEO into natural retirement, forced resignation, unexpected departures due to unexpected death and illness, M&A activity, restructuring, proxy fight, and the separation of CEO/chairman duality.
4. The earliest announcement date of incumbent CEO departure and permanent replacement CEO appointment.
5. The actual incumbent CEO departure and new CEO takeover date.
6. Whether the replacement CEO has been on the appointing company's board of directors at least six months before the appointment announcement.
7. Cause of the unexpected departure. Whether the unexpected departure is due to sudden death, illness, or is due to incumbent CEO being hired away either by a better company, or accepted a government job.
8. Whether the replacement CEO has had CEO experience before in other companies.
9. Whether the retiring CEO is the founder of the company, and whether the company is a family company.
10. The previous positions held by replacement CEOs.

The final sample consists of 351 sudden CEO departures from 1991 to 2009, of which 119 are unexpected departures.

3.2. Sudden CEO departures and firm operating performance

After collecting data for the whole CEO departure sample, we narrow our focus to sudden CEO departures. We define sudden CEO departures as those that arise due to death and illness or

unexpected forced departures due to lawsuits and criminal investigations. In the first half of the paper, we examine the research questions by using a stricter sample of 119 unexpected CEO departures. In order to ensure that the results are not driven by sample construction and to address the small sample issue, we use the broader sample of all 351 sudden CEO departures (expected and unexpected) in the second part of the paper.

We use two measures for firm operating performance. The first is the industry-adjusted ROA, measured as a sample firm's ROA minus the median industry ROA, using the Fama and French (1997) 48-industry classification. To control for potential mean reversion in accounting returns for poorly performing firms, we follow the methodology of Barber and Lyon (1996) to compute changes in industry-and-performance adjusted ROA. Each sample firm with a sudden CEO departure is matched to a control firm with no CEO departures. Industry-and-performance adjusted ROA is then defined as each sample firm's ROA less the ROA of a control firm, matched on primary two-digit SIC industry and with the ROA within 10% in the previous year. If no firm in the same two-digit industry has a year-1 ROA within 10%, we first select the firm in the same one- digit industry, and then disregard industry and only match on year-1 ROA within 10%.[6]

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[6] In order to demonstrate that firms that experience sudden CEO departures are comparable to the universe of firms that experienced general CEO departures, we compare summary statistics on firm, corporate governance and departing CEO characteristics to Coles, Daniel, and Naveen 2008 (Journal of Financial Economics) (untabulated). Their sample consists of 8,125 CEO turnovers over the period of 1992-2001.The definition of all variables is provided in the Appendix. The average board size in my sample is nine members, with two insiders and seven outsiders. The insider percentage is 20.63%. These numbers are comparable to those in Coles et al. Boards on average have two insiders and eight outsiders, with insider percentage 22% for firm year observations from Execucomp over the period of 1992-2001. Using data over the period 1989-1994, Huson et al. (2005) find that the median board size is 12, with median insider percentage of 21%. The mean firm age in our sample is 20 years, R&D intensity is 3.74%, and stock price volatility is 3.29%. These results are a bit different from those of Coles et al. They report an average of 28 years in firm age, R&D intensity of 1.9%, and firm risk 2.6%. Compared to their general sample, firms that experience sudden CEO departures are younger, more R&D intensive, and experienced greater stock volatility during the prior year.

4. Results

4.1. Univariate Analysis

We begin our analysis by comparing firm, corporate governance, and unexpected CEO departure replacement decisions in two subsamples of firms partitioned by whether there is least one non-CEO inside director. Table 1 presents univariate comparisons across these two subsamples. The definitions of all variables tabulated in Table 1 are in the Appendix. We find no differences in mean values of typical firm characteristics across the groups, including *Tobin's Q, Market Capitalization, Market-to-book Ratio, R&D Intensity, Firm Risk*, and *Industry-adjusted ROA*. However, there is evidence that firms with greater inside director presence are younger in firm age. In addition, the mean differences in corporate governance characteristics are significant between the two subsamples, although the difference may be driven by design.

--Insert Table 1 about here--

Specifically, firms with at least one non-CEO inside director have greater insider presence as well as larger boards with lower board independence. These firms are also more likely to be clustered during the time period before 2001, right before the board independence requirement mandated by the Sarbanes Oxley Act (SOX). These results indicate that with a lack of difference in firm characteristics between the two subsamples ex ante, if we observe any performance differences after the CEO departure, the differences are more likely to be associated with board composition.

--Insert Table 2 about here--

We further investigate the relation between inside director presence and CEO transitional characteristics and report the results in Table 2. Panel A exhibits the permanent replacement CEOs' characteristics. Firms are significantly more likely to use inside succession and to appoint and inside director as the new CEO if they have at least one non-CEO inside director on board. Specifically, firms with stronger inside director presence are 30.40% (p<0.05) more likely to hire a new CEO from inside the company, and 42.70% (p<0.01) more likely to appoint an inside directors as the new CEO. However, the new CEOs appointed by both subsamples of firms are

similar in age and possess equal external board seats. These univariate results highlight a potentially important relation between board composition and the choice of replacement CEOs across the firms that otherwise appear similar.

Panel B demonstrates the transitional cost measures. On average, firms with stronger inside director presence experience 16 fewer days of no CEO leadership, although the mean difference is not statistically significant. Although firms in both subsamples are likely to use interim CEOs while searching for the permanent replacement, 56.41% of firms with at least one non-CEO inside director use inside director as the interim. In addition, approximately 74% of these directors were eventually promoted to become the permanent CEOs. In contrast, in the subsample of firm with no non-CEO inside directors, only 20% of the interim director-CEOs were promoted to a permanent role. Statistics reported in Panel B further shows that change in firm performance around the announcement of unexpected CEO departures appear greater in firms with at least one non-CEO inside directors[7]. Firms with greater inside director presence outperform its comparison group by 5.08% (p<0.10) and 5.97% (p<0.10) two to three years after the CEO power transition, respectively.

Finally, we test whether firms with greater inside director presence are more likely to take advantage of the CEO departure and engage in big bath accounting. Following prior literature (Moehrle 2002 and Christensen et al. 2008), we examine the percentage of firms reporting a large negative special item charge that equals to or exceeds 10% of total assets in the same fiscal year. Panel C shows the results. Consistent with our hypothesis, firms with greater inside director presence are significantly less likely to engage in big bath accounting, compared to their comparison group. Specially, firms with at least one non-CEO inside director are 10%-13% less likely to large write off bad assets for up to two years after the CEO power transition. This result

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[7] We calculate all three measures of firm performance: raw ROA (untabulated), Fama French 48 industry-adjusted ROA (untabulated), as well as industry-and-performance-adjusted ROA to control for mean reversion. We also examine the Cumulative Abnormal Returns (CARs) around the unexpected CEO departure announcement (not tabulated) and find that investors react negatively at the departure announcements in both subsamples, indicating that unexpected CEO departures create uncertainty to a firm regardless of its board composition. However, the mean difference is not statistically different.

indicates that inside directors can help firms weather the sudden shift of leadership so that firms have less need to manipulate the books to smooth earnings or to create better returns for the future.

The univariate results indicate that non-CEO inside directors can play two roles in reducing transitional costs: they can either be appointed as the new permanent CEO, or act as interim to provide stability to the firm, while it searches for a competent new permanent CEO. In the next section, we examine these results in a multivariate setting.

4.2. Inside succession and the appointment of inside director as replacement CEO

To examine the determinants of an inside succession and the appointment of an inside director as the new permanent CEO, we use the complete sample of 351 sudden CEO departures and utilize both the linear probability model, controlling for industry fixed effects and Probit regressions. The independent variables of primary interest are whether firms have at least one non-CEO inside director (*Inside Succession*), and the total number of inside directors on board (*Inside Director New CEO*). We also include *Unexpected departure* to determine whether the choice of replacement CEO is impacted specifically by the sudden death and illness of the incumbent CEO.

--Insert Table 3 about here--

Following Coles et al. (2008), we include a number of other variables in the regressions to identify whether other firm and corporate governance characteristics have an impact on the choice of replacement CEOs. These variables include firm size (*log Market Cap*), firm age (*log Firm age*), and board size (*log Board size*). we include *Free Cash Flow*, firms' debt to value ratio (*Leverage)* to measure whether meeting financial payout obligations motivates the choice of an inside successor. We also include an indicator of for whether the incumbent CEO was also founder (*Founder CEO).* Naveen (2006) argues that firms greater information asymmetry are more likely to use inside succession. Therefore, we control for *R&D Intensity* as a measure for the need for firm specific knowledge and information asymmetry. Last but not least, Denis and Denis (1996) argue that firms are more likely to appoint an outside successor following prior poor performance.

Hence we include both prior year cumulative market adjusted stock return (*Prior year stock return*) as well as *stock price* volatility to control for stock performance and firm risk, respectively.

These regressions, presented in Table 3, provide evidence that board composition and the cause of sudden CEO departure matter for the use of inside succession. In particular, each additional non-CEO inside directors increases the likelihood of inside succession by 24.2% (p<0.01). Firms are also more likely to use inside succession after unexpected CEO departures. A change from sudden forced to unexpected CEO departure increases the likelihood of inside succession by 37.1% (p<0.01). In addition, we find that firm size is positively related to the likelihood of inside succession. This finding is consistent with the idea that larger firms have a greater pool of qualified inside talents, therefore, are more likely to use inside succession to maintain continuity, rather hiring from outside the company. Last but not least, firms with higher stock price volatility are more likely to hire from inside the company. The result might be driven by the fact that directors in more volatile companies are hesitant to hire from outside the company (Dalton and Kesner 1985).

The likelihood of boards appointing an inside director as the new CEO demonstrates a similar pattern as the likelihood of inside succession. Specifically, each additional inside director increases the likelihood of boards appointing an inside director as the new permanent CEO by 13.3% (p<0.01). Furthermore, a change from sudden forced to unexpected CEO departure increases the likelihood of an inside director appointed as the new CEO by 60.6% (p<0.01). Lastly, firms size also positively impacts the likelihood of boards appointing an inside director as the new CEO.

Most of the fundamental firm level control variables do not show up as significant determinants of inside succession, consistent with univariate results presented in Table 2. This suggests that the selection of new CEO replacement is based more on board composition than on particular firm characteristics. An exception is that the coefficients on firm size are consistently positive and significant, suggesting that larger, more mature firms are more likely to use inside succession as well as to appoint inside directors as the new CEO.

4.3. Board Composition and Change in Firm Performance

Having documented that board composition is correlated with the selection of new CEO replacement, we next consider whether board composition is associated with a change in firm performance after the unexpected CEO departure. To examine this question, we employ a multivariate regression setting using change in industry-and-performance-adjusted return on assets (ROA) three years around the incumbent CEO departure as the dependent variable. We rely on related prior studies, for instance, Yermack (1996), Naveen (2006), Coles et al. (2008), and Coles et al. (2012), for guidance in selecting independent variables.

--Insert Table 4 about here--

The independent variables of interest measure board composition as well as information asymmetry presented in a firm. Specifically, we include a binary variable *>=1 non-CEO inside directors* to indicate whether the board has at least one non-CEO inside director. In addition, we control for a continuous variable *outside director connections* to evaluate whether well connected outside director impact the change in firm performance around the unexpected CEO departures. We include R&D intensity to measure firms' information asymmetry and the need for firm specific information. The interaction terms between R&D intensity and board composition (*R&D intensity*>=1 non CEO inside directors* and *R&D intensity*Outside director connections*) are used to evaluate whether certain board composition are particularly important in high information asymmetry firms. In all regressions we include the dependent control variables firm size (*Log Market cap*), firm age (*Log Firm age*), whether departing CEOs are founders (*Founder CEO*), as well as *log board size* to account for variation in change in ROAs that is drive by firm maturity and difficulty of monitoring. We include a binary variable *Post 2001 period* to account for the potential impact of the board independence shift around the year 2001. New CEO age (*Log New CEO age*) is included to proxy for new CEO experience (Brickley 2003). Finally, Behn et al. (2006) argue that delay in appointing a CEO successor may negatively impact firm performance. We use the variable *log delay* to control for the impact of the delay in appointing a CEO successor.

The results of these regressions are presented in Table 4. The dependent variable in columns (1) to (6) is the change in industry-and-performance-adjusted ROA from one year before to three years after the fiscal year of departure announcement. The coefficients are estimated using the Ordinary Least Squares (OLS) with the White robustness errors.

We find that change in firm operating performance is less adverse for firms with greater inside director presence as well as firms with well-connected outside directors. We document lower changes in operating performance in firms with younger new CEOs. Our investigation also reveals that there is a significant relationship between board composition and change in firm performance in high R&D intensity firms, in which firm specific knowledge is important. In particular, the coefficient estimates on the interaction term between R&D intensity and inside director presence indicate that for each additional percentage increase in R&D intensity, having at least one non-CEO inside director increases one, two and three-year firm performance by 1.34%, and 1.86%, and 1.07%. This result is consistent with the univariate analysis results that non-CEO inside directors are associated with less destructive change in operating performance. Replacement CEOs selected by boards with greater insider presence may be of better quality. Another interesting result is that although outside director's connections are positively related to changes in industry-and-performance adjusted ROAs, well-connected boards do not contribute to positive change in operating performance in high information asymmetry firms. The coefficients on the interaction term between R&D intensity and outside director connection are consistently negative around the unexpected CEO departure. This negative relationship indicates that for firms with greater information asymmetry, well-connected outside directors lack firm specific knowledge to help companies weather the sudden shift of leadership.

Overall, our results show that non-CEO inside directors are associated with less destructive operating performance after an unexpected CEO departure. Their roles are particularly important in high R&D intensity firms. In the next section, we investigate whether non-CEO inside directors affect the likelihood of firms taking a big bath.

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4.4. Multivariate analysis on firms' earnings management

As a result of encountering disruption costs such as longer period of no CEO leadership and weaker operating performance, firms might take advantage of the unexpected CEO departure and engage in earnings management. We next consider whether certain board composition is associated big bath accounting. We examine the likelihood of firms taking a big bath in the two years after the unexpected CEO departure using use Probit regression controlling for firm, corporate governance, and managerial discretion characteristics. We use the same measure as Christensen et al. (2008). The dependent variables in columns (1)-(6) are binary variables that equals to 1 if firms report a largely negative special items charge (Compustat annual data item 17) that equals to or exceeds 10% of their total assets over the next three years after a sudden CEO departure. The main independent variables of interest are whether firms have at least one non-CEO inside director as well as the interaction term between firms' R&D intensity and inside director presence.

--Insert Table 5 about here--

Table 5 presents the results. We find that firms with at least one non-CEO inside director are less likely to take a big bath. In addition, in firms with high R&D intensity, having non-CEO inside directors further reduces the likelihood of big bath accounting. The coefficients on the interaction terms are -14.58 and -19.70, respectively (p<0.01). This is consistent with our earlier findings that inside directors can play important roles in helping firms weather the sudden shift of leadership without engaging in earnings management. They may be more capable of continuing with the ongoing positive NPV projects the departure CEO initiated. For instance, firms with greater inside director presence have economically more positive change in Capital Expenditure (CAPEX) (untabulated). Therefore firms have less incentive to engage in big bath accounting. We also find that firms with greater stock price volatility are more likely to engage in taking a big bath after the unexpected CEO departure. Christensen et al. (2008) argue that if managers have pessimistic private information about the future perspective of a firm, they are more likely to take

a big bath and smooth earnings and try to create better future returns. Managers in firms more volatile stock price movements are more likely to engage in taking a big bath.

In summary, inside directors play important roles in crisis management. They can either help firms identify qualified inside replacement, or provide stability either as the new permanent CEO, or as an interim while firms carry out a careful search for a qualified replacement. They are also less likely to be involved in earnings management. In the next section, we examine whether well connected outside directors can add value by helping firms both identify and certify quality replacement CEOs through their connections.

4.5. *Can outside directors enhance firm resilience?*

In this section, we examine the role outside directors can play in enhancing firm resilience. Although the focus of this paper is on the role of inside directors, it is important to understand whether and how outside directors monitor and advise in the new CEO selection process. Coles et al. (2012) argue that the number of outside director connections (the sum of connections that the outside directors of a firm has with directors at other firms) is a proxy for outside directors' experience, expertise and services. Following Coles et al., we measure the connectedness of outside directors by calculating the total number of outside director connections for each sample firm. We then sort sample firms into terciles based the total number of outside director connections. We create two variables to capture the way outside directors can identify qualified CEO successors via their connections. *Outside CEO same board* is a binary variable that equals to 1 if the new CEO is hired from outside the company, and has been serving on the same board(s) with at least one existing director in the departure firm, and 0 otherwise. *New outside CEO's board* is a binary variable that equals to 1 if at least one existing director has been serving on the board of the outside replacement CEO's former company.

It is important to understand when and how well-connected outside directors add value. Table 6 presents four combinations of inside director presence and outside director connections:

1. <u>LowInside-LowCnct</u>: combination of no non-CEO inside director on board before departure and low outside director connections (bottom tercile connections).
2. <u>LowInside-HighCnct</u>: combination of no non-CEO inside director on board before departure and top tercile outside director connections.
3. <u>HighInside-LowCnct</u>: combination of at least one non-CEO inside director on board before departure and bottom tercile outside director connections.
4. <u>HighInside-HighCnct</u>: combination of at least one non-CEO inside director on board before departure and top tercile outside director connections[8].

Overall, the results in Table 6 indicate that firms with non-CEO inside directors and well-connected outside directors are more resilient when faced with unexpected CEO departures; whereas firms with no non-CEO inside directors and poorly connected outside directors are the least resilient. Specifically, firms with both non-CEO inside directors and well-connected outside directors are associated with less adverse change in firm operating performance and are less likely to engage in earnings management.

--Insert Table 6 about here--

On the other hand, firms with neither non-CEO inside directors or well-connected outside directors suffer the most. Specifically, it takes boards the longest time to appoint a new CEO (136 days), and these CEOs are the least likely to stay more than 18 months after the replacement (16.07% new CEO turnover). Furthermore, firms with neither non-CEO inside directors and well-connected outside directors have the lowest change in firm operating performance for up to three years after the departure. Last but not least, these firms are significantly more likely to engage earnings management and write off bad assets. These results indicate that not only do these firms have higher transitional costs, the new replacement CEO appointed may also be of worse quality. The same comparison using a broader sample of sudden CEO departures are tabulated in Table 10. The results are consistent with the stricter sample. In summary, firms might not weather the sudden shift of leadership well if there the incumbent CEO was the only insider on board and the outside directors are not well connected to other boards. In addition, the roles played by inside and outside

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[8] The middle tercile (N=33) is not tabulated.

directors in lowering transitional costs are particularly important when the departure is caused by truly exogenous shocks such as death and illness.

5. Robustness tests using a broader sample of sudden CEO departures

In the previous section, we examined the research questions by using the more exogenous sample of 119 unexpected CEO departures. It is possible that the correlations we have identified are driven by the cause of the CEO departure, and not by board composition. In this section, we run the same analysis by using the broader sample of all sudden departures to incorporate other types of sudden CEO departures. This sample consists of 351 CEO departures that are not only caused by death and illness, but also caused by sudden forced departures due to criminal investigations and lawsuits. Overall, the results are consistent with the stricter sample of unexpected CEO departures, indicating that my results are not subjected to sample construction.

5.1. CEO transitional characteristics around sudden CEO departures

We first investigate the relation between inside director presence and CEO transitional characteristics in the broader sample of sudden CEO departures. Table 7 shows the results.

--Insert Table 7 about here--

Consistent with the results in section 4.1, our findings show that firms with greater inside director presence are more likely to use inside succession and to appoint an inside director as the new CEO. In addition, although firms in both subsamples of firm are likely to use interim CEOs while searching for the permanent replacement, firms at least one non-CEO inside director are 49% more likely to use inside director as the interim CEO. Furthermore, approximately 75% of these inside directors were eventually promoted to become the permanent CEOs. In contrast, in the subsample of firm with no non-CEO inside directors, only 37.5% of the interim director-CEOs were promoted to a permanent role. Finally, we test whether firms with greater inside director presence are more likely to take advantage of the CEO departure and engage in big bath accounting. Panel C shows the results. Consistent with the earlier results, firms with greater inside director presence are significantly less likely to engage in big bath accounting, compared to their comparison group.

Specially, firms with no non-CEO inside director are approximately two to three times more likely to largely write off bad assets after the CEO power transition. These results indicate that non-CEO inside directors play an important role in helping firms weather the sudden shift of leadership after a sudden CEO departure. Their roles are not only important when firms face sudden CEO death and illness, but also when the incumbent CEOs are forced out due to law suits and criminal investigations.

5.2. *Multivariate analysis on change in firm performance around sudden CEO departure*

In this section, we present the same multivariate regression on the boarder sample as in section 4.3. The results of these regressions are presented in Table 8. The dependent variable in columns (1) to (6) is the change in industry-and-performance-adjusted ROA from one year before to three years after the fiscal year of departure announcement.

--Insert Table 8 about here--

Consistent with prior findings, changes in firm operating performance is greater for firms with greater inside director presence, but only when the departure is caused by an exogenous shock such as death and illness. There also exists a positive relation between well-connected outside directors and change in firm performance. We document lower changes in operating performance in firms with high R&D intensity, in which firm specific knowledge is important. These results are consistent with the univariate analysis results and show that there is a significant relationship between board composition and changes in firm performance.

5.3. *Multivariate analysis on firms' earnings management around sudden CEO departures*

In this section, we examine whether firms take advantage of the sudden CEO departure and engage in earnings management. We use the same multivariate regression setting as in section 4.4, and examine the likelihood of firms taking a big bath after a sudden CEO departure. Table 9 shows the results. We document a negative relation between non-CEO inside director presence and the likelihood of firms engaging in big bath accounting. This relationship is particularly profound if the departure is caused by death and illness. However, we find that firms are more likely to engage

in big bath accounting in firms with greater free cash flow (FCF), higher stock price volatility, and higher R&D intensity. These results indicate that managers in firms with greater discretion, higher risk, and higher information asymmetry could have greater incentive to engage in big bath accounting to smooth earnings and create better returns to gain excess to external capital in the near future.

--Insert Table 9 about here--

In summary, our results in the robustness section demonstrate that there exists a significant relation between board composition and CEO transitional costs. These results are consistent with the earlier analysis using subsample of 119 unexpected CEO departures.

6. Conclusion

We examine the relationship between board composition and organizational resilience by studying whether non-CEO inside directors and well-connected outside directors improve the firms' ability to weather a sudden shift in executive leadership. We find that firms with more non-CEO inside directors are associated with lower transitional and disruption costs. These directors possess both superior firm specific information and experience and are thus better able to either assume the role of CEO or more efficiently identify the replacement CEO than outside directors. Their roles are particularly important after an unexpected CEO departure due to death, illness and sudden resignation, as well as in R&D intensive firms, in which firm specific information is important. In addition, well connected outside directors appear to enhance the resilience through their network. In fact, firms with both non-CEO inside directors and well-connected outside directors appear to be more resilient to sudden CEO departures than firms with neither directors. These results shed light not only on the important monitoring and advising roles directors play in crisis management and organizational resilience when succession planning is not possible, but also provide evidence of a third important role inside directors play, which is to become the new permanent CEO.

References

Adams, R. B., and D. Ferreira, 2007. A theory of friendly boards. *Journal of Finance* 62, 217-250.

Agrawal, A., C. Knoeber, and T. Tsoulouhas, 2006. Are Outsiders Handicapped in CEO Successions? *Journal of Corporate Finance* 12, 619-644.

Barber B.M. and J.D. Lyon, 1996. Detecting abnormal performance: the empirical power and specification of test statistics. *Journal of Financial Economics* 41, 359-399.

Bruce K. Behn, D. D. Dawley, R. Riley and Y Yang, 2006. Deaths of CEOs: are delays in naming successors and insider/outsider succession associated with subsequent firm performance? *Journal of Managerial Issues* 18, 32-46.

Brickley, J., 2003. Empirical research on CEO turnover and firm-performance: a discussion. *Journal of Accounting and Economics* 36, 227-233.

Christensen T. E., G. Paik, and E. Stice, 2008. Creating a bigger bath using deferred tax valuation allowance. *Journal of Business Finance and Accounting* 35, 601-625.

Coles, J. L., N. D. Daniel, and L. Naveen, 2008. Boards: does one size fit all? *Journal of Financial Economics* 82, 329-356.

Coles, J. L., D. Naveen, and L. Naveen, 2012. Board advising. Working paper.

Dalton, D. R., and I. F. Kesner, 1985. Organizational performance as an antecedent of inside/outside Chief Executive succession: an empirical assessment. *The Academy of Management Journal* 28, 749-762.

Denis, D. and D. Denis, 1995. Performance changes following top management dismissals, Journal of Finance 50, 1029 – 1057.

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

Fich, E.M., and A. Shivdasani. 2006. Are Busy Boards Effective Monitors? *The Journal of Finance* 61:689–724.

Hazarika, S., J. M. Karpoff, and R. Nahata, 2012. Internal corporate governance, CEO turnover, and earnings management. *Journal of Financial Economics* 104, 44-69.

Healy, P., 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7, 85-107.

Huang, P., 2011. Marital Prenups? A Look at CEO Severance Agreements. Working paper.

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

Intintoli, V. J., K. Khale, W. Zhao, 2015. Board connectedness and board effectiveness. Working paper.

Masulis, R,. and S. Mobbs, 2009. Are all inside directors the same? Evidence from external
        directorship market. *Journal of Finance* 66:823-872.

Mobbs, S., 2012. CEOs Under Fire: Pressure From Within - The Effects of Inside Directors on CEO
        Compensation and Turnover. *Journal of Financial and Quantitative Analysis* 48, 669-698.

Moehrle, S. 2002. Do Firms Use Restructuring Charge Reversals to Meet Earnings Targets? *The
        Accounting Review*77, 397–414.

Naveen L., 2006. Organizational complexity and CEO succession planning. *Journal of Financial and
        Quantitative Analysis* 41, 661‐ 684.

Omer, T.C., M. Shelly., and F. Tice, 2012. Do well-connected directors improve firm performance?
        Working paper.

Parrino, R., 1997. CEO Turnover and Outside Succession: A Cross-Sectional Analysis. *Journal of
        Financial Economics* 46, 165–197.

Raheja, C., 2005. Determinants of board size and composition: A theory of corporate boards. *Journal
        of Financial and Quantitative Analysis* 40, 283-306.

Rivolta, M.L., 2014. Does lead-time in CEO succession planning matter? Working paper.

Salas, J.M., 2010. Entrenchment, governance and the stock price reaction to sudden executive deaths.
        Journal of Business and Finance 34, 656-666.

Taylor, L.A., 2010. Why are CEOs rarely fired? Evidence from structural estimation, *Journal of
        Finance* 65, 2051-2087.

Walsh, P., R. Craig, and F. Clarke, 2006. "Big bath accounting" using extraordinary items
        adjustments: Australian empirical evidence. *Journal of Business Finance and Accounting* 18,
        173-189.

Watts, R., and J. Zimmerman, 1986. Positive Accounting Theory. Englewood Cliffs, N.J.:Prentice-
        Hall.

Worrell, D.L., W.N. Davidson III, P.R. Chandy, and S.L. Garrison, 1986. Management turnover
        through deaths of key executives: effects on investor wealth. *Academy of Management* 29,
        674-694.

Zhang, Y., and N. Rajagopalan, 2008. When the known devil is better than an unknown god: an
        empirical study of the antecedents and consequences of relay CEO successions. *Academy of
        Management* 47, 483–500.

Zhang, Y., and N. Rajagopalan, 2010. CEO succession planning: Finally at the center
        stage of the boardroom. *Business Horizons* 53, 455-462.

Table 1: Summary Statistics

This table reports the mean values of the firm, corporate governance, and departing CEO characteristics for the two subsamples based on inside director presence. Definitions of all variables are in the Appendix. ***, **, and * indicate that the mean difference is significantly different from 0 at 1%, 5%, and 10% level, respectively.

	(1) Non-CEO Inside Directors >0 (N=73)	(2) Non-CEO Inside Directors =0 (N=46)	Mean diff. between (1) and (2)
Firm characteristics			
Firm age	**19.63**	**23.78**	**-4.16***
Tobin's Q	2.70	2.43	0.27
Market cap (000)	5,256.77	5,615.54	-358.77
Market to book ratio	1.42	1.36	0.06
R&D intensity	3.41%	4.47%	-1.06%
Leverage	21.82%	23.40%	-2.87%
Free cash flow	1.77%	2.57%	-0.80%
Firm risk$_{t-1}$	2.95%	2.81%	0.15%
Institutional ownership	59.43%	65.88%	-6.45%
Blockholder	60.81%	73.91%	-13.10%
Industry adjusted ROA$_{t-1}$	3.14%	3.66%	-0.52%
Corporate Governance Characteristics			
%. of inside directors	**31.42%**	**12.09%**	**19.30%***
Num. of inside directors	**2.92**	**1.00**	**1.92***
Board size	**9.76**	**8.82**	**0.94***
Board independence	**60.95%**	**78.45%**	**-17.50%***
Post year 2001	**51.31%**	**78.26%**	**-26.90%***
Outside director connections	8.78	8.69	0.09
Departing CEO founder	9.21%	2.17%	7.04%

Table 2: Comparison of CEO transitional characteristics around unexpected CEO departures

This table presents the univariate comparison of firms' transitional characteristics after an unexpected CEO departure based on whether the board has no non-CEO inside directors or at least 1 non-CEO inside director. t represents the fiscal year of the incumbent CEO departure announcement. Panel A shows permanent replacement CEO characteristics. Panel B shows the replacement transitional characteristics. The number in the parentheses indicates the percentage of interim CEOs that were promoted to the permanent CEO position. Panel C shows the results of the big bath hypothesis. *, **, and *** indicate that the mean difference is significantly different from 0 at 10%, 5%, and 1% level. *a, b,* and *c* indicate that the return is significantly different from 0 at 10%, 5%, and 1% level. Note: information on some variables may not be available for the whole sample period. Definitions of all variables are in the Appendix.

Panel A. Permanent Replacement CEO Characteristics

	(1) Non-CEO Inside Directors >0 (N=73)	(2) Non-CEO Inside Directors =0 (N=46)	Mean diff. between (1) and (2)
Current employee	**77.63%**	**52.17%**	**30.40%****
Current director	**64.47%**	**26.08%**	**42.70%*****
Current employee director	57.89%	-	-
New CEO Age	51.92	52.12	-0.18
Outside CEO same board	13.30%	12.50%	0.80%

Panel B. Transitional Costs

	(1) Non-CEO Inside Directors >0 (N=73)	(2) Non-CEO Inside Directors =0 (N=46)	Mean diff. between (1) and (2)
# of days without leadership	38.32	54.19	-15.87
% of interim appointment	38.15%	36.95%	1.20%
--interim was inside dir	**56.41% (73.68%)**	**--**	**56.41%*****
--Interim was outside dir	**10.25% (22.22%)**	**26.67% (20.00%)**	**-16.43%***
Indperf_adj ROA$_{t-1}$	-0.11%	0.21%	-0.32%
Change in indperf_adj ROA$_{t+1}$	2.75%^{b}	4.50%*	-1.77%
Change in indperf_adj ROA$_{t+2}$	**3.97%**^{b}	**-1.09%**	**5.08%***
Change in indperf_adj ROA$_{t+3}$	**4.70%**^{a}	**-1.26%**	**5.97%***

Panel C. Big bath hypothesis

% Firms Taking Big bath$_{t-1}$	2.63%	8.69%	-6.06%
% Firms Taking Big bath$_{t+1}$	**2.94%**	**13.63%**	**-10.70%***
% Firms Taking Big bath$_{t+2}$	**1.52%**	**15.00%**	**-13.50%****
% Firms Taking Big bath$_{t+3}$	1.61%	2.63%	-1.02%

Table 3: Determinants of inside succession and the appointment of inside director as new CEO

The table shows the multivariate regression of the linear probability model and probit regressions of the determinants of an inside succession and an inside director as the new permanent CEO. *, **, and *** indicate significance levels 10%, 5%, and 1%, respectively. *P*-values are in the parenthesis.

	Inside Succession		Inside Director New CEO	
	Probit	OLS	Probit	OLS
Unexpected departure	1.161***	0.371***	0.443**	0.133**
	(0.00)	(0.00)	(0.05)	(0.02)
>=1 non-CEO inside directors	0.731***	0.242***		.
	(0.00)	(0.00)		.
Log (Total # of inside directors)	.	.	2.204***	0.606***
	.	.	(0.00)	(0.00)
Log (Market Cap)	0.160**	0.045**	0.149*	0.033*
	(0.02)	(0.04)	(0.06)	(0.10)
Log (Firm age)	0.083	0.020	-0.248	-0.059
	(0.55)	(0.68)	(0.11)	(0.15)
Log (Board size)	0.197	0.055	-0.285	-0.062
	(0.68)	(0.71)	(0.60)	(0.64)
R&D intensity	-1.508	-0.357	2.507	0.632
	(0.49)	(0.60)	(0.26)	(0.37)
Free cash flow	0.631	0.272	-0.760	-0.169
	(0.52)	(0.37)	(0.48)	(0.53)
Leverage	0.311	0.117	-0.528	-0.141
	(0.62)	(0.58)	(0.44)	(0.43)
Prior year stock return	-0.123	-0.414	-0.161	-0.033
	(0.42)	(0.43)	(0.36)	(0.48)
Stock price volatility$_{t-1}$	6.453**	1.951*	-1.548	-0.736
	(0.05)	(0.06)	(0.90)	(0.71)
Founder CEO	0.536	0.160	0.205	0.047
	(0.30)	(0.29)	(0.68)	(0.77)
Intercept	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
N	351	351	351	351
R-sq or Pseudo R-sq	0.229	0.307	0.274	0.293

Table 4: Change in firm operating performance

This table shows the estimate of OLS regressions explaining changes in firm operating performance. The dependent variables are changes in industry-and-performance adjusted ROAs from one year before to three years after the unexpected CEO departure. This analysis only contains firms with at least three consecutive years of operation after the incumbent CEO departure. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. *p*-values are reported in the parentheses. Definitions of all variables are in the Appendix. Changes in performance are winsorized at 1%.

Independent variables	*Change in performance one year before to up to three years after the unexpected departure*					
	(1) Change in indperf adjusted ROA_{t+1}	(2) Change in indperf adjusted ROA_{t+1}	(3) Change in indperf adjusted ROA_{t+2}	(4) Change in indperf adjusted ROA_{t+2}	(5) Change in indperf adjusted ROA_{t+3}	(6) Change in indperf adjusted ROA_{t+3}
>=1 non-CEO inside directors	0.036	0.027	**0.077***	**0.082***	**0.097***	**0.089***
	(0.27)	(0.99)	(0.10)	(0.09)	(0.01)	(0.06)
Outside director connections	0.001	**0.009****	-0.000	**0.014***	0.001	**0.011***
	(0.80)	(0.01)	(0.93)	(0.00)	(0.45)	(0.00)
R&D intensity	-0.414	0.002	-0.870	1.418	**-1.175***	-0.321
	(0.56)	(0.99)	(0.42)	(0.14)	(0.06)	(0.52)
R&D intensity *		**1.339***		**1.857****		**1.068****
>=1 non-CEO inside directors		(0.05)		(0.03)		(0.05)
R&D intensity *		**-0.132****		**-0.200****		**-0.191***
Outside director connections		(0.02)		(0.04)		(0.00)
Log (Market cap)	-0.007	-0.011	-0.000	-0.007	0.015	0.010
	(0.64)	(0.46)	(0.98)	(0.68)	(0.24)	(0.36)
Log (Firm age)	-0.001	-0.013	-0.003	-0.022	0.013	0.001
	(0.95)	(0.50)	(0.87)	(0.35)	(0.48)	(0.97)
Log (board size)	0.030	0.041	0.001	0.022	-0.059	-0.028
	(0.68)	(0.59)	(0.99)	(0.81)	(0.37)	(0.58)
Founder CEO	0.129	0.105	0.071	0.036	0.066	0.043
	(0.37)	(0.39)	(0.61)	(0.76)	(0.36)	(0.52)

Table 4 continued	Change in performance one year before to up to three years after the unexpected departure					
Independent variables	(1) Change in indperf adjusted ROA_{t+1}	(2) Change in indperf adjusted ROA_{t+1}	(3) Change in indperf adjusted ROA_{t+2}	(4) Change in indperf adjusted ROA_{t+2}	(5) Change in indperf adjusted ROA_{t+3}	(6) Change in indperf adjusted ROA_{t+3}
Post 2001 period	-0.026	-0.042	-0.003	-0.028	-0.010	-0.025
	(0.49)	(0.26)	(0.95)	(0.54)	(0.78)	(0.39)
Stock price volatility$_{t-1}$	1.534	1.823	-0.086	0.491	1.234	1.116
	(0.48)	(0.41)	(0.96)	(0.80)	(0.54)	(0.58)
Log (New CEO age)	-0.133	-0.179**	-0.161	-0.230*	-0.080	-0.141**
	(0.11)	(0.05)	(0.11)	(0.03)	(0.27)	(0.04)
Log (Delay)	-0.001	0.003	-0.014	-0.007	-0.006	-0.002
	(0.93)	(0.57)	(0.14)	(0.25)	(0.31)	(0.75)
Constant and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Other control variables [a]	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	98	98	98	98	89	89
R-sq	0.138	0.251	0.122	0.286	0.345	0.547

Table 5: The big bath hypothesis

This table contains Probit regressions. We follow Christensen et al. (2008) definition of the big bath accounting. Firms are taking a big bath if they have largely negative Special Item expenses (Compustat Data Item 17), and this expense is at least 10% of the total asset in the same fiscal year. The dependent variables are binary variables that equals to 1 if a firm is taking a big bath, and 0 otherwise. The analysis only contains firms with at least three consecutive years of operation after the unexpected CEO departures. We do not include the proportion of firms taking a big bath three years after the unexpected CEO departure ($t+3$) because of the small sample and missing observations. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. p-values are reported in the parentheses.

Independent variables	(1)	(2)	(3)	(4)
	Big bath$_{t+1}$	Big bath$_{t+1}$	Big bath$_{t+2}$	Big bath$_{t+2}$
R&D Intensity*		**-14.58***		**-19.70***
>=1 non-CEO inside directors		(0.00)		(0.00)
Outside dir. Connections *		0.241		-0.135*
>=1 non-CEO inside directors		(0.14)		(0.66)
>=1 non-CEO inside directors	**-1.940***	**-1.649***	**-1.486***	**-2.863***
	(0.00)	(0.00)	(0.00)	(0.00)
Outside dir. Connections	-0.069	-0.002	-0.008	-0.112*
	(0.28)	(0.97)	(0.84)	(0.06)
Log (Market cap)	-0.058	0.054	-0.395***	-0.451**
	(0.80)	(0.78)	(0.01)	(0.03)
Log (Firm age)	-0.533	1.362	-0.787	-2.204
	(0.74)	(0.47)	(0.57)	(0.32)
Log (board size)	-1.378	-1.068	-0.530	-1.039
	(0.22)	(0.31)	(0.59)	(0.38)
Post 2001 period	-1.061**	-1.239*	-0.307	-0.620
	(0.02)	(0.10)	(0.43)	(0.27)
Stock price volatility$_{t-1}$	23.990**	37.300**	-11.58	-1.477
	(0.04)	(0.02)	(0.48)	(0.94)
R&D intensity	-0.837	-1.445	-0.711	13.180**
	(0.73)	(0.81)	(0.79)	(0.02)
Constant	Yes	Yes	Yes	Yes
Number of observations	94	94	90	90
Pseudo R-sq	0.491	0.570	0.253	0.361

Table 6 Do outside directors with connections influence stock and firm operating performance after unexpected CEO departures?

This table shows the mean comparison of firm performance and earnings management in firms with different combinations of inside and outside directors. We compare firms with (1) low inside director presence (# of non-CEO inside directors=0) with low outside director connection *LowCnct* (bottom tercile # of connections), (2) low inside director presence (# of non-CEO inside directors=0) with high outside director connections *HighCnct* (top tercile # of connections), (3) high inside director presence (# of non-CEO inside directors>=1) with low outside director connection (bottom tercile # of connections), and (4) high inside director presence (# of inside directors>=1) with high outside director connections (top tercile # of connections). Note that the middle tercile outside director connections are not included in this table. *, **, and *** indicate that the returns are significantly different from 0 at 10%, 5%, and 1% level. We also include two-sided t-tests for mean differences among the four combinations. Changes in performance are winsorized at 1%.

	Non-CEO inside director>0		Non-CEO inside director=0		t-stats of mean diff. between	t-stats of mean diff. between	t-stats of mean diff. between	t-stats of mean diff. between
	(1) HighCnct (N=25)	(2) LowCnct (N=31)	(3) HighCnct (N=18)	(4) LowCnct (N=12)	(1) and (2)	(3) and (4)	(1) and (3)	(2) and (4)
Change in firm performance								
ROA$_{t-1}$	14.78%	13.63%	16.15%	12.08%	0.44	1.06	-0.52	0.41
Change indperf_ROA$_{t+1}$	0.78%	1.92%	**5.14%***	**0.26%**	-0.37	**1.63**	-1.27	0.39
Change indperf_ROA$_{t+2}$	2.87%	6.65%*	**4.38%***	**-3.91%**	-1.08	**1.96**	-0.44	**2.28**
Change indperf_ROA$_{t+3}$	3.06%	8.58%**	**5.29%***	**-3.42%***	-1.11	**1.87**	-0.57	**1.68**
% of firms taking a big bath								
% Firms Taking Big bath$_{t+1}$	0.00%	0.00%	**0.00%**	36.36%	.	**-3.09**	.	**-4.11**
% Firms Taking Big bath$_{t+2}$	0.00%	4.17%	7.14%	27.27%	-0.98	-1.36	-1.29	**-2.06**
% Firms Taking Big bath$_{t+1}$	0.00%	0.00%	0.00%	10.00%	.	-1.15	.	-1.51

Table 7 Comparison of CEO transitional characteristics around sudden CEO departures
This table presents the univariate comparison of firms' transitional characteristics after a sudden CEO departure based on whether the board has no non-CEO inside directors or at least 1 non-CEO inside director. t represents the fiscal year of the incumbent CEO departure. Panel A shows permanent replacement CEO characteristics. Panel B shows the replacement transitional characteristics. The number in the parentheses indicates the percentage of interim CEOs that were promoted to the permanent CEO position. Panel C shows the results of the big bath hypothesis. The number in the parentheses indicates the percentage of interim CEOs eventually became the permanent CEOs. *, **, and *** indicate that the mean difference is significantly different from 0 at 10%, 5%, and 1% level. Note: information on some variables may not be available for the whole sample period. Definitions of all variables are in the Appendix.

Panel A. Permanent Replacement CEO Characteristics

	(1) Non-CEO Inside Directors >0 (N=176)	(2) Non-CEO Inside Directors =0 (N=175)	Mean diff. between (1) and (2)
Current employee	**64.80%**	**30.85%**	**33.90%***
Current director	**51.39%**	**21.71%**	**29.70%***
Current employee director	**45.81%**	-	-
New CEO Age	52.48	52.28	0.20
New CEO # of external board seats	0.54	0.51	0.03
Outside CEO same board	12.76%	11.22%	1.54%

Panel B. Replacement Transitional Characteristics

# of days without leadership	53.92	64.43	-10.51
% of interim appointment	27.37%	22.86%	4.52%
--Interim was inside director	**48.97%**	**--**	**48.97%***
	(75.00%)		
--Interim was outside director	**12.25%**	**25.00%**	**12.25%***
	(42.85%)	(37.50%)	

Panel C: Big bath hypothesis

% Firms Taking Big bath$_{t-1}$	6.14%	10.85%	-4.71%
% Firms Taking Big bath$_{t+1}$	**4.90%**	**9.75%**	**-4.85%[a]**
% Firms Taking Big bath$_{t+2}$	**4.52%**	**9.09%**	**-4.57%[a]**
% Firms Taking Big bath$_{t+3}$	**4.11%**	**11.97%**	**-7.86%[a]**

Table 8 Change in firm operating performance around sudden CEO departures

This table shows the estimate of OLS regressions explaining changes in firm operating performance. The dependent variables are changes in industry-and-performance adjusted ROAs from one year before to three years after the sudden CEO departures. This analysis only contains firms with at least three consecutive years of operation after the incumbent CEO departure. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. *p*-values are reported in the parentheses. Definitions of all variables are in the Appendix. Changes in performance are winsorized at 1%.

Independent variables	(1) Change in indperf adjusted ROA_{t+1}	(2) Change in indperf adjusted ROA_{t+1}	(3) Change in indperf adjusted ROA_{t+2}	(4) Change in indperf adjusted ROA_{t+2}	(5) Change in indperf adjusted ROA_{t+3}	(6) Change in indperf adjusted ROA_{t+3}
Unexpected*		-0.003		**0.075***		**0.062***
>=1 non-CEO inside directors		(0.96)		**(0.09)**		**(0.08)**
Unexpected	-0.011	0.006	0.009	-0.291	0.007	-0.012
	(0.77)	(0.90)	(0.69)	(0.47)	(0.71)	(0.73)
>=1 non-CEO inside directors	0.009	0.031	-0.010	0.028	0.017	0.028
	(0.72)	(0.61)	(0.65)	(0.50)	(0.37)	(0.56)
Log (Market cap)	-0.014	-0.017	-0.003	-0.002	0.002	0.002
	(0.14)	(0.13)	(0.65)	(0.77)	(0.73)	(0.72)
Log (Firm age)	0.024	0.023	0.007	0.007	0.001	0.002
	(0.28)	(0.29)	(0.59)	(0.57)	(0.91)	(0.84)
Log (board size)	-0.079	-0.093	0.003	0.010	0.017	0.018
	(0.28)	(0.83)	(0.83)	(0.90)	(0.72)	(0.77)
Founder CEO	0.072	0.067	0.086	0.073	0.052	0.043
	(0.48)	(0.49)	(0.19)	(0.30)	(0.28)	(0.41)
Post 2001 period	-0.043	-0.044	-0.034	-0.033	-0.026	-0.025
	(0.26)	(0.27)	(0.20)	(0.21)	(0.18)	(0.19)
Stock price volatility$_{t-1}$	1.374	1.108	-0.025	0.182	0.138	0.238
	(0.37)	(0.46)	(0.97)	(0.81)	(0.86)	(0.77)

(Table 8 continued)	(1) Change in industry adjusted ROA$_{r+1}$	(2) Change in industry adjusted ROA$_{r+1}$	(3) Change in industry adjusted ROA$_{r+2}$	(4) Change in industry adjusted ROA$_{r+2}$	(5) Change in industry adjusted ROA$_{r+3}$	(6) Change in industry adjusted ROA$_{r+3}$
R&D intensity	-0.112	-0.309	-0.464	0.405	**-0.612***	-0.104
	(0.65)	(0.60)	(0.30)	(0.59)	(0.06)	(0.86)
Outside director connections	-0.000	0.004	-0.000	**0.005***	0.001	**0.006***
	(0.96)	(0.15)	(0.96)	**(0.08)**	(0.21)	**(0.06)**
Constant and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	282	282	283	283	254	254
R-sq	0.140	0.148	0.061	0.109	0.133	0.172

Table 9 Firms taking a big bath after sudden CEO departures

This table shows the estimate of multivariate Probit regressions. WE follow Christensen et al. (2008) definition of the big bath accounting. Firms are taking a big bath if they have largely negative Special Item expenses (Compustat Data Item 17), and this expense is at least 10% of the total asset in the same fiscal year. The dependent variables are binary variables that equals to 1 if a firm is taking a big bath, and 0 otherwise.. The analysis only contains firms with at least three consecutive years of operation after the unexpected CEO departures. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. p-values are reported in the parentheses.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
	Big bath$_{t+1}$	Big bath$_{t+1}$	Big bath$_{t+2}$	Big bath$_{t+2}$	Big bath$_{t+3}$	Big bath$_{t+3}$
Unexpected*		-1.512**		-1.721**		0.498
>=1 non-CEO inside directors		(0.03)		(0.02)		(0.54)
Unexpected	-0.057	-0.199	-0.063	-1.131**	-0.829**	-0.248
	(0.85)	(0.68)	(0.86)	(0.02)	(0.02)	(0.65)
>=1 non-CEO inside directors	-0.024	0.797	-0.163	0.153	-0.600*	-1.110*
	(0.43)	(0.19)	(0.66)	(0.76)	(0.06)	(0.02)
Log (Market cap)	-0.101	-0.151	-0.081	-0.059	-0.163	-0.182
	(0.92)	(0.17)	(0.45)	(0.64)	(0.14)	(0.12)
Log (Firm age)	0.088	-0.042	0.224	0.172	-0.042	-0.048
	(0.63)	(0.82)	(0.39)	(0.52)	(0.84)	(0.83)
Log (board size)	-1.048	-1.131	-0.097	-1.601*	0.048	0.317
	(0.13)	(0.16)	(0.24)	(0.07)	(0.95)	(0.68)
Post 2001 period	0.139	0.309	0.183	0.298	-0.114	-0.052
	(0.65)	(0.33)	(0.56)	(0.42)	(0.73)	(0.85)
Stock price volatility$_{t-1}$	23.320***	19.140**	21.270***	22.950***	12.470	13.270
	(0.01)	(0.02)	(0.01)	(0.01)	(0.24)	(0.23)
R&D intensity	4.884**	-1.446	3.956**	15.850***	2.830	3.892
	(0.02)	(0.81)	(0.04)	(0.00)	(0.27)	(0.43)
Free Cash Flow	3.071***	4.824*	1.141	3.041**	4.881***	5.736*
	(0.01)	(0.06)	(0.30)	(0.03)	(0.00)	(0.06)

(Table 9 continued)	(1)	(2)	(3)	(4)	(5)	(6)
	Big bath$_{t+1}$	Big bath$_{t+1}$	Big bath$_{t+2}$	Big bath$_{t+2}$	Big bath$_{t+3}$	Big bath$_{t+3}$
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	282	282	283	283	254	254
Pseudo R-sq	0.193	0.303	0.266	0.347	0.208	0.233

Appendix

Variable definitions

Blockholder is a binary variable that equals to 1 if there is at least one blockholder in the sample firm, and 0 otherwise. *Blockholder* and *institutional ownership* information are obtained from Thomson Financial database.

Change in Indperf-adj ROA is the change in industry-and-performance-adjusted ROAs from one year up to three years after the incumbent CEO departure.

Current employee is a binary variable that equals to 1 if the replacement CEO has been with the hiring company for at least 2 years prior to the departure, and 0 if the they are hired from outside.

Current director is an indicator variable that equals to 1 if the replacement CEO has been a director in the firm for at least 6 months, and 0 otherwise.

Current employee director is an indicator variable that equals to 1 if the replacement CEO has been an insider/employee in the firm for at least 2 years and as a director in the firm for at least 6 months, and 0 otherwise.

Departing CEO founder is a binary variable that equals to 1 if the departing CEO was the founder, and 0 otherwise.

Firm age is the maximum number of years between CRSP listing age and Compustat listing age.

Firm risk$_{t-1}$ is the standard deviation of daily stock price during the prior calendar year.

Industry-adjusted ROA$_{t-1}$ is measured as a sample firm's ROA minus the median industry ROA, using the Fama and French (1997) 48-industry classification.

Industry-and-performance-adjusted ROA$_{t-1}$ is defined as each sample firm's ROA less the ROA of a non-sample firm, matched on primary two-digit SIC industry and with the ROA within 10% in the previous year. If no firm in the same two-digit industry has a year-1 ROA within 10%, We first select the firm in the same one- digit industry, and then disregard industry and only match on year-1 ROA within 10%.

Market value of equity (***mkcap***) is calculated using end of the year closing price of equity to multiply common stock shares outstanding.

Market to book is the market to book ratio of equity.

New CEO Age is obtained from Execucomp as of the year of CEO departure.

New CEO # of external board seats is the total number of other public board connections the new CEO possesses.

Outside CEO same board is a binary variable that equals to 1 if the new CEO is hired from outside, and has been sitting on the same board with at least one existing director in the turnover firm, and 0 otherwise.

Outside director connections is calculated as the sum of other public board seats held by outside directors in the sample firm.

Post year 2001 is a binary variable that equals to 1 if the year of departure is after 2001, 0 otherwise.

Percentage of insider directors and ***Number of inside directors*** are the percentage and number of inside directors on board.

R&D intensity is defined as research and development expenditure to sales. I calculate R&D intensity by taking the maximum value of 0, or R&D expense from Compustat, whichever is larger, and then divide it by sales.

ROA is the operating earnings before interest and taxes (OIBDP) over total book assets (AT).

Total # of inside directors is the total number of inside directors on board.

# of days without leadership is the number of days between the departure announcement of the incumbent CEO and the appointment of either an interim or permanent replacement.

 # Days w/o permanent CEO is the number of days between the departure announcement of the incumbent CEO and the appointment of a permanent replacement CEO.

% of director departures$_{t+n}$ is the percentage of existing director turnover rate up to three years after the CEO departure.

% of firms taking a big bath is the percentage of firms reporting large negative special item charges (Compustat annual data item 17) that equals to or exceeds 10% of their otal assets.

% of interim appointment is the percentage of sample firms that appointed an interim CEO before appointing a permanent CEO.

% of permanent replacement CEO turnover within 18mons is percentage of firms for which the new CEO left the company within 18 months after being hired.

% of senior management turnover within 18mons is the percentage of senior management (president, CFO, and COO) that left the company 18 months after the departures.