The Value of Independent Directors: Evidence from Sudden Deaths*

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Abstract

We investigate the contributions of independent directors to shareholder value by examining the stock price reaction to sudden deaths in the United States from 1994 to 2007. We have four key findings. First, following the death of an independent director, the firm's stock price drops by almost 1 percent on average. Second, the degree of independence and the power structure of the board determine the marginal value of independent directors. Third, independence is more valuable in crucial board functions, such as the audit committee. Finally, controlling for director-invariant heterogeneity using a fixed-effects approach, we identify the value of independence over and above the value of individual skills and competences. Overall, our results suggest that independent directors provide a valuable service to shareholders.

Keywords: Independent Director, Sudden Death, Board of Directors, Corporate Governance, Firm Value

JEL Classifications: G3, G30

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Do independent directors provide a valuable service to shareholders? The dominant view on this question seems to be that independent directors are beneficial to shareholder value. This view is emphasized in an abundance of international guidelines for corporate governance and in regulatory initiatives following the corporate scandals of recent years.[1] Surprisingly, in spite of a rich body of academic literature on the topic of boards of directors, direct empirical evidence on the value of independent directors is scant. This paper attempts to fill this void by examining the stock price reaction to sudden deaths of corporate directors. Overall, we find that the sudden death of an independent director significantly reduces firm value by almost 1 percent and that the contribution to firm value depends on his/her very independence as well as on individual and firm characteristics.

The emphasis on the value of independence in both academic and practitioner work reflects the notion that independent directors are better at monitoring the management because they are not, or are less, subject to the classical agency problem. In recognizing directors' competence to perform this task, Fama and Jensen (1983) note that the majority of independent directors are managers or decision makers in other complex organizations. Because such individuals care about their reputations when accepting directorships, they have incentives to carry out tasks that are the most prone to serious agency problems.

Many studies offer empirical evidence to support Fama and Jensen's (1983) conjecture. Weisbach (1988), for example, reports that outsider-dominated boards are more likely to remove a poor performing CEO, while other papers show that outside directors tend to defend shareholder interest (Byrd and Hickman (1992); and Brickley, Coles, and Terry (1994)). In addition to the reputation effect, recent evidence also suggests that director competence and skill matter. Güner, Malmendier, and Tate (2006) and Dittmann, Maug, and Schneider (2008), for example, report that financial expertise of directors does impact firm financing policy.

There has been conflicting evidence, however, on whether the supposedly effective monitoring by independent directors materializes. The majority of prior papers show that the contribution of independent directors to firm value is insignificant (McAvoy et al. (1983); Bhagat and Black (1999, 2002); Hermalin and Weisbach (1991); Klein (1998)), or even negative (Agrawal and Knoeber (1996)). One exception is Rosenstein and Wyatt (1990), who show that stock price positively reacts to the nomination of independent directors to the board. Another exception is

[1] Examples include the Cadbury report in the U.K., the Vienot reports in France, and the Sarbanes-Oxley Act in the U.S., which have all called for greater independence of the board of directors.

Core, Holthausen, and Larcker (1999), who find a positive relationship between the fraction of outside directors and market-to-book ratio.

Several potential explanations exist for these conflicting and inconclusive insights. First, as Hermalin and Weisbach (1998, 2003) argue, the board of directors is an endogenously determined institution. Thus, on an empirical basis, it is difficult to convincingly identify any relationship between board composition and firm performance, or firm value. A second potential explanation could be that not all independent directors effectively monitor management. Shivdasani and Yermack (1999) argue, for instance, that CEOs might be involved in the selection of independent directors. Third, if prior literature does not find a significant relationship between independent directors and firm value, this circumstance might result simply because independent directors do not contribute to firm value at all. One potential explanation might be that inferior information limits the effectiveness of independent directors (Fama and Jensen (1983)).

In this paper, we first analyze the contributions of independent directors to firm value by studying the stock price reaction to sudden deaths of corporate directors. Our underlying hypothesis is that if an independent director properly monitors and/or provides managers with pertinent advice, firm value should decline immediately following the director's sudden death. Second, we study potential determinants of independent directors' contributions to firm value by examining their degrees of independence, as well as proxies for their competence and monitoring role.

Compiling a sample of 229 suddenly deceased directors holding 279 directorships in the United States from 1994 to 2007, we identify 109 independent directors. We find considerable variation in the stock price reaction following the death of an independent director. The stock price drops by almost 1 percent on average. These negative abnormal returns are significantly different from zero and important in economic terms. Given an average market capitalization of $4 billion, the sudden death of an independent director reduces firm value by almost $39 million.

Consistent with the view that independence is valuable, we find that stock prices react less negatively when the independent director has long tenure. Controlling for the effect of tenure, the stock price reacts less negatively when the director is appointed during the tenure of the current CEO. The marginal value of independence is higher when there are fewer outside directors or in cases where the deceased independent director serves crucial board functions, such as the audit or nominating committees. Independence is particularly valuable when the

deceased director holds the swing-vote that secures a majority of independent directors on the board.

Although our results collectively support the argument that independence is valuable, these findings might be driven by independent directors' ability and skills rather than by their independent stand in decision making. We thus isolate the effect of independence from ability and skills by focusing on individuals with multiple directorships. For this group, we compare the stock price reaction across director types (independent, gray, and inside) while effectively controlling for director-invariant heterogeneity, using a fixed-effect approach. Holding the individual effect constant, the stock price reaction is significantly more negative for independent directorships than for other directorships.

Our paper contributes to the literature on corporate boards along several dimensions. First, this paper provides direct empirical evidence for the contribution of independent directors to shareholder value. Second, in terms of methodology, our use of sudden deaths allows us to avoid potential endogeneity problems—a common issue in the literature on board of directors (Hermalin and Weisbach (2003)). Given that board composition is hardly exogenous, it has been a challenge to convincingly confirm an association between board or director characteristics and firm value. Third, the use of sudden deaths of directors with multiple directorships also helps us in separating the issue of skills and competence from the issue of independence. Controlling for director-invariant heterogeneity, we confirm the value of independence over and above the value of individual skills and competence.

Overall, we provide evidence of the benefit of having independent directors on a corporate board. Meanwhile, results from our paper should be interpreted with caution. Adding more independent directors onto a board might not always be beneficial. Indeed, as Fama and Jensen (1983) note, inside directors are more likely to possess superior information that, together with their experience and skill, allows them to contribute to firm value. A board might be value-enhancing when it allows both independent directors and inside directors to perform their roles optimally.

The remainder of the paper is organized as follows. Section I reviews related literature. Section II describes the data collection and empirical strategy. In Section III, we report our main empirical findings. Several robust checks of the results are presented in Section IV. Section V closes with a discussion of the results and our conclusions.

I. Prior literature on independent directors

Prior literature, both theoretical and empirical, has focused on one of the many facets of the board of directors as a monitor and/or as an advisor.[2] For several reasons, outside independent directors have been seen as the most able to assume both roles inside the board.[3]

First, outside independent directors are not, or are less, subject to potential conflicts of interest that reduce their monitoring capacity. In any firm the ultimate decisions on crucial issues, such as setting executive compensation or searching for replacements of top managers, fall strictly under board authority and, in most cases, are in the hands of independent directors. Second, outside directors are typically also serving as experienced professionals in other firms or large organizations who care about their reputation. Fama and Jensen (1983) hypothesize that this reputation effect, not large compensation, induces outside directors to monitor. Third, outside independent directors possess technical expertise both in management and decision-making, which allows them to be effective monitors (Fama and Jensen (1983)).

Abundant evidence exists to suggest that independent directors are better monitors of management. Weisbach (1988) reports that outsider-dominated boards are more likely to fire CEOs for poor performance. Byrd and Hickman (1992) provide evidence that bidding firms with outsider-dominated boards have significantly higher announcement-date abnormal returns, and Cotter, Shivdasani, and Zenner (1997) find similar results for target firms. Brickley, Coles, and Terry (1994) show that stock markets react positively when a firm with an outsider-dominated board announces adoption of poison pills. Recently, mixed evidence from several papers points out some limits to the effectiveness of monitoring by independent directors. Ferris, Jagannathan, and Pritchard (2003) find that outside directors with multiple directorships do not harm firm performance, nor do they increase the likelihood of firms to be named in security fraud. Perry and Peyer (2005) show that in some circumstances, outside directors who accumulate multiple directorships enhance firm value. Fich and Shivdasani (2006) go further in specifying that independent directors and boards can only be good monitors if they are not "too

[2] Prior literature originally concentrated on the monitoring role of the board and only recently started focusing on the expertise and the advisory role. See, for example, Adams and Ferreira (2006) for a theoretical model showing interaction between monitoring and advisory roles, and Güner, Malmendier and Tate (2006), and Dittmann, Maug, and Schneider (2008) for empirical evidence on the financial expertise of directors.

[3] Directors who are not current or former employees, and who do not have dealings with the firm, are designated as (independent) outside directors. Weisbach (1988) and Shivdasani and Yermack (1999) provide a succinct review of the measures of board independence used in the literature. Hermalin and Weisbach (1998) and Carter and Lorsch (2003) also consider relative and absolute tenure of the CEO in comparison to directors' tenure as alternative measures of independence.

busy." Markets react positively when a busy outside director leaves, and negatively when a director becomes busy by accepting an additional directorship.

The evidence on the value of independent directors to shareholders is thin. We know little about whether all independent directors are equally good or whether there are other determinants of the value of independent directors. The existing evidence is also conflicting. Many previous papers show that independent directors are not value-increasing (McAvoy et al. (1983), Bhagat and Black (1999, 2002), Hermalin and Weisbach (1991), Klein (1998)), or even value-decreasing (Agrawal and Knoeber (1996)). One exception is Rosenstein and Wyatt (1990), who show that stock prices react positively to the nomination of independent directors to the board. However, as pointed out by Hermalin and Weisbach (2003), the positive market reaction could be driven by the need for change rather than the contribution of independence. Indeed, in a follow-up study, Rosenstein and Wyatt (1997) find similar effects for nomination of insiders. In terms of methodology, the paper by Rosenstein and Wyatt (1990) is the closest to ours. In comparison, our choice of event allows us to better alleviate the endogeneity concerns related to board changes and to identify the very value of independence. Another exception is Core, Holthausen, and Larcker (1999), who find a positive relationship between firm value and a panel of proxies for good governance where the fraction of outside directors on a board is just one of the variables.

A potential reason for this inconclusive insight is that, as noted by Hermalin and Weisbach (1998, 2003), boards of directors arise as endogenously determined institutions. Board composition and nominations are not likely to be exogenously related to firm performance.[4] Thus, any successful attempt to address these important issues will have to overcome the potential endogeneity problems to be able to identify the value of independent directors.

The literature on the value of corporate executives suffers from similar identification problems because managerial turnover decisions are rarely random and often coincide with other relevant news about the firm. To mitigate such endogeneity problems, several papers have studied exogenous events. In a seminal study, Johnson et al. (1985) use sudden deaths of executives to estimate the value of executives' continued employment. Using a sample of 53 executives' sudden deaths between 1971 and 1982, they find positive stock price reaction to the death of founder-CEOs and negative reaction to that of professional CEOs. The attractiveness

[4] To provide a few examples: Hermalin and Weisbach (1998) show that board independence might just be the outcome of a bargaining process between the CEO and the board, and Shivdasani and Yermack (1999) report evidence that the CEOs are involved in the selection of directors.

of this approach is that sudden, unexpected deaths occur randomly and are exogenous to current firm and market conditions. In later studies this approach has been used to examine interaction between characteristics of executives and the stock price reaction to sudden death announcements: Worrell et al. (1986) analyze the relationship between the market reaction to 127 announcements of executive deaths and the position of these executives (CEO vs. chairman); Slovin and Sushka (1993) examine the stock price reaction to the death of 85 inside blockholders; Haynes and Schaeffer (1999) compare the stock market reaction to manager/firm separation where managers quit their jobs, to 29 cases where the firm loses its CEO to sudden death; Borokhovich et al. (2006) use a sample of 161 executive deaths to examine the relationship to managerial ownership; Salas (2007) examines 184 sudden deaths to shed light on whether entrenched CEOs are associated with a positive stock price reaction. Roberts (1990), Fisman (2001), and Faccio and Parsley (2008) use sudden deaths (or rumors of poor health) of politicians to estimate the value of having a politically connected CEO. More recently, Bennedsen, Pérez-González, and Wolfenzon (2007) study the event of the deaths of CEOs, and of their relatives to examine the relevance of CEOs for corporate performance.

We extend this line of research by studying the stock market reaction to sudden deaths of independent directors. To the best of our knowledge, this paper is the first to exploit sudden deaths to overcome endogeneity problems in identifying and measuring the value of directors. This is quite surprising given the fact that the approach introduced by Johnson et al. (1985) has been known for more than two decades.

II. Sample and data

A. Sample selection and definition of sudden deaths

The sample consists of 229 sudden deaths of corporate directors holding 279 directorships between January 1, 1994 and December 31, 2007, of which 109 are classified as independent. A gross sample of 772 deceased directors of firms listed on AMEX, NASDAQ, and NYSE was identified by searching Factiva, Lexis-Nexis, and Edgar Online, using keyword search terms on directors (board member, director, etc.) and death (passed away, died, deceased, etc.). Unlike prior research using sudden death events, our search terms do not include keywords designed to capture sudden deaths (e.g., "sudden" or "unexpected"). This omission is important, as many newspaper articles report the medical cause of death without explicitly mentioning that the death

is sudden, e.g., cerebral hemorrhage (stroke). Thus, by conducting a general search designed to identify all deceased directors, we identify cases of sudden deaths that would not show up in a search with keywords focusing on identifying sudden deaths.[5] The cost of the general keyword search design is that the search returns a significant number of newspaper articles. In fact, our sample of 772 director deaths was identified from more than 20,000 newspaper articles. Our efforts also involve the examination of more than 2,000 corporate filings to the SEC related to deaths of directors and executives.

For the purpose of our paper it is important that our sample only includes deaths that are truly sudden and unexpected by the stock market. Prior research has not provided a stringent definition of sudden death: Johnson et al. (1985, p. 157) identify their sample of 53 executive deaths from a gross sample of 210 deaths by excluding deaths where the cause *was not attributed to "prolonged illness," "complications following surgery," or indeterminate*, whereas Slovin and Sushka (1993) do not seem to impose any restriction on their sample of deceased blockholders. More recent papers (e.g., Haynes and Schaefer (1999) and Salas (2007)) rely on keyword search terms directly related to "sudden deaths." A natural reference point for any such discussion and selection of sudden death is the medical literature, which defines sudden death as an unexpected and non-traumatic death that occurs instantaneously or within a few hours of an abrupt change in the person's previous clinical state. One example is sudden cardiac death, which according to the American Academy of Pediatrics, is defined as a non-traumatic**,** nonviolent, unexpected event resulting from sudden cardiac arrest within six hours of a previously witnessed state of normal health. Although our ability to follow a stringent medical definition is limited by our use of newspaper articles to classify causes of death, we have tried to be careful to ascertain that the deaths in our sample were indeed sudden and consistent with the medical definition.

To classify the deaths as sudden, the cause of death was verified by an additional search on news containing the name of the director in a one-year period surrounding his death. In cases of inconsistency in the reported cause of death across different sources (e.g., one newspaper reports the death as sudden whereas another reports cancer as the cause of death), our approach is to be

[5] Our search shows large variations across media outlets in the description of the causes of death. For example, strokes are also referred to as aneurysm and cerebral hemorrhage, and accidents are cited by type without employing the word "accident" (e.g., airplane or helicopter crash, fall incident, shooting incident, or death caused by leisure activities). Inherently, the large variation makes it difficult to sample all sudden deaths by including keywords such as "accident," "sudden," and "stroke" tailored to capture sudden deaths only. Thus, conducting a general search and subsequently classifying the causes of death increases the sample size significantly. This is important, as prior research using sudden deaths has suffered from relatively modest sample sizes varying from 29 to 184 cases.

conservative and only include events where we have no conflicting evidence that the death is sudden and unexpected. As a result, death caused by, for example, heart attack will only be classified as sudden if we cannot find any evidence of declining health 24 hours prior to the heart attack. Similarly, deaths described as "sudden" or "unexpected" with no cause listed are only included if we could find no news indicating that the director was ill or suffered from declining health.

From the gross sample of 772 deceased directors we identify 229 individual directors who according to our strict definition suddenly died. We include heart attacks, stroke, and accidents, as well as deaths for which the cause is unreported, but the death is described as unanticipated. Thus, our sudden death sample does not include causations such as cancer, complications from illness, past strokes, surgery, or suicides.[6] Panel A of Table I shows the reported causes of death for all deceased directors, while Panel B reports the causes for sudden deaths.

Panel A shows that, out of the 772 deceased directors in our gross sample, 229 (29.7 percent) of the deaths were, according to our definition, sudden. Of the remaining decedents, 156 directors died of cancer; 67 died from complications related to various specified diseases (of which complications from past strokes account for 27 cases); 20 died from complications related to surgery; 6 committed suicide; and 97 were reported to have died from unspecified illnesses, with the cause of death unreported for the remaining 197 cases.

Panel B of Table I shows that 38.9 percent of the directors who suddenly died suffered from heart attack, whereas 7.9 percent died from a stroke. Accidents, including plane/helicopter crashes (20 cases), traffic accidents (15 cases), fall accidents (5 cases), drowning (2 cases), murder (2 cases), and shooting incidents (1 case) account for 19.7 percent of our sample.[7] Finally, a total of 77 deaths (33.6 percent) are described as sudden and unexpected without specific details provided about the medical cause of death.[8]

Several of the suddenly deceased directors held multiple directorships. Panel C in Table I shows the distribution of suddenly terminated directorships for the 229 deceased directors. In total, the 229 individuals held 279 directorships, as is shown in Panel D of Table I.

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[6] We exclude suicides because such cases might be related to the current situation surrounding the firm.

[7] In supplementing the medical definition of sudden death, we also include accidental and traumatic deaths (murder and violence) in our definition of sudden death because these events are unanticipated by the stock market.

[8] In a robustness check in Section IV we show that our results are not affected in any meaningful way by excluding the cases reported as "sudden" or "unexpected" from our sudden death sample.

For the sample of sudden deaths, the death date and news date were verified by an additional search of news containing the name of the director. In cases in which the death is reported by multiple news agencies, the earliest date is assigned as the news date. The time lag between death and news dates is on average 2.3 days, with a median of 1 day. The average is affected by a few extreme cases in which a firm held back the announcement for several weeks. If these cases are excluded, the average drops to 1.5 days. Otherwise, the delay is mainly caused by intervening weekends. The mean time lag between death and news dates is 1.7 trading days for the entire sample, and 1.0 if we exclude the few extreme cases.

We also check the possibility of confounding news surrounding the event. Whenever there is important corporate news from day -1 to day +2 around the deaths, the events are eliminated from the sample. We thus drop 17 cases, reducing our original sample from 296 directorships to 279. Examples of confounding news include announcement of quarterly earnings (7 cases), merger and acquisition decision (5 cases), discovery of new drug (2 cases), stock repurchase (2 cases), and major strike (1 case).

Table II shows the composition of the sample across time and director types. Following Weisbach (1988) and Shivdasani and Yermack (1999), we classify directors into inside, "gray," and independent. Inside directors are current employees of the firm, whereas board members who are retired employees of the firm, relatives of the CEO, and/or persons with conflicts of interest or related to the firm's business are classified as "gray" (outside) directors. Directors who are not current or former employees, and who do not have dealings with the firm, are designated as independent (outside) directors.

Table II shows that, out of the 279 directorships held by 229 suddenly deceased directors, 39.1 are independent, 40.5 percent are inside, and 20.4 percent are gray. Across time we observe significantly fewer independent director deaths in the beginning of our sample than in recent years. We attribute this pattern to the introduction of the Sarbanes-Oxley Act in July 2002, which among other things has increased the number and the ratio of independent directors on corporate boards.

B. Descriptive statistics

Table III gives descriptive statistics for our sample of deceased directors. Panel A reports director characteristics. The average independent (gray/inside) director suddenly died at the age of 64.0 years (62.5 years), with a sample average of 63.1 years. There is substantial variation in independent director age, with a range from 40 to 90 years, at the time of death. Our sample is

male-dominated, as 91 percent of our independent directors are male.[9] The average independent director had served on the board for 7.8 years. Almost all directors held a bachelor's degree; a relatively modest fraction also held a professional, postgraduate, M.B.A., or Ph.D. degree. Finally, more than 50 percent of the deceased independent directors were members of the audit or compensation committee, whereas 38 percent were serving on the nomination committee. This reflects that independent directors are likely to be members of the key governance committees.

Panel B of Table III reports firm characteristics. The average firm in our sample has 4 billion USD in market capitalization, market-to-book ratio of assets equal to 2.1, and an average age of 45.7 years.

Panel C shows board characteristics. Average board size is 8.8, lower than the average board of around 12 directors that is reported in Yermack (1996) for Forbes 500 firms in the mid-1990s. On average, around 67 percent of the directors (5.9 board members) are classified as outsiders. Finally, 39 percent of the sample firms maintain a separation between the CEO and chairman positions.

III. The value of independent directors

In this section, we use two empirical tests to investigate the stock price reaction to the sudden death of independent directors. First, we examine the stock return in the period coincident with the sudden death of independent directors. Second, we exploit the cross-section of stock price reactions to examine the impact of different measures of independence, controlling for individual and firm characteristics.

A. Event study of the stock price reaction to sudden director deaths

To examine the stock price reaction to sudden deaths, we access daily returns from Center for Research in Security Prices (CRSP) for each of our 109 events for an eleven-day period around the death (from day -5 to day +5), as well as a 255-day pre-event estimation period (from day -300 to day -46). The event day is defined as the trading day of the director's death or the

[9] This is similar to the 91 percent male ratio reported by Adams and Ferreira (2008) for a large sampling of U.S. firms.

first trading day following the death, if it occurred on a non-trading day.[10] To calculate the abnormal return, we follow the standard event study approach and assume a single-factor model, where beta is estimated using the data from the pre-event window. We obtain virtually identical results using market-adjusted returns and, therefore, only present results from the market model.

Panel A in Table IV presents the time series of abnormal returns for the eleven trading days around the news date. We report the mean abnormal return and the number of positive and negative abnormal returns for each of the trading days. Panel A indicates that, on average, a small and negative share price adjustment is associated with the unexpected loss of independent directors. In particular, the stock price reaction on the days surrounding the death is negative for four straight days from day -1 to +2. This pattern suggests that deaths are incorporated into market prices in the period from the death until the event becomes publicly known to all market participants.

In Panel B we report event study results for valuation effects of sudden deaths of independent directors. Cumulated average abnormal returns are calculated for the two-, three-, and four-day event windows from day -1 to 0, -1 to +1, and -1 to +2, respectively (day 0 is the death date). This approach is motivated by two observations. First, our reliance on the medical definition of sudden death allows for a 24-hour time interval from the change in the prior clinical state until sudden death. In our sample we do observe cases where the media reports that a director has been hospitalized due to a heart attack or stroke occurring on day -1, and resulting in death the following day. Second, it takes, on average, 1.7 trading days before the death is reported and covered in the news.

Panel B shows that for independent directors the cumulated abnormal returns (CAR) are systematically negative and significantly different from zero. Two-day (-1, 0), three-day (-1, +1), and four-day (-1, +2) CARs are -0.47, -0.73, and -0.96 percent, respectively, and all are significant at the 5 percent level. Using a sign-rank test we even find a significantly negative effect at the 10 and 5 percent levels for the (-1, +1) and (-1, +2) event windows, respectively. Panel B also shows considerable variation in the stock price reaction to sudden deaths. Although the average CAR is negative, CARs are not always negative. In particular, 43 out of 109 deaths (39.4 percent) are associated with positive stock price reactions over the four-day event window. Thus, we will study potential determinants of the stock price reaction to the death of independent directors.

[10] In a robustness check in Section IV, we propose many alternative event windows, including one anchored around the news date. Our results are not affected in any meaningful way by the definition of the event date.

Overall, the results in Table IV show that stock prices drop significantly following the death of independent directors. This result is consistent with our main hypothesis that independent directors are valuable to shareholders.

B. Independence as determinant of the stock price reaction to the sudden death

To study whether the degree of independence of directors is a determinant of their contribution to shareholder value, the following subsection exploits the cross-section of stock price reactions to sudden deaths. We proceed with a multivariate approach that allows us to control for observable director and firm characteristics. In all regressions, we value-weight stock returns to alleviate the possibility that our results are driven by small firms where the stock price is likely to vary considerably more when corporate talent is lost.[11] As control variables we include director age, market capitalization, market-to-book ratio of assets, firm age, and industry indicators.

Table V outlines our main results using the stock price reaction for the (-1, +2) four-day window. In Columns 1 and 2, we examine the impact of the degree of independence of independent directors. To proxy for different degrees of independence, we follow recent literature on boards of directors. Hermalin and Weisbach (1998) and Carter and Lorsch (2003) argue that relative tenure of the CEO in comparison to director tenure and the absolute director tenure should be considered as alternative measures of director independence. Similarly, Shivdasani and Yermack (1999) show that the CEOs might be involved in the selection of directors. Thus, our first proxy for the independence of directors is the length of the tenure of independent directors measured by years of board service. Our second proxy is an indicator variable for whether the independent director is appointed during the tenure of the current CEO.

In Column 1, we include the deceased director's tenure on the board (years). We find that directors with short tenure, who are considered more independent, are valued more by investors. The coefficient on tenure indicates that the stock price reaction is 0.19 percent higher per year of service on the board. This evidence supports the conjecture that the degree of independence of an independent director is reduced with the length of his tenure. In Column 2 we include our second proxy for independence, which measures the tenure of the deceased independent director

[11] This is important because a simple control for firm size cannot counterbalance the fact that small firms will be subject to greater variance in the stock price irrespective of the sign of the stock market reaction to firm size.

relative to the tenure of the CEO. We control for tenure because directors who are appointed during the tenure of the current CEO by definition will have shorter tenure. Controlling for the positive effect of tenure, we find a positive and significant stock price reaction for directors who are appointed during the tenure of the current CEO. The marginal effect is quite large, as the cumulative abnormal return is 1.44 percent higher. Independent directors are thus less valuable when they have long tenure or are appointed during the tenure of the current CEO. This bolsters the case for our interpretation of the event study results because we show that within variation in the degree of independence affects the value of independence.

If the negative stock prices reaction is caused by independence, it is natural to expect that the marginal effect is larger whenever the board includes fewer outside directors. In Column 3, we test this hypothesis by including the ratio of outside directors on the board. Our results confirm the conjecture that the marginal effect of independent directors is larger in boards with few outsiders. In an unreported regression, we obtain the same result when the specification includes the number of outside directors rather than the ratio of outsiders.

The marginal value of independent directors is also likely to be affected by the possibility that the loss of a director would influence the power structure within the board. In Column 4 we indentify cases in which the deceased director held the swing-vote that secured a majority of independent directors on the board. In such cases, shareholders might fear that the loss of an independent director could lead to a majority change against their interest. Column 4 shows that the cumulative abnormal return is indeed 1.23 percent lower.

The separation of CEO from the chairman position might also affect the power structure within the board (Brickley, Coles, and Jarrell (1997)), and thereby, the potential contributions of independent directors. We thus examine this effect by including an indicator variable for separation of power. In Column 5 we find no significant effect of being an independent board member in firms that separate the CEO and chairman positions.

In Columns 6 and 7 we jointly test the insights from Columns 1 to 5. Generally, the results confirm the prior findings. In addition, the indicator for separation of power now becomes statistically significant. The stock price reaction is between -1.52 and -1.94 percent following the death of independent directors in firms with separation of the CEO and chairman position. Thus, the presence of powerful CEOs on the board apparently mitigates the effectiveness of independent directors.

In summary, Table V provides evidence of the value of independent directors to shareholders: independence matters within the group of independent directors. Absolute and

relative board tenure—two of the most scrutinized proxies for the degree of independence—do explain the variation in stock price reaction. The value of independent directors is also larger when there are few outsiders, separation of power or when the death threatens independent majority on the board.

C. Value of independence in crucial board functions

The prior section provides evidence that independent directors are valuable to firms. In this section we continue to explore potential channels of their contributions to firm value. In listed companies, either by legal requirements or by shareholders' demand, independent directors assume critical functions in areas where insiders have potential conflicts of interest. The Sarbanes-Oxley Act, for example, requires that chairmen and members of audit committees be independent and have competence in accounting and auditing. As a result, outside directors currently occupy important board committees (audit, nomination, compensation), which are supposed to monitor the management.

We hypothesize that if these crucial board functions provide a valuable service to shareholders, the stock price will react more negatively when independent chairmen or members of such committees suddenly die. We test this hypothesis empirically by creating indicators that take the value of one if the suddenly deceased independent director is chairman, or a member of the audit, compensation, nomination, or other committees.

Table VI reports results. Column 1 shows that the effect of being an independent chairman is negative but insignificant. However, we also note that the power of the test is affected by the limited number of observations, as we only have eleven independent chairmen in the sample. Column 2 shows that if the deceased director served on the audit committee, the magnitude of the negative stock price reaction is significantly larger. Audit committee membership causes the stock price to drop by 2.15 percent. This is consistent with the findings of DeFond, Hann, and Hu (2005), who show that abnormal returns resulting from nominations of directors with accounting financial expertise to the audit committee are more than 1.5 percent higher than for those resulting from the nominations of non-expert directors. In contrast, we do not find additional effects of serving on the compensation and nominating committees. The coefficient on the indicators for compensation and nominating committees are 0.56 and -0.27 percent, respectively. Both effects are insignificant at conventional levels. One potential explanation for the difference in the value of being an independent audit rather than a compensation and nomination committee member is provided by Shivdasani and Yermack

(1999). They show that CEOs are actively involved in the selection of board members, and that the stock price following such nominations drops by more than 1 percent. Because audit committee members must possess auditing experience and skills, it might be tougher for CEOs to place candidates here. Meanwhile it might be easier for CEOs to influence the choice of compensation and nomination committee members. Indeed, we find that members of the audit committee have shorter board tenure (7.4 years) than compensation and nomination committee members (8.8 years), which, according to the prior literature, is one proxy for independence.

In Column 5 we include an indicator variable for directors serving on other committees. On average, 28 percent of the independent directors serve on subcommittees other than audit, compensation, and nominating. For these directors we find an additional -2.55 percent cumulative abnormal return.

Some independent directors can sit on many committees of the same board. This possibility is not taken into account in regressions from Columns 1 to 5. Thus, we pool all variables into one regression in Column 6. The joint specification shows similar results, although the effects tend to be more statistically significant. For all board functions we now find a negative cumulative abnormal return. The deaths of independent chairmen and members of the audit, nominating, and other committees are associated with CARs of -3.56, -1.76, -1.60, and -2.45 percent, respectively. All effects are significant at the 5 percent level. The effect of serving the compensation committee is insignificant, which perhaps, given the controversy surrounding executive compensation, is not so surprising.

In summary, we find that although independence matters for ordinary board members, there is an additional value associated with having independent directors to perform crucial board functions. Our results demonstrate that having an independent chairman or audit committee member is particularly valuable to shareholders.

D. Isolating the effect of independence from ability, expertise, and skills

One may argue that independent directors are valuable for shareholders, not only because of their independent stand in decision-making, but also for their ability, expertise, and skills. Econometrically, the problem is that competence is difficult to identify, let alone quantify. It is even more challenging to separate ability, expertise, and skills from firm-specific factors. To address this concern, we first include measurable and observable proxies for skills related to

directors' educational backgrounds, as obtained from biographical information.[12] Second, we isolate the effect of independence from ability, expertise, and skills, using director fixed effect on the subsample of directors with multiple directorships.

From Table III we know that 96 percent of the independent directors in the sample hold at least a bachelor's degree. Taken at face value this seems to suggest that board members have at least an adequate minimum level of formal education. We therefore control for skill by including three indicator variables: *Postgraduate*, *M.B.A.,* and *Ph.D.,* taking the value one if the director holds any one of these three degrees. The core motivation for including these variables is that a M.B.A. degree provides the relevant training in understanding the business model to provide executives with advice, whereas a Ph.D. degree signals that the director possesses high ability and, therefore, is likely to be skillful.

Table VII reports the relationship between the degree of independence proxied by tenure and stock market reaction while attempting to control for director ability and skills. When we include education indicators among the controls in Column 1 of Table VII, we find little impact on the overall result of the value of being independent. Controlling for education, we find the same effect of tenure on the stock price reaction as is given in Table V. Interestingly, none of the proxies for competences are statistically significant.

Although Column 1 attempts to control for differences in ability, expertise, and skills, indicators for education might be imperfect proxies for competences. Using a cross-sectional approach, we, thereby, cannot reject the conjecture that our results are explained by omitted factors related to directors' abilities and skills. In Columns 2, 3, and 4, we therefore run fixed-effect estimations of the relationship between independence and the market reaction to sudden deaths. The advantage of this approach is that we effectively control for any director-invariant heterogeneity (e.g., ability, experience, and skills) in relation to shareholder value; the disadvantage, however, is that the specification restricts the sample to directors that serve on at least two boards and have variation in the independence status. In total, 30 directors with a total of 74 directorships satisfy these criteria. The magnitude of our fixed-effect estimates should therefore be interpreted with caution.

For comparative purposes, we run the regression on this subsample without director fixed effects in Column 2. We find a -3.52 percent negative stock price reaction to sudden deaths of independent directors. The effect is economically large and statistically significant at the 1

[12] We lack educational background variables for 31 directors mainly because the proxy statements do not include the information, or because the SEC Def 14A form itself is unavailable prior to the death.

percent level despite the low number of observations. Column 3 confirms these results when we also control for director fixed effects. We find a larger negative stock price reaction to the sudden death of independent directors. The stock price drops on average by 5.01 percent following the death. Moreover, the adjusted R-square reveals that the indicator for independence, together with the fixed effects, explain 50.06 percent of the variation in the stock price reaction. We add more control variables in the regression reported in Column 4. Again, we find a large negative stock price reaction to the sudden death of independent directors. The stock price drops on average by 4.95 percent following the death.

Overall, the director fixed-effects estimation confirms our main result that independent directors provide a valuable service to shareholders. As the fixed-effects approach effectively controls for differences in director ability and skills, this result bolsters the case for our interpretation of the event study and cross-sectional results being related to the status of independence in relation to shareholder value.

IV. Alternative specifications and robustness checks

A. Confounding news

In our sample selection procedure, we pay particular attention to confounding news surrounding the event of sudden deaths of directors. Whenever there is important corporate news from day -1 to day +2 around the sudden deaths, the events are eliminated from the sample. Examples of confounding news include announcement of quarterly earnings, a merger and acquisition decision, discovery of new drugs, news on a major strike, etc. The results we report in the above sections come from the final sample that already excludes events with confounding news.

B. Alternative specifications of the event study

In this section we provide additional evidence, using alternative specifications of our event study. Our robustness analysis focuses on two important issues: i) the event dates, and ii) our sample of sudden deaths. Table VIII summarizes this exercise.

In the prior analysis we mainly focus on the four-day event window from -1 to +2. This choice is motivated by three observations: first, although we use a strict definition of sudden deaths, news about heart attacks and stroke can occur on day -1. Second, deaths announced in

local and regional newspapers are, as noted by Johnson et al. (1985), likely to precede publication in national newspapers such as the *New York Times* and *Wall Street Journal*. Thus, the share price reaction might occur before the news date obtained from search engines such as Factiva and LexisNexis that tend to rely heavily on national sources. Our third observation is that the average death is reported with a time lag of 1.7 trading days (reduced to one day if we exclude outliers), which means that the stock price reaction on average occurs fairly close to the actual date of death. In the prior analysis we therefore analyze the stock price reaction in a four-day event window around the death date. As the chosen event date specification simply was one among several possibilities, Table VIII reproduces our main result using four alternative approaches.

Columns 1 and 2 report our event study results using alternative event windows. We provide additional evidence consistent with independent directors, providing a valuable service by focusing on shorter event windows from -1 to 0 and -1 to +1 around the death date, respectively. We find similar results to those of the previous section.

We also follow the approach suggested by Johnson et al. (1985) and focus the empirical tests on a firm-specific announcement period, defined as the trading period from the event date through the publication date of our first news report. As about 70 percent of our events have an announcement period of one trading day or less, and more than 89 percent of the deaths are reported within three trading days, the announcement period is quite short for the majority of the sample. Again, as reported in Column 3, we find a negative and statistically significant stock market reaction to the sudden death of independent directors. Moreover, the magnitude of the estimated effect is almost identical to the effect we find using windows around the date of deaths.

Column 4 shows the results when we use the three-day event window surrounding the news announcement date. Again, we find a negative and statistically significant stock price reaction to the sudden death of independent directors.

In summary, our results appear to be consistent and robust to alternative specifications of the event window. Sudden deaths of independent directors are associated with a drop in stock prices, and stock price reaction is statistically significant across the specifications.

C. Age of directors

Another valid concern with the sudden death literature relates to the sample selection. To be able to measure empirically the stock price reactions, deaths are required to be both sudden and unexpected by the stock market. Although our definition of sudden deaths attempts to

secure that these two conditions are satisfied, director age implies an increased probability of mortality and discontinuation of service. Simply put, a sudden death of an eighty-year-old director might not be as surprising as the sudden death of a fifty-year old. Similarly, the probability of retirement from the board will also provide a negative bias to the stock market reaction. Although we control for director age in the cross-sectional analysis, the age of directors might still bias the estimated stock price reactions.

We address this concern by doing complimentary tests that take age into consideration. We first restrict the sample to directors that are aged 70 or below, and 65 or below, at the time of death, respectively. Our choice of these particular cut-off levels are suggested by the existence of bylaws amendments that block directors from being older than, for example, 70 years in some firms. Columns 5 and 6 of Table VIII show that on average the stock price drops by 0.94 percent following sudden deaths of independent directors aged 70 or below. The corresponding reaction for the sample of directors younger than 65 years is -0.63 percent. Both effects are statistically significant despite the reduction in the sample size.

We take the exercise one step further by requiring that we know these directors' causes of death. We thereby address the concern that our sample includes deaths that are described as sudden and unexpected in the newspapers, without explicitly citing the cause of death. In this subsample, in which we know that the cause of death is sudden and likely to be unanticipated by the stock market, we find a -1.03 percent stock price reaction to the death of the average independent director, as is reported in Column 7.

In summary, Table VIII provides evidence that our results are robust to alternative specifications of the event study and to our sample selection of sudden and unexpected deaths.

V. Conclusions

This paper attempts to investigate the contributions of independent directors to firm value. Our underlying argument is that if independent directors are beneficial to shareholders—as purveyors of advice to, and monitors of, top managers—then stock price should react negatively to their sudden deaths. While being tragic events, sudden deaths offer exogenous identification of how the markets value independent directors and alleviate endogeneity concerns related to appointment and composition of the board of directors.

Compiling a sample of 229 directors holding 279 directorships who suddenly died in the United States from 1994 to 2007, we identify 109 independent directors. Following the death of

independent directors, stock prices drop by almost 1 percent. Since the average capitalization of firms in our sample is $4 billion, firm value is on average reduced by almost $39 million.

More importantly, the magnitude of negative stock price reaction varies cross-sectionally. Consistent with the value of being independent, we show that stock prices react less negatively when directors are appointed during the tenure of the current CEO or have long board tenure. We also show that the marginal value of independence is higher when there are few independent directors or when they perform crucial board functions, such as serving as chairman or audit committee member. Using a director fixed-effects approach that effectively controls for differences in director ability and skills, we confirm that independence contributes positively to shareholder value.

Given that stock price reactions to sudden deaths are likely to be uncorrelated with current firm and market conditions, the results demonstrate that, in general, independent directors provide a valuable service to shareholders. Independent directors are particularly valuable in crucial board functions and in situations in which their deaths cast doubt over the influence of independent board members in decision making. However, our results also demonstrate that their contribution depends on their very independence, and might be limited by powerful CEOs. Overall, our paper provides evidence that independent directors are beneficial to firm value.

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Table I.
Cause of Director Deaths

This table reports the composition of our sample of directors of AMEX-, NASDAQ-, and NYSE-listed firms who suddenly died between the dates of January 1, 1994 and December 31, 2007. Based on the cited cause of death in newspaper articles reporting the deaths, Panel A classifies the cause of deaths into: *cancer*; *complications from diseases* (other than cancer); *complications from surgery*; *sudden death* (accidents, heart attack, strokes, and deaths described as sudden and unexpected with no other cause cited); *suicide* (self-inflicted gunshots, death from carbon-monoxide poisoning); *unspecified illness* (cause of death described as brief or long illness); and *undisclosed* (in cases where no cause is reported but the death is not described as sudden or unexpected). Panel B shows the reported cause of death for the subsample of sudden deaths from Panel A. Panel C reports the number of directorships held by each suddenly deceased director, and Panel D reports the total number of suddenly terminated directorships. In panels A through C, each individual is counted once irrespective of the number of directorships held.

	N	**Share of total**
A. Cause of death		
Cancer	156	0.202
Complications from specified diseases	67	0.087
Complications from surgery	20	0.026
Sudden death	229	0.297
Suicide	6	0.008
Unspecified illness	97	0.126
Undisclosed	197	0.255
All	772	1.000
B. Cause of sudden death		
Heart attack	89	0.389
Stroke	18	0.079
Accident or murder	45	0.197
Sudden and unexpected death, but unspecified cause	77	0.336
All	229	1.000
C. Number of directorships per suddenly deceased individual		
1	194	0.847
2	26	0.114
3	5	0.022
4	3	0.013
5	0	0.000
6	1	0.004
All	229	1.000
D. Total number of suddenly terminated directorships	279	

Table II.
Timing of Director Deaths

This table reports the composition of our sample of directors of AMEX-, NASDAQ-, and NYSE-listed firms who suddenly died between the dates of January 1, 1994 and December 31, 2007. We follow a strict definition of sudden death from medical literature, which defines sudden death as an unexpected death that occurs instantaneously or within a few hours of an abrupt change in the person's previous clinical state. We also include accidental and traumatic deaths that are unanticipated by the stock market and unrelated to current firm conditions. We report the number of suddenly terminated directorships per year, as well as the number of deceased *independent*, *gray* and *inside directors*. Inside directors are current employees of the firm, whereas board members who are retired employees of the firm, relatives of the CEO, and/or persons with conflicts of interest or related to the firm's business are classified as "gray" (outside) directors. Directors who are not current or former employees, and who do not have dealings with the firm, are designated as independent (outside) directors.

	Director type						
	Independent		**Gray**		**Inside**		**All**
	N	**%**	**N**	**%**	**N**	**%**	**N**
Number and share of suddenly terminated directorships per year							
1994	8	0.364	2	0.091	12	0.545	22
1995	1	0.111	5	0.556	3	0.333	9
1996	5	0.185	6	0.222	16	0.593	27
1997	2	0.182	4	0.364	5	0.455	11
1998	1	0.059	6	0.353	10	0.588	17
1999	3	0.250	2	0.167	7	0.583	12
2000	1	0.100	1	0.100	8	0.800	10
2001	4	0.222	3	0.167	11	0.611	18
2002	4	0.267	4	0.267	7	0.467	15
2003	13	0.619	2	0.095	6	0.286	21
2004	19	0.633	2	0.067	9	0.300	30
2005	17	0.548	6	0.194	8	0.258	31
2006	18	0.600	7	0.233	5	0.167	30
2007	13	0.500	7	0.269	6	0.231	26
All	109	0.391	57	0.204	113	0.405	279

Table III.
Descriptive Characteristics of Directors Who Suddenly Died

This table reports descriptive statistics for our sample of directors of AMEX-, NASDAQ-, and NYSE-listed firms who suddenly died from January 1, 1994 to December 31, 2007. We follow a strict definition of sudden death from medical literature, which defines sudden death as an unexpected death that occurs instantaneously or within a few hours of an abrupt change in the person's previous clinical state. We also include accidental and traumatic deaths that are unanticipated by the stock market and unrelated to current firm conditions. Panel A reports the following director characteristics: *age* (measured in years); *gender* (indicator taking the value one if the director is male); *tenure* (measured in years); *education* indicators equal to one if the director holds a *professional*, *bachelor's*, *postgraduate, M.B.A.,* or *Ph.D.* degree, as well as indicator variables taking the value one if the director is the *chairman* of the board or sits on the board's *audit, compensation,* or *nominating* committees. Panel B shows the following firm characteristics: *market capitalization* (in millions of $), *market-to-book ratio* of assets, and *firm age* (measured in years). Panel C reports board characteristics: *board size*, number of outsiders (*outsiders*) on board, the ratio of outsiders (*outside ratio*) on the board, and an indicator variable taking the value one if there is *separation of power* between the CEO and Chairman positions. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	All	Type of Director			
		Independent	Gray and Inside	Difference	
		(1)	(2)	(1)-(2)	t-stat
A. Director characteristics					
Age (years)	63.09	64.03	62.49	1.54	1.16
Gender (1=male)	0.950	0.908	0.976	-0.068	-2.57**
Tenure (years)	11.17	7.84	13.31	-5.47	-4.35***
Education					
- Professional degree	0.150	0.198	0.118	0.080	1.76*
- Bachelor's degree	0.937	0.960	0.922	0.039	1.25
- Postgraduate degree	0.157	0.178	0.144	0.034	0.74
- M.B.A.	0.130	0.089	0.157	-0.068	-1.57
- Ph.D.	0.087	0.089	0.085	0.004	0.11
Board and sub-committee functions					
- Chairman of board	0.308	0.101	0.441	-0.340	-6.41***
- Audit committee member	0.284	0.570	0.089	0.481	9.95***
- Compensation committee member	0.299	0.551	0.127	0.424	8.26***
- Nominating committee member	0.197	0.383	0.070	0.313	6.78***
B. Firm characteristics					
Market capitalization (mill. $)	3923.3	4015.2	3864.4	150.8	0.08
Market-to-book ratio	2.142	2.116	2.158	-0.042	-0.12
Firm age (years)	43.58	45.65	42.25	3.40	0.71
C. Board characteristics					
Board size	8.63	8.82	8.50	0.324	0.84
Outsiders	5.15	5.94	4.61	1.324	4.14***
Outsider ratio	0.585	0.667	0.529	0.137	6.74***
Separation of power	0.402	0.390	0.410	-0.020	-0.32

Table IV.
The Stock Price Reaction to Sudden Death of Independent Directors

This table shows the stock price reaction to the sudden death of independent directors. Panel A shows the mean abnormal return for each trading day from five days before the death date to five days after. Panel B shows the cumulative abnormal return for various event windows surrounding the death date. In addition to the mean abnormal return, we report the corresponding t-stat and the number of positive and negative stock price reactions. Our sample includes independent directors of AMEX-, NASDAQ-, and NYSE-listed firms who died suddenly between the dates of January 1, 1994 and December 31, 2007. Independent directors are not current or former employees, and have dealings with the firm. We follow a strict definition of sudden death from medical literature, which defines sudden death as an unexpected death that occurs instantaneously or within a few hours of an abrupt change in the person's previous clinical state. We also include accidental and traumatic deaths that are unanticipated by the stock market and unrelated to current firm conditions. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Trading day / Event window	N	Mean abnormal return	Patell Z	Number of Positive: Negative	Median return	Sign rank test
A. Daily abnormal returns						
-5	109	0.53	2.430***	61:48	0.28	2.370***
-4	108	0.47	2.621***	61:47	0.10	1.730**
-3	109	-0.23	0.160	44:65	-0.26	-0.670
-2	109	-0.14	-0.543	52:57	-0.20	-0.600
-1	109	-0.36	-1.677**	41:68	-0.32	-1.620*
0	109	-0.12	-0.683	59:50	0.10	0.110
+1	109	-0.25	-0.672	45:64	-0.13	-0.740
+2	109	-0.24	-0.603	46:63	-0.21	-1.140
+3	109	0.05	0.405	58:51	0.26	1.000
+4	109	0.23	1.051	58:51	0.11	1.320
+5	109	0.17	-0.598	54:55	0.00	-0.210
B. Cumulative abnormal returns						
(-1,+0)	109	-0.47	-1.669**	47:62	-0.28	-1.074
(-1,+1)	109	-0.73	-1.751**	51:58	-0.28	-1.293*
(-1,+2)	109	-0.96	-1.818**	43:66	-0.45	-1.652**

Table V.
The Degree of Independence and Stock Price Reaction to Sudden Director Death

This table shows the determinants of the stock price reaction to the sudden death of independent directors. We use cross-section of stock price reactions from Table IV weighted by market capitalization as dependent variable. The reported results are based on the event period from -1 to +2, where 0 is the death date. *Tenure* is the years of tenure on the board. *Appointed by CEO* is an indicator taking the value one if the independent director was appointed during the tenure of the current CEO. *Board size* is the number of directors on the board, whereas *outsider ratio* is the ratio of independent (outside) directors on the board. *Majority change* is an indicator variable taking the value one if the deceased independent director held the swing-vote and secured a majority of independent directors on the board. *Separation of power* is an indicator taking value one if the chairman and CEO positions are separated. *Director age* is measured in years. *Market capitalization* is log of the firm's market capitalization. *Market-to-book* is the market-to-book ratio of assets, which is defined as market value of equity plus book value of debt over book value of assets. *Firm age* is log of firm age measured in years. Industry effects are Fama-French's five-industry classification. t-stats are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	1	2	3	4	5	6	7
Tenure	0.0019***	0.0025***				0.0015***	0.0025***
	(4.12)	(4.37)				(2.66)	(4.50)
Appointed by CEO		0.0144*				0.0165**	0.0205**
		(1.72)				(2.06)	(2.34)
Board size			-0.0015			-0.0011	
			(-1.51)			(-1.11)	
Outsider ratio			0.0895***			0.0834***	
			(4.70)			(3.73)	
Majority change				-0.0123*			-0.0113*
				(-1.90)			(1.69)
Separation of power					-0.0128	-0.0152*	-0.0194**
					(-1.20)	(-1.71)	(-2.07)
Director age	0.0007	0.0006	0.0011**	0.0013**	0.0012**	0.0007	0.0006
	(1.36)	(1.14)	(2.20)	(2.33)	(2.13)	(1.36)	(1.08)
Market capitalization	0.0019	0.0010	0.0051**	0.0050**	0.0032	0.0005	-0.0012
	(0.80)	(0.41)	(2.20)	(2.09)	(1.13)	(0.17)	(-0.47)
Market-to-book	-0.0033	-0.0042*	-0.0009	-0.0036	-0.0045*	-0.0029	-0.0052**
	(-1.49)	(-1.87)	(-0.43)	(-1.55)	(-1.83)	(-1.31)	(-2.32)
Firm age	-0.0109**	-0.0065	-0.0062	-0.0093*	-0.0083	0.0001	-0.0027
	(-2.09)	(-1.13)	(-1.25)	(-1.70)	(-1.37)	(0.01)	(-0.47)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.204	0.219	0.314	0.100	0.081	0.363	0.252
N	109	109	109	109	109	109	109

Table VI.
The Value of Independence in Crucial Board Functions

This table shows the determinants of the stock price reaction to the sudden death of independent directors. We use cross-section of stock price reactions from Table IV weighted by market capitalization as dependent variable. The reported results are based on the event period from -1 to +2, where 0 is the death date. *Chairman* is an indicator taking the value one if the deceased independent director is chairman of the board. *Audit*, *compensation*, *nominating* and *other committees* are indicators taking the value one if the deceased independent director served on the audit, compensation, nominating or other committees of the board, respectively. *Other subcommittees* counts the number of subcommittees served by the deceased director other than audit, compensation, and nominating committees. *Tenure* is the years of tenure on the board. *Board size* is the number of directors of the board, whereas *outside ratio* is the ratio of independent (outside) directors on the board. *Director age* is measured in years. *Market capitalization* is log of the firm's market capitalization. *Market-to-book* is the market-to-book ratio of assets, which is defined as market value of equity plus book value of debt over book value of assets. *Firm age* is log of firm age measured in years. Industry effects are Fama-French's five-industry classification. t-stats are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	1	2	3	4	5	6
Chairman	-0.0273					-0.0356**
	(-1.54)					(-2.12)
Audit committee		-0.0215***				-0.0176**
		(-3.14)				(-2.52)
Compensation committee			0.0056			-0.0027
			(1.00)			(-0.47)
Nominating committee				-0.0027		-0.0160**
				(-0.34)		(-2.13)
Other subcommittees					-0.0255***	-0.0245***
					(-3.71)	(2.98)
Tenure	0.0016***	0.0011**	0.0017***	0.0017***	0.0018***	0.0016***
	(3.52)	(2.36)	(3.76)	(3.53)	(4.28)	(3.28)
Board size	-0.0027***	-0.0016	-0.0027***	-0.0029***	-0.0018*	-0.0017*
	(-2.96)	(-1.62)	(-2.90)	(-2.81)	(-1.93)	(-1.73)
Director age	0.0008	0.0008	0.0007	0.0009	0.0001	0.0009
	(1.63)	(1.58)	(1.28)	(1.44)	(0.18)	(1.54)
Market capitalization	0.0040	0.0026	0.0043*	0.0050*	0.0042*	0.0042
	(1.62)	(1.08)	(1.74)	(1.84)	(1.81)	(1.64)
Market-to-book	-0.0015	-0.0002	-0.0018	-0.0016	-0.0010	0.0002
	(-0.67)	(-0.08)	(-0.79)	(-0.74)	(-0.48)	(0.08)
Firm age	-0.0055	-0.0010	-0.0056	-0.0070	0.0020	0.0053
	(-1.05)	(-0.19)	(-1.09)	(-1.31)	(0.37)	(0.99)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.271	0.323	0.260	0.253	0.328	0.400
N	109	109	109	109	109	109

Table VII.
Isolating the Effect of Independence from Ability and Skills

This table shows the determinants of the stock price reaction to the sudden death of directors. We use cross-section of stock price reactions from Table IV weighted by market capitalization as dependent variable. The reported results are based on the event period from -1 to +2, where 0 is the death date. In Column 1 the sample includes all independent directors. In Columns 2, 3, and 4, the sample includes non-independent directorships held by a deceased independent director. In Columns 3 and 4 the specification further includes a fixed-effect for each director. *Independent director* is an indicator taking the value one if the director is independent. *Postgraduate* is an indicator equal to one if the director holds a postgraduate degree. *M.B.A.* is an indicator taking the value one if the deceased director was holding a M.B.A. degree; *Ph.D.* is an indicator for holding a Ph.D. degree. *Director age* is measured in years. *Market capitalization* is log of the firm's market capitalization. *Market-to-book* is the market-to-book ratio of assets, which is defined as market value of equity plus book value of debt over book value of assets. *Firm age* is log of firm age measured in years. Industry effects are Fama-French's five-industry classification. t-stats are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

	1	2	3	4
Independent		-0.0352***	-0.0501***	-0.0495***
		(-3.97)	(-3.96)	(-3.56)
Tenure	0.0019***			
	(4.35)			
Postgraduate	-0.0029			
	(-0.42)			
M.B.A.	0.0179			
	(1.61)			
Ph.D.	-0.0103			
	(-0.63)			
Board size	-0.0032***			-0.0050
	(-3.20)			(-1.36)
Director age	0.0013**			
	(2.43)			
Market capitalization	0.0043			-0.0013
	(1.83)			(-0.29)
Market-to-book	-0.0005			-0.0004
	(-0.21)			(-0.07)
Firm age	-0.0033			0.0004
	(-0.62)			(0.03)
Industry effects	Yes	Yes	Yes	Yes
Director Fixed effects	No	No	Yes	Yes
Adj. R-squared	0.331	0.193	0.506	0.467
N	101	74	74	74

Table VIII.
Additional Evidence using Alternative Event Study Specifications

This table shows the stock price reaction to the sudden death of independent directors for alternative specifications of the event samples and event window. Columns 1 and 2 report the cumulative abnormal return (CAR) to sudden deaths for alternative event windows from -1 to 0, and -1 to +1 around the death date. Column 3 reports CARs for the period from death date (day -1) to the news date. The sample in Column 3 is restricted to events where the death is reported in the news within 5 trading days of the death. Column 4 shows the CARs around the news date. Columns 5 to 7 report CARs from -1 to +2 around the death date. Column 5 restricts the sample to directors aged 70 or below at the time of death, whereas Column 6 includes only directors aged 65 or below. Column 7 includes only directors with a known cause of sudden death. Patell Z-scores and are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Event sample	**All**	**All**	**News in 1 week**	**All**	**Age ≤ 70**	**Age ≤ 65**	**Known cause of death**
Event date	**Death**	**Death**	**Death**	**News**	**Death**	**Death**	**Death**
Event window	**[-1, 0]**	**[-1,+1]**	**[-1,news date]**	**[-1,+1]**	**[-1,+2]**	**[-1,+2]**	**[-1,+2]**
	1	**2**	**3**	**4**	**5**	**6**	**7**
CAR	-0.0047**	-0.0073**	-0.0069*	-0.0079**	-0.0094**	-0.0063*	-0.0103*
Patell Z	(-1.669)	(-1.751)	(-1.370)	(-1.694)	(-1.696)	(-1.386)	(-1.610)
N	109	109	95	109	86	62	89