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Are Directors More Likely to Relinquish Their Riskiest Directorships after the Crisis?

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Abstract: This paper documents that directors exhibit a strong tendency to resign from their riskiest directorships in the period subsequent to the financial crisis of 2007−2008. I also find that, in the post-crisis period, riskier directorships become more costly for directors and that the post-crisis director turnover alters board characteristics at riskier firms. While directors departing from their riskiest directorships are more experienced, hold more boards, and are better connected than other departing directors, no such pattern is observed among replacing directors. Finally, I find that departures from riskiest directorships are associated with lower announcement returns. Overall, my results suggest that, after the crisis, the costs of serving on risky boards have increased to the point of inducing board turnover that results in a non-trivial reshaping of corporate boards.

1. Introduction

In the aftermath of the financial crisis of 2007–2008, the widely held perception that excessive risk-taking was central to the breakdown of the financial markets has fueled extensive legislative, regulatory, and judicial activity on directors' responsibility for risk oversight. In line with these efforts, shareholder activists, stock exchanges, credit rating agencies, proxy advisors, and corporate governance best practice guidelines have also devoted special attention to the role of the board in risk management during the post-crisis period.

The purpose of this paper is to further our understanding of the economic consequences of this post-crisis emphasis on risk oversight by examining its effect on director turnover. Specifically, I propose that the emphasis on risk oversight has increased the cost of serving on corporate boards (especially on boards of riskier firms) to the point where directors are induced to relinquish their riskiest directorships.

Directorship risk could impose costs on directors in several ways. First, oversight of corporate risk management may require substantial time and effort, especially given the highly specific and technical nature of some risk-management activities. Second, directorship risk may translate into volatility in the directors' equity holdings and performance-based cash payments. In most cases, this risk cannot be perfectly diversified away. Third, litigation and other actions arising from shareholder discontent are likely to be more frequent in more volatile directorships. In addition to resulting in potential civil penalties, these actions could impose significant reputational, emotional, and opportunity costs on directors.

Serving on riskier firms may have become more costly during the post-crisis period due to greater institutional emphasis on the role of the board in corporate risk management. In particular, more intense scrutiny of the directors' oversight of corporate risks may have increased

the directors' workload, especially at firms with more complex risk management. The financial crisis may also have decreased the shareholders' tolerance of firm risk, increasing the likelihood of boards' being penalized for allowing higher levels of risk-taking.[2]

However, it is also plausible that directors do *not* bear significant costs from directorship risk, for several reasons. To begin with, directors are rarely subject to criminal penalties for corporate misbehavior. Civil penalties that require out-of-pocket payments are also extremely rare among independent board members (Black et al., 2006), because the members are protected by director and officer (D&O) insurance and because breaches of fiduciary duty are difficult to verify in court and rarely penalized. Even the additional effort and the potential non-monetary costs (e.g., reputational losses, emotional costs, etc.) associated with directorship risk may not be substantial enough to affect the directors' preferences across directorships. In terms of monetary incentives, director compensation is modest compared to executive pay, so the average effect of firm risk on a director's wealth may not be first-order. Finally, directors may be able to adjust or diversify away some directorship risk according to their personal preferences. All of these considerations suggest a possibility that there is no association between directorship risk and director turnover.

Yet the hypothesis that directors are more likely to leave their riskiest directorships is supported by survey evidence: 8% of the directors surveyed by the PwC's 2009 annual Board of Directors Survey indicated they had resigned or seriously thought about resigning from a board

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[2] The financial crisis could have decreased shareholders' tolerance towards firm risk for two reasons. First, it is possible that the financial crisis prompted investors' risk awareness or changed investors' sentiment towards risk, making them more likely to attribute bad outcomes to poor risk management than to the risky nature of the business. As an example, in 2014 CalPERS and the New York City Pension Funds asked for the resignation of four members of Duke's board of directors, accusing them of lax risk oversight in a toxic waste spill. Second, the financial crisis may have increased investors' risk aversion. For example, many economic agents experienced stringent financial and liquidity constraints during the crisis and post-crisis period that affected their risk preferences or their ability to diversify their portfolio.

due to personal liability and reputational concerns, and 46% indicated they had turned down a board position because the risk was too high (PwC, 2009).

Survey evidence also suggests that directors feel increasingly at risk in the post-crisis period. According to a survey conducted by PwC shortly after the financial crisis, 69% of directors believe that the liability risk of serving on boards had increased from the prior year. Only 35% responded affirmatively to the same question in a survey conducted before the crisis (PwC, 2009). Consistent with this perception, the average total limits of D&O insurance have increased substantially in the post-crisis period (Towers Wattson, 2006-2012). As shown in Figure 1, these limits have risen from less than 40 million dollars in the period between 2006 and 2008 to more than 120 million dollars in the years after 2009. This dramatic change is unlikely to be driven by inflation, salary increases, or insurance prices.

To empirically examine whether directors are more likely to relinquish their riskiest directorships after the crisis, I use a large sample of directors holding board positions at U.S. firms from 2004 to 2013. Over the whole sample period, I find that directors are more likely to relinquish the riskiest directorship listed in their portfolio (i.e., the directorship with highest past stock return volatility). This result is robust to including director-year, firm-year, and director-firm fixed effects, suggesting that my inferences are unlikely to be confounded by unobserved variation in director- and firm-specific circumstances. And when, to further sharpen identification, I exploit variation in the directors' personal circumstances and firm volatility, I find that the directors tend to depart from their riskiest directorships when they experience personal circumstances leading to turnover and when the directorship becomes riskier.

Critically, directors' tendency to resign from their riskiest directorships is stronger in the years following the crisis. This inter-period difference is more pronounced among audit

committee members and systemically important firms, namely directors and firms more exposed to the regulatory emphasis on risk management. Consistent with these patterns being driven by a post-crisis increase in the cost of serving on riskier directorships, I find that, after 2008, increases in firm volatility are more likely to be followed by increases in the costs of serving on the boards of listed firms, as measured by the number of board meetings, the probability of class action lawsuits, and the magnitude of compensation premiums.

Regarding board characteristics, I find that, after the crisis, increases in firm volatility are followed by decreases in directors' average experience, networking capability, and academic qualifications. Consistently, directors departing from their riskiest directorships are more experienced, hold more boards, and are better connected than other departing directors, but no such pattern is observed among replacing directors.

Finally, I analyze the stock market reaction to board departure announcements to shed some light on the effect of the documented director turnover pattern on shareholder wealth. I find that, in the post crisis period, such departures are associated with lower announcement returns.

Overall, the results suggest that the post-crisis institutional changes related to risk oversight have significantly increased the cost of serving on risky boards. Moreover, the results suggest that the post-crisis emphasis on risk management is reshaping corporate boards. Because such departures appear to have material consequences on shareholder value, my results highlight the need to carefully consider the potential trade-offs associated with the recent emphasis on having board members oversee their firms' risk management practices.

My findings contribute to two strands of the corporate governance literature. First, I add to recent work on voluntary director resignations (e.g., Masulis and Mobbs, 2014; Fahlenbrach et al., 2017). This contribution is important because, unlike those of executive turnover, the

determinants of director turnover are still not well understood (e.g., Larcker and Tayan, 2011).[3]

Since voluntary turnover is empirically elusive, most of the existing literature on director

turnover focuses on director departures around significant negative events or internal conflicts—

i.e., departures that are less likely to be purely voluntary.[4] This paper contributes to this literature

by proposing that directorship risk is an important (yet unexplored) determinant of voluntary

board resignations. Moreover, the notion that a director's decision to resign from a directorship

may hinge on the *relative* characteristics of the firms in her directorship portfolio (rather than on

the *absolute* characteristics of those firms) is absent from previous empirical literature. One

notable exception is Masulis and Mobbs (2014), who show that directors are less willing to

relinquish their relatively more prestigious directorships. My paper extends the findings in

Masulis and Mobbs (2014) by showing that, in addition to prestige, directorship risk has recently

become an important determinant of directors' preferences across their directorship portfolio,

preferences that could have a substantial effect on the firm (e.g., Huang et al., 2017).[5]

Second, my study contributes to the literature examining the effect of regulation on

corporate boards. In the context of the Sarbanes-Oxley Act (SOX), Linck et al. (2010) provide

evidence that the level of director compensation increases significantly after SOX, and they

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[3] While there is an extensive literature on executive turnover (e.g., DeFond and Park, 1999; Engel et al., 2003; Farrell and Whidbee, 2003; Balsam and Miharjo, 2007) relatively little is known about the determinants of director turnover.

[4] In particular, Yermack (2004) shows that director turnover often follows poor firm performance. Srinivasan (2005) and Arthaud-Day et al. (2006) document that director and audit committee members are more likely to turn over if the company experiences a restatement. The resignations analyzed in these papers are interpreted as an attempt by the restating firms to repair the reputational damage caused by the accounting irregularity. Also, the evidence in Agrawal and Chen (2011) suggests that some director resignations are driven by conflicts with management or other directors related to governance issues or disagreements over strategy or financing decisions. Finally, Fahlenbrach et al. (2017) show that in some cases directors leave in anticipation of upcoming adverse news such as poor performance, accounting irregularities, or shareholder litigation. Note that, unlike Agrawal and Chen (2011) and Fahlenbrach et al. (2017), I document that directors leave board positions not only because of *already existing* problems, but also because of *potential* problems (i.e., problems that may never occur or materialize).

[5] Huang et al. (2017) extend the findings in Masulis and Mobbs (2014) and document that bank loans of firms with a greater proportion of independent directors for whom the board is among their most prestigious have a lower cost of capital.

suggest that this increase may be a means of compensating directors for increased regulatory scrutiny and public pressure. Duchin et al. (2010) find that, in firms where outside directors face high information-acquisition costs, performance falls after the SOX-mandated addition of outside directors. My paper extends these studies in at least two ways. First, neither Linck et al. (2010) nor Duchin et al. (2010) study how regulation affects voluntary director departures (or director departures of any kind). Second, I study a regulatory change (i.e., the post-crisis regulation) that differs fundamentally from SOX: whereas SOX emphasized board independence and focused on financial reporting, the post-crisis regulation is concerned with risk oversight.

The remainder of the paper proceeds as follows. Section 2 provides relevant background information. Section 3 describes and characterizes the sample and presents the results from the analysis of the frequency of departures from directors' riskiest directorships. Section 4 provides firm-level analysis of director costs and board characteristics based on firm risk. Section 5 analyzes board departures, including the characteristics of departing directors as well as stock market reactions to departure announcements. Section 6 analyzes alternative explanations for the results and additional robustness tests. Section 7 concludes.

2. The institutional emphasis on risk oversight after the financial crisis

In the years following the financial crisis, the perception that boards should more closely monitor corporate risks led to new laws and regulations governing the risk management responsibilities of corporate officers and directors. Following the passage of the Emergency Economic Stabilization Act of 2008 (which provided for establishment of the Troubled Asset Relief Program (TARP)), members of Congress introduced two new bills with provisions on risk management: the Shareholder Bill of Rights Act of 2009 and the Corporate Governance Reform Act of 2009. Among other stipulations, the proposed legislation would have required that all

public companies establish a risk committee composed entirely of independent directors. Although these bills did not pass, some of their content was rewritten and included in the Dodd-Frank Wall Street Reform and Consumer protection Act of 2010. In addition to its other risk management provisions, Dodd-Frank requires nonbank financial companies supervised by the Board of Governors and certain bank holding companies (i.e., those with more than ten billion dollars in assets) to establish their own risk committees formed of independent directors and at least one expert with "experience in identifying, assessing, and managing risk exposures of large, complex firms."[6]

The Securities and Exchange Commission (SEC) also took steps to encourage risk oversight. In 2009, the SEC adopted rules requiring public companies to disclose the risks arising from their compensation policies and practices if these policies and practices are reasonably likely to have a material adverse effect on the company. The SEC believed this new disclosure would help investors identify company incentives that could lead to excessive or inappropriate risk-taking by employees, and pay policies or practices that could expose the company to material risk. The new rules also required that proxy statements disclose "the board's role on risk oversight." The required disclosure would address questions such as "whether the persons who oversee risk management report directly to the board as a whole, to a committee, such as the audit committee, or to one of the other standing committees of the board; and whether and how the board, or board committee, monitors risk."[7]

Some stock exchanges have also emphasized risk management by establishing explicit risk oversight requirements for listed companies. In November 2009, for example, the New York Stock Exchange amended its listing rules, adding risk oversight to the responsibilities of the

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[6] See section 165 of the Dodd-Frank Act (https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf)
[7] See Final Rule on "Proxy Disclosure Enhancements" (http://www.sec.gov/rules/final/2009/33-9089.pdf).

audit committee (regardless of the existence of a separate risk committee or subcommittee) and including risk management among the internal control systems that all listed companies must have.[8]

The emphasis on risk management has also found its way into the courts, as plaintiffs have filed lawsuits alleging that risk management failures constitute breaches in fiduciary duty. For example, the plaintiffs in *In re Citigroup Inc. Shareholder Derivative Litigation* alleged that the directors of Citigroup had breached their fiduciary duties by not properly monitoring and managing business risks and by ignoring "red flags" that consisted primarily of press reports and events indicating worsening market conditions.[9] In a similar case, *In re The Goldman Sachs Group, Inc. Shareholder Litigation*, claims against directors of Goldman Sachs were based on allegations that the directors failed to properly oversee the company's excessive risk taking and inadequate hedging.[10] Although both cases were dismissed by the Delaware courts, recent state law jurisprudence implies that a failure to ensure that the risks faced by the company are understood and managed in the best interest of shareholders could be considered a breach of duty.[11] This jurisprudence builds upon a growing body of law and regulation related to issues such as fraudulent conduct by employees, product liability, health and safety, and environmental compliance (e.g., Sarbanes-Oxley, or the Federal Sentencing Guidelines).

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[8] Specifically, the NYSE rules require that an audit committee "discuss guidelines and policies to govern the process by which risk assessment and management is undertaken" (see Section 303A of the NYSE Listing Manual).
[9] http://courts.delaware.gov/opinions/download.aspx?ID=118110
[10] http://courts.delaware.gov/opinions/download.aspx?ID=161650
[11] The Business Judgment Rule is often cited as the main standard of review of director conduct by Delaware courts. In *In re Caremark International Inc. Derivative Litigation,* 698 A.2d 959, 971 (Del. Ch. 1996), the Delaware Chancery Court stated that director liability for a failure of board oversight required a sustained or systemic failure of the board to exercise oversight, such as an utter failure to assure a reasonable information and reporting system exists, and noted that this was a "demanding test." However, more recent jurisprudence revises the definition of the duty of good faith (*In re Walt Disney Co. Derivative Litig.,* Cons. C.A. No. 15452, 2005 Del. Ch. LEXIS 113 (Del Ch. Aug. 9, 2005)). While upholding the validity of the Business Judgment Rule, Chancellor Chandler underscored the importance of good faith in the performance of corporate duties and stated that directors and officers are expected to fully understand current best practices (such as risk management) as well as ensure that business decisions are taken in light of widely recognized corporate governance standards.

The post-crisis emphasis on risk oversight is not limited to legislative, regulatory, and judicial actions, or to financial firms. Recent industry-specific guidance and general best-practices manuals support the notion that risk management and governance should be linked.[12] Credit rating agencies have begun incorporating enterprise risk management (ERM) criteria in their ratings.[13] A search using publicly available information reveals a higher number of firms recently implementing formal risk-management processes, as well as an increase in ERM programs and risk-related consulting services, software, courses, and research centers.[14] Also in line with these changes, the media appears to be paying close attention to risk management failures.[15]

Risk management has also been the focus of recent shareholder activism, especially after the SEC reexamined its framework to analyze shareholder proxy proposals addressing risk oversight.[16] Finally, Institutional Shareholder Services (the proxy advisory firm with the largest market share) now includes specific references to risk oversight as part of its criteria to recommend withholding votes in uncontested director elections.

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[12] See, for example, the guidelines issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), specific guidelines for banking and other industries (for example, utilities, ports, nuclear materials management, and pharmaceuticals), and corporate governance guidelines of foreign jurisdictions such as the Turnbull Report in the U.K.

[13] See "Standard & Poor's To Apply Enterprise Risk Analysis to Corporate Ratings," 5/7/2008 (available at https://riskonnect.com/wp-content/uploads/2011/04/SP-PDF.pdf).

[14] A search on Factiva reveals a steady increase in the number of times the words "Enterprise Risk Management (ERM)" appears in the news (185 hits in 2000, 1,358 hits in 2006, and 2,771 hits in 2009). In terms of public disclosures, ERM appears in 67 SEC filings in 2000, 768 SEC filings in 2006, and 1,391 SEC filings in 2009 (usually proxy statements, 10-K or 10-Q reports).

[15] British Petroleum, Airbus, and Siemens are some examples of recent failures in risk management in major non-financial companies that have drawn significant media attention.

[16] See SEC Staff Legal Bulletin No. 14E (CF) on shareholder proposals.

3. Analysis of the frequency of departures from directors' riskiest directorships

3.1. *Sample and research design*

To test the hypothesis that directors are more likely to relinquish their riskiest listed directorships in the post-crisis period, I collect information on board memberships from the BoardEx database from 2004 to 2013. BoardEx provides detailed biographical profiles of executives and directors of public and large private firms in the United States and the rest of the world from the year 2000, including information on dates of appointment and departure.[17] I focus on firms and directors tracked by BoardEx (i.e., those included in the Board Summary Tables) where the directorship is covered by CRSP/Compustat. The 2004-2013 sample period is defined as a symmetric 5-year window around the start of 2009, the year when the 2007-2008 financial turmoil receded and when the post-crisis regulatory initiatives related to risk-oversight were introduced. This results in a sample of 263,437 director-firm-year observations corresponding to 4,511 firms.

To explore whether directors are more likely to give up their riskier directorships after the financial crisis, I start by examining the relative riskiness of departed directorships through time. Figure 2 shows the difference in annualized volatility (in %) between departed directorships and retained directorships in each of the years of the sample period.[18] The figure reveals that there is a significant upward trend in the relative riskiness of departed directorships. Notably, the higher riskiness of the departed directorships peaks right after the crisis, which suggests that the response to the post-crisis institutional changes is more pronounced right after the changes are introduced.

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[17] BoardEx's information sources include firms' filings with the SEC and press releases, corporate websites, and stock exchanges, supplemented by press sources such as the *Wall Street Journal* and the *Financial Times*.

[18] This difference in volatility adjusts for common variation in volatility due to economic and/or market conditions.

Next, I conduct a multivariate test of my hypothesis by estimating the following OLS model:[19]

$$Relinquished_{ijt} = \alpha_0 + \alpha_1\,Max\_Volatility_{ijt} + \theta_1\,Director\_Controls_{it}$$
$$+\ \theta_2\,Firm\_Controls_{jt} + \theta_3\,Director\_Firm\_Controls_{ijt} + \varepsilon_{ijt}, \qquad (1)$$

where *Relinquished* equals one if director *i* departs from directorship *j* in year *t*, and zero otherwise. *Max_Volatility* equals one if firm *j* is the listed directorship with highest *Volatility* in director *i*'s portfolio in year *t*, and zero otherwise. *Volatility* is the firm's annual stock return volatility measured using daily data over year *t*−1 (that is, at the start of year *t*).

Following prior literature on director turnover (e.g., Yermack, 2004; Masulis and Mobbs, 2014) equation (1) includes four sets of controls, all measured at the start of the year (i.e., in year *t*−1).

(i) Portfolio_Controls includes controls for firm characteristics that could affect the director's choices within her/his portfolio of directorships. In particular, directors could be less likely to relinquish their largest directorships (Mobbs and Masulis, 2014), their directorships with higher performance (Yermack, 2004), or their directorships with more growth opportunities. As such, I include *Max_Size*, defined as one if the directorship exhibits the highest value of *Size* in the directors' portfolio, and zero otherwise. *Size* is defined as the firm's total book value of assets measured at the start of the year. I define *Max_MB* and *Max_Return* similarly, based on *MB* and *Return*, respectively (*MB* is the ratio of market value of equity to book value of equity measured at the start of the year, and *Return* is the stock return compounded over the 365 days prior to the start of the year using daily data).

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[19] Inferences are unchanged when equation (1) is estimated using probit or logit models. I present results using OLS because my tests include fixed effects and nonlinear models (such as logit and probit) that include fixed effects suffer from the "incidental parameter problem"; i.e., they produce upwardly biased estimates (Neyman and Scott, 1948).

(ii) Director_Controls includes proxies for personal determinants of director turnover. *Log(Age)* is the logarithm of age of the director (in years). I include this variable because older directors can have different preferences than younger directors and are more likely to retire. *Log(Number_Directorships)* is the logarithm of the number of directorships held by the director. This variable captures director reputation as well as the magnitude of directors' workload. *Health_Deterioration* equals one if the director is older than 70 years or if she/he passes away during the following 3 years. This variable measures a director's incentive to reduce the size of her directorship portfolio due to deterioration of her health condition. *Increased_Workload* equals one if the sum of the number of board meetings across the director's directorship portfolio increased in the prior year. This variable is aimed at capturing whether the director decides to reduce her directorship portfolio due to accumulation of work. *Appointment* equals one if the director is appointed to a new board that year. I include this variable because a director could decide to leave one of her existing directorships after receiving an offer to serve on a more attractive board. *Female* equals one if the director is female, and zero otherwise. *FinExpert* equals one if the director is a financial expert, and zero otherwise. Following Güner, Malmendier and Tate (2008), a director is defined to be a financial expert if she/he has worked as an executive at a financial firm (commercial bank, investment bank, or insurance company), or if she/he has work experience as CFO, Accountant, Treasurer, or Vice President for Finance. All these variables are constructed using BoardEx data except for *Increased_Workload*, which is based on data from Equilar.[20]

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[20] 18.75% of the observations have missing data on board meetings. To avoid missing observations, in these cases I set *Increased_Workload* and *More_Meetings* to zero. Excluding these observations from the tests produces very similar results.

(iii) Firm_Controls includes variables aimed at capturing whether the firm is currently navigating through problems and/or significant changes. Such firms are more likely to experience director turnover for two reasons. First, these firms could feel the need to renew their slate of directors. Indeed, prior research shows that directors at firms in difficult situations or firms involved in fraud are sometimes pressured to leave their seats (e.g., Srinivasan, 2005; Fich and Shivdasani, 2007). Second, rather than leaving board positions due to concerns about what *might occur* in the future (i.e., risk), directors could avoid personal costs by leaving directorships with *already existing* problems (Fahlenbrach and Stulz, 2017).

The variables included in *Firm_Controls* are as follows. *Litigation* is defined as one if the firm has been subject to class action suits during the prior calendar year, and zero otherwise.[21] I include this variable because lawsuits are likely to increase directors' personal costs (litigation usually involves additional work and sometimes also reputational losses and civil penalties). *More_Meetings* equals one if the number of board meetings increased in the prior year. This variable is aimed at capturing whether the directorship is demanding additional time and effort from the director. *CEO_Turnover* equals one if the CEO of the company is replaced during the year. I include this measure because the CEO is replaced when the firm experiences severe problems and/or deep transformations, and CEO turnover is often times followed by board changes.[22] Because proxy fights and/or ownership changes (i.e., acquisitions of a majority stake or large blocks of stocks) could result in board changes, *Controls* includes two additional indicator variables for these events. *Proxy_Fight* is defined as one if in that year there is a proxy

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[21] I identify whether a company was subject to litigation in a given year using data on corporate news from Capital IQ's Key Development database.

[22] The definition of *CEO_Turnover* captures both voluntary and forced CEO turnover. To ensure that my inferences are not affected by the measurement of this control variable, I repeat the tests in Tables 2 and 3 excluding all observations in which the firm experiences CEO turnover. The results of these additional tests are similar to those in Tables 2 and 3, confirming that my inferences are not driven by forced CEO turnover.

fight, and zero otherwise. *Owneship_Change* equals one if in that year there is an announcement of acquisition of a significant percentage of the firm's shares, and zero otherwise. Data on proxy fights and acquisition announcements are collected from SDC. I also include *Past_Performance*, defined as the firm's market-adjusted stock return compounded over the last year (using daily data). This variable is commonly used in the director turnover literature as a catch-all measure of recent problems in the firm (e.g., Yermack, 2004). Finally, to the extent that firm size is a common determinant of the level of scrutiny to which the firm is subject, I include *Size*, as previously defined.

(iv) Director_Firm_Controls includes measures of economic and personal ties between each firm and each director that can affect the director's departure decision. I include the following controls to capture the effect of these ties. *Log(Equity_Holdings)* is the logarithm of the value of the director's equity portfolio in the firm. *Log(Compensation)* is the logarithm of the total annual compensation received by the director at that directorship.[23] *Tenure* is the logarithm of the director's tenure in the firm, measured in years. *CEO_Linked* equals one if the director has a social connection with the CEO. Social connections are measured using BoardEx data on service overlap at executive and board positions in other firms and organizations. *Independent* equals one if the director meets the regulatory definition of independence. *Retirement_Year* equals one if the director's time to retirement is less than one year, and zero otherwise.[24] *Nomination_Committee*, *Audit_Committee*, and *Comp_Committee* equal one if the director is a member of the nomination, audit, and/or compensation committee, respectively, and zero

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[23] In consistency with prior literature (e.g., Adams and Ferreira, 2008), directors' annual compensation is computed as the sum of retainers, meeting, and committee fees (paid in both cash and equity)

[24] A substantial number of directors do not appear to retire in their retirement year. This is because not all firms have retirement policies and/or make public disclosures of these policies. When such data are not available, BoardEx assumes a retirement age of 70 years.

otherwise. *Chairman* equals one if the director is the chairman of the board, and zero otherwise. *Lead_Director* equals one if the director is the lead director of the board, and zero otherwise. Finally, I include industry-year fixed effects (i.e., an indicator variable for each industry in each year) to control for industry shocks affecting the probability of directors' departure from a given industry. Data on director compensation and holdings are collected from Equilar.[25] The rest of the variables are based on BoardEx data.

Table 1 presents descriptive statistics of the sample of BoardEx director-firm-year observations. Key statistics are presented separately for the observations with (without) director turnover, that is, director-firm-year observations in which the director departs from (remains on) the firm's board in that year. Consistent with the notion that directors are more likely to depart from riskier directorships, Table 1 reveals that the relinquished directorships exhibit significantly higher levels of *Volatility* than the retained directorships.

Table 2 presents the multivariate results from estimating equation (1). In Panel A, the four sets of controls are added sequentially. The coefficient on *Max_Volatility* is positive and statistically significant across all four specifications (*t*-statistics range from 6.75 to 8.39), suggesting that the pattern is robust to controls for both firm and director characteristics/circumstances. The magnitude of the coefficient α_1 is 0.01 (rounded to the second decimal digit). This is a significant figure, considering that the average value of *Relinquished* for the sample observations is 0.07. Regarding director-level controls, Table 2, Panel A, reveals that directors with health issues and new job opportunities are more likely to adjust their directorship portfolio. Regarding firm-level controls, directorship departures are positively associated with past litigation, increase in the number of meetings, CEO turnover, proxy fights, ownership

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[25] For observations with missing Equilar data (14.2% of the total observations), *Equity_Holdings* and *Compensation* are set to industry median values. Excluding these observations from the tests produces very similar results.

changes, and poor performance. Finally, Table 2, Panel A, shows that departures are more common among directors with longer tenure in the company and who are reaching retirement age. Although directors appear to be more reluctant to leave the directorships in which they receive a higher annual compensation, more accumulation of wealth in the company is associated with a higher probability of departure (perhaps as a consequence of directors' desire to liquidate and diversify their firm-specific investments).

3.2. *Controlling for unobserved heterogeneity*

To control for unobserved, potentially confounding heterogeneity, I exploit within-firm-year and within-director-year variation, as well as variation within each director-firm pair. I do so by including three types of fixed effects in equation (1).

First, I include *director-year* fixed effects to control for *year-specific* director characteristics.[26] That is, I test whether a given director in a given year departs from the public directorship in her portfolio that exhibits highest stock volatility. Note that, in contrast to director fixed effects (which control for *time-invariant* director characteristics), director-year fixed effects control for *time-variant* director characteristics. Because director-year fixed effects control for any personal circumstance affecting the director in that specific year, this test addresses the concern that my inferences could be confounded by unobserved personal reasons for adjusting the directorship portfolio, or by reputational shocks with spillover effects across the director's portfolio (Fich and Shivdasani, 2007).

Second, I test the association between *Max_Volatility* and *Relinquished* including *firm-year* fixed effects. That is, I test whether, among the directors present in a given firm in a given year,

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[26] By "director-year" fixed effect for director A in year t I mean an indicator variable that takes the value of one if the observation relates to director A in year t, and zero otherwise. Note that a director-year fixed effect is different from a director fixed effect (a fixed effect for director A would take the value of one for director A in all years, not specifically in year t).

the director that leaves is the director for whom the board is the riskiest in her directorship portfolio. Note that firm-year fixed effects control for unobserved variation in firm characteristics in a given year and thus address the concern that unobserved firm circumstances could drive the association between *Max_Volatility* and *Relinquished*. Year-specific firm circumstances include situations that could induce a firm to make board changes (e.g., prosecutions, possible disagreements between top management and directors, changes in corporate strategy, among many others).

Third, I repeat the analysis including *director-firm* fixed effects. That is, I test whether a given director serving on a given board leaves that board in the year in which the board becomes the riskiest directorship in the director's portfolio. Note that including director-firm fixed effects tests time-series variation within director-firm pairs and thus mitigates concerns related to unobserved determinants of the matching between firms and directors (e.g., directors' personal preferences towards specific directorships, firms' preferences towards specific directors, and links between directors and firms) as well as director-firm characteristics with little time variation such as committee membership, compensation level or industry expertise (e.g., Wang et al., 2015; Ellis et al., 2017).

As shown in Table 2, Panel B, the coefficient on *Max_Volatility* remains positive and statistically significant when equation (1) is re-estimated including director-year, firm-year, and director-firm fixed effects, thus mitigating the concern that my inferences are confounded by unobserved variation in director circumstances, firm circumstances, or the determinants of the matching between firms and directors.

Collectively, the evidence in Table 2 is consistent with the notion that firm risk plays an important role in determining directors' *relative* preferences among the firms in their directorship

portfolio. That is, the director chooses to depart from the directorship after assessing the risk of that firm *with respect to* the rest of the firms in the directorship portfolio.

3.3. Situations triggering voluntary departures from the riskiest directorships

To further sharpen the identification of the effect of directorship risk on directors' turnover decisions I perform two additional tests in which I specifically model director and firm situations that, at certain points in time, could trigger directors' decision to leave their riskiest directorships.

First, a change in personal circumstances (i.e., circumstances related to directors' private and professional life) could prompt directors to resign from board positions. In particular, a director could feel the need to relinquish one of her/his directorships because she/he is suffering from health problems or because she/he is offered a better job opportunity. When deciding which directorship to relinquish, the director will weigh the costs and benefits of serving on each. If directorship risk is costly for the director, ceteris paribus she will be more likely to abandon her riskiest directorship.

Second, if directorship risk is costly for directors, directors could decide to leave a directorship after a significant increase in the risk of that firm. For each director, the probability of departing will be higher if the increase occurs at the riskiest directorship, because the new risk level at that firm is more likely to surpass the director's risk tolerance limit.

To test whether directors are more likely to depart from their riskiest directorship in years when they experience personal circumstances that could lead them to drop one directorship, I interact *Health_Deterioration* and *Appointment* (both as previously defined) with *Max_Volatility*. Table 3, Panel A, presents the results of this test. Both the interaction between *Health_Deterioration* and *Max_Volatility* and the interaction between *Appointment* and

Max_Volatility are positive and significant, suggesting that directors are more likely to depart from their riskiest directorships when they experience circumstances that could induce them to decrease the size of their directorship portfolio. Note that the specification includes director-firm and firm-year fixed effects to control for the determinants of the director-firm matching and for the specific circumstances of the firm in that year. As such, the results of Table 3, Panel A, suggest that, for a given director-firm pair (and controlling for the circumstances of the firm in that year), the director leaves her/his riskiest directorship when he/she experiences personal circumstances leading to drop one directorship.

I test the second situation leading to turnover—whether directors are more likely to depart from their riskiest directorships after an increase in firm volatility—by interacting *Max_Volatility* with *Δ_Volatility*, defined as the change in *Volatility* with respect to the prior year (*Volatility* is defined as in previous tests). Table 3, Panel B, reveals that the coefficient on the interaction between *Max_Volatility* with *Δ_Volatility* is positive and statistically significant. This suggests that directors are indeed more likely to depart from their riskiest directorships after those directorships become riskier. Note that, in parallel with Panel A, this specification includes director-firm fixed effects and director-year fixed effects (to control for directors' personal circumstances leading to turnover). As such, the results of Table 3, Panel B, suggest that, for a given director-firm pair (and controlling for the circumstances of the director in that year), the director leaves her/his riskiest directorship when the firm experiences an increase in risk.

3.4. Time variation in the frequency of departures from directors' riskiest directorships

Next, I examine whether the pattern documented in Table 2 is concentrated in the years subsequent to the financial crisis. I estimate equation (1) separately in the post-crisis period (from 2009 to 2013) and in the preceding period (from 2004 to 2008). Table 4 presents the

results. The coefficient on *Max_Volatility* is consistently positive and significant only in the post-crisis period (a test of equality of coefficients confirms that the inter-period difference in coefficient magnitudes is statistically significant). This evidence suggests that directors' tendency to relinquish their riskiest directorships is a novel (or at least more pronounced) economic phenomenon. This is consistent with the notion that, post crisis, a stronger institutional emphasis on risk oversight has increased the cost of serving on risky boards.

3.5. Cross-sectional variation in the influence of the post-crisis institutional changes

To corroborate that the post-crisis increase in the frequency of departures from directors' riskiest directorships is driven by risk oversight, I exploit sources of variation in firms' and directors' exposure to the post-crisis emphasis on risk management.

First, I partition the sample into director-firm pairs based on whether the director is a member of the audit committee. As the audit committee of listed firms has increased responsibility for risk, serving on this committee is likely to be more costly after the crisis. Table 5, Panel A, reveals that the post-crisis increase in the frequency of departures from directors' riskiest directorships (see Table 4) is more pronounced when the director is a member of the audit committee.

Second, I test whether directors are more likely to leave large bank holding companies and nonbank financial companies supervised by the Board of Governors. As previously explained, these companies are deemed "systemically important" and thus their risk management is subject to closer regulatory scrutiny and tighter Dodd-Frank requirements. In consistency with post-crisis regulation, I define *Systemically_Important* as an indicator variable that equals one if the firm is a bank holding company of more than ten billion in assets or a nonbank financial company classified as "systemically important" by the Board of Governors. As shown in the online appendix (Table

OA1 and OA2), firms coded as *Systemically_Important* = 1 exhibit higher levels of stock return volatility and are more likely to be the riskiest directorships in directors' portfolios. Table 5, Panel B, reveals that, post crisis, directors are indeed more likely to depart from firms considered systemically important.

4. Analysis of changes in firm characteristics

4.1. Characteristics associated with directors' personal costs

To further substantiate my interpretation of the results in Tables 2 through 5 —the post-crisis emphasis on risk management has increased the cost of serving on riskier boards to the point of inducing turnover— I examine whether directors' personal costs from serving on boards vary with firm risk and whether this association is stronger in the post-crisis period. The analysis is conducted at the firm-year level. For each firm-year observation, I construct three variables aimed at capturing directors' personal costs related to board membership in the firm.

First, *Number_Meetings* is computed as the logarithm of the number of times that the firm's board met in that year. This measure intends to capture directors' time and effort spent on board matters at a given firm in a given year. The information to construct this variable is gathered from Equilar. Second, *Shareholder_Litigation* equals one if the firm is subject to shareholder litigation in that year, and zero otherwise. Although directors are not always named in class action lawsuits, legal actions often translate into additional effort and dedication by board members (Brochet and Srinivasan, 2010). Data on litigation is obtained from press releases in Capital IQ's Key Developments database.

Following prior literature (e.g., Linck et al., 2010), I use the average level of annual abnormal director compensation as a third proxy for the costs that directors bear from serving on boards. The rationale behind this proxy is that, for retention purposes, firms need to make up for

directors' higher personal costs by compensating them with higher levels of pay. Thus, finding a

positive association between director compensation levels and firm risk would suggest that

directors' personal costs associated with firm risk require additional compensation (i.e., a

premium) and thus are substantial. The firm's average annual abnormal compensation per

director, *Avg_AbnComp*, is computed as the residual of industry-specific regressions of the

logarithm of directors' average annual compensation on *Size*, *Return*, *MB*, and year indicators.

Size is the firm's equity market value measured at the start of the year. *MB* is the ratio of market

value of equity to book value of equity measured at the start of the year. *Return* is the stock

return compounded over the 365 days prior to the start of the year (using daily data). Directors'

annual compensation includes retainers, meeting, and committee fees (paid in both cash and

equity).

I test the association between firm risk and firm-specific directors' personal costs by

regressing these variables on the logarithm of *Volatility*, which is defined as in prior tests and

measured at the start of the year (i.e., *Volatility* is lagged with respect to the dependent

variables). Because I am interested in testing whether the association between directors' personal

costs and firm volatility increases in the post-crisis period, I interact *Volatility* with *Post_Crisis*,

an indicator variable that equals one in the years between 2009 and 2013, and zero otherwise.

The specification also includes the control variables in *Firm_Controls* (as defined in prior tests)

and firm fixed effects to ensure that my tests capture time-series variation and are not affected by

potential inter-period differences in sample composition.

Table 6 shows the results. Consistent with the notion that riskier firms are more costly for

directors in the post-crisis period, the coefficient on the interaction between *Volatility* and

Post_Crisis is positive and significant in all three specifications. The inclusion of firm fixed

effects suggests that, for a given firm, increases in volatility levels in the post-crisis period (but not in the pre-2009 period) are followed by an increase in directors' personal costs. Thus, the evidence in Table 6 corroborates that directors' marginal cost of serving on riskier boards increases substantially in the post-crisis period.

4.2. Board characteristics

A natural question that arises from the result that directors are more likely to relinquish their riskiest directorships in the post-crisis period is whether these departures had a material effect on the boards experiencing them. On the one hand, the turnover pattern documented in Tables 2 through 5 might not have any material consequence on riskier firms, because those firms easily replace the departing directors with candidates of similar talent and skills. On the other hand, the riskier firms might have become less attractive after the crisis, and have problems replacing their directors with similarly qualified candidates (i.e., post crisis, the supply for director talent decreases among riskier firms).

To shed some light on this question I analyze the evolution of sample firms' average director characteristics during the sample period as a function of firm risk. Specifically, in Table 7 I replicate the tests in Table 6 replacing the dependent variables with seven firm-level measures of key director characteristics. *Avg_Experience* is the logarithm of the firm-year average of the number of years the directors have served on public boards. *Avg_Directorships* is the logarithm of the *firm*-year average of the accumulated number of public directorships in which the directors have served until that year. *Avg_Education* is the logarithm of the firm-year average of the number of academic degrees held by the directors.[27] *Avg_Network* is the logarithm

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[27] BoardEx counts degree-level qualifications including all professional and academic qualifications (undergraduate level and above). The size of the director's network is a cumulative variable measuring the total number of social ties the director has formed through her current and past employment, education, and other types of social activities.

of the firm-year average of the social ties developed by the directors during their professional career. *Pct_Female* is the percentage of female directors. *Pct_FinExperts* is the percentage of directors that are classified as financial experts as in previous tests. *Avg_Age* is the average age of the directors. The information to construct all these variables is collected from BoardEx. As in Table 6, the analysis in Table 7 is performed at the firm-year level and includes the control variables in *Firm_Controls* (as defined in prior tests) and firm fixed effects.

The evidence in Table 7 suggests that the post-crisis emphasis on risk management has led to a reshaping of corporate boards. The coefficient on the interaction between *Volatility* and *Post_Crisis* is negative and significant in models (1) through (4), indicating that higher volatility levels are associated with relatively lower levels of director experience, number of directorships, network opportunities, and academic qualifications in the post-crisis period (compared with the pre-2009 period). This coefficient is also significantly negative in model (5), indicating a relative decrease in female directors. To the extent that prior evidence suggests that female executives and directors exhibit a higher degree of risk aversion (e.g., Sunden and Surette, 1998) this result corroborates that the documented patterns are indeed related to directors' risk preferences. In contrast, the interaction between *Volatility* and *Post_Crisis* is not significant for *Avg_Age*; that is, riskier firms are not simply hiring younger directors to replace older retiring directors. The coefficient is also insignificant for *Pct_FinExperts*; while the greater regulatory push for risk oversight could be driving firms to recruit directors who have greater expertise in risk management, it is unclear whether riskier firms are successful at attracting such directors.[28]

It includes direct ties, but not indirect ties (i.e., ties that *might* have developed through a third director serving on both boards).

[28] In untabulated tests, I repeat the test in Table 7 using *Board_Size* (defined as the logarithm of the number of directors serving on the board) as dependent variable. The coefficient on the interaction between *Volatility* and *Post_Crisis* is insignificant, suggesting that the documented patterns are not driven by changes in board size.

5. Analysis of directors' departures

To further facilitate the interpretation of my previous results, I next examine in more detail the departures from directors' riskiest directorships as compared to other director departures. I proceed in two steps. First, I analyze the characteristics of the departing and subsequently appointed directors. Second, I analyze the stock market reaction to departure announcements.

5.1. Characteristics of departing and subsequently appointed directors

Table 8 analyzes the characteristics of departing and subsequently appointed directors in firms experiencing director turnover. The dependent variables parallel those in Table 7 but, instead of computing these variables by averaging at the firm-year level, I use the metrics at the director-year level. For example, similar to *Avg_Experience* in Table 7, *Experience* in Table 8 is defined as the logarithm of the number of years that the director has served on public directorships. The results in Table 8 are consistent with those in Table 7. As shown in the table, directors departing from their riskiest directorships are more experienced, hold more boards, and are better connected than other departing directors. However, no such pattern is observed among replacing directors. Table 8 also reveals that there is a smaller proportion of women among the directors subsequently appointed at firms with *Max_Volatility* = 1. This is consistent with prior evidence suggesting a higher degree of risk aversion among female executives and directors (Sunden and Surette, 1998).

5.2. Stock market reaction to departure announcements

To explore whether the previous pattern has a material effect on shareholder wealth, I next analyze the stock market reaction to board departures. Using information on resignation dates from BoardEx, I estimate the following model:

$$Abnormal\ Return = \delta_0 + \delta_1\ Max\_Volatility + \theta\ Controls + \varepsilon, \tag{2}$$

Abnormal Return is the market-adjusted return around the departure date. I compound daily returns over the (–1, +3) day window around that date (the SEC requires firms to file a Form 8-K within four days from the resignation date). *Max_Volatility* is as in equation (1). *Controls* is a vector of control variables that previous literature has found to be associated with returns, including *Size*, *BM*, and *Past_Return*.[29] *Size* is the firm's equity market value measured at the start of the year. *BM* is the ratio of book value of equity to market value of equity measured at the start of the year. *Past_Return* is the stock return compounded over the 365 days prior to the start of the year (using daily data).

The results of estimating equation (2) are presented in Table 9. The coefficient on *Max_Volatility* is negative and significant in the post-crisis period (column 3, t-stat. = −3.88). This evidence is consistent with departures from riskiest directorships being relatively more costly for shareholders than the rest of departures. Table 9 reveals a similar (and even stronger) pattern of returns in the crisis period (column 2). In contrast, such pattern does not exist in the pre-crisis period (the coefficient on *Max_Volatility* in column 1 is positive and insignificant). The magnitude of *Max_Volatility* in column 3 indicates that, in the post-crisis period, the returns around departures from directors' riskiest directorships are approximately 35 basis points lower than those around other departures. This magnitude is nontrivial, especially considering that this phenomenon affects a large number of firms in the economy.

One possible interpretation of the results in Table 9 is that directors' departures from their riskiest directorships are not beneficial for shareholders. However, the lower announcement returns could also reflect that the risk-return profile of the firm is expected to change.

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[29] To eliminate the effect of outliers, I eliminate observations with studentized residuals greater than three in absolute value.

Regardless, the results in Table 9 are hard to reconcile with the notion that the director turnover pattern I document is inconsequential. The additional analyses in Tables OA3 and OA4 of the online appendix are also consistent with departures from directors' riskiest directorships having material consequences; after the crisis, treatment firms exhibit lower changes in accounting profitability and lower changes in stock return volatility than control firms.

6. Alternative explanations and robustness

6.1. Alternative explanations

"Forced" turnover

A concern regarding my interpretation of the association between *Relinquished* and *Max_Volatility* is that this association could be driven by "forced" turnover, in which the director appears to leave the board voluntarily but has actually departed due to pressure from other board members. A director could be "encouraged" to leave the board for reasons related to i) the director herself (e.g., she is accused of being involved in fraud), ii) the firm (e.g., the firm decides to make board changes after regulatory prosecution, litigation, board-level disagreements, or poor performance), or iii) the director-firm match (e.g., the director's dedication to that specific firm is deemed insufficient and/or her skills are no longer needed). The sources of variation i, ii, and iii are unlikely to drive my results, as this heterogeneity is controlled for by, respectively, director-year, firm-year, and director-firm fixed effects (see Table 2).

While it is also possible that riskier firms change their strategy after the crisis (e.g., they become more risk-averse) and renew the board by targeting a different type of director, this possibility is hard to reconcile with my results. To begin, the determinants of the firm's recruitment strategy are controlled for by firm-year fixed effects. Moreover, Table 8, Panel B,

does not reveal any specific pattern for the characteristics of directors appointed after departures from directors' riskiest directorships. Finally, Tables 8 suggest that the directors who relinquish their riskiest directorships have high abilities (they have relatively more directorships, qualifications, and network opportunities) and Table 3 shows that these directors leave for a better opportunity and other personal circumstances, a result that is hard to attribute to "forced" turnover.

Directors "running ahead of trouble"

An alternative explanation for the association between *Max_Volatility* and *Relinquished* is that directors leave their riskiest directorships because those directorships happen to suffer from problems that are still not publicly known but are bound to surface in the future (e.g., Fahlenbrach et al., 2017). For example, a director could decide to leave a directorship before the announcement of an earnings restatement, a federal class action securities fraud lawsuit, or a stock exchange delisting. My hypothesis is fundamentally different from that of Fahlenbrach et al. (2017) in that these authors analyze *potential* rather than *existing* (latent) problems.

It is unlikely that my inferences are confounded by latent problems at the relinquished directorships. To begin with, the cross-sectional variation in those unobserved problems is controlled for by the firm-year fixed effects included in Table 2 (these fixed effects capture all types of observed and unobserved firm circumstances, including latent problems). Moreover, it is not clear why the tendency to leave directorships ahead of trouble would be more pronounced in the post-crisis period, given that the Sarbanes-Oxley Act had already introduced a significant increase in director accountability for corporate misconduct during the pre-crisis period.

That said, to check whether my results can be explained by directors' desire to leave the company before the announcement of adverse news, I include two catch-all measures of future

bad news as additional controls in equation (1). These two measures rely on the observation that, when corporate problems surface, the affected firm usually experiences negative returns and/or litigation. Accordingly, *Future_Negative_Returns* is defined as one if the market-adjusted stock return compounded daily over year $t+1$ (t is the year of departure) is negative, and zero otherwise. *Future_Litigation* equals one if the firm is subject to shareholder litigation in year $t+1$, and zero otherwise. Including these variables does not alter the inferences (untabulated).

6.2. Additional robustness tests

Directors could also reduce the cost from the total risk of their directorship portfolio by relinquishing a directorship that is not the riskiest among those in her portfolio. Thus, I repeat my main analyses taking fractional ranks of *Volatility*, *Size*, *Return* and *MB*. I call these ranked variables *Rank_Volatility*, *Rank_Size*, *Rank_Return*, and *Rank_MB*, respectively. For consistency with prior tests, the remaining part of the specifications is as in Tables 2 and 4. Table 10 presents the results of these additional tests. As shown in Table 10, the pattern in the coefficients on *Ranked_Volatility* parallel that in the coefficient on *Max_Volatility* documented in prior tables.[30]

In addition to including *Max_Size* and *Rank_Size* as control variables, I conduct several additional tests to further control for directors' preferences for directorship size. In particular, these additional tests address the concern that *Max_Volatility* could be simply capturing directors' tendency to leave smaller firms in their portfolio of directorships. First, I replace *Max_Size* with *Min_Size*, an indicator variable for whether the firm is the smallest in the director's directorship portfolio. Second, I explore whether, among the directors' smallest

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[30] I conduct other (untabulated) robustness tests to check that my inferences are not sensitive to measurement choices. First, I repeat the main tests using an alternative definition of *Max_Volatility* measuring stock return volatility over the 3 and 5 prior years. Second, I measure firm performance using return on assets (i.e., net income scaled by total assets) rather than annual stock returns. Third, I measure firm size as the logarithm of the market value of equity. Inferences are unaffected.

directorships, the most volatile directorships are the ones more likely to be relinquished. I do so by repeating the analysis in Table 2 of the paper for the subsample of directors holding at least three directorships and excluding the directorship with the maximum value of *Size*. Third, I repeat the analysis in Table 2 of the paper excluding observations where both *Max_Volatility* and *Min_Size* equal 1. In all these tests the coefficient on *Max_Volatility* is positive and statistically significant (untabulated).

Another possible concern about the results in Table 2 is that the correlation between *Relinquished* and *Max_Volatility* could reflect a firm-level association between firm risk and director turnover. That is, rather than reflecting directors' preferences across directorships, the empirical pattern documented in Section 3 could reflect that riskier companies are more likely to experience extreme outcomes that trigger board renewal. The inclusion of firm-year fixed effects in prior specifications directly addresses this concern by exploiting within-firm variation (firm-year fixed effects control for year-specific firm-level characteristics, and for firm risk in particular). That said, I further check that my results are not capturing a firm-level association between director turnover and firm risk by regressing *Relinquished* on *Max_Volatility* controlling for *Volatility* (in logarithmic form). The coefficient on *Max_Volatility* remains positive and significant in this alternative test (untabulated).

While *Portfolio_Controls* explicitly controls for directors' within-portfolio preferences regarding important characteristics such as firm size, performance, and the market-to-book ratio, my inferences could be affected by directors' preferences with respect to other firm characteristics. Note that for this to be the case, the omitted characteristic must be a continuous variable (dichotomous variables are controlled for by firm-year fixed effects). Moreover, to drive my inferences from Tables 2 through 5, the potentially confounding firm characteristic would

have to be correlated with firm risk not only in the cross-section, but also in time. Critically, the association between a potentially confounding firm characteristic and the directors' personal costs would have to become stronger after the crisis and be associated with the firm's exposure to the post-crisis institutional changes related to risk management.

Finally, to further confirm that directors' tendency to leave their riskiest directorships is not a temporary phenomenon that disappears after the early phases of the post-crisis period, I repeat the tests of Table 2 restricting the sample to years after 2009, years after 2010, and years after 2011. My inferences hold in this restricted sample (untabulated), suggesting that the phenomenon I document is not temporary; the effect persists over the whole post-crisis period.[31]

7. Conclusions

This paper examines whether the post-crisis institutional emphasis on risk management affects director turnover. I find that directors exhibit a stronger tendency to depart from their riskiest directorships during the period following the 2007-2008 financial crisis, an empirical pattern that is robust to a battery of tests addressing endogeneity concerns.

I also find evidence suggesting that the directors' personal costs associated with board positions at risky firms increase after the financial crisis. In the post-crisis period (but not in the pre-2009 period), increases in firm volatility are followed by increases in the number of board meetings, frequency of shareholder litigation, and levels of director compensation. Additional tests suggest that departures from riskier firms have reshaped corporate boards since the crisis. Compared to directors at less risky firms and to the pre-2009 period, directors at riskier firms in the post-crisis period are relatively less experienced, less connected, and less well educated.

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[31] The phenomenon is somewhat less pronounced in later years than in 2009 and 2010, but this is not surprising, as in later years there could be more directors that incorporate risk considerations into their decisions to accept/reject the board position. Such anticipation suggests that, although the effect of directorship risk on director turnover could have become less observable in later years, the effect remains important.

When I analyze board departures, I find that directors departing from their riskiest directorships are more experienced, hold more boards, and are better connected and educated than other departing directors, but no such pattern is observed among replacing directors. In line with the notion that the documented turnover pattern has material consequences, I also find lower stock returns around announcements of departures from directors' riskiest directorships.

Overall, my evidence suggests that, for directors, firm risk has become costly enough to be an important determinant of turnover after the financial crisis. From an institutional perspective, my study sheds light on the economic consequences of the post-crisis emphasis on risk oversight. The results indicate that the post-crisis insistence on risk oversight could have altered directors' preferences across their directorship portfolio. This change in preferences translates into a turnover pattern that appears to have non-trivial consequences for the affected firms.

References

Adams, R., Ferreira, M., 2008. Do directors perform for pay? Journal of Accounting and Economics 46, 154 – 171.

Agrawal, A., Chen, M., 2011. Boardroom brawls: An empirical analysis of disputes involving directors. Working paper.

Arthaud-Day, M., Certo, T., Dalton, C., Dalton, D., 2006. A changing of the guard: Executive and director turnover following corporate financial restatements. Academy of Management Journal 49, 1119 – 1136.

Balsam, S., Miharjo, S., 2007. The effect of equity compensation on voluntary executive turnover. Journal of Accounting and Economics 43, 95–119.

Black, B., Cheffens, B., Klausner, M., 2006. Outside director liability. Stanford Law Review 58, 1055 – 1159.

Brochet, F., Srinivasan, S., 2014. Accountability of independent directors: Evidence from firms subject to securities litigation. Journal of Financial Economics 111, 430 – 449.

Cai, J., Garner, J., Walkling, R., 2009. Electing directors. Journal of Finance 64, 2389 – 2421.

DeFond, M., Park, C., 1999. The effect of competition on CEO turnover. Journal of Accounting and Economics 27, 35 – 56.

Duchin, R., Matsusaka, J., Ozbas, O., 2010. When are outside directors effective? Journal of Financial Economics 96, 195 – 214.

Ellis, J., Fee, E., Thomas, S., 2017. Playing Favorites? Industry Expert Directors in Diversified Firms. Journal of Financial and Quantitative Analysis, forthcoming.

Engel, E., Hayes, R., Wang, X., 2003. CEO turnover and properties of accounting information. Journal of Accounting and Economics 36, 197 – 226.

Fahlenbrach, R., Low, A., Stulz, R., 2017. The dark side of outside directors: Do they quit ahead of trouble? Review of Financial Studies, forthcoming.

Fama, E., Jensen, M., 1983. Separation of ownership and control. Journal of Law and Economics 26, 301 – 325.

Farrell, K., Whidbee, D., 2003. Impact of firm performance expectations on CEO turnover and replacement decisions. Journal of Accounting and Economics 36, 165 – 196.

Fisher, P., Gramlich, J., Miller, B., White, H., 2009. Investor perceptions of board performance: Evidence from uncontested director elections. Journal of Accounting and Economics 48, 172 – 189.

Fich, E., Shivdasani, A., 2007. Financial fraud, director reputation, and shareholder wealth. Journal of Financial Economics 86, 306 – 336.

Güner, A., Malmendier, U., Tate, G., 2008. Financial expertise of directors. Journal of Financial Economics 88, 323–354.

Huang, H., Lobo, G., Wang, C., 2017. Do banks price independent directors' attention? Journal of Financial and Quantitative Analysis, forthcoming.

Larcker, D., Tayan, B., 2011. Corporate governance matters. A closer look at organizational choices and their consequences. Ed. FT Press.

Linck, J., Netter, J., Yang, T., 2010. The effects and unintended consequences of the sarbanes-oxley act on the supply and demand for directors. Review of Financial Studies 22, 3287 – 3328.

Masulis, R., Mobbs, S., 2014. Independent director incentives: Where do talented directors spend their limited time and energy? Journal of Financial Economics 111, 406 – 429.

Neyman, J., Scott, E.L., 1948. Consistent estimation from partially consistent observations. Econometrica 16, 1 – 32.

Price Waterhouse Coopers (PwC), 2009. What do Directors Think 2009: Annual Board of Directors Survey.

Srinivasan, S., 2005. Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. Journal of Accounting Research 43, 291 – 334.

Sunden, A., Surette, B., 1998. Gender differences in the allocation of assets in retirement savings plans. American Economic Review 88, 207 – 211.

Towers Watson, 2006-2012. Directors and Officers Liability annual surveys

Wang, C., Xie, F., Zhu, M., 2015. Do Banks Price Independent Directors' Attention? Journal of Financial and Quantitative Analysis 50, 929 – 962.

Yermack, D., 2004. Remuneration, retention, and reputation incentives for outside directors. The Journal of Finance 59, 2281 – 2308.

Appendix A. Variable definitions

A.1. Main variables

Relinquished Indicator variable that equals one if the director departs from that directorship in that year, and zero otherwise.

Max_Volatility Indicator variable that equals one if the firm is the directorship covered by CRSP/Compustat with highest value of *Volatility* in the director's portfolio of directorships, and zero otherwise. *Volatility* the firm's annual stock return volatility measured using daily data

A.2. Portfolio-level controls

Max_Size Indicator variable that equals one if the firm is the directorship covered by CRSP/Compustat with highest value of *Size* in the director's portfolio of directorships, and zero otherwise. *Size* is defined as the firm's total book value of assets measured at the start of the year

Max_MB Indicator variable that equals one if the firm is the directorship covered by CRSP/Compustat with highest value of *MB* in the director's portfolio of directorships, and zero otherwise. *MB* is the ratio of market value of equity to book value of equity measured at the start of the year

Max_Return Indicator variable that equals one if the firm is the directorship covered by CRSP/Compustat with highest *Return* in the director's portfolio of directorships, and zero otherwise. *Return* is the stock return compounded over the 365 days prior to the start of the year using daily data

A.3. Director-level controls

Log(Age) Logarithm of the age of the director (in years)

Log(Number_Directorships) Logarithm of the total number of directorships held by the director in that year

Health_Deterioration Indicator variable that equals one if the director is older than 70 years or if she/he passes away during the following three years, and zero otherwise

Increased_Workload Indicator variable that equals one if the number of board meetings across the directors' directorship portfolio increased with respect to the prior year, and zero otherwise

Appointment Indicator variable that equals one if the director is appointed to a new board position or to a top executive position during that year, and zero otherwise

Female Indicator variable that equals one if the director is female, and zero otherwise

FinExpert Indicator variable that equals one if the director is a "financial expert" (as defined by Güner, Malmendier and Tate, 2008), and zero otherwise

Appendix A. Variable definitions (cont'ed)

A.4. Firm-level controls

Litigation	Indicator variable that equals one if in that year there is an announcement that the firm is subject to a shareholder lawsuit, and zero otherwise
More_Meetings	Indicator variable that equals one if the number of board meetings at the firm in that year increased with respect to the prior year, and zero otherwise
CEO_Turnover	Indicator variable that equals one if a new CEO is appointed in that year, and zero otherwise
Proxy_Fight	Indicator variable that equals one if there is a proxy fight in the firm in that year, and zero otherwise
Ownership_Change	Indicator variable that equals one if there is an announcement of an acquisition of a significant percentage of firm shares, and zero otherwise
Past_Performance	Stock return adjusted for the weighed market return compounded over one year using daily data
Size	Logarithm of total book value of assets at the start of the year

A.5. Director-firm pair-level controls

Equity_Holdings	Logarithm of director's accumulated wealth in the firm. Director wealth is computed as the value of the director's equity portfolio in the firm (that is, the market value of the owned shares and the options exercisable within 60 days)
Compensation	Logarithm of the total annual compensation by director at the firm (including retainers, meeting, and committee fees (in both cash and equity)
Tenure	Logarithm of director's tenure in the firm (measured in years)
CEO_Linked	Indicator variable that equals one if the director is socially connected to the CEO. Social connections are coded as one if the two persons overlap in their service to a company or organization (other than the firm) prior to that year
Independent	Indicator variable that equals one if the director qualifies as independent, and zero otherwise
Retirement_Year	Indicator variable that equals one if the director's time to retirement is less than one year, and zero otherwise. Data on time to retirement is collected from Boardex. When data on the firm's retirement policy is not available, Boardex assumes that the retirement age of surpervisory directors is 70
Nomination_Committee	Indicator variable that equals one if the director is a member of the nomination committee, and zero otherwise
Audit_Committee	Indicator variable that equals one if the director is a member of the audit committee, and zero otherwise
Comp_Committee	Indicator variable that equals one if the director is a member of the compensation committee, and zero otherwise
Chairman	Indicator variable that equals one if the director is the chairman of the board, and zero otherwise
Lead_Director	Indicator variable that equals one if the director is the lead director of the board, and zero otherwise

Figure 1. Limits of D&O insurance

This figure shows the annual average total limits of D&O insurance (in US$ millions) in the period between 2006 and 2012. Source: Towers Watson's Directors and Officers Liability annual surveys.
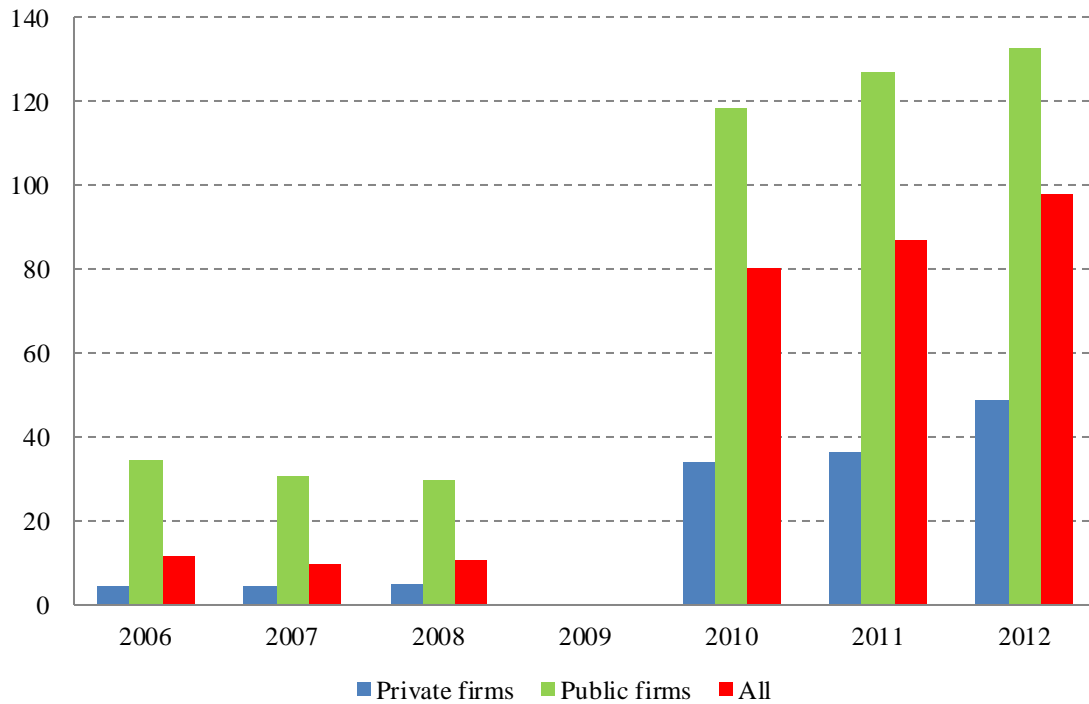
Figure 2. Trend in the riskiness of departed and retained directorships

This figure plots the difference between the annualized return stock volatility (in %) of departed directorships and that of retained directorships for each year of the sample period. Stock return volatility is computed over one year using daily data. The figure also includes a linear regression fit for the data as well as the corresponding confidence and prediction limits.

Linear regression fit

Fit □ 95% Confidence Limits ----- 95% Prediction Limits
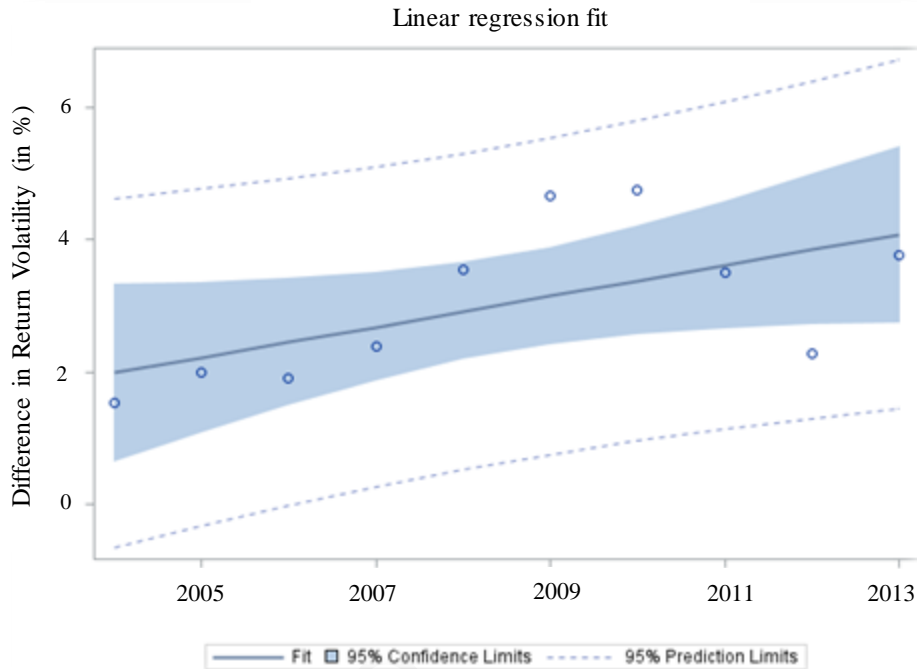
_p_-value of the slope

All observations: _p_-value = 0.029
Excluding 2009: _p_-value = 0.023

Table 1. Descriptive statistics

This table presents descriptive statistics of the 263,437 director-firm-year observations in the BoardEx universe from 2004 to 2013 in which the firm is covered by CSRP/Compustat. "Observations with (without) turnover" refers to director-firm-year observations in which the director departs (does not depart) from the firm's board in that year. Continuous variables are presented unlogged for reading convenience. See Appendix A for variable definitions.

Variable	Observations with turnover		Observations without turnover		Tests of equality (p-values)	
	mean	median	mean	median	t-test	Wilcoxon
Volatility	0.49	0.41	0.46	0.39	<.0001	<.0001
Director controls:						
Age	61.67	62	59.99	60	<.0001	<.0001
Number_Directorships	2.89	2	2.94	2	0.011	<.0001
Health_Deterioration	0.26	0	0.12	0	<.0001	<.0001
Increased_Workload	0.32	0	0.31	0	0.004	0.004
Appointment	0.24	0	0.15	0	<.0001	<.0001
Female	0.08	0	0.1	0	<.0001	<.0001
FinExpert	0.16	0	0.18	0	<.0001	<.0001
Firm controls:						
Litigation	0.15	0	0.13	0	<.0001	<.0001
More_Meetings	0.3	0	0.28	0	<.0001	<.0001
CEO_Turnover	0.2	0	0.08	0	<.0001	<.0001
Proxy_Fight	0.04	0	0.02	0	<.0001	<.0001
Ownership_Change	0.06	0	0.04	0	<.0001	<.0001
Past_Performance	0.05	−0.05	0.09	−0.01	<.0001	<.0001
Size	17,607	1,018	12,090	1,004	<.0001	0.744
Director-firm controls:						
Equity_Holdings ($ thousands)	45,479	1,054	42,220	813	0.595	<.0001
Compensation ($ thousands)	139	106	152	107	0.659	0.061
Tenure (years)	9.94	7.2	8.82	6.3	<.0001	<.0001
CEO_Linked	0.20	0	0.21	0	0.005	0.005
Independent	0.83	1	0.82	1	0.060	0.060
Retirement_Year	0.04	0	0.03	0	<.0001	<.0001
Nomination_Committee	0.30	0	0.35	0	<.0001	<.0001
Audit_Committee	0.34	0	0.43	0	<.0001	<.0001
Comp_Committee	0.36	0	0.42	0	<.0001	<.0001
Chairman	0.12	0	0.13	0	<.0001	<.0001
Lead_Director	0.02	0	0.03	0	<.0001	<.0001
Number of director-firm-year obs.	20,774		242,663			

Table 2. Frequency of departures from directors' riskiest directorships

This table presents an analysis of directors' tendency to leave their riskiest directorships. The sample includes 263,437 director-firm-year observations from 2004 to 2013 corresponding to the BoardEx universe for which the firm is covered by CRSP-Compustat. The dependent variable, *Relinquished*, equals one if the director departs from that directorship in that year, and zero otherwise. *Max_Volatility* equals one if the firm is the directorship covered by CSRP/Compustat with highest *Volatility* in the director's portfolio, and zero otherwise. The rest of the variables are defined in Appendix A. Panel A presents results using the specification in equation (1). Panel B includes additional fixed effects to control for several sources of unobserved heterogeneity. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively. Intercepts are omitted.

Panel A. Baseline Specification

Independent Variables:	Dependent Variable: *Relinquished*			
	(1)	(2)	(3)	(4)
Max_Volatility	0.01^{***}	0.01^{***}	0.01^{***}	0.01^{***}
	(8.39)	(6.75)	(6.68)	(6.76)
Portfolio-level controls:				
Max_Size	0.01^{***}	0.01^{***}	0.00	0.00
	(4.88)	(3.26)	(1.30)	(0.89)
Max_MB	-0.005^{***}	-0.01^{***}	-0.01^{***}	-0.01^{***}
	(−2.57)	(−3.51)	(−2.80)	(−3.91)
Max_Return	-0.01^{***}	-0.01^{***}	0.00	−0.00
	(−2.97)	(−3.63)	(−1.52)	(−1.61)
Director-level controls:				
Log(Age)		-0.04^{***}	-0.05^{***}	-0.05^{***}
		(−5.78)	(−6.67)	(−7.67)
Log(Number_Directorships)		-0.01^{***}	-0.01^{***}	-0.01^{***}
		(−6.43)	(−6.66)	(−7.19)
Health_Deterioration		0.11^{***}	0.11^{***}	0.11^{***}
		(34.63)	(34.53)	(32.90)
Increased_Workload		0.005^{***}	−0.00	−0.00
		(3.13)	(−0.85)	(−0.86)
Appointment		0.06^{***}	0.06^{***}	0.06^{***}
		(22.25)	(21.32)	(22.36)
Female		-0.01^{***}	-0.01^{***}	-0.01^{***}
		(−5.08)	(−6.35)	(−5.68)
FinExpert		-0.01^{***}	-0.004^{***}	−0.00
		(−3.39)	(−2.77)	(−0.79)
Firm-level controls:				
Litigation			0.01^{***}	0.01^{***}
			(4.90)	(3.95)
More_Meetings			0.004^{**}	0.004^{**}
			(2.11)	(2.26)
CEO_Turnover			0.10^{***}	0.10^{***}
			(29.91)	(29.48)
Proxy_Fight			0.05^{***}	0.06^{***}
			(8.02)	(8.40)
Ownership_Change			0.02^{***}	0.03^{***}
			(5.14)	(5.44)
Past_Performance			-0.002^{*}	-0.003^{**}
			(−1.91)	(−2.05)
Size			0.001^{*}	0.00
			(1.80)	(0.79)
Director-firm pair-level controls:				
Log(Equity_Holdings)				0.004^{***}
				(3.71)
Log(Compensation)				-0.01^{***}
				(−6.07)

Log(Tenure)				0.01***
				(4.89)
CEO_Linked				−0.00
				(−0.06)
Independent				0.03***
				(13.52)
Retirement_Year				0.05***
				(10.62)
Nomination_Committee				−0.02***
				(−12.79)
Audit_Committee				−0.03***
				(−22.83)
Comp_Committee				−0.02***
				(−14.58)
Chairman				−0.03***
				(−13.92)
Lead_Director				−0.03***
				(−10.13)
Industry-year fixed effects				YES
R²	< 0.001	0.02	0.04	0.05
N	263,437	263,437	263,437	263,437

Panel B. Controlling for unobserved heterogeneity

	Dependent Variable: Relinquished		
	Controlling for unobserved director circumstances	Controlling for unobserved firm circumstances	Controlling for unobserved determinants of director-firm match
Independent Variables:	(1)	(2)	(3)
Max_Volatility	0.01***	0.01***	0.01***
	(3.35)	(3.20)	(2.92)
Portfolio-level controls	YES	YES	YES
Director-level controls		YES	YES
Firm-level controls	YES		YES
Director-firm pair-level controls	YES	YES	
Industry-year fixed effects	YES		YES
Director-year fixed effects	**YES**		
Firm-year fixed effects		**YES**	
Director-firm fixed effects			**YES**
R²	0.52	0.21	0.32
N	76,864	263,437	253,581

Table 3. Situations triggering voluntary departures from riskiest directorships

This table presents the results of a variant of the analysis in Table 2 modeling situations that trigger voluntary departures from the riskiest directorships. Panel A analyzes whether directors' departures from their riskiest directorships are associated with personal circumstances leading the director to leave directorships. Panel B analyzes whether directors' departures from their riskiest directorships are associated with increases in firm volatility. In Panel A, *Personal_Circumstance* is one of two indicator variables; *Appointment* and *Health_Deterioration*. *Appointment* equals one if the director is appointed to a new board position or to a top executive position during that year, and zero otherwise, and *Health_Deterioration* equals one if the director is older than 70 years or if she/he passes away during the following three years, and zero otherwise. In Panel B, *Δ_Volatility* is the change in volatility with respect to the prior year. *Relinquished* and *Max_Volatility* are as defined in previous tables. The control variables and sample are as in Table 2. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Personal circumstances

Independent Variables:	Dependent Variable: *Relinquished*			
	Personal_Circumstance: Appointment		*Personal_Circumstance: Health_Deterioration*	
	(1)	(2)	(3)	(4)
*Max_Volatility * Personal_Circumstance*		0.014***		0.014*
		(4.02)		(1.80)
Personal_Circumstance	0.041***	0.030***	0.105***	0.094***
	(17.74)	(11.06)	(18.70)	(11.08)
Max_Volatility	0.005**	0.002	0.006***	0.004**
	(2.44)	(0.83)	(2.67)	(2.07)
Portfolio-level controls	YES	YES	YES	YES
Firm-year fixed effects	YES	YES	YES	YES
Director-firm fixed effects	YES	YES	YES	YES
R^2	0.59	0.59	0.60	0.60
N	253,581	253,581	253,581	253,581

Panel B. Increase in directorship risk

Independent Variables:	Dependent Variable: *Relinquished*		
	(1)	(2)	(3)
*Max_Volatility * Δ_Volatility*			0.024***
			(2.70)
Δ_Volatility	0.014**	0.011*	−0.005
	(2.06)	(1.72)	(−0.91)
Max_Volatility		0.009***	0.010**
		(2.72)	(2.59)
Portfolio-level controls	YES	YES	YES
Director-year fixed effects	YES	YES	YES
Director-firm fixed effects	YES	YES	YES
R^2	0.68	0.68	0.68
N	72,084	72,084	72,084

Table 4. Time variation in the frequency of departures from directors' riskiest directorships

This table presents the results of a variant of the analysis in Table 2 testing inter-period differences in directors' tendency to leave their riskiest directorships. The subsample denoted by "Year < 2009" includes director-firm-year observations in years from 2004 to 2008. The subsample denoted by "Year ≥ 2009" includes director-firm-year observations in years from 2009 to 2013. *Post_Crisis* equals one if year ≥ 2009, and zero otherwise. The control variables and sample are as in Table 2. *p*-values reported at the bottom correspond to tests of the equality of the coefficient on *Max_Volatility* estimated in the two subsamples. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

	Dependent Variable: *Relinquished*				
	Controlling for unobserved director circumstances		*Controlling for unobserved firm circumstances*		*Controlling for unobserved determinants of director-firm match*
Independent Variables:	Year < 2009 (1)	Year ≥ 2009 (2)	Year < 2009 (3)	Year ≥ 2009 (4)	Whole sample (5)
Max_Volatility	0.003	0.012***	0.004	0.008***	−0.000
	(0.85)	(3.69)	(1.31)	(3.59)	(−0.20)
*Max_Volatility*Post_Crisis*					0.013***
					(4.16)
Portfolio-level controls	YES	YES	YES	YES	YES
Director-level controls			YES	YES	YES
Firm-level controls	YES	YES			YES
Director-firm pair-level controls	YES	YES	YES	YES	
Industry-year fixed effects	YES	YES			YES
Director-year fixed effects	YES	YES			
Firm-year fixed effects			YES	YES	
Director-firm fixed effects					YES
R^2	0.51	0.53	0.20	0.21	0.32
N	37,118	39,746	130,386	133,051	253,581
Equality of *Max_Volatility*:	*p*-value = 0.051		*p*-value = 0.091		

Table 5. Exposure to the post-crisis institutional changes

This table presents the results of a variant of the analysis in Table 2 based on the exposure to the post-crisis institutional changes. Panel A presents an analysis of differences in directors' tendency to leave their riskiest directorships based on whether the director is a member of the audit committee (AC) of the board. Panel B presents an analysis of differences in directors' tendency to leave directorships where the firm is considered systemically important and thus more affected by the Dodd-Frank Act. *Post_Crisis* equals one if year $\geq$ 2009, and zero otherwise. In Panel B, *Systemically_Important* equals one if the firm is a bank holding company of more than ten billion in assets or a nonbank financial company classified as "systemically important" by the Board of Governors, and zero otherwise. The control variables and sample are as in Table 2. *p*-values reported at the bottom correspond to tests of the equality of the coefficient on *Max_Volatility* estimated in the two subsamples. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Audit committee (AC) membership

	Dependent Variable: *Relinquished*	
	AC member	Not AC member
Independent Variables:	(1)	(2)
Max_Volatility	−0.003	−0.000
	(−0.85)	(−0.09)
*Max_Volatility*Post_Crisis*	0.017***	0.007*
	(4.37)	(1.83)
Portfolio-level controls	YES	YES
Firm-level controls	YES	YES
Director-level controls	YES	YES
Industry-year fixed effects	YES	YES
Director-firm fixed effects	YES	YES
R^2	0.32	0.34
N	106,371	142,918
Equality of *Max_Volatility*Post_Crisis*:	*p*-value = 0.060	

Panel B. Systemically important firms

	Dependent Variable: *Relinquished*		
	Year < 2009	Year $\geq$ 2009	Whole sample
Independent Variables:	(1)	(2)	(3)
Systemically_Important	0.020*	0.044***	
	(1.68)	(4.18)	
*Systemically_Important*Post_Crisis*			0.022**
			(2.36)
Portfolio-level controls	YES	YES	YES
Firm-level controls	YES	YES	YES
Director-firm pair-level controls	YES	YES	YES
Industry-year fixed effects	YES	YES	YES
Director-year fixed effects	YES	YES	
Director-firm fixed effects			YES
R^2	0.51	0.53	0.31
N	37,118	39,746	253,581
Equality of *Systemically_Important*:	*p*-value = 0.113		

Table 6. Directors' personal costs and firm risk

This table presents results of estimating inter-period differences in the association between firm risk and proxies for directors' personal costs of serving on the firm's board. *Number_Meetings* is the logarithm of the number of board meetings in that year. *Shareholder_Litigation* is an indicator variable that equals one if the firm is subject to shareholder litigation in that year, and zero otherwise. *Avg_AbnComp* is the firm's average annual abnormal compensation per director, computed as the residual of industry-specific regressions of the logarithm of annual compensation on *Size*, *Return*, *MB*, and year indicators. Annual compensation includes retainers, meeting, and committee fees (in both cash and equity). *Volatility* is defined as in prior tests and measured at the start of the year (i.e., lagged with respect to the dependent variables). *Post_Crisis* is an indicator variable that equals one in the years between 2009 and 2013, and zero otherwise. *Firm-level controls* includes the same variables as in Table 2. The models include all firm-year observations in the sample with non-missing values of the dependent variable. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

| | Dependent variable: | | |
| | *Number_ Meetings* | *Shareholder_ Litigation* | *Avg_ AbnComp* |
Independent Variables:	(1)	(2)	(3)
Log(Volatility)	0.01	0.02**	0.01
	(0.44)	(2.28)	(0.48)
*Log(Volatility)*Post_Crisis*	0.03***	0.02**	0.05**
	(3.01)	(2.15)	(2.55)
Post_Crisis	0.11***	0.04	0.18**
	(2.60)	(1.40)	(2.37)
Firm-level controls	YES	YES	YES
Firm fixed effects	YES	YES	YES
R^2	0.64	0.39	0.58
N	25,336	33,020	26,046

Table 7. Board-level director characteristics and firm risk

This table presents results of estimating inter-period differences in the association between firm risk and the average characteristics of the directors serving on the firm's board. *Avg_Experience* is the logarithm of the firm-year average of the number of years that the directors have served on public directorships. *Avg_Directorships* is the logarithm of the firm-year average of the accumulated number of listed directorships in which the directors have served until that year. *Avg_Education* is the logarithm of the firm-year average of the number of academic degrees held by the directors. *Avg_Network* is the logarithm of the firm-year average of directors' network measured in number of ties. *Pct_Female* is the percentage of female directors on the board in that year. *Avg_FinExperts* is the percentage of financial experts on the board in that year (financial expertise is defined as in Güner, Malmendier and Tate, 2008). *Avg_Age* is the logarithm of the firm-year average age of the firm's directors. *Volatility* is defined as in prior tests and measured at the start of the year (i.e., lagged with respect to the dependent variables). *Post_Crisis* is an indicator variable that equals one in the years between 2009 and 2013, and zero otherwise. *Firm-level controls* includes the same variables as in Table 2. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

| | Dependent variable: | | | | | | |
Independent Variables:	*Avg_Experience* (1)	*Avg_Directorships* (2)	*Avg_Education* (3)	*Avg_Network* (4)	*Pct_Female* (5)	*Pct_FinExperts* (7)	*Avg_Age* (6)
Log(Volatility)	−0.01	−0.00	0.00	0.01	−0.004***	−0.005***	−0.01***
	(−0.99)	(−0.41)	(0.26)	(0.87)	(−2.77)	(−2.69)	(−8.29)
*Log(Volatility)*Post_Crisis*	−0.03**	−0.01**	−0.02**	−0.03**	−0.01***	0.00	−0.00
	(−2.27)	(−2.24)	(−2.35)	(−2.53)	(−7.40)	(1.18)	(−0.57)
Post_Crisis	0.05	0.00	−0.01	−0.02	−0.02***	0.02***	0.03***
	(1.26)	(0.04)	(−0.45)	(−0.59)	(−3.65)	(2.84)	(4.67)
Firm-level controls	YES	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES	YES	YES	YES
R^2	0.84	0.90	0.90	0.94	0.81	0.84	0.84
N	30,730	30,730	30,730	30,730	30,730	30,730	30,730

Table 8. Characteristics of departing and subsequently appointed directors

This table presents results of estimating inter-period differences in the characteristics of departing and subsequently appointed directors based on whether the director leaves from her/his riskiest directorship. *Experience* is the logarithm of the number of years that the director has served on public directorships. *Directorships* is the logarithm of the accumulated number of listed directorships in which the director has served until that year. *Education* is the logarithm of the number of academic degrees held by the director. *Network* is the logarithm of the director's network measured in number of ties. *Female* equals one if the director is female, and zero otherwise. *FinExpert* equals one if the director is a financial expert (as defined by Güner, Malmendier and Tate, 2008), and zero otherwise. *Age* is the logarithm of the director's age (in years). *Max_Volatility* is as defined in previous tables. *Post_Crisis* is an indicator variable that equals one if the departure occurs between 2009 and 2013, and zero otherwise. Panel A analyzes characteristics of departing directors. Panel B analyzes characteristics of directors appointed within one year after those directors' departures. The models include the departure observations in the sample (i.e., observations where *Relinquished* = 1). Standard errors are clustered by year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Departing directors

	Dependent variable:						
	Experience	*Directorships*	*Education*	*Network*	*Female*	*FinExpert*	*Age*
Independent Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
*Max_Volatility*Post_Crisis*	0.06**	0.10***	0.04**	0.28***	−0.01	−0.01	−0.00
	(2.33)	(3.06)	(2.32)	(3.75)	(−1.21)	(−0.41)	(−0.01)
Post_Crisis	0.03	−0.03	0.01	0.02	0.02***	0.01	0.04***
	(0.80)	(−1.30)	(1.21)	(0.76)	(2.76)	(0.64)	(6.25)
Max_Volatility	−0.07***	−0.96***	−0.18***	−1.64***	−0.01**	0.00	−0.02***
	(−2.94)	(−42.08)	(−11.06)	(−32.99)	(−2.11)	(0.23)	(−4.01)
R^2	0.002	0.190	0.017	0.081	<0.001	<0.001	0.010
N	20,637	20,718	20,735	20,583	20,744	20,744	20,649

Panel B. Subsequently appointed directors

	Dependent variable:						
	Experience	*Directorships*	*Education*	*Network*	*Female*	*FinExpert*	*Age*
Independent Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
*Max_Volatility*Post_Crisis*	0.02	−0.02	0.00	0.01	−0.05***	0.01	0.01**
	(0.64)	(−0.98)	(0.23)	(0.14)	(−3.57)	(0.41)	(2.07)
Post_Crisis	−0.01	0.04	−0.00	−0.06	0.08***	−0.01	0.01
	(−0.15)	(1.45)	(−0.08)	(−1.09)	(5.36)	(−0.55)	(1.34)
Max_Volatility	−0.18***	−0.14***	−0.03**	−0.42***	−0.01	0.01	−0.01***
	(−7.86)	(−6.60)	(−2.00)	(−10.84)	(−1.07)	(0.58)	(−2.21)
R^2	0.003	0.005	<0.001	0.011	0.004	<0.001	0.005
N	24,836	24,818	24,855	24,666	24,893	24,893	23,425

Table 9. Stock market reaction to board departures

This table presents analysis of abnormal returns around board departure announcements. The dependent variable *Abnormal_Return* is the market-adjusted compounded return over a (−1, +3) window around the announcement date (expressed as a %). *Max_Volatility* is as defined in previous tables. *Pre-crisis* includes board departures announced before august 2007. *Crisis* includes board departures announced between august 2007 and March 2009. *Post-crisis* includes board departures announced after March 2009. *Size* is the firm's equity market value measured at the start of the year. *BM* is the ratio of book value of equity to market value of equity measured at the start of the year. *Past_Return* is the stock return compounded over the 365 days prior to the start of the year (using daily data). *p*-values reported at the bottom correspond to tests of the equality of the coefficient on *Max_Volatility* estimated in the subsamples of models (1) and (3). Standard errors are clustered by year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

| | Dependent variable: *Abnormal_Return* | | |
| | *Pre-crisis* | *Crisis* | *Post-crisis* |
Independent Variables:	(1)	(2)	(3)
Intercept	0.27	−1.06*	0.44
	(0.62)	(−1.83)	(1.33)
Max_Volatility	0.04	−0.88***	−0.35***
	(0.29)	(−7.59)	(−3.88)
Size	−0.04	0.17	0.01
	(−1.22)	(1.60)	(0.25)
BM	−0.00	0.43	−0.07
	(−0.03)	(1.11)	(−0.61)
Past_Return	−0.08	0.50	−0.14
	(−0.21)	(1.12)	(−1.02)
R^2	<0.001	0.007	0.001
N	3,198	2,115	6,012

Equality of *Max_Volatility* (1)-(3): *p*-value = 0.031

Table 10. Alternative measurement

This table reports results of a variant of the analysis in Table 4 using an alternative measure of the relative value of directorship characteristics within the director's directorship portfolio. The prefix *Ranked_* refers to the fractional rank of the value of the corresponding directorship characteristic (*Volatility*, *Size*, *MB*, and *Return* are as defined in prior tests) within the director's portfolio. The control variables and sample are as in Table 4. *p*-values reported at the bottom correspond to tests of the equality of the coefficient on *Ranked_Volatility* estimated in the two subsamples. Standard errors are clustered by industry-year. *t*-statistics are in parentheses. *, ** and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

| Independent Variables: | Dependent Variable: *Relinquished* | | | | |
| | Controlling for unobserved director circumstances | | Controlling for unobserved firm circumstances | | Controlling for unobserved determinants of director-firm match |
	Year < 2009 (1)	Year ≥ 2009 (2)	Year < 2009 (3)	Year ≥ 2009 (4)	Whole sample (5)
Ranked_Volatility	0.005	0.019***	0.008	0.016***	0.00
	(0.82)	(3.07)	(1.47)	(3.59)	(0.16)
*Ranked_Volatility*Post_Crisis*					0.025***
					(4.04)
Portfolio-level controls					
Ranked_Size	−0.01	−0.01	−0.02***	−0.00	0.00
	(−0.85)	(−1.32)	(−3.76)	(−0.06)	(0.40)
Ranked_MB	−0.02***	−0.02***	−0.01**	0.00	−0.01**
	(−3.81)	(−4.32)	(−2.06)	(0.87)	(−2.40)
Ranked_Return	−0.01	−0.02***	0.00	0.00	−0.01*
	(−1.63)	(−3.68)	(0.21)	(0.18)	(−1.94)
Director-level controls			YES	YES	YES
Firm-level controls	YES	YES			YES
Director-firm pair-level controls	YES	YES	YES	YES	
Industry-year fixed effects	YES	YES			YES
Director-year fixed effects	YES	YES			
Firm-year fixed effects			YES	YES	
Director-firm fixed effects					YES
R²	0.51	0.54	0.21	0.22	0.32
N	37,118	39,746	130,386	133,051	253,581
Equality of *Ranked_Volatility*:	*p*-value = 0.090		*p*-value = 0.044		

Highlights

For your convenience, I highlight the changes in the manuscript:

- A discussion of the concern that the main variable of the paper, *Max_Volatility*, could be simply capturing the small firms in a director's portfolio of directorships. A description of the tests to address this concern is also included in the main body of the paper (section 6.2).

- The test in model 1 of Table 6 in the prior version is no longer in the paper.

- An additional specification in Table 5 including just Δ_*Volatility*

- The discussion of non-listed firms in the last paragraph before the conclusion and the corresponding online table are dropped. That discussion is replaced with a discussion of Figure R1.1 (now Figure 2 in the paper). The new version introduces this figure early in the narrative of the paper (section 3.1). The space previously filled by the discussion of non-listed firms now contains the description of the tests restricting the sample to the most recent years of the sample period.

- A couple of typos in Table 5 are corrected.

- The new version of the manuscript reports the number of observations for each model in the tables.