Board Monitoring, Director Connections, and Credit Quality

Jason Sandvik*

Abstract

Firms with poor board monitoring effectiveness receive lower credit ratings and larger credit spreads. I identify these effects by using director deaths as exogenous shocks to monitoring effectiveness. These effects are especially pronounced when firms are highly levered. Incremental decreases in monitoring effectiveness impact credit quality the most when a majority of the board members become co-opted by management and when firms are more likely to increase corporate risk.

JEL: G240, G330, G340

Keywords: Board Monitoring, Corporate Governance, Cost of Debt, Rating Agency, Corporate Default

*jsandvik@tulane.edu (503-522-6628) A.B. Freeman School of Business, Tulane University.

1 Introduction

Corporate boards of directors help solve the agency problems that arise from the separation of ownership and control within publicly owned corporations (Berle and Means, 1932; Fama and Jensen, 1983; Hermalin and Weisbach, 2003). These directors, elected by the shareholders, are responsible for advising and monitoring management in an effort to maximize shareholder wealth (Mace, 1979; Fama, 1980). Directors with an ability and disposition to monitor management will encourage executives to pursue risky, positive-NPV projects (Coles et al., 2006), compensate executives based on their performance (Jensen and Murphy, 1990), and dismiss executives who fail to create shareholder value (Jenter and Kanaan, 2015). While these monitoring behaviors are likely to benefit the owners of the firm, it is less clear how board monitoring affects a firm's creditors.

A creditor's interest in firm performance is often different from that of a shareholder (Jensen and Meckling, 1976; Jiang et al., 2010). While diversified shareholders want firms within their investment portfolios to pursue risky, positive-NPV projects, creditors place pressure on firms to adopt less risky investment strategies (Myers, 1977). Previous research suggests that creditors can be affected *both* positively and negatively when board monitoring quality improves, effectively aligning the actions of management with the preferences of shareholders. Fields et al. (2012) find that banks offer smaller credit spreads on loans to firms with well-monitored executives, as bank management expends fewer resources to monitor these firms themselves. Effective board monitoring also reduces the propensity of managers to engage in earnings management (Xie et al., 2003; Faleye et al., 2011), allowing creditors to better assess a borrower's risk profile (Smith and Stulz, 1985; Barton, 2001; Burgstahler et al., 2006).[1] In line with this, Anderson et al. (2004) find that firms with effective audit committees, which play a crucial role in mitigating earnings management, realize smaller

[1]When rating agencies issue credit ratings they consider measures of monitoring effectiveness, like directors' independence from management, and adjust ratings downward if board oversight appears weak (Standard and Poor's, 2018).

bond yield spreads. Furthermore, well-monitored executives have less freedom to expand the scope of their corporate control through unprofitable empire building activities. These examples suggest that increased board monitoring quality can be beneficial to creditors.

On the other hand, an increase in monitoring effectiveness can lead to increased corporate risk-taking, which is costly to creditors (Bradley and Chen, 2015). Bertrand and Mullainathan (2003) describe the preference of executives to live "the quiet life" by forgoing risky investment and operating strategies. To overcome this managerial preference for risk-avoidance, directors who monitor effectively incentivize executives to pursue risky, positive-NPV projects (Guay, 1999; Coles et al., 2006, 2018). Increased corporate risk-taking as the result of improved monitoring quality is, however, not necessarily favored by creditors, as evidenced by Bradley and Chen (2011). They show that reduced monitoring quality leads to decreased risk-taking, which creditors prefer. So while effective board monitoring can curb earnings management and empire building, which benefits creditors, it can also lead to increased corporate risk-taking and more aggressive operating strategies, which can harm creditors.

To disentangle the mixed evidence on the relation between board monitoring quality and a firm's credit quality, I utilize a relatively new measure of board monitoring effectiveness, *Board Co-option*, which is the proportion of directors who were appointed to the board after the sitting CEO assumed office. This measure is motivated by the fact that CEOs have an informal role in appointing directors to the board,[2] so newly appointed directors will likely feel allegiance towards management and be less inclined to monitor effectively (Boeker, 1992; Daily and Dalton, 1995). Directors who are appointed to the board by the sitting CEO are, therefore, considered to be captured, "co-opted," by management (Hermalin and Weisbach, 2003). On the other hand, directors who appointed the CEO are likely to monitor more effectively because they want to earn reputational capital in the market for expert decision-

[2]CEOs can no longer be on nominating committees, but conventional wisdom is that they are still very influential in the nomination process (Coles et al., 2014; Wilson Jr, 2017).

makers (Fama and Jensen, 1983). The seminal work on director co-option, by Coles et al. (2014), demonstrates that *Board Co-option* beats board independence in a statistical horse-race for explanatory power of monitoring effectiveness.[3] These findings cast doubt on the usefulness of board independence as a proxy for monitoring quality, suggesting that previous board monitoring studies need to be readdressed through the lens of *Board Co-option*.[4]

Given its empirical success as a proxy for board monitoring effectiveness, I use *Board Co-option* to estimate the effect of board monitoring quality on a firm's credit quality. Using ordinary least squares estimations, I find that increased *Board Co-option*, i.e., decreased monitoring effectiveness, leads to lower credit ratings and larger credit spreads and CDS spreads. To mitigate the endogeneity concerns that prevent proper identification in many empirical corporate finance studies,[5] I use an instrumental variables approach. The exogenous instrumental variable I use is the death of a non-co-opted director. The death of a non-co-opted director in year $t-1$ causes a positive change in co-option in year t. In other words, non-co-opted director deaths act as exogenous, positive shocks to *Board Co-option*. Using non-co-opted director deaths as an instrumental variable within a generalized method of moments estimation, I find that increased *Board Co-option* leads to an economically and statistically significant decrease in a firm's future credit rating—e.g., a move from a B to a B- rating. Rating changes of this magnitude can have a major impact on a firm's cost of debt (Kisgen and Strahan, 2010).

Motivated by the existing literature, I consider how the relation between board monitor-

[3]Coles et al. (2014) find that as *Board Co-option* increases, CEOs are paid higher salaries, are terminated less frequently, and have more freedom to invest (i.e., empire build), so increased *Board Co-option* causes *decreased* monitoring effectiveness. They conclude that not all independent directors monitor management effectively, as co-opted directors—regardless of their independence—are observed to be less effective monitors.

[4]Other researchers have considered the effect of *Board Co-option* on a firm's investment and payout policies (Chintrakarn et al., 2016; Jiraporn and Lee, 2017), on board meeting frequency (Wilson Jr, 2017), on clawback adoption practices (Huang et al., 2017), on the inclusion of covenants in loan contracts (Lim et al., 2020), and on financial misstatement propensity (Cassell et al., 2018). The empirical evidence from all of these studies suggests that *Board Co-option* is a reasonable empirical proxy of directors' allegiance to management and, hence, their ability and disposition to monitor the CEO effectively.

[5]Endogeneity can result from omitted variables bias, reverse causality, etc., see Coles et al. (2008b, 2012); Roberts and Whited (2013).

ing effectiveness and credit quality differs depending on a firm's leverage ratio. I hypothesize that creditors' negative reactions towards decreased board monitoring effectiveness will be localized in highly levered firms, as these firms have an increased likelihood to default on their debt obligations. Bradley and Chen (2015) find that *increased* board monitoring within highly levered firms leads to an increase in bond yield spreads, as bondholders are exposed to additional risk from these boards setting risky corporate policies. In contrast to this result, I show that *decreased* board monitoring within highly levered firms leads to an increased cost of debt in the form of smaller credit ratings and larger credit and CDS spreads.

The difference between my results and those in Bradley and Chen (2015) could be due to a couple different factors. First, *Board Co-option* has been found to have substantially more explanatory power for board monitoring quality than the more traditionally employed *Board Independence* measure (Coles et al., 2014; Jiraporn and Lee, 2017; Lim et al., 2020), and the correlation between these two measures in my sample is small and negative ($\rho = -0.0961$). That *Board Co-option* is potentially a more incisive proxy for monitoring quality could partially explain the divergence between my results and those in Bradley and Chen (2015), who use *Board Independence* to proxy for monitoring effectiveness. Second, Bradley and Chen (2015) use a sample that ends in 2005, whereas the sample I use covers fiscal years from 2002 to 2016. My main results change very little, however, when I repeat the analysis on a sample that ends in 2005. This suggests that the difference in results is most likely driven by my use of *Board Co-option*, rather than *Board Independence*, to proxy for monitoring quality.

In addition, Bradley and Chen (2015) find that increased monitoring quality leads to greater corporate risk-taking in the two years after the Sarbanes-Oxley Act imposed new director independence regulations. In contrast, I estimate a negative relation between monitoring quality and stock return volatility when I use *Board Co-option* as a proxy for monitoring quality across a wider range of years. These results suggest that poorly monitored

CEOs may also make decisions that increase corporate risk, which potentially explains the negative relation between *Board Co-option* and credit quality among highly levered firms.

To further explore the relation between monitoring effectiveness and credit quality, and the possible mechanisms at play, I consider three other settings in which the effects potentially vary: when over half of the directors are co-opted by the CEO, when boards are not covered by directors' duties laws, and when CEOs have relatively large risk-taking incentives. I find evidence that credit quality is predominantly impacted by changes in *Board Co-option* when co-option surpasses the 50% threshold, where CEOs have effectively captured a majority of the board's votes. In addition, I find that increased *Board Co-option* has a greater effect on credit quality when firms are not covered by directors' duties laws and when CEOs have high compensation convexity. These are settings in which CEOs may be more inclined to pursue riskier investment and operating strategies, so weakened board oversight of the CEO in these settings could lead to increased firm risk, which is costly to creditors. These findings suggest that corporate risk-taking may play a more nuanced role as a mechanism linking board monitoring effectiveness and credit quality than previously thought.

The existing *Board Co-option* literature takes as given the reduced monitoring effectiveness of directors who are elected after the CEO took office. There may exist, however, a richer story as to which type of co-opted directors actually get captured by management. Just as Coles et al. (2014) claim that not all independent directors are, by nature of their independence, effective monitors, it may be the case that not all co-opted directors are equally susceptible to being captured by management. To shed light on this potential heterogeneity, I consider how the relation between co-option and credit quality differs when pre-appointment connections exist between co-opted directors and the CEO. Given the endogenous nature of appointing connected versus non-connected directors to the board, it is very difficult to infer causality between director-CEO connections and board monitoring quality, and previous studies lend support to the existence of both positive and negative effects (Westphal, 1999;

Adams and Ferreira, 2007; Hwang and Kim, 2009; Fracassi and Tate, 2012; Cohen et al., 2012; Fogel et al., 2018).

To explore the interplay between director-CEO connections and director co-option as they relate to a firm's credit quality, I generate two new co-option measures, *Non-Connected Co-option* and *Connected Co-option*. I define *Non-Connected Co-option* (*Connected Co-option*) as the fraction of a firm's directors who are both co-opted and non-connected (connected) to the CEO before their appointment to the board, via previous employment, education, board membership, non-profit participation, and other associations. With these two new measures, I examine whether pre-existing director-CEO connections exacerbate or attenuate the negative relation between director co-option and a firm's credit quality. In four of the six specifications, the effect of *Non-Connected Co-option* on credit quality is significantly greater than the effect of *Connected Co-option*. When specifically considering the effect on credit ratings, the magnitude of the effect is three times as large, representing a unit change in credit rating. These results suggest that co-opted directors with previous connections to the CEO may have an increased ability and disposition to monitor management, relative to their non-co-opted counterparts. It is also possible that director-CEO connections do not improve director monitoring quality but, instead, introduce other benefits—e.g., increased advising quality—that offset the negative effect of *Board Co-option* on credit quality. While Fracassi and Tate (2012) find that director-CEO connections reduce firm value, my results suggest that these connections among co-opted directors may produce benefits for, or at least send positive signals, to creditors.

This paper contributes to the growing literature that uses *Board Co-option* to study the effects of board monitoring quality on corporate outcomes. As the natural turnover of directors on boards will systematically lead to increased levels of *Board Co-option*, there may be an increased need for shareholder activists to elect directors who monitor effectively. Similarly, the negative relation between co-option and credit quality documented in this paper should provide caution in policy discussions about director tenure limits (Mascia, 2016), which could increase the rate at which CEOs are able to co-opt the board. Finally, my findings suggest that the relation between board monitoring effectiveness and corporate risk-taking may be more nuanced than previously thought, and future research would reasonably explore this relation further.

2 Data

The main data used in my empirical analysis come from BoardEx, which provides extensive individual- and board-level information concerning director roles, associations, network connections, and start dates. I obtain firm financial, accounting, and credit ratings data from Compustat, bank loan data from the Loan Pricing Corporation Deal Scan database, and credit default swap data from Markit.

The BoardEx data provides several advantages over the conventional data used in previous studies of co-option, which rely on the ISS (formerly RiskMetrics) data. First, BoardEx covers a broader population of firms, over 8,000 in some fiscal years, whereas the ISS database is limited to firms in the S&P 1,500.[6] BoardEx also includes the exact dates that a director or executive started their role, allowing me to accurately determine whether a director joined the board before or after the sitting CEO took office and, hence, build a precise measure of *Board Co-option*.[7] BoardEx includes comprehensive data concerning the network connections between individuals, and this allows me to determine if directors were connected to the CEO before they were appointed to the board, permitting me to develop my measures of *Non-Connected Co-option* and *Connected Co-option*. Finally, BoardEx includes death dates for deceased directors, and this allows me to construct an instrument that acts as an exogenous shock to *Board Co-option*.

[6]The main results of my empirical tests are qualitatively similar when I restrict my sample to firms in the S&P 1,500.

[7]Researchers who use the ISS data have to impute director start dates.

2.1 *Board Co-option*

Previous research on the effects of board monitoring on credit quality has relied on director independence as a proxy for monitoring effectiveness. Motivated by early research on the benefits of director independence,[8] the New York Stock Exchange (NYSE) claimed, in 2002, that boards with a majority independent directors "[...] will increase the quality of board oversight [i.e., monitoring quality]."[9] In their 2014 Corporate Governance Guide, however, the NYSE claimed that recent empirical evidence concerning the merits of director independence is inconclusive. Coles et al. (2008a), for instance, call into question the empirical foundations for the assertion that a more independent board is a better board. Similarly, the model in Kumar and Sivaramakrishnan (2008) suggests increased independence may decrease the monitoring effectiveness of the board, as less information will be revealed to independent directors. These mixed findings suggest that board independence is a less incisive measure of monitoring effectiveness than thought previously. The shortcomings of the board independence measure has led to a new, more incisive proxy of monitoring effectiveness, *Board Co-option*.

I follow Coles et al. (2014) and calculate the basic measure of *Board Co-option* in a given firm-year as the fraction of directors appointed after the sitting CEO took office over the total number of directors, i.e., *Board Size*. Thus, any director who is elected to the board while a CEO is already in place is considered "co-opted," but once the sitting CEO leaves and another is hired, the existing directors are, by definition, non-co-opted. *Board Co-option*

[8]See, for example, Weisbach (1988), Rosenstein and Wyatt (1990), and Brickley et al. (1994), who study the merits of "outside" directors.

[9]This assertion, alongside the Sarbanes-Oxley Act of 2002 (SOX), led to listing standard changes that mandated majority independent boards and fully independent auditing, nomination, and compensation committees (see NYSE Rule 303A.01). Similar claims were made by the NASDAQ Stock Market, leading to NASDAQ Rule 5605(b)(1). Independence, as defined by NYSE Rule 303A.02(a)(i), states that a director is independent if she "has no material relationship with the listed company (either directly or as a partner, shareholder or officer of an organization that has a relationship with the company)." Board independence requirements have become common elsewhere, including the Shanghai and Shenzhen stock exchanges.

is calculated as follows:

$$\text{Board Co-option} = \frac{\#\text{Co-opted Directors}}{\text{Board Size}}. \quad (1)$$

Board Co-option can range from 0 to 1, with 1 indicating a fully co-opted board and 0 indicating that every board member had already been appointed when the sitting CEO was hired. I classify CEOs as co-opted, as they, *a priori*, have high allegiance towards themselves, so co-option never equals 0 in any firm-year in the data sample where a CEO is in place.[10]

I make several improvements to estimating *Board Co-option*, beyond what previous studies have considered. First, I use board voting analytics data, provided by Institutional Shareholder Services (ISS), to identify instances in which directors are placed onto the board through shareholder activism efforts. These "watch-dog" directors are not likely to be captured by management, so they are classified as non-co-opted, regardless of when they were appointed to the board relative to the sitting CEO. Similarly, this data allows me to identify directors who were specifically nominated by management. These directors maintain a co-opted classification throughout their tenure on the board, as their ties to management likely extend beyond the CEO alone. I also classify inside directors, e.g., vice presidents, c-level executives, presidents, etc., as co-opted throughout their tenure on the board. While these adjustments seem intuitive, they have not been made in previous studies that use the *Board Co-option* measure. Across all firm-years in my sample, the average level of *Board Co-option* is 54.7%.

Previous research suggests that more tenured board members have greater influence than less-tenured directors (Huang, 2013), so Coles et al. (2014) employ an alternative, "tenure-weighted (TW)," measure of co-option as well. *TW Co-option* is calculated by dividing the sum of the tenure of co-opted directors by the total tenure of all directors on the board. The authors also use *Residual TW Co-option*, to remove the positive correlation between CEO

[10]Firm-years in which no CEO is identifiable are removed from the sample.

tenure and co-option. This is measured as the residuals from a regression of *TW Co-option* on *CEO tenure*.[11] Additional concerns can be raised that CEO-turnover events could play a role in driving some of the estimated effects. To alleviate this concern, I run additional empirical tests removing firm-years in which a new CEO is in place, one with tenure less than two years. My results are robust to this adjustment.

2.2 Non-Connected Co-option and Connected Co-option

To proxy for allegiance that can result from director-CEO connections, I consider five types of pre-appointment connections between directors and CEOs: education, non-profit organizations, listed organizations, unlisted organizations, and other. For example, a director is classified as having a pre-appointment listed-organization connection to the CEO if the two have a documented BoardEx association of the type "Listed Organization" with overlap years before the director's start date on the board. The variable *Connected* is set to one if a director has a pre-appointment connection to the CEO through any one of these five association types. This allows me to construct a measure of firm-year *Connected Co-option*, i.e., the fraction of the board that is both connected (pre-appointed) to the CEO and co-opted. It also allows me to construct a measure of firm-year *Non-Connected Co-option*, i.e., the fraction of the board that is both not connected (pre-appointment) to the CEO and co-opted. Across all firm-years in my sample, the average level of *Connected Co-option* is 17.2% (45,723 director-firm-year obs.), and the average level of *Connected Non-Co-option* is 7.4% (19,671 director-firm-year obs.), meaning the average ratio of connected directors to total directors is 24.6%. The average level of *Non-Connected Co-option* is 37.4% (99,421 director-firm-year obs.), and the average level of *Non-Connected Non-Co-option* is 38.0% (101,015 director-firm-year obs.).

[11] My main results are qualitatively similar when using these alternative measures and whether or not improvements are made in determining which directors are classified as co-opted.

2.3 Standard and Poor's Credit Ratings

Using ratings data from Compustat, I follow Bradley and Chen (2011) and collapse the S&P Long Term Domestic Issuer Credit Ratings into seven categories, with AA+ or higher firms receiving a 7 and CCC+ or lower firms receiving a 1. I use a similar procedure to numerically categorize the three other ratings provided by Compustat: the S&P Domestic Short Term Issuer Credit Ratings; the S&P Subordinated Debt Ratings; and the S&P Current Quality Rankings.[12] I then average across these four ratings to arrive at a single, firm-year *Credit Rating*. Taking this aggregated approach gives me the greatest coverage across firms in the sample, and it provides a more holistic view of how the market perceives the firm's credit quality.[13] The minimum *Credit Rating* observed in the data is 1, the maximum is 7, and the full sample mean value is 2.87, which is approximately a B+ rating.

2.4 Deal Scan Credit Spreads

To capture credit spreads, I retrieve bank loan interest rates from the Loan Pricing Corp. Deal Scan database, which provides information regarding the spreads, covenants, fees, sizes, and maturities of loans made by many commercial banks to businesses. In the database, the spread, or loan cost, is called the all-in-spread (hereafter AISD), which generally consists of a floating interest rate and relevant fees. The AISD is the amount the borrower pays in basis points over LIBOR for each dollar drawn down. It adds the spread of the loan with any annual (or facility) fee paid to the bank group. Fields et al. (2012) attenuate possible simultaneity problems by assessing the relation between board characteristics in year t and loan spreads in year $t + 1$, so I analyze the effects of co-option on a firm's future credit quality. In my statistical analysis, I use the natural logarithm of a firm's AISD. The AISD

[12] This ranking proxies for Graham & Dodd's sustainable earnings power (Dodd and Graham, 1951), which captures the long-term growth and stability of a firm's earnings.

[13] My main results are qualitatively similar if I use these ratings variables individually, instead of as an average of the four.

takes an average value of 164.55 basis points. The number of firms in my sample that receive bank loans is substantially smaller than those that have credit ratings, so the sample sizes are much smaller when performing empirical analyses of bank loan spreads.[14]

2.5 Markit Credit Default Swap Spreads

To further estimate firms' credit spreads, I use credit default swap (CDS) spread data from Markit. Specifically, I use the five-year spread measure for each available firm-year. In my statistical analysis, I use the natural logarithm of a firm's five-year CDS spread. The average CDS spread in my sample is 161.57 basis points. Reliably matching this data with observations in my main dataset resulted in a relatively small sample size, though it is similar to the bank loan sample size.

2.6 Summary Statistics

Table 1 displays summary statistics of yearly credit ratings, credit spreads, CDS spreads, co-option levels, governance and board characteristics, and financial variables. BoardEx pulls data from a large sample of firms, leaving me with over 30,000 firm-year observations in my baseline analysis, ranging from fiscal year 2002 to fiscal year 2016. With this wealth of data, I break up the summary statistics into quartiles of total assets to assess whether *Board Co-option* and *Connected Co-option* levels differ across firm size. For instance, the average levels of *Board Co-option* between the smallest (0.57) and largest (0.51) quartiles of firm size are statistically different from one another at the 1% level.

While my sample size is larger than that used in previous studies of co-option, the mean and standard deviation values of board composition variables like *Board Size*, *Board Co-*

[14] Berg et al. (2016) introduce a total-cost-of-borrowing measure (TCB), which includes various fees charged by lenders. Their measure is arguably a more complete measure of a firm's total cost of borrowing in the loan market. My loan spread results are very similar when I use TCB instead of AISD to capture loan spreads, though my sample size shrinks when I use the TCB measure proposed by Berg et al. (2016).

option, and *Board Independence* are similar to those in other research (Coles et al., 2014; Chintrakarn et al., 2016; Withisuphakorn and Jiraporn, 2016). This is especially true when considering organizations in the top two quartiles of firm size, as these closely represent the S&P 1,500 firms studied previously. *Credit Rating* increases monotonically in firm size. Levels of *Board Co-option*—a proxy of poor monitoring quality—generally decrease in firm size, whereas *Board Independence*—a proxy of good monitoring quality—increases as firms get larger. To account for these correlations with firm size, I control for firm size, using the log of a firm's total assets, in all of my empirical tests. To attenuate the influence of extreme outliers, I winsorize accounting control variables at the 1.0% and 99.0% levels, though Table 1 reports unwinsorized averages.

3 Methodology & Results

In this section I describe the methodologies used to estimate the relation between board monitoring effectiveness and credit quality, and I report the general results.

3.1 Ordinary Least Squares Estimation

Preliminary analysis relies on ordinary least squares regressions on a panel of firm-year co-option and credit quality data. I include year and industry fixed-effects to capture heterogeneity across firms and industries (Petersen, 2009),[15] and I cluster standard errors at the firm level. To measure the relation between increased *Board Co-option*, i.e., decreased monitoring quality, and a firm's credit ratings, credit spreads, and CDS spreads, I estimate

[15] As within-firm *Credit Rating* is a fairly static variable across years, and as some firms only exist in the sample for a single year, there is not enough variation to justify the use of firm fixed effects.

the following specification:

$$\begin{aligned}\text{Credit}_{i,t} = \beta_0 + \beta_1\text{Board Co-option}_{i,t} + \beta_2\text{Board Independence}_{i,t} \\ + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},\end{aligned} \tag{2}$$

where *Credit* can be either the *Credit Rating*, *Credit Spread* (the logarithm of bank loan spreads), or *CDS Spread* (the logarithm of CDS spreads) at times $t+1$ or $t+2$; *Board Co-option* is the main regressor of interest; *Board Independence*,[16] *CEO Chair*, and *CEO Tenure* are controls for independence (the fraction of the board that is composed of independent directors), CEO chair (equal to one if the CEO is also the chair of the board, and zero otherwise), and CEO tenure (in years), respectively; $X_{i,t}$ is a matrix of financial and board controls;[17] γ_t and ψ_j denote year and industry fixed effects, respectively; and $\varepsilon_{i,t}$ is an idiosyncratic error term.

Table 2 documents a negative relation between *Board Co-option* and a firm's future credit ratings. This relation exists at both times $t+1$ (Column (1)) and $t+2$ (Column (2)). The magnitudes of the point estimates, -0.391 and -0.393, respectively, suggest that a shift from a completely non-co-opted board to a fully co-opted board would lead to a unit change in credit rating, e.g., a downgrade from an A to an A-. To put such a downgrade into perspective, Volkswagen AG's credit rating was downgraded from an A to an A- in the wake of their emissions scandal in 2015.[18] This is evidence that credit rating agencies perceive an increase in the fraction of captured directors as a reduction in a board's oversight of management, possibly exposing firms to higher default risk.

Columns (3)–(4) of Table 2 show that increased *Board Co-option* is associated with an

[16]Removing *Board Independence* from the regression equation does not change the empirical results, confirming the assertion of Coles et al. (2014) that *Board Co-option* has more explanatory power for monitoring effectiveness than does *Board Independence*.

[17]These controls include *Board Size*, the board's *Frac. Male Dir.*, *Firm Size*, *Return on Assets*, *Yearly Return*, and *Leverage*.

[18]Rating downgrades can have substantial effects on firm value. For example, Avramov et al. (2009) find that low-rated firms experience significant negative returns when their ratings are downgraded.

11%–14% increase in future credit spreads.[19] This suggests that banks perceive an increase in the fraction of captured directors as a reduction in a board's monitoring quality, which possibly exposes them to greater default risk and means the banks have to devote more resources to monitoring the firms themselves. Finally, Columns (5)–(6) show a positive relation between co-option and CDS spreads. Taken together, these results suggest that rating agencies, financial institutions, and creditors respond to decreased board monitoring quality by issuing relatively low credit ratings and charging relatively high credit spreads.

While the use of industry and year fixed effects is a helpful empirical tactic, endogeneity through, for example, omitted variables bias, could still be a problem, as is often the case in empirical corporate finance research (Coles et al., 2008b, 2012).[20] I seek to more precisely identify the effect of board monitoring on a firm's credit quality in the following section using an instrumental variables estimation.

3.2 Instrumenting with Director Deaths

A potentially precise source of identification is the use of an instrumental variable within a generalized method of moments estimation. This methodology overcomes the endogeneity concerns of fixed effects estimations and allows me to identify the existence of a causal relation between board monitoring effectiveness and a firm's credit quality.[21] The exogenous instrumental variable I use is the death of a non-co-opted director. I use the BoardEx variable *dod*, "date of death," to determine the exact death date of a deceased director. Importantly, I identify which deceased directors were *not* co-opted at the time of their death because these firms would then have experienced an exogenous shock to *Board Co-option*

[19]When I use the total-cost-of-borrowing measure (TCB) proposed by Berg et al. (2016), instead of the AISD, the range of these point estimates is 17%–21%.

[20]The models used in this section include year and industry fixed effects, effectively controlling for omitted variables that are industry-specific and time-invariant. The inclusion of these fixed effects does not, however, control for omitted variables that are time-varying or not industry-specific. If such variables exist, the error terms will be correlated with co-option and the interpretation of my results will be invalid.

[21]Generalized method of moments (GMM) is used, as opposed to two-stage least squares, as Baum et al. (2003) find GMM to be more efficient if heteroskedasticity exists.

when they subsequently elected a new director. Table 3 provides evidence that the death of a non-co-opted director in year $t-1$ results in an increase in *Board Co-option* in the following year—i.e., the deceased non-co-opted director has been replaced by a co-opted director.[22]

The proposed instrument, the death of a non-co-opted director in year $t-1$, is positively correlated with a firm's change in co-option in year t. This association can be seen by performing an ordinary least squares regression of a firm's change in co-option in year t on a binary indicator variable, *Non-Co-opted Director Death*, that equals one if a non-co-opted director died in the previous year, and zero otherwise. This constitutes the first stage regression of the GMM-IV procedure, which I estimate using the following equation:

$$\begin{aligned}\Delta\text{Co-option}_{i,t} = \beta_0 + \beta_1 \mathbb{1}(\text{Non-Co-opted Director Death})_{i,t-1} \\ + \beta_2 \text{Board Independence}_{i,t} + \beta_3 \text{CEO Chair}_{i,t} \\ + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},\end{aligned} \tag{3}$$

where i represents a firm, t is the fiscal year, $X_{i,t}$ represents financial and board control variables, γ_t is year fixed effects, ψ_j is industry fixed effects, and $\varepsilon_{i,t}$ is an idiosyncratic error term. Column (1) in Table 4 shows that non-co-opted deaths are positively related to a firm's subsequent change in *Board Co-option*. This effect is statistically significant at the 1% level. The Cragg-Donald F-statistics, reported at the bottom of the table, suggest that the proposed instrument is relevant and strong.[23]

[22]The table shows that of the 551 director deaths recorded in the sample period, 158 were co-opted directors and 393 were non-co-opted directors. When a director dies, *Board Co-option* in the subsequent year increases, on average, by 6.6 percentage points. If the deceased director is co-opted, *Board Co-option* decreases in the subsequent year by 3.3 percentage points (i.e., occasionally the deceased director is not immediately replaced). If the deceased director is non-co-opted, *Board Co-option* increases in the subsequent year by 10.6 percentage points. Figure 1 presents the density graphs of level changes in *Board Co-option* after the death of a co-opted director (dotted line) and a non-co-opted director (solid line).

[23]The rule of thumb proposed by Staiger and Stock (1994) suggests that instruments should be considered weak if the F-statistic is less than ten. Stock and Yogo (2005) propose various critical values that should be considered in determining the strength of the instrument. The Cragg-Donald F-statistics, alongside the Stock-Yogo critical values, are reported at the bottom of Table 4. In all specifications, the F-statistics exceed the threshold of 10.0, proposed by Staiger and Stock (1994), and the threshold of 16.38, proposed by Stock and Yogo (2005). I also preform a test for endogeneity that is similar to the Hausman Test (Hausman, 1978)

I then use the predicted values from the estimations of Equation (3), Δ*Co-option (Pred.)*, to estimate the causal effect of a change in co-option on the firm's future changes in credit quality. I estimate the second stage regression with the following equation:

$$\begin{aligned}\%\Delta\text{Credit}_{i,t} &= \beta_0 + \beta_1(\Delta\text{Co-option (Pred.)})_{i,t} + \beta_2\text{Board Independence}_{i,t} \\ &+ \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t}.\end{aligned} \tag{4}$$

The results of these second stage regressions are reported in Columns (2)–(7) of Table 4. Columns (2)–(4) consider the percent change in a firm's credit rating at time $t+1$, whereas Columns (5)–(7) consider the percent change in a firm's credit rating at time $t+2$. Columns (3) and (6) and Columns (4) and (7) restrict the sample to firms with below and above median leverage ratios, respectively, and these results are discussed in Section 3.4. Column (5) shows that exogenous, positive changes in *Board Co-option* that stem from the death of a non-co-opted director cause an economically and statistically significant decrease in a firm's *Credit Rating* at time $t + 2$. The point estimate of -0.051 can be interpreted as a 5% decrease in future credit rating. For a firm with an average rating of 2.87, about a B+ rating, this downgrade would lead to a credit rating of 2.73, which is near the threshold of a B rating. Column (2) shows a negative relation between changes in co-option and changes in credit rating at time $t+1$, but the coefficient is not precisely estimated.[24] Taken together, the results of these instrumental variables estimations show that the death of a non-co-opted director increases *Board Co-option*, and this positive shock to co-option causes a decrease in future credit quality for the firm.[25]

but that accounts for violations of conditional homoskedasticity.

[24]One might wonder how changes in *Board Co-option* affect a firm's credit quality when a co-opted, rather than a non-co-opted, director dies. The death of a co-opted director in year $t-1$ leads to a *decrease* in co-option in year t. The predicted values of these changes in *Board Co-option* are not, however, associated with a meaningful decrease in credit quality. The results from this exercise are presented in Table A.1 in the Appendix. The null results from instrumenting with co-opted director deaths suggests that the changes in credit quality observed when instrumenting with non-co-opted director deaths can be attributed to changes in board quality, and not simply from the death of a director. This provides support that the exclusion requirement of instrumental variables is satisfied in this setting.

[25]Running this instrumental variables procedure on the *Credit Spread* and *CDS Spread* data does not

3.3 Difference-in-Differences Estimation

To provide an additional empirical approach to reduce concerns that my results are driven by the endogenous structure of corporate boards, I conduct difference-in-differences estimations. In November of 2003, both the NYSE and NASDAQ amended their listing standards to require listed firms to have boards composed of at least 50% independent directors. These regulatory changes to board independence also acted as shocks to *Board Co-option*. Listed firms that were not in compliance with the new NYSE and NASDAQ listing standards were, in order to achieve at least 50% board independence, required to either (1) replace some affiliated (inside or gray) directors with independent directors, (2) terminate some affiliated directors, or (3) increase board size and appoint more independent directors. Option (1) could increase *Board Co-option* if the replaced affiliated directors were not previously co-opted. Option (2) could also increase the fraction of co-opted directors, depending on whether or not the terminated affiliated directors were co-opted or not. Option (3) would unambiguously increase *Board Co-option* as newly appointed (and therefore co-opted) directors joined the board.

Given that SOX and the NYSE/NASDAQ listing standard changes facilitated a quasi-exogenous shock to *Board Co-option* for non-compliant firms, I use these reforms to test the effects of co-option on a firm's credit rating and credit and CDS spreads. The empirical model follows a standard difference-in-differences methodology, but it allows for the possibility that SOX and the associated listing standard changes had a direct effect on a firm's credit quality. As described in Coles et al. (2014), the "clean" effect of co-option on the variable of interest—in this case, credit quality—is isolated by summing up coefficients β_1, β_3, and β_4 from the specification below (this makes the approach distinct from that in Gormley and

allow for reliable estimation, as those sample sizes are much smaller and, as a consequence, severely limit the number of non-co-opted director deaths that can be used as instruments. I perform these tests and compile the results into Tables A.2, for *Credit Spreads*, and A.3, for *CDS Spreads*, in the Appendix.

Matsa (2014)):[26]

$$
\begin{aligned}
\text{Credit}_{i,t} = \beta_0 + \beta_1\text{Co-option}_{i,t} + \beta_2\text{Post} \times \text{Co-option}_{i,t} \\
+ \beta_3\text{Noncompliant} \times \text{Co-option}_{i,t} \\
+ \beta_4\text{Post} \times \text{Noncompliant} \times \text{Co-option}_{i,t} + \beta_5\text{Post}_{i,t} \\
+ \beta_6\text{Noncompliant}_{i,t} + \beta\text{X}_{i,t} + \varepsilon_{i,t},
\end{aligned} \tag{5}
$$

where: *Credit* can be either the *Credit Rating*, *Credit Spread*, or *CDS Spread* at times $t+1$ or $t+2$; *Co-option* denotes *Board Co-option*; *Post* is an indicator variable that equals one if the firm-year observation is in the post-treatment period, 2005–2007, and zero otherwise.[27] *Noncompliant* is an indicator variable that equals one if the firm was non-compliant—i.e., did not have at least 50% board independence—in either 2002 or 2003, and 0 otherwise. The controls, in matrix $X_{i,t}$, include the previously used control variables, year fixed effects, industry fixed effects, and the interactions of all the control variables with the three key dummy variables: *Post*; *Noncompliant*; and *Post*×*Noncompliant*. $\varepsilon_{i,t}$ is an idiosyncratic error term. Table 5 shows the output of these difference-in-differences estimations. Column (1) reproduces the results from Table 2. Column (2) displays the corresponding "clean effects" from the difference-in-differences estimations. The estimates in Column (2) suggest that increased *Board Co-option* has a negative effect on a firm's credit rating and a positive effect on a firm's credit and CDS spreads.[28]

[26]Coles et al. (2014) make specific assumptions regarding the estimation bias that different types of firms are subjected to. They allow this bias to differ across compliant and non-compliant firms in the pre-SOX period, but they restrict the bias of compliant firms to be the same in both the pre- and post-SOX periods. Because of the strictness of these assumptions, I mainly focus on the inference drawn from the instrumental variables and ordinary least squares analyses.

[27]The implementation of the new listing standards took place throughout 2004, so I omit this year. The results are similar when different post-treatment estimation windows are used and if 2004 is included in the post-treatment period.

[28]The relatively large standard errors produced from these difference-in-differences estimations is likely due to the small sample used, as only two years of pre-SOX data are available when using BoardEx data.

3.4 The Relation Among Highly Levered Firms

Bradley and Chen (2015) find a heterogeneous effect of *Board Independence* on a firm's cost of debt across leverage levels. Specifically, they show that independent boards are associated with higher bond yield spreads when the firm is highly levered, and they attribute this relation to the increased risk-taking that independent boards impose on corporate strategy.[29] Motivated by their work, I investigate whether rating agencies and creditors respond to *Board Co-option* differently depending on the leverage ratio of firms. Table 6 reports results from the same specifications used to populate Table 2, but split across subsets of a firm's leverage ratio (a firm's long-term debt and current liabilities divided by the sum of its long-term debt, current liabilities, and market value).

Panel A shows a negative, significant relation between *Board Co-option* and a firm's $\textit{Credit Rating}_{t+2}$ at all but the lowest quartile of leverage ratios. This may be due to the fact that firms with little debt do not make a substantial impact in the fixed income securities market and, hence, do not require much attention from rating agencies and creditors. Panel B shows that the positive impact of co-option on a firm's $\textit{Credit Spread}_{t+2}$ is driven solely by highly levered firms.[30] Similarly, Panel C shows that the positive relation between *Board Co-option* and $\textit{CDS Spread}_{t+2}$ is localized in the most levered firms. Across all three measures of credit quality, the point estimates on *Board Co-option* are between 2.6 and 11.1 times larger in magnitude when considering firms with leverage ratios in the top quartile relative to firms with leverage ratios in the bottom quartile.[31]

I also investigate this heterogeneous effect using my instrumental variables approach.

[29] I also consider the effect of increased *Board Co-option* on the offering yields, gross spreads, and treasury spreads of a firm's yearly bond issuance with the longest duration and highest offering amount. This empirical exercise yields a very small sample of issuing firms, preventing me from cutting the data on leverage ratios and from implementing my instrumental variables approach. I do find, however, a positive relation between *Board Co-option* and the yields and spreads on corporate bonds, suggesting that bondholders require greater returns from firms with relatively low board monitoring effectiveness. I report these ordinary least squares results in Table A.4 in the Appendix.

[30] Results are similar when using the total-cost-of-borrowing measure.

[31] For brevity, only results at time $t+2$ are displayed in Table 6. The results are qualitatively similar, however, when considering the time $t+1$ values of the dependent variables.

Column (7) of Table 4 shows that the relation between decreased monitoring quality and decreased credit ratings is localized in highly levered firms. This estimate is statistically significant and larger in magnitude than the estimate in Column (5), whereas the estimate in Column (6) is insignificant and smaller in magnitude than the estimate in Column (5). The point estimate in Column (7) implies that a unit change in *Board Co-option* causes a 9.7% reduction in a firm's future credit rating. For a firm with a relatively average credit rating of 3, a 9.7% reduction would drop the firm's rating to 2.71, which corresponds to a move from a BB- to a B+.

While Bradley and Chen (2015) find that, when leverage is high, increased debt costs are driven by *better* board monitoring, I find the opposite, namely that increased debt costs are driven by *worse* board monitoring. This divergence in results could be attributed to two differences between the studies. First, Bradley and Chen (2015) use *Board Independence* to proxy for monitoring quality, whereas I use *Board Co-option*. The correlation between the two measures in my sample is small and negative ($\rho = -0.0961$), and *Board Co-option* has been argued to have more explanatory power for monitoring effectiveness. Second, Bradley and Chen (2015) use SOX as a quasi-natural experiment to study the effects of *Board Independence*. As such, their sample ends in 2005, whereas the sample I use covers fiscal years from 2002 to 2016, where the post-SOX regulations make *Board Independence* fairly static within and across firms.[32] If I repeat my main analysis on data that stops in 2005, my main results are qualitatively similar, albeit the standard errors increase due to lower observational power. This suggests that the difference in results is most likely driven by my use of *Board Co-option*, rather than *Board Independence*, to proxy for monitoring quality.

[32]Since the change in listing standards forced corporate boards to have a majority of independent directors and fully independent key committees, within-firm and cross-sectional variation in independent director ratios is quite limited. Since 2002, over 75% of firms in my sample have a standard deviation of board independence that is less than 10%, with the average firm having a standard deviation of board independence that is less than 7%. This lack of variation suggests that board independence is an ineffective proxy for monitoring quality, which is likely to vary within firms over time and in the cross-section of firms.

Furthermore, Bradley and Chen (2015) propose that the reason increased board monitoring might be *worse* for creditors is because increased board monitoring may result in increased risk-taking, whereas decreased board monitoring should result in decreased risk-taking (which creditors prefer). I consider this potential mechanism in Section 3.5, and I do not find evidence that decreased monitoring leads to decreased risk-taking. In fact, I find the opposite relation—i.e., increased *Board Co-option* (decreased board monitoring quality) is associated with increased corporate risk.

3.5 Monitoring Effectiveness, Corporate Risk, and Earnings Management

The ex ante ambiguity behind the relation between board monitoring effectiveness and credit quality stems, in part, from opposing exposure to default risk. On the one hand, an increase in monitoring effectiveness can lead to increased corporate risk-taking, which is costly to creditors (Bradley and Chen, 2011, 2015). On the other hand, increased monitoring quality is associated with less earnings management (Xie et al., 2003; Faleye et al., 2011). This reduction in earnings management allows creditors to better assess a borrower's risk profile (Smith and Stulz, 1985; Barton, 2001; Burgstahler et al., 2006). So while effective board monitoring can make a firm's risk profile more transparent through reduced earnings management, it may also lead to increased corporate risk-taking and more aggressive operating strategies. In this section, I empirically estimate the relation between monitoring quality and corporate risk and between monitoring quality and earnings management to assess whether these mechanisms are present.

Using similar ordinary least squares regressions as I used in Section 3.1, I estimate the relation between *Board Co-option* and a firm's *Cash Flow Volatility* and *Return Volatility*—proxies for corporate risk (Babenko et al., 2019)—and the relation between *Board Co-option* and *Earnings Management*. *Cash Flow Volatility* is measured as the standard deviation of a firm's yearly cash flow over the subsequent five years. *Return Volatility* is measured as the standard deviation of daily stock returns throughout the fiscal year. *Earnings Management* is measured as the absolute value of accruals divided by the absolute value of a firm's operating cash flow (Leuz et al., 2003).

The results displayed in Table 7 show that, at times t and $t+1$, *Cash Flow Volatility* is not significantly associated with *Board Co-option*. *Return Volatility*, however, increases in *Board Co-option* at both time periods, and the relation is precisely estimated. This finding is somewhat at odds with the results of Bradley and Chen (2011, 2015), who suggest that decreased monitoring effectiveness leads to less corporate risk. My results, in contrast, imply that poorly monitored CEOs may make decisions that *increase* corporate risk, which partially explains the negative relation between co-option and credit quality that I estimate. Columns (5) and (6) of Table 7 show that the relation between *Board Co-option* and *Earnings Management* is positive, which aligns with previous research, but the coefficients are not precisely estimated. My findings suggest that the effect of board monitoring quality on corporate risk-taking potentially differs from what previous research has found.[33]

4 Additional Analysis

Next I explore the sensitivity of the results within different subsamples of the data in which creditors may be more or less likely to respond to changes in *Board Co-option*. First, I consider the importance of CEOs co-opting at least 50% of the directors, as this level of co-option has important implications for board voting outcomes when decisions are made by majority rule. Next, I investigate how directors' duties laws and CEO risk-taking incentives affect my main results. Finally, I generate and test new co-option measures based on director-

[33] As shown in Table A.5, I do not find a significant causal relation between decreased board monitoring quality and firm risk when applying my instrumental variables estimation, as neither *Cash Flow Volatility* nor *Return Volatility* significantly change in the wake of an exogenous increase in *Board Co-option*. Similarly, I do not identify a significant association between *Board Co-option* and *Earnings Management*. The insignificant relation between co-option and firm risk estimated using instrumental variables estimations provides a partial explanation for the divergence between my findings and those of previous research.

CEO connections.

4.1 Co-opting Over Half the Board

Among boards in which voting decisions are determined by majority rule, meaning 50% or more, a CEO must have the allegiance of at least half of the directors in order for the board to be truly co-opted. Because of this, a firm's credit quality is less likely to be negatively correlated with low levels of co-option—e.g., below 50%—than with high levels of co-option. Interacting this prediction with my previous finding that the observed relation between co-option and credit quality is localized among highly levered firms, I predict that the negative relation between co-option and credit quality will be driven by highly levered firms with co-option that is above 50%. To test this prediction, I create indicator variables for each firm-year to classify a firm's board as having a level of *Board Co-option* in one of the four quartiles: 0–25%, 25–50%, 50–75%, or 75–100%. I estimate the impact of a firm's level of *Board Co-option* relative to a baseline level of 0–25% by estimating the following equation using OLS:

$$\begin{aligned}\text{Credit}_{i,t} = \beta_0 + \beta_1(\text{25–50\% Co-option})_{i,t} + \beta_2(\text{50–75\% Co-option})_{i,t} \\ + \beta_3(\text{75–100\% Co-option})_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},\end{aligned} \tag{6}$$

where *Credit* can be either the *Credit Rating*, *Credit Spread* (the logarithm of bank loan spreads), or *CDS Spread* (the logarithm of CDS spreads) at times $t+1$ or $t+2$. *Co-option* denotes *Board Co-option.* The controls, in matrix $X_{i,t}$, include the same control variables used in the initial OLS models; year fixed effects are represented by γ_t; ψ_j denotes industry fixed effects; and $\varepsilon_{i,t}$ is an idiosyncratic error term. For a given dependent variable, I run this specification multiple times, within subsets of leverage ratios, as done to populate Table 6.

Table 8 shows evidence of a negative and statistically significant relation between *Board*

Co-option and a firm's credit quality when, and only when, co-option is greater than 50% and leverage is high. The relation holds at times $t+1$ and $t+2$, though only the results for time $t+2$ are displayed. Panel A of Table 8 shows that firms with 25–50% or 50–75% co-option do not realize a significant decrease in *Credit Rating* relative to firms with 0–25% co-option. Firms with co-option in the top quartile of co-option, however, realize significant decreases in credit ratings relative to firms with co-option in the 0–25% quartile. As expected, this result does not come through when leverage is low, suggesting, again, that creditors do not react significantly to perceptions of poor board monitoring quality when firms have low leverage ratios. Similarly, Panels B and C show that firms with 25–50% co-option do not realize a significant increase in *Credit Spread* and *CDS Spread*, respectively, relative to firms with 0–25% co-option. In sum, these results suggest that increased co-option is generally not perceived as detrimental to a board's ability and disposition to monitor management until co-option surpasses the 50% threshold, where CEOs have effectively captured a majority of the board's votes. Furthermore, creditors appear to disregard variation in levels of board monitoring effectiveness among firms with low leverage, likely because these firms pose low default risk.

4.2 Directors' Duties Laws and CEO Risk-Taking Incentives

To further explore the relation between *Board Co-option* and a firm's credit quality, I consider two settings in which the effects are likely to be more pronounced: among firms that are not covered by directors' duties laws and among firms that reward CEOs for taking risks. Previous research finds that firms that are covered by directors' duties laws and other anti-takeover provisions enjoy less expensive debt financing costs (Klock et al., 2005; Cremers et al., 2007; Waisman, 2013; Paligorova and Yang, 2014; Gao et al., 2020), potentially because anti-takeover provisions allow firms to pursue less risky investments (e.g., reduced innovation (Atanassov, 2013)) and because of the decreased likelihood of asset substitution concerns

(Chava et al., 2009).[34] I categorize firms as being covered by directors' duties laws based on the firm's state of incorporation and using the law adoption dates reported in Karpoff and Wittry (2018).[35] I focus on directors' duties laws, as these provide the most explicit protection for directors, whereas the other most common anti-takeover provisions—control share acquisition laws, business combination laws, fair price laws, and poison pill laws—lead to many of the same outcomes, e.g., reduced innovation, but are less explicit in their protection of directors.[36]

As the cost of debt appears to decrease in states covered by directors' duties laws (henceforth, DDL states), one would expect the negative effects of *Board Co-option* on credit quality to be most pronounced in non-DDL states, where risky investment policies are more common. I find some evidence in support of this prediction in Panel A of Table 9. To determine whether the effects of *Board Co-option* on credit quality among firms in non-DDL states and DDL states are significantly different, I estimate a variation of Equation (2) that includes an indicator variable for a firm being in a non-DDL state, *Non-DDL State*, and the interaction between *Board Co-option* and *Non-DDL State*. The negative coefficient on *(Board Co-option x Non-DDL State)* in Column (1) and the positive coefficients in Columns (4) and (7) suggest that increased *Board Co-option* has a stronger deleterious effect on a firm's credit quality if the firm is not covered by directors' duties laws. This effect is statistically significant at the 1% level in Column (4). As shown in Section 3.4, the effect of *Board Co-option* on credit quality is most pronounced in highly levered firms, and I show that this finding also exists when considering the interaction between co-option and directors' duties

[34]One potential reason that directors' duties laws and *Board Co-option* have opposite effects on a firm's cost of debt is that the former insulates directors from shareholder litigation, allowing them to pass over risky investment/M&A opportunities, while the latter leads to wasteful corporate resource allocation via overpaying CEOs and reduced CEO-performance turnover sensitivity (Coles et al., 2014).

[35]Other papers have considered the effect of law changes on other corporate outcomes (Becker and Strömberg, 2012; Chen et al., forthcoming).

[36]My results are qualitatively similar, however, if I use either a binary indicator to capture the adoption of *any* of these five anti-takeover provision laws or if I use a discrete variable that takes the sum of the anti-takeover provisions adopted within a given state.

laws. For example, Columns (5) and (6) show that the interactive effect of *(Board Co-option x Non-DDL State)* on a firm's credit spreads is statistically significant among firms with high leverage, but insignificant among less levered firms.

As creditors appear to react negatively to increases in *Board Co-option* and risky business decisions (Myers, 1977), one would expect the negative relation between *Board Co-option* and a firm's credit quality to be accentuated when firms are managed by CEOs with relatively strong incentives to take risks. To proxy for CEO risk-taking incentives, I use CEO vega. CEO vega captures the sensitivity of a CEO's wealth to changes in a firm's stock return volatility.[37] Increased compensation convexity (CEO vega) can motivate risk-averse managers to pursue risky operating and investment strategies (Guay, 1999). It is important to note, however, that the relation between CEO vega and firm risk-taking is both theoretically and empirically mixed (Carpenter, 2000; Ross, 2004; Brick et al., 2012).

Panel B of Table 9 provides evidence that increased *Board Co-option* has a stronger effect on a firm's credit quality when CEO vega is high. I estimate a variation of Equation (2) that includes an indicator variable for a firm having above median CEO vega, *High Vega*, and the interaction between *Board Co-option* and *High Vega*. The negative coefficient on *(Board Co-option x High Vega)* in Column (1) and the positive coefficients in Columns (4) and (7) suggest that increased *Board Co-option* is more of a concern to creditors when CEOs have relatively strong risk-taking incentives. These effects are statistically significant at the 1% and 10% levels in Columns (1) and (4), respectively. When splitting the results by firm leverage ratio, I find that the magnitudes of the point estimates are larger (though not significantly different) among highly levered firms relative to less levered firms. Taken together, the results in Table 9 indicate that increased *Board Co-option* is even more concerning to creditors when firms are not covered by directors' duties laws and when CEOs have strong

[37]CEO vega is computed as the dollar change in the expected value of the CEO's portfolio of accumulated stock and options awards net of dispositions to a 1% change in the annualized standard deviation of the stock returns of that firm. I thank Lalitha Naveen for making these data available: https://sites.temple.edu/lnaveen/data/.

incentives to take risks. These findings provide further evidence that increased risk-taking may be one of the mechanisms underlying the negative relation between *Board Co-option* and credit quality.

4.3 Co-option and Director-CEO Connections

I finish by considering how the relation between co-option and credit quality differs when pre-appointment connections exist between co-opted directors and the CEO. As director appointments are endogenously determined, it is difficult to infer causality between director-CEO connections and board monitoring quality, and the extant literature provides evidence of both a positive and a negative relation. Hwang and Kim (2009), for instance, find that directors with pre-appointment similarities to management—e.g., both served in the military—pay their CEOs higher salaries than do directors without such connections.[38] Similarly, Cohen et al. (2012) show that firms with management-sympathetic directors—i.e., prior sell-side analysts who actively covered the firm—increase earnings management activities and pay their CEOs larger salaries. Other research, however, suggests that pre-appointment connections between directors and the CEO can increase the effectiveness of the board. Adams and Ferreira (2007) provide a theoretical framework that highlights the benefits of "management-friendly" boards. The authors show that non-independent, i.e., friendly, directors can extract more of a CEO's private information, allowing the board to operate more effectively. Similarly, Westphal (1999) shows that director-CEO social connections can increase the advising and counseling interactions between the CEO and the board, thereby improving board involvement and firm performance.

To empirically estimate the interactive effect of director-CEO connections and co-option on a firm's credit quality, I generate and test two new measures of a board's ability and disposition to monitor management, *Non-Connected Co-option* and *Connected Co-option*. I

[38]Fogel et al. (2018) show that the social network centrality of CFOs can affect the cost and terms of their firm's private debt.

define *Non-Connected Co-option* (*Connected Co-option*) as the fraction of a firm's directors who are both co-opted and non-connected (connected) to the CEO before their appointment to the board, via previous employment, education, board membership, non-profit participation, or other associations. With these two new measures, I examine the effect of prior director-CEO connections on the relation between co-option and a firm's credit quality.

Table 10 shows the effects of *Non-Connected Co-option* and *Connected Co-option* on a firm's credit quality. I employ the same model used to populate Table 2, but I include *Connected Co-option* and *Non-Connected Co-option* instead of *Board Co-option* into Equation (2). In addition, I control for an array of director-level characteristics to reduce omitted variables bias. Not all directors in my dataset have this information available, so including these controls reduces my sample size.[39] The negative effect of *Non-Connected Co-option* on credit quality is statistically and economically significant across all specifications. The effects of *Connected Co-option* on credit quality, however, are not statistically significant and are, in five of the six specifications, smaller in magnitude than the estimated effects of *Non-Connected Co-option*. The results of difference in means tests are displayed in the bottom row and show that the point estimates on *Non-Connected Co-option* and *Connected Co-option* in Columns (1)–(2) and Columns (5)–(6) are statistically different from each other at the 5% level.

This evidence suggests that the negative effects of co-option on a firm's credit quality can be partially ameliorated by the benefits that come from having connected directors on the board. It is possible, however, that creditors simply view increased *Connected Co-option* as a signal of CEO quality (Engelberg et al., 2013), as more connected CEOs are potentially better CEOs. It could also be the case that dynamic decision-making patterns throughout

[39]The characteristics I control for are as follows: whether the director is local, relative to firm headquarters (I define local as within 60 miles (Knyazeva et al., 2011)); whether the director attended graduate school; whether the director has an M.D.; whether the director is/has been a college professor; the fraction of a director's previous/current jobs in which he/she was the CEO/CFO/COO; the director's age; whether the director is female; and whether the director's nationality is American. I take firm-year level averages of these variables to create controls.

CEO life cycles could drive both director appointment decisions and credit quality (Pan et al., 2016). These and other possible confounding factors make it difficult to identify whether or not director-CEO connections reduce or improve director monitoring ability. However, when I estimate the effects of *Non-Connected Co-option* and *Connected Co-option* on future CEO compensation, one of the main dependent variables studied in Coles et al. (2014), I find a positive and significant relation between *Non-Connected Co-option* and CEO pay (p-value = 0.018), but a negative and insignificant relation between *Connected Co-option* and CEO pay (p-value = 0.387). It thus appears that the positive relation between *Board Co-option* and CEO pay documented in Coles et al. (2014) is primarily driven by directors without prior connections to the CEO. The difference between these results and those of Hwang and Kim (2009) suggests that additional research is needed to understand the relation between director-CEO connections and monitoring quality.

5 Conclusion

This paper contributes to the literature on the organization design of corporate boards in three main ways. First, I use *Board Co-option*, a relatively new proxy for a board's ability and disposition to monitor management, to study how credit rating agencies and creditors respond to variations in board monitoring effectiveness, and I investigate the underlying mechanisms—specifically the relation between board monitoring and firm risk. This disentangles previous findings that both positive and negative effects on a firm's credit quality can result from decreased oversight of the CEO. Second, I identify these effects using a novel methodology, instrumenting with the deaths of non-co-opted directors. This improves upon previously used identification strategies. Third, I am the first to explore the interaction between co-option and director-CEO connections.

The relation between board monitoring effectiveness and a firm's credit quality is not obvious ex ante. Fields et al. (2012) find that increased monitoring quality leads to smaller credit spreads, whereas Bradley and Chen (2015) find that increased oversight can lead to riskier operating strategies that are costly to creditors. Using ordinary least squares regressions, I find a negative association between *Board Co-option* and a firm's credit quality. Specifically, poor monitoring quality is associated with decreased credit ratings and increased credit and CDS spreads. To more precisely establish causation, I instrument with non-co-opted director deaths and find evidence that an increase in co-option causes an economically and statistically significant decrease in future credit ratings.

While previous research highlights a positive association between board monitoring and corporate risk (Bradley and Chen, 2011, 2015), I find evidence that poorly monitored CEOs may also increase firm risk. In addition, I find evidence that the negative relation between *Board Co-option* and credit quality is exacerbated when firms are highly levered, when firms are not covered by directors' duties laws, and when CEOs have strong incentives to take risks. Taken together, my empirical findings suggest that increased board monitoring effectiveness on behalf of shareholders is perceived favorably by a firm's creditors, so monitoring quality possibly contributes *less* to the shareholder-bondholder conflict than previously thought.

References

Adams, R.B., Ferreira, D., 2007. A theory of friendly boards. The Journal of Finance 62, 217–250.

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

Atanassov, J., 2013. Do hostile takeovers stifle innovation? Evidence from antitakeover legislation and corporate patenting. The Journal of Finance 68, 1097–1131.

Avramov, D., Chordia, T., Jostova, G., Philipov, A., 2009. Credit ratings and the cross-section of stock returns. Journal of Financial Markets 12, 469–499.

Babenko, I., Bennett, B., Bizjak, J.M., Coles, J.L., Sandvik, J., 2019. Clawback provisions and firm risk. Charles A. Dice Center Working Paper .

Barton, J., 2001. Does the use of financial derivatives affect earnings management decisions? The Accounting Review 76, 1–26.

Baum, C.F., Schaffer, M.E., Stillman, S., et al., 2003. Instrumental variables and gmm: Estimation and testing. Stata Journal 3, 1–31.

Becker, B., Strömberg, P., 2012. Fiduciary duties and equity-debtholder conflicts. The Review of Financial Studies 25, 1931–1969.

Berg, T., Saunders, A., Steffen, S., 2016. The total cost of corporate borrowing in the loan market: Don't ignore the fees. The Journal of Finance 71, 1357–1392.

Berle, A., Means, G.C., 1932. The modern corporation and private property. New York: World .

Bertrand, M., Mullainathan, S., 2003. Enjoying the quiet life? Corporate governance and managerial preferences. Journal of Political Economy 111, 1043–1075.

Boeker, W., 1992. Power and managerial dismissal: Scapegoating at the top. Administrative Science Quarterly , 400–421.

Bradley, M., Chen, D., 2011. Corporate governance and the cost of debt: Evidence from director limited liability and indemnification provisions. Journal of Corporate Finance 17, 83–107.

Bradley, M., Chen, D., 2015. Does board independence reduce the cost of debt? Financial Management 44, 15–47.

Brick, I.E., Palmon, O., Wald, J.K., 2012. Too much pay-performance sensitivity? Review of Economics and Statistics 94, 287–303.

Brickley, J.A., Coles, J.L., Terry, R.L., 1994. Outside directors and the adoption of poison pills. Journal of Financial Economics 35, 371–390.

Burgstahler, D.C., Hail, L., Leuz, C., 2006. The importance of reporting incentives: Earnings management in european private and public firms. The accounting review 81, 983–1016.

Carpenter, J.N., 2000. Does option compensation increase managerial risk appetite? The journal of finance 55, 2311–2331.

Cassell, C.A., Myers, L.A., Schmardebeck, R., Zhou, J., 2018. The monitoring effectiveness of co-opted audit committees. Contemporary Accounting Research 35, 1732–1765.

Chava, S., Livdan, D., Purnanandam, A., 2009. Do shareholder rights affect the cost of bank loans? The Review of Financial Studies 22, 2973–3004.

Chen, Z., Li, N., Shen, J., forthcoming. Litigation risk and debt contracting: Evidence from a natural experiment. Journal of Law and Economics .

Chintrakarn, P., Jiraporn, P., Sakr, S., Lee, S.M., 2016. Do co-opted directors mitigate managerial myopia? Evidence from r&d investments. Finance Research Letters 17, 285–289.

Cohen, L., Frazzini, A., Malloy, C.J., 2012. Hiring cheerleaders: Board appointments of "independent" directors. Management Science 58, 1039–1058.

Coles, J., Sandvik, J., Seegert, N., 2018. Personal taxes and risk incentives combine to distort investment decisions. Working Paper .

Coles, J.L., Daniel, N.D., Naveen, L., 2006. Managerial incentives and risk-taking. Journal of Financial Economics 79, 431–468.

Coles, J.L., Daniel, N.D., Naveen, L., 2008a. Boards: Does one size fit all? Journal of Financial Economics 87, 329–356.

Coles, J.L., Daniel, N.D., Naveen, L., 2014. Co-opted boards. Review of Financial Studies 27, 1751–1796.

Coles, J.L., Lemmon, M.L., Meschke, J.F., 2012. Structural models and endogeneity in corporate finance: The link between managerial ownership and corporate performance. Journal of Financial Economics 103, 149–168.

Coles, J.L., Lemmon, M.L., Wang, Y.A., 2008b. The joint determinants of managerial ownership, board independence, and firm performance, in: Second Singapore International Conference on Finance.

Cremers, K.M., Nair, V.B., Wei, C., 2007. Governance mechanisms and bond prices. The Review of Financial Studies 20, 1359–1388.

Daily, C.M., Dalton, D.R., 1995. Ceo and director turnover in failing firms: An illusion of change? Strategic Management Journal 16, 393–400.

Dodd, D.L.F., Graham, B., 1951. Security Analysis: Principals and Technique. McGraw-Hill.

Engelberg, J., Gao, P., Parsons, C.A., 2013. The price of a ceo's rolodex. The Review of Financial Studies 26, 79–114.

Faleye, O., Hoitash, R., Hoitash, U., 2011. The costs of intense board monitoring. Journal of Financial Economics 101, 160–181.

Fama, E.F., 1980. Agency problems and the theory of the firm. Journal of Political Economy 88, 288–307.

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

Fields, L.P., Fraser, D.R., Subrahmanyam, A., 2012. Board quality and the cost of debt capital: The case of bank loans. Journal of Banking & Finance 36, 1536–1547.

Fogel, K., Jandik, T., McCumber, W.R., 2018. Cfo social capital and private debt. Journal of Corporate Finance 52, 28–52.

Fracassi, C., Tate, G., 2012. External networking and internal firm governance. The Journal of finance 67, 153–194.

Gao, H., Li, K., Ma, Y., 2020. Stakeholder orientation and the cost of debt: Evidence from a natural experiment. Available at SSRN 2878415 .

Gormley, T.A., Matsa, D.A., 2014. Common errors: How to (and not to) control for unobserved heterogeneity. The Review of Financial Studies 27, 617–661.

Guay, W.R., 1999. The sensitivity of ceo wealth to equity risk: an analysis of the magnitude and determinants. Journal of Financial Economics 53, 43–71.

Hausman, J.A., 1978. Specification tests in econometrics. Econometrica: Journal of the Econometric Society , 1251–1271.

Hermalin, B.E., Weisbach, M.S., 2003. Boards of directors as an endogenously determined institution: A survey of the economic literature. Technical Report. National Bureau of Economic Research.

Huang, S., 2013. Zombie boards: Board tenure and firm performance. Available at SSRN 2302917 .

Huang, S., Lim, C.Y., Ng, J., 2017. Not clawing the hand that feeds you: The case of co-opted boards and clawbacks .

Hwang, B.H., Kim, S., 2009. It pays to have friends. Journal of Financial Economics 93, 138–158.

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

Jensen, M.C., Murphy, K.J., 1990. Performance pay and top-management incentives. Journal of Political Economy 98, 225–264.

Jenter, D., Kanaan, F., 2015. Ceo turnover and relative performance evaluation. The Journal of Finance 70, 2155–2184.

Jiang, W., Li, K., Shao, P., 2010. When shareholders are creditors: Effects of the simultaneous holding of equity and debt by non-commercial banking institutions. The Review of Financial Studies 23, 3595–3637.

Jiraporn, P., Lee, S.M., 2017. Do co-opted directors influence dividend policy? Financial Management .

Karpoff, J.M., Wittry, M.D., 2018. Institutional and legal context in natural experiments: The case of state antitakeover laws. The Journal of Finance 73, 657–714.

Kisgen, D.J., Strahan, P.E., 2010. Do regulations based on credit ratings affect a firm's cost of capital? The Review of Financial Studies 23, 4324–4347.

Klock, M.S., Mansi, S.A., Maxwell, W.F., 2005. Does corporate governance matter to bondholders? Journal of Financial and Quantitative Analysis 40, 693–719.

Knyazeva, A., Knyazeva, D., Masulis, R.W., 2011. Effects of local director markets on corporate boards, in: AFA 2012 Chicago Meetings Paper.

Kumar, P., Sivaramakrishnan, K., 2008. Who monitors the monitor? The effect of board independence on executive compensation and firm value. Review of Financial Studies 21, 1371–1401.

Leuz, C., Nanda, D., Wysocki, P.D., 2003. Earnings management and investor protection: an international comparison. Journal of financial economics 69, 505–527.

Lim, J., Do, V., Vu, T., 2020. Co-opted directors, covenant intensity, and covenant violations. Journal of Corporate Finance , 101628.

Mace, M.L., 1979. Directors: Myth and reality-ten years later. Rutgers L. Rev. 32, 293.

Mascia, F., 2016. Til death do us part: The long tenured directors puzzle., in: Annual meeting American Accounting association.

Myers, S.C., 1977. Determinants of corporate borrowing. Journal of Financial Economics 5, 147–175.

Paligorova, T., Yang, J., 2014. Corporate governance, product market competition and debt financing. Technical Report. Bank of Canada Working Paper.

Pan, Y., Wang, T.Y., Weisbach, M.S., 2016. Ceo investment cycles. The Review of Financial Studies 29, 2955–2999.

Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: Comparing approaches. The Review of Financial Studies 22, 435–480.

Roberts, M.R., Whited, T.M., 2013. Endogeneity in empirical corporate finance1, in: Handbook of the Economics of Finance. Elsevier. volume 2, pp. 493–572.

Rosenstein, S., Wyatt, J.G., 1990. Outside directors, board independence, and shareholder wealth. Journal of Financial Economics 26, 175–191.

Ross, S.A., 2004. Compensation, incentives, and the duality of risk aversion and riskiness. The Journal of Finance 59, 207–225.

Smith, C.W., Stulz, R.M., 1985. The determinants of firms' hedging policies. Journal of Financial and Quantitative Analysis 20, 391–405.

Staiger, D.O., Stock, J.H., 1994. Instrumental variables regression with weak instruments.

Standard, Poor's, 2018. Rating Criteria sp credit rating criteria. URL: https://www.spratings.com/en_US/understanding-ratings#fourthPage.

Stock, J.H., Yogo, M., 2005. Testing for weak instruments in linear iv regression. Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg .

Waisman, M., 2013. Product market competition and the cost of bank loans: Evidence from state antitakeover laws. Journal of Banking & Finance 37, 4721–4737.

Weisbach, M.S., 1988. Outside directors and ceo turnover. Journal of Financial Economics 20, 431–460.

Westphal, J.D., 1999. Collaboration in the boardroom: Behavioral and performance consequences of ceo-board social ties. Academy of Management Journal 42, 7–24.

Wilson Jr, T.E., 2017. Co-opted directors and board effectiveness: The impact of director gender .

Withisuphakorn, P., Jiraporn, P., 2016. Co-opted directors and powerful ceos: Evidence from the ceo pay slice (cps). Available at SSRN 2781532 .

Xie, B., Davidson III, W.N., DaDalt, P.J., 2003. Earnings management and corporate governance: the role of the board and the audit committee. Journal of Corporate Finance 9, 295–316.

Figures and Tables

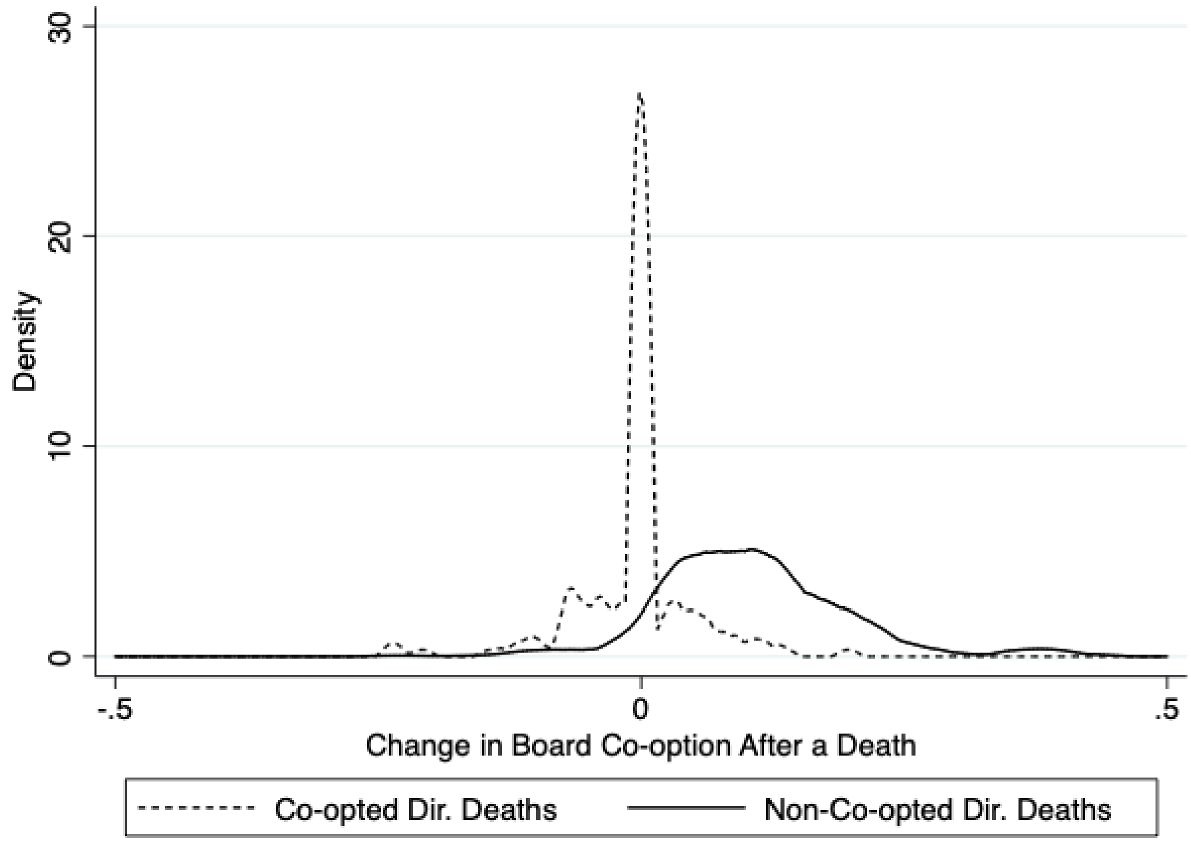

Figure 1
Director deaths as a shock to board co-option

This figure presents a density graph of level changes in *Board Co-option* after the death of co-opted (dotted line) and non-co-opted (solid line) directors. It is evident that the death of a non-co-opted director acts as an exogenous, positive shock to *Board Co-option*, whereas co-opted director deaths generally result in no level change in *Board Co-option*.

Table 1

Summary statistics

The main data used in the analysis comes from BoardEx, which provides extensive individual- and board-level information concerning director roles, associations, network connections, and role start dates. I obtain firm financial, accounting, and credit ratings data from Compustat. Credit spread data comes from Deal Scan. CDS spread data comes from the Markit database. Financial controls used in the statistical analysis include: log total assets, yearly stock return, return on assets, and leverage. The sample ranges from fiscal year 2002 to fiscal year 2016. Columns (2)–(5) display statistics in subsets (quartiles) of firm size, measured by total assets, with Column (2) restricting to the smallest firms and Column (5) restricting to the largest firms. Financial controls are winsorized at the 1.0% and 99.0% levels to mitigate the influence of extreme outliers, though this table reports unwinsorized averages.

Firm Size Subsets:	Full Sample	Smallest 25%	25–50%	50–75%	Largest 25%
	(1)	(2)	(3)	(4)	(5)
Credit Rating					
Mean	2.87	1.87	2.60	3.09	3.93
Std Dev.	1.37	1.00	1.20	1.21	1.16
Credit Spread (bps)					
Mean	164.55	238.23	200.10	167.88	121.19
Std Dev.	120.48	123.33	126.91	110.50	106.25
CDS Spread (bps)					
Mean	161.57	205.18	202.70	208.01	142.73
Std Dev.	265.86	265.18	248.59	273.78	261.40
Board Co-option					
Mean	0.55	0.57	0.57	0.54	0.51
Std Dev.	0.28	0.27	0.29	0.28	0.27
Connected Co-option					
Mean	0.17	0.19	0.18	0.17	0.15
Std Dev.	0.11	0.09	0.11	0.11	0.11
Board Independence					
Mean	0.74	0.70	0.73	0.74	0.77
Std Dev.	0.16	0.14	0.15	0.17	0.17
CEO Chair					
Mean	0.55	0.50	0.52	0.55	0.62
Std Dev.	0.50	0.50	0.50	0.50	0.49
CEO Tenure					
Mean	8.02	8.21	8.51	7.79	7.56
Std Dev.	6.89	7.35	7.54	6.35	6.18
Board Size					
Mean	8.80	6.82	8.06	9.25	11.07
Std Dev.	2.72	1.62	1.90	2.37	2.80
Fraction Male Dir.					
Mean	0.91	0.94	0.93	0.90	0.86
Std Dev.	0.10	0.09	0.09	0.09	0.09
Firm Size					
Mean	6.95	4.27	6.34	7.60	9.60
Std Dev.	2.11	1.04	0.39	0.36	1.19
Return on Assets					
Mean	-0.01	-0.13	0.02	0.03	0.04
Std Dev.	0.50	0.97	0.12	0.09	0.07
Yearly Return					
Mean	0.16	0.17	0.17	0.22	0.08
Std Dev.	4.10	1.44	2.66	7.60	0.61
Leverage					
Mean	0.23	0.16	0.21	0.27	0.27
Std Dev.	0.35	0.58	0.23	0.21	0.19
Observations	30,208	7,552	7,552	7,552	7,552

Table 2

The effect of board co-option on credit quality

Preliminary analysis relies on the following model, which I estimate using ordinary least squares:

$$\text{Credit}_{i,t} = \beta_0 + \beta_1 \text{Board Co-option}_{i,t} + \beta_2 \text{Board Independence}_{i,t} + \beta_3 \text{CEO Chair}_{i,t} + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where *Credit* can be either the *Credit Rating*, *Credit Spread* (the logarithm of bank loan spreads), or *CDS Spread* (the logarithm of CDS spreads) at times $t+1$ or $t+2$; *Board Independence*, *CEO Chair*, and *CEO Tenure* are controls for independence, CEO chair, and CEO tenure, respectively; $X_{i,t}$ is a matrix of financial and board controls; γ_t and ψ_j denote year and industry fixed effects, respectively; and $\varepsilon_{i,t}$ is an idiosyncratic error term. These controls are used in all models. Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Credit Rating		Credit Spread		CDS Spread	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
	(1)	(2)	(3)	(4)	(5)	(6)
Board Co-option	-0.391***	-0.393***	0.111**	0.138**	0.232*	0.204*
	(-6.472)	(-6.299)	(2.105)	(2.129)	(1.944)	(1.711)
Independence	-0.134	-0.102	-0.089	-0.128	0.004	-0.012
	(-1.285)	(-0.953)	(-1.147)	(-1.402)	(0.020)	(-0.070)
CEO Chair	0.123***	0.114***	-0.032	-0.039	-0.089	-0.091
	(4.134)	(3.693)	(-1.223)	(-1.194)	(-1.626)	(-1.601)
CEO Tenure	0.016***	0.015***	-0.003	-0.001	-0.011**	-0.011**
	(5.777)	(5.406)	(-0.988)	(-0.167)	(-2.132)	(-2.196)
Board Size	0.056***	0.055***	-0.022***	-0.012	-0.041***	-0.034***
	(7.137)	(6.859)	(-3.452)	(-1.525)	(-3.257)	(-2.684)
Frac. Male Dir.	-0.801***	-0.761***	0.289**	0.117	0.485*	0.450
	(-4.885)	(-4.435)	(2.004)	(0.614)	(1.801)	(1.606)
Firm Size	0.292***	0.292***	-0.199***	-0.221***	-0.120***	-0.112***
	(25.916)	(25.226)	(-15.982)	(-14.112)	(-3.459)	(-2.972)
Return on Assets	1.588***	1.601***	-1.927***	-1.984***	-2.398***	-1.976**
	(18.018)	(17.436)	(-9.581)	(-6.574)	(-2.859)	(-2.414)
Yearly Return	-0.003	-0.002	0.007***	0.008***	-0.056	-0.023
	(-1.573)	(-1.548)	(4.482)	(5.880)	(-1.258)	(-0.619)
Leverage	-0.699***	-0.725***	0.763***	0.526***	1.840***	1.770***
	(-9.277)	(-9.292)	(9.559)	(5.121)	(7.409)	(6.872)
Year FEs	✓	✓	✓	✓	✓	✓
Industry FEs	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.464	0.460	0.497	0.466	0.510	0.522
Observations	30,208	27,167	4,203	2,842	3,029	2,684

Table 3

Director deaths as a shock to board co-option

This table provides evidence that the death of a non-co-opted director in year $t-1$ results in an increase in *Board Co-option* in the following year—i.e., the deceased non-co-opted director has been replaced by a co-opted director. Of the 551 director deaths recorded in the sample period, 158 were co-opted and 393 were non-co-opted. When a director dies, *Board Co-option* in the subsequent year increases, on average, by 6.6 percentage points. If the deceased director was co-opted, *Board Co-option* decreases in the subsequent year by 3.3 percentage points, whereas if the deceased director was non-co-opted, *Board Co-option* increases in the subsequent year by 10.6 percentage points. The difference between these average changes in co-option is statistically significant at the 1% level, as indicated by the differences in means test in the bottom row of the table.

	(1)
Director Deaths$_{t-1}$	N = 551
Subsequent Δ in Co-option	0.066
Co-opted Director Deaths$_{t-1}$	N = 158
Subsequent Δ in Co-option$_C$	-0.033
Non-Co-opted Director Deaths$_{t-1}$	N = 393
Subsequent Δ in Co-option$_N$	0.106
H_0: ΔCo-option$_C$=ΔCo-option$_N$	p<0.001***

Table 4

Instrument with the deaths of non-co-opted directors

I estimate the first stage regression of the GMM-IV procedure using the following equation:

$$\Delta\text{Board Co-option}_{i,t} = \beta_0 + \beta_1 \mathbb{1}(\text{Non-Co-opted Director Death})_{i,t-1} + \beta_2\text{Board Independence}_{i,t} + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where i represents a firm, t is the fiscal year, $X_{i,t}$ represents financial and board control variables, γ_t is year fixed effects, ψ_j is industry fixed effects, and $\varepsilon_{i,t}$ is an idiosyncratic error term. The predicted values, Δ*Board Co-option (Pred.)*, are used to estimate the causal effect of a change in co-option on future changes in credit quality. The second stage regression is estimated with the following equation:

$$\%\Delta\text{Credit}_{i,t+2} = \beta_0 + \beta_1(\Delta\text{Board Co-option (Pred.)})_{i,t} + \beta_2\text{Board Independence}_{i,t} + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \epsilon_{i,t},$$

where *Credit* represents *Credit Rating* at times $t+1$ or $t+2$. First stage regression results are reported in Column (1). Second stage regression results are reported in Columns (2)–(7), with subsamples of below (above) median leverage results reported in Columns (3) and (6) (Columns (4) and (7)). IV diagnostic results are reported at the bottom of the table. I use Stata's *ivreg2* command to perform these regressions. Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	First Stage	Second Stage					
	Δ Co-option	Credit Rating$_{t+1}$			Credit Rating$_{t+2}$		
	Full Sample (1)	Full Sample (2)	Least Leverage (3)	Most Leverage (4)	Full Sample (5)	Least Leverage (6)	Most Leverage (7)
Non-Co-opted Dir. Death$_{t-1}$	0.093***						
	(18.241)						
Δ Co-option (Pred.)		-0.024	-0.019	-0.027	-0.051**	-0.004	-0.097**
		(-0.803)	(-0.622)	(-0.516)	(-2.006)	(-0.147)	(-2.237)
Controls	✓	✓	✓	✓	✓	✓	✓
Year & Industry FE	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.024	-0.000	-0.005	0.004	-0.016	-0.002	-0.051
Observations	30,208	30,208	15,040	15,168	27,167	13,584	13,583
Endogeneity Test		0.898	0.280	0.516	3.994	0.024	4.915
and p-value		0.343	0.597	0.473	0.046	0.876	0.027
F-stat excl. inst.		145.98	72.67	74.46	138.43	70.85	68.98
Stock-Yogo 10% c.v.		16.38	16.38	16.38	16.38	16.38	16.38

Table 5

Difference-in-differences estimations of the effect of co-option on credit quality

I use SOX and the NYSE/NASDAQ listing standard changes as a quasi-natural experiment to test the effects of co-option on a firm's credit quality. The approach follows a standard difference-in-differences methodology, but it allows for the possibility that SOX and the associated listing provisions had a direct effect on a firm's credit quality. The "clean," or casual, effect of co-option on the credit ratings and credit and CDS spreads is isolated by summing up coefficients β_1, β_3, and β_4 from Equation (5). The "clean" estimates are reported in the Column (2), and the corresponding base case results from the OLS regressions are reported in Column (1). Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Credit Rating

Specification:	Board Co-option	
	OLS Estimate	"Clean" Estimate
	(1)	(2)
Effect at Time_{t+1}	-0.391***	-0.495*
	(-6.472)	(-1.946)
Effect at Time_{t+2}	-0.393***	-0.521**
	(-6.299)	(-1.976)

Panel B: Credit Spread

Specification:	Board Co-option	
	OLS Estimate	"Clean" Estimate
	(1)	(2)
Effect at Time_{t+1}	0.111**	0.352
	(2.105)	(1.499)
Effect at Time_{t+2}	0.138**	0.493*
	(2.128)	(1.670)

Panel C: CDS Spread

Specification:	Board Co-option	
	OLS Estimate	"Clean" Estimate
	(1)	(2)
Effect at Time_{t+1}	0.232*	0.336
	(1.944)	(0.678)
Effect at Time_{t+2}	0.204*	0.789
	(1.711)	(1.572)

Table 6

The effect of board co-option on credit quality across firm leverage ratio

To analyze the effect of co-option on credit quality across quartiles of firm leverage ratio, I estimate the following model using ordinary least squares:

$$\text{Credit}_{i,t} = \beta_0 + \beta_1 \text{Board Co-option}_{i,t} + \beta_2 \text{Board Independence}_{i,t} + \beta_3 \text{CEO Chair}_{i,t} + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where *Credit* can be either the *Credit Rating*, *Credit Spread* (the logarithm of bank loan spreads), or *CDS Spread* (the logarithm of CDS spreads) at time $t+2$; *Board Independence*, *CEO Chair*, and *CEO Tenure* are controls for independence, CEO chair, and CEO tenure, respectively; $X_{i,t}$ is a matrix of financial and board controls; γ_t and ψ_j denote year and industry fixed effects, respectively; and $\varepsilon_{i,t}$ is an idiosyncratic error term. The effect of co-option on the credit quality for firms with the smallest (largest) leverage ratios is shown in Column (1) (Column (4)). Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Credit Rating$_{t+2}$

	Bottom 25%	25–50%	50–75%	Top 25%
	(1)	(2)	(3)	(4)
Board Co-option	-0.135	-0.409***	-0.445***	-0.351***
	(-1.124)	(-3.793)	(-4.130)	(-3.684)
Controls	✓	✓	✓	✓
Year & Industry FEs	✓	✓	✓	✓
Adj. R-Square	0.419	0.454	0.471	0.524
Observations	6,790	6,789	6,791	6,789

Panel B: Credit Spread$_{t+2}$

	Bottom 25%	25–50%	50–75%	Top 25%
	(1)	(2)	(3)	(4)
Board Co-option	0.068	0.201	0.068	0.222**
	(0.536)	(1.382)	(0.528)	(2.126)
Controls	✓	✓	✓	✓
Year & Industry FEs	✓	✓	✓	✓
Adj. R-Square	0.440	0.496	0.417	0.525
Observations	706	706	705	701

Panel C: CDS Spread$_{t+2}$

	Bottom 25%	25–50%	50–75%	Top 25%
	(1)	(2)	(3)	(4)
Board Co-option	0.054	0.192	0.146	0.600**
	(0.256)	(1.157)	(0.588)	(2.425)
Controls	✓	✓	✓	✓
Year & Industry FEs	✓	✓	✓	✓
Adj. R-Square	0.531	0.528	0.493	0.597
Observations	666	666	667	666

Table 7

The effect of board co-option on corporate risk and earnings management

To investigate the effects of co-option on corporate risk and earnings management, I estimate the following model using ordinary least squares:

$$\text{Risk}_{i,t} = \beta_0 + \beta_1\text{Board Co-option}_{i,t} + \beta_2\text{Board Independence}_{i,t} + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where *Risk* can be either *Cash Flow Volatility*, *Return Volatility*, or *Earnings Management* at times t or $t+1$. *Board Independence*, *CEO Chair*, and *CEO Tenure* are controls for independence, CEO chair, and CEO tenure, respectively; $X_{i,t}$ is a matrix of financial and board controls; γ_t and ψ_j denote year and industry fixed effects, respectively; and $\varepsilon_{i,t}$ is an idiosyncratic error term. Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Board Co-option

Dep. Variable:	Cash Flow Volatility		Return Volatility		Earnings Management	
	t	$t+1$	t	$t+1$	t	$t+1$
	(1)	(2)	(3)	(4)	(5)	(6)
Board Co-option	0.075	0.081	0.002***	0.002***	0.018	0.048
	(1.126)	(1.098)	(3.236)	(2.723)	(0.291)	(0.755)
Independence	-0.283	-0.319	-0.002**	-0.002**	-0.193**	-0.230**
	(-1.187)	(-1.203)	(-2.440)	(-2.109)	(-2.035)	(-2.328)
CEO Chair	-0.006	-0.005	0.000	0.000	0.010	0.018
	(-0.409)	(-0.312)	(1.579)	(1.455)	(0.382)	(0.644)
CEO Tenure	-0.003	-0.003	-0.000***	-0.000***	-0.004	-0.005*
	(-1.350)	(-1.332)	(-4.256)	(-4.236)	(-1.531)	(-1.719)
Board Size	0.001	0.001	-0.000***	-0.000	-0.013*	-0.010
	(0.554)	(0.693)	(-2.927)	(-1.563)	(-1.777)	(-1.403)
Frac. Male Dir.	-0.109**	-0.122**	0.002*	0.003**	0.224	0.280*
	(-2.236)	(-2.294)	(1.800)	(1.972)	(1.493)	(1.828)
Firm Size	-0.011***	-0.011***	-0.003***	-0.003***	-0.074***	-0.069***
	(-4.303)	(-3.880)	(-26.374)	(-22.549)	(-7.248)	(-6.656)
Return on Assets	-0.988**	-1.035**	-0.025***	-0.030***	-0.482***	-0.455***
	(-2.395)	(-2.199)	(-23.420)	(-20.320)	(-4.425)	(-4.021)
Yearly Return	0.006	0.006	0.000	-0.000	-0.000	-0.001
	(0.802)	(0.801)	(1.235)	(-0.530)	(-0.295)	(-0.608)
Leverage	-0.005	-0.011	0.009***	0.009***	0.195**	0.173**
	(-0.126)	(-0.230)	(11.091)	(9.848)	(2.565)	(2.186)
Year FEs	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.036	0.035	0.491	0.488	0.066	0.066
Observations	24,812	22,753	28,851	27,330	22,026	20,829

Table 8

The effect of board co-option quartiles on credit quality across firm leverage ratio

To analyze the effect of co-option quartiles on credit quality, I create indicator variables for each firm-year to classify a firm's board as having a level of *Board Co-option* in one of the four quartiles: 0–25%, 25–50%, 50–75%, or 75–100%. I estimate the impact of a firm's level of *Board Co-option* relative to a baseline level of 0–25% by estimating the following equation using OLS:

$$\text{Credit}_{i,t} = \beta_0 + \beta_1(\text{25–50\% Co-option})_{i,t} + \beta_2(\text{50–75\% Co-option})_{i,t} \\ + \beta_3(\text{75–100\% Co-option})_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where *Credit* can be either the *Credit Rating*, *Credit Spread*, or *CDS Spread* at time $t+2$. The controls, in matrix $X_{i,t}$, include the same control variables used in the earlier models; year fixed effects are represented by γ_t; ψ_j denotes industry fixed effects; and $\varepsilon_{i,t}$ is an idiosyncratic error term. For brevity, I do not include checkmarks to indicate that these controls are included in the models. The effect of co-option quartiles on the credit quality for firms with the smallest (largest) leverage ratios is shown in Column (1) (Column (4)). Standard errors are clustered at the firm-level, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Credit Rating$_{t+2}$

	Bottom 25%	25–50%	50–75%	Top 25%
	(1)	(2)	(3)	(4)
25–50% Co-option	-0.025	0.061	0.061	0.053
	(-0.409)	(1.118)	(1.300)	(1.170)
50–75% Co-option	-0.011	-0.036	-0.063	-0.062
	(-0.157)	(-0.544)	(-1.025)	(-1.037)
75–100% Co-option	-0.077	-0.212***	-0.273***	-0.164**
	(-0.849)	(-2.603)	(-3.475)	(-2.386)
Adj. R-Square	0.418	0.454	0.472	0.523
Observations	6,790	6,789	6,791	6,789

Panel B: Credit Spread$_{t+2}$

	Bottom 25%	25–50%	50–75%	Top 25%
	(1)	(2)	(3)	(4)
25–50% Co-option	0.037	0.107	0.055	0.014
	(0.350)	(1.341)	(0.710)	(0.179)
50–75% Co-option	-0.080	0.049	0.164*	0.089
	(-0.710)	(0.543)	(1.785)	(1.035)
75–100% Co-option	0.094	0.199*	0.006	0.139
	(0.826)	(1.710)	(0.059)	(1.574)
Adj. R-Square	0.442	0.497	0.421	0.523
Observations	706	706	705	701

Panel C: CDS Spread$_{t+2}$

	Bottom 25%	25–50%	50–75%	Top 25%
	(1)	(2)	(3)	(4)
25–50% Co-option	-0.085	0.036	-0.099	0.111
	(-0.706)	(0.471)	(-1.052)	(1.188)
50–75% Co-option	-0.151	0.150	-0.006	0.241*
	(-1.275)	(1.477)	(-0.049)	(1.780)
75–100% Co-option	-0.102	0.010	0.131	0.376**
	(-0.606)	(0.088)	(0.689)	(2.210)
Adj. R-Square	0.531	0.529	0.495	0.592
Observations	666	666	667	666

Table 9

Directors' duties laws and CEO risk-taking incentives

This table considers different subsamples of the data in which the results may be more or less pronounced. Panel A considers whether firms are covered by directors' duties laws. Panel B considers whether firms have high CEO vega. In Panel A, I estimate a variation of Equation (2) that includes an indicator variable for a firm being in a non-DDL state, *Non-DDL State*, and the interaction between *Board Co-option* and *Non-DDL State*. In Panel B, I estimate a variation of Equation (2) that includes an indicator variable for a firm having high CEO vega, *High Vega*, and the interaction between *Board Co-option* and *High Vega*. Columns (1), (4), and (7) use the full sample of data and differ based on the credit quality variable used. Columns (2), (5), and (8) restrict the sample to firms with below median leverage, and Columns (3), (6), and (9) restrict the sample to firms with above median leverage. Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Directors' Duties Laws

	Credit Rating$_{t+2}$			Credit Spread$_{t+2}$			CDS Spread$_{t+2}$		
	Full Sample	Low Leverage	High Leverage	Full Sample	Low Leverage	High Leverage	Full Sample	Low Leverage	High Leverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Board Co-option × Non-DDL State	-0.001	0.174	-0.139	0.259***	0.229	0.349***	0.180	-0.018	0.237
	(-0.006)	(1.260)	(-1.129)	(2.587)	(1.486)	(2.750)	(1.188)	(-0.083)	(1.137)
Board Co-option	-0.371***	-0.394***	-0.318***	-0.043	-0.027	-0.047	0.076	0.113	0.223
	(-3.880)	(-2.949)	(-2.598)	(-0.484)	(-0.200)	(-0.422)	(0.536)	(0.566)	(1.074)
Non-DDL State	-0.195***	-0.323***	-0.049	-0.085	-0.079	-0.107	-0.022	0.023	0.028
	(-2.978)	(-3.590)	(-0.582)	(-1.212)	(-0.753)	(-1.221)	(-0.227)	(0.168)	(0.209)
Controls & Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.464	0.455	0.492	0.468	0.466	0.473	0.523	0.493	0.548
Observations	27,167	13,583	13,583	2,842	1,419	1,415	2,684	1,338	1,340

Panel B: CEO Risk-Taking Incentives

	Credit Rating$_{t+2}$			Credit Spread$_{t+2}$			CDS Spread$_{t+2}$		
	Full Sample	Low Leverage	High Leverage	Full Sample	Low Leverage	High Leverage	Full Sample	Low Leverage	High Leverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Board Co-option × High Vega	-0.325***	-0.317**	-0.346**	0.219*	0.169	0.246	0.343	0.315	0.450*
	(-2.954)	(-2.060)	(-2.443)	(1.768)	(0.941)	(1.465)	(1.622)	(0.907)	(1.797)
Board Co-option	-0.160	-0.121	-0.146	0.002	0.007	0.055	-0.051	-0.157	0.000
	(-1.463)	(-0.816)	(-1.077)	(0.015)	(0.044)	(0.370)	(-0.239)	(-0.435)	(0.001)
High Vega	0.362***	0.297***	0.439***	-0.231***	-0.205	-0.226**	-0.260**	-0.169	-0.338**
	(5.083)	(2.804)	(5.158)	(-2.664)	(-1.558)	(-2.131)	(-2.213)	(-0.895)	(-2.289)
Controls & Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.442	0.436	0.478	0.443	0.453	0.458	0.551	0.571	0.548
Observations	13,155	6,574	6,577	2,040	1,016	1,017	2,220	1,110	1,108

Table 10

Connected and non-connected co-option and credit quality

Analysis of director connectedness relies on the following model, which I estimate using ordinary least squares:

$$\text{Credit}_{i,t} = \beta_0 + \beta_1\text{Non-Connected}_{i,t} + \beta_2\text{Connected}_{i,t} + \beta_3\text{Board Independence}_{i,t} + \beta_4\text{CEO Chair}_{i,t} + \beta_5\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where *Credit* can be either the *Credit Rating*, *Credit Spread* (the logarithm of bank loan spreads), or *CDS Spread* (the logarithm of CDS spreads) at times $t+1$ or $t+2$; *Non-Connected* stands for *Non-Connected Co-option* and *Connected* stands for *Connected Co-option*. *Board Independence*, *CEO Chair*, and *CEO Tenure* are controls for independence, CEO chair, and CEO tenure, respectively; $X_{i,t}$ is a matrix of financial and board controls; γ_t and ψ_j denote year and industry fixed effects, respectively; and $\varepsilon_{i,t}$ is an idiosyncratic error term. All models also include controls for the locality, education, profession, job title, age, gender, and nationality of connected and non-connected co-opted directors. Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The bottom row reports p-values that capture the statistical significance of the difference between the coefficients on *Non-Connected Co-option* and *Connected Co-option*.

Dep. Variable:	Credit Rating		Credit Spread		CDS Spread	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
	(1)	(2)	(3)	(4)	(5)	(6)
Non-Connected Co-option	-0.452***	-0.450***	0.284***	0.176*	0.592***	0.483***
	(-4.029)	(-3.897)	(3.260)	(1.684)	(3.752)	(2.994)
Connected Co-option	0.126	0.152	0.236	0.209	-0.431	-0.273
	(0.527)	(0.632)	(1.162)	(0.893)	(-1.450)	(-0.886)
Independence	-0.088	-0.070	-0.083	-0.213	-0.123	-0.100
	(-0.565)	(-0.437)	(-0.732)	(-1.610)	(-0.581)	(-0.490)
CEO Chair	0.150***	0.149***	-0.057	-0.030	-0.089	-0.113
	(3.084)	(2.973)	(-1.452)	(-0.612)	(-1.178)	(-1.441)
CEO Tenure	0.016***	0.015***	-0.009***	-0.006	-0.017***	-0.017**
	(3.748)	(3.347)	(-2.582)	(-1.505)	(-2.645)	(-2.571)
Board Size	0.053***	0.053***	-0.013	0.001	-0.037***	-0.034**
	(5.089)	(5.001)	(-1.581)	(0.056)	(-2.621)	(-2.342)
Frac. Male Dir.	-1.020***	-0.940***	0.427	0.251	1.044***	0.987**
	(-3.457)	(-3.057)	(1.596)	(0.765)	(2.705)	(2.350)
Firm Size	0.333***	0.330***	-0.209***	-0.232***	-0.160***	-0.156***
	(18.057)	(17.307)	(-12.053)	(-11.081)	(-4.459)	(-4.185)
Return on Assets	2.273***	2.273***	-1.754***	-1.822***	-3.543***	-3.038***
	(12.745)	(12.102)	(-6.307)	(-4.592)	(-8.024)	(-7.639)
Yearly Return	-0.002	-0.001	0.022	0.033***	-0.083	-0.065
	(-1.447)	(-1.353)	(0.998)	(2.668)	(-1.341)	(-1.107)
Leverage	-0.714***	-0.737***	0.952***	0.749***	1.600***	1.595***
	(-6.145)	(-6.110)	(7.909)	(5.294)	(5.936)	(5.666)
Director Characteristics	✓	✓	✓	✓	✓	✓
Year & Industry FE	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.504	0.499	0.509	0.498	0.584	0.602
Observations	12,016	10,947	2,311	1,625	1,965	1,755
Comparisons (p-values)						
H_0: Non-Conn. = Conn.	0.0243	0.0198	0.8232	0.8984	0.0016	0.0237

A Appendix

Variable Definitions

Variable	Variable Definition	Data Source
Credit Rating	Maps the S&P Domestic Long Term Issuer Credit Rating, the S&P Domestic Short Term Issuer Credit Rating, the S&P Subordinated Debt Rating, and the S&P Quality Ranking each onto a scale from 1–7, then averages at the firm-year level.	Compustat
Credit Spread	Also called the loan "spread." This is the loan cost, the all-in-spread (AISD). I use the ln(AISD).	Deal Scan
CDS Spread	The spread of a firm's listed five-year credit default swap. I use the ln(CDS Spread).	Markit
Board Co-option	The number of co-opted directors divided by the total number of directors on the board.	BoardEx
Connected Co-option	The number of connected, co-opted directors divided by the total number of directors on the board.	BoardEx
Non-Connected Co-option	The number of non-connected, co-opted directors divided by the total number of directors on the board.	BoardEx
Board Independence	The number of independent directors divided by the total number of directors on the board.	BoardEx
Frac. Male Dir.	The ratio of male directors to total directors on the board.	BoardEx
CEO Tenure	The length of time the sitting CEO has been in office (in years).	BoardEx
Board Size	The number of directors on the board.	BoardEx
CEO Chair	Equal to 1 if the sitting CEO is the Chair of the board, and 0 otherwise.	BoardEx
Return on Assets	A firm's income before extraordinary items divided by total book assets.	Compustat
Firm Size	The log of a firm's total book assets.	Compustat
Yearly Return	A firm's annual stock return.	Compustat

Variable Definitions (continued)

Variable	Variable Definition	Data Source
Leverage	A firm's long-term debt and current liabilities divided by the sum of its long-term debt, current liabilities, and market value.	Compustat
Director Death	Equal to 1 if the firm had a director die in that fiscal year, 0 otherwise.	BoardEx
(Non-)Co-opted Director Death	Equal to 1 if the firm had a (non-)co-opted director die in that fiscal year, 0 otherwise.	BoardEx
Cash Flow Volatility	The standard deviation of a firm's yearly cash flows over the subsequent five years.	Compustat
Stock Return Volatility	The standard deviation of a firm's daily stock returns throughout the fiscal year.	CRSP
Tenure-Weighted (TW) Co-option	The sum of the tenure of co-opted directors divided by the total tenure of all directors on the board.	BoardEx
Residual (TW) Co-option	The residuals from a regression of *TW Co-option* on *CEO tenure*.	BoardEx
Noncompliant	Equal to 1 if the firm had less than 50% independent directors on the board of directors in 2002 or 2003.	BoardEx
Post-SOX	Equal to 1 if the fiscal year is 2005–2007, 0 otherwise.	Compustat
Offering Yield	Based on the bond coupon and any discount or premium to par value at the time of sale. I consider the offering yield of a firm's bond issuance with the longest duration and highest offering amount in a given firm-year (YTM%).	FISD
Gross Spread	The difference between the price that the issuer receives for its securities and the price that investors pay for them (including selling concession and underwriting and management fees). I consider the gross spread of a firm's bond issuance with the longest duration and highest offering amount in a given firm-year (USD).	FISD
Treasury Spread	The difference between the yield of the benchmark treasury issue and issue's offering yield, I consider the treasury spread of a firm's bond issuance with the longest duration and highest offering amount in a given firm-year (bps).	FISD
Discretionary Accruals	Change in current assets minus change in cash or cash equivalents minus change in current liabilities plus change in short-term debt plus change in taxable income minus depreciation.	Compustat
Earnings Management	As in Leuz et al. (2003), earnings management is defined as the absolute value of a firm's discretionary accruals divided by the absolute value of its operating cashflow.	Compustat

Table A.1

Instrument with the deaths of co-opted directors

I estimate the first stage regression of the GMM-IV procedure using the following equation:

$$\Delta\text{Board Co-option}_{i,t} = \beta_0 + \beta_1\mathbb{1}(\text{Co-opted Director Death})_{i,t-1} + \beta_2\text{Board Independence}_{i,t}$$
$$+ \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where i represents a firm, t is the fiscal year, $X_{i,t}$ represents financial and board control variables, γ_t is year fixed effects, ψ_j is industry fixed effects, and $\varepsilon_{i,t}$ is an idiosyncratic error term. The predicted values, Δ*Board Co-option (Pred.)*, are used to estimate the causal effect of a change in co-option on future changes in credit quality. The second stage regression is estimated with the following equation:

$$\%\Delta\text{Credit}_{i,t+2} = \beta_0 + \beta_1(\Delta\text{Board Co-option (Pred.)})_{i,t} + \beta_2\text{Board Independence}_{i,t}$$
$$+ \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \epsilon_{i,t},$$

where *Credit* represents *Credit Rating* at times $t+1$ or $t+2$. First stage regression results are reported in Column (1). Second stage regression results are reported in Columns (2)–(7), with subsamples of below (above) median leverage results reported in Columns (3) and (6) (Columns (4) and (7)). Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Co-opted Dir. Deaths

	First Stage	Second Stage					
	Δ Co-option	Credit Rating$_{t+1}$			Credit Rating$_{t+2}$		
	Full Sample	Full Sample	Least Leverage	Most Leverage	Full Sample	Least Leverage	Most Leverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Co-opted Dir. Death$_{t-1}$	-0.060***						
	(-4.527)						
Δ Co-option (Pred.)		0.068	0.073	0.056	-0.003	0.026	-0.044
		(1.283)	(0.972)	(0.739)	(-0.104)	(1.601)	(-0.761)
Controls	✓	✓	✓	✓	✓	✓	✓
Year & Industry FE	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.020	-0.022	-0.053	-0.001	0.002	-0.008	-0.009
Observations	30,208	30,208	15,040	15,168	27,167	13,584	13,583

Table A.2

Instrument with the deaths of non-co-opted directors: credit spreads

I estimate the first stage regression of the GMM-IV procedure using the following equation:

$$\Delta \text{Board Co-option}_{i,t} = \beta_0 + \beta_1 \mathbb{1}(\text{Non-Co-opted Director Death})_{i,t-1} + \beta_2 \text{Board Independence}_{i,t}$$
$$+ \beta_3 \text{CEO Chair}_{i,t} + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where i represents a firm, t is the fiscal year, $X_{i,t}$ represents financial and board control variables, γ_t is year fixed effects, ψ_j is industry fixed effects, and $\varepsilon_{i,t}$ is an idiosyncratic error term. The predicted values, Δ*Board Co-option (Pred.)*, are used to estimate the causal effect of a change in co-option on future changes in credit quality. The second stage regression is estimated with the following equation:

$$\%\Delta \text{Credit}_{i,t+2} = \beta_0 + \beta_1 (\Delta \text{Board Co-option (Pred.)})_{i,t} + \beta_2 \text{Board Independence}_{i,t}$$
$$+ \beta_3 \text{CEO Chair}_{i,t} + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \epsilon_{i,t},$$

where *Credit* represents *Credit Spread* (the logarithm of bank loan spreads) at times $t+1$ or $t+2$. First stage regression results are reported in Column (1). Second stage regression results are reported in Columns (2)–(7), with subsamples of below (above) median leverage results reported in Columns (3) and (6) (Columns (4) and (7)). Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	First Stage	Second Stage					
	Δ Co-option	Credit Spread$_{t+1}$			Credit Spread$_{t+2}$		
	Full Sample	Full Sample	Least Leverage	Most Leverage	Full Sample	Least Leverage	Most Leverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Co-opted Dir. Death$_{t-1}$	0.107***						
	(6.358)						
Δ Co-option (Pred.)		0.222	0.760	0.960	-1.950	-2.083	-2.282*
		(0.119)	(0.297)	(0.376)	(-1.475)	(-0.754)	(-1.790)
Controls	✓	✓	✓	✓	✓	✓	✓
Year & Industry FE	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.027	0.142	0.141	0.094	0.013	-0.019	-0.049
Observations	4,203	4,203	2,102	2,101	2,843	1,374	1,469

Table A.3

Instrument with the deaths of non-co-opted directors: CDS spreads

I estimate the first stage regression of the GMM-IV procedure using the following equation:

$$\Delta \text{Board Co-option}_{i,t} = \beta_0 + \beta_1 \mathbb{1}(\text{Non-Co-opted Director Death})_{i,t-1} + \beta_2 \text{Board Independence}_{i,t}$$
$$+ \beta_3 \text{CEO Chair}_{i,t} + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where i represents a firm, t is the fiscal year, $X_{i,t}$ represents financial and board control variables, γ_t is year fixed effects, ψ_j is industry fixed effects, and $\varepsilon_{i,t}$ is an idiosyncratic error term. The predicted values, Δ*Board Co-option (Pred.)*, are used to estimate the causal effect of a change in co-option on future changes in credit quality. The second stage regression is estimated with the following equation:

$$\%\Delta \text{Credit}_{i,t+2} = \beta_0 + \beta_1 (\Delta \text{Board Co-option (Pred.)})_{i,t} + \beta_2 \text{Board Independence}_{i,t}$$
$$+ \beta_3 \text{CEO Chair}_{i,t} + \beta_4 \text{CEO Tenure}_{i,t} + \beta \text{X}_{i,t} + \gamma_t + \psi_j + \epsilon_{i,t},$$

where *Credit* represents *CDS Spread* (the logarithm of CDS spreads) at times $t+1$ or $t+2$. First stage regression results are reported in Column (1). Second stage regression results are reported in Columns (2)–(7), with subsamples of below (above) median leverage results reported in Columns (3) and (6) (Columns (4) and (7)). Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	First Stage	Second Stage					
	Δ Co-option	CDS Spread$_{t+1}$			CDS Spread$_{t+2}$		
	Full Sample	Full Sample	Least Leverage	Most Leverage	Full Sample	Least Leverage	Most Leverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Co-opted Dir. Death$_{t-1}$	0.112***						
	(6.186)						
Δ Co-option (Pred.)		-0.279	-0.577	-0.140	-0.041	1.202	-0.320
		(-0.476)	(-0.419)	(-0.232)	(-0.048)	(0.382)	(-0.501)
Controls	✓	✓	✓	✓	✓	✓	✓
Year & Industry FE	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.039	0.379	0.318	0.441	0.384	0.299	0.438
Observations	3,029	3,029	1,515	1,514	2,684	1,333	1,351

Table A.4

The effect of board co-option on bond yields and spreads

Preliminary analysis relies on the following model, which I estimate using ordinary least squares:

$$\text{Bond Yield}_{i,t} = \beta_0 + \beta_1\text{Board Co-option}_{i,t} + \beta_2\text{Board Independence}_{i,t} + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where *Bond Yield* can be either the *Offering Yield*, *Gross Spread*, or *Treasury Spread* at times $t+1$ or $t+2$; *Board Independence*, *CEO Chair*, and *CEO Tenure* are controls for independence, CEO chair, and CEO tenure, respectively; $X_{i,t}$ is a matrix of financial and board controls; γ_t and ψ_j denote year and industry fixed effects, respectively; and $\varepsilon_{i,t}$ is an idiosyncratic error term. These controls are used in all models. Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Offering Yield		Gross Spread		Treasury Spread	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
	(1)	(2)	(3)	(4)	(5)	(6)
Board Co-option	0.117*	0.120	0.132	0.101	0.126	0.142
	(1.840)	(1.437)	(1.577)	(0.885)	(1.283)	(0.872)
Independence	0.131	0.045	0.073	0.037	0.373***	0.389**
	(1.425)	(0.332)	(0.735)	(0.193)	(3.061)	(2.168)
CEO Chair	-0.062**	-0.027	-0.098**	-0.090	-0.094**	-0.031
	(-1.986)	(-0.472)	(-2.279)	(-0.993)	(-2.212)	(-0.494)
CEO Tenure	-0.002	-0.004	-0.003	-0.004	0.003	-0.000
	(-0.588)	(-0.879)	(-0.646)	(-0.707)	(0.539)	(-0.045)
Board Size	-0.002	-0.020**	0.004	-0.000	-0.011	-0.010
	(-0.343)	(-2.091)	(0.565)	(-0.030)	(-1.385)	(-0.840)
Frac. Male Dir.	0.175	0.331	0.316	0.432	0.318	0.639*
	(0.924)	(1.181)	(1.409)	(1.157)	(1.285)	(1.970)
Firm Size	-0.028	-0.017	-0.046*	-0.080*	-0.100***	-0.095**
	(-1.574)	(-0.510)	(-1.914)	(-1.977)	(-4.427)	(-2.571)
Return on Assets	-0.646*	-0.837	-0.638	-0.734	-2.871***	-3.177***
	(-1.810)	(-1.207)	(-1.114)	(-0.731)	(-5.073)	(-3.468)
Yearly Return	0.016	-0.003	0.030	-0.002	-0.009	-0.013
	(0.559)	(-0.059)	(0.937)	(-0.030)	(-0.179)	(-0.282)
Leverage	0.399***	0.393	0.424**	0.470	0.619***	0.964***
	(3.103)	(1.470)	(2.297)	(1.169)	(3.752)	(3.165)
Year FEs	✓	✓	✓	✓	✓	✓
Industry FEs	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.445	0.508	0.300	0.368	0.559	0.666
Observations	577	272	577	272	577	272

Table A.5

Instrument with the deaths of non-co-opted directors: corporate risk and earnings management

I estimate the first stage regression of the GMM-IV procedure using the following equation:

$$\Delta\text{Board Co-option}_{i,t} = \beta_0 + \beta_1 \mathbb{1}(\text{Non-Co-opted Director Death})_{i,t-1} + \beta_2\text{Board Independence}_{i,t} + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \varepsilon_{i,t},$$

where i represents a firm, t is the fiscal year, $X_{i,t}$ represents financial and board control variables, γ_t is year fixed effects, ψ_j is industry fixed effects, and $\varepsilon_{i,t}$ is an idiosyncratic error term. The predicted values, Δ*Board Co-option (Pred.)*, are used to estimate the causal effect of a change in co-option on future changes in corporate risk and earnings management. The second stage regression is estimated with the following equation:

$$\%\Delta\text{Risk}_{i,t+2} = \beta_0 + \beta_1(\Delta\text{Board Co-option (Pred.)})_{i,t} + \beta_2\text{Board Independence}_{i,t} + \beta_3\text{CEO Chair}_{i,t} + \beta_4\text{CEO Tenure}_{i,t} + \beta\text{X}_{i,t} + \gamma_t + \psi_j + \epsilon_{i,t},$$

where *Risk* can be either *Cash Flow Volatility*, *Return Volatility*, or *Earnings Management* at times t or $t+1$. First stage regression results are reported in Column (1). Second stage regression results are reported in Columns (2)–(7). Standard errors are clustered by firm, and t-statistics are denoted in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	First Stage	Second Stage					
	Δ Co-option	Cash Flow Volatility		Return Volatility		Earnings Management	
	t	t	$t+1$	t	$t+1$	t	$t+1$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Co-opted Dir. Death$_{t-1}$	0.095***						
	(17.339)						
Δ Co-option (Pred.)		1.737	0.324	-0.260	0.140	0.499	-0.450
		(0.917)	(0.429)	(-1.401)	(0.730)	(0.660)	(-0.564)
Controls	✓	✓	✓	✓	✓	✓	✓
Year & Industry FE	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.026	-0.024	0.001	0.492	0.480	0.025	0.025
Observations	24,764	24,764	22,718	28,798	27,321	22,026	20,829