Board Co-option and Excess Cash Holdings

Asad Ali Rind
South Champagne Business School, Y Schools, Troyes, France
INTRARE, Université de Reims Champagne Ardenne, Reims, France
asad-ali.rind@yschools.fr

Aitzaz Ahsan Alias Sarang
School of Business Studies, Institute of Business Administration, Karachi, Pakistan
asarang@iba.edu.pk

Viet Anh Dang
Alliance Manchester Business School, University of Manchester, United Kingdom
vietanh.dang@manchester.ac.uk

Marc Goergen*
IE Business School, IE University, Madrid, Spain
European Corporate Governance Institute, Brussels, Belgium
marc.goergen@ie.edu

Abstract

This study examined how board co-option resulting from appointing directors after the chief executive officer (CEO) assumes office affects corporate excess cash holdings. An analysis of a sample of U.S. firms over the 1996–2018 period revealed a significantly positive relationship between co-opted directors and excess cash holdings. The results were robust to alternative variable definitions and persisted after entropy balancing and a difference-in-differences analysis. Cross-sectional tests demonstrated that co-opted directors are more likely to hold excess cash in firms with weaker internal monitoring due to low director compensation and longer CEO tenure. Furthermore, external monitoring resulting from high institutional ownership and financial analyst coverage moderated the positive relationship between co-opted directors and excess cash holdings. Finally, the interaction between co-option and excess cash resulted in lower firm value.

Keywords: corporate governance; agency costs; board monitoring; chief executive officer (CEO); co-opted directors; excess cash holdings

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* Corresponding author

1. Introduction

Previous research has suggested that corporate boards play an important role in advising and monitoring top management (Adams & Ferreira, 2007; Helland & Sykuta, 2004; Mace, 1971; Schmidt, 2015). In turn, a board's effectiveness is affected by its composition (Ma & Khanna, 2016). Specifically, agency theory conjectures that board monitoring is stricter and more effective if the board is more independent from management (Fama & Jensen, 1983). However, contrary to conventional wisdom, the empirical literature on the relationship between board independence and various firm outcomes has yielded mixed results (Adams et al., 2010; Coles et al., 2008; Harris & Raviv, 2008; Schmidt, 2015).

Coles et al. (2014) argued that a major reason for this inconsistent evidence is that board members are frequently co-opted—i.e., selected by the chief executive officer (CEO). However, traditional approaches to measuring board independence tend to ignore the degree to which CEOs have captured directors. While co-opted board members may not have any financial or other material ties with the company, they may still feel compelled to side with the CEO (Ma & Khanna, 2016). This argument is supported by anecdotal evidence[2] and academic research (Coles et al., 2014), which suggests that co-opted directors engage in less rigorous monitoring, thereby lowering board effectiveness and worsening agency conflicts. For example, Wells Fargo's opening of millions of accounts without customer approval between 2002 and 2016 and its subsequent prosecution under civil and criminal law were blamed on a weak board of directors.[3] During the 2006 fiscal year, Dick Kovacevich, who served as Wells Fargo's CEO from 1998 to 2007 (he was

[2] Activist investor Carl Icahn alleged that "members of the boards are cronies appointed by the very CEOs they're supposed to be watching" (https://www.bloomberg.com/news/articles/2005-11-17/carl-icahns-cure-for-corporate-america).

[3] See https://www.justice.gov/opa/pr/wells-fargo-agrees-pay-3-billion-resolve-criminal-and-civil-investigations-sales-practices (accessed on October 15, 2024).

subsequently chairman of the board until 2009), sat on the board alongside 12 independent directors, of which seven were co-opted.[4]

Our paper explores whether co-opted directors affect excess cash holdings, which is a measure of the extent of the agency problems affecting a firm (Schmidt, 2015). We focus on excess cash due to the increasing tendency of firms to hoard cash. Recent research has documented an upward trend in cash holdings among nonfinancial U.S. firms (e.g., Falato et al., 2022), with holdings reaching $4 trillion in 2016, up from $2.7 trillion a decade earlier (Faulkender et al., 2019). Govindarajan et al. (2024) further underscored this trend, noting that cash reserves surged to $6.9 trillion in 2022. They found that despite rising interest rates, approximately one in every five dollars owned by companies is now in the form of cash. Barclays estimates that companies currently hold $800 billion in "excess" cash (Scaggs, 2023). The finance literature refers to this increase in corporate cash holdings as a puzzle given the traditional association of cash with agency costs (Jensen, 1986). Indeed, previous research suggests that firms facing greater agency conflicts tend to hold excess cash (Dittmar et al., 2003), making cash hoarding a double-edged sword (Opler et al., 1999). On the one hand, holding cash reduces a firm's liquidity risk and the probability of financial distress. On the other hand, having excess cash exacerbates the risk of shareholder expropriation (Nikolov & Whited, 2014).

This study examines whether co-opted directors exacerbate agency problems, as reflected by greater excess cash holdings. Although the extant literature has shown that co-opted board members are ineffective monitors, it has not explored whether firms with more co-opted directors hold more excess cash—that is, whether they have greater agency problems. Understanding the impact of co-opted directors on excess cash is crucial for at least two reasons. First, excessive cash

[4] The data were collected from BoardEx and the 2006 10-K of Wells Fargo & Co.

reserves may indicate underlying agency problems within the firm, such as empire building, with managers prioritizing their interests over those of shareholders. Second, holding excess cash may result in suboptimal capital allocation decisions, with funds not being utilized efficiently to generate returns for shareholders (Dittmar et al., 2003; Jensen, 1986).

We documented a significantly positive relationship between co-opted directors and excess cash holdings. This positive relationship supports the notion that co-opted directors engage in less rigorous monitoring, which may in turn lead to stockpiling cash beyond the optimal level. This result persisted when using alternative definitions of co-opted directors and excess cash. Our results were found to be robust following a battery of tests that addressed potential endogeneity concerns. Specifically, to alleviate potential omitted variable bias, we first augmented our baseline equation with the lagged dependent variable, and the results were upheld. Second, we limited our analysis to firms whose board co-option remained unchanged for two consecutive years; again, we obtained similar results. Third, to address reverse causality, we used lags of the independent and control variables in our regression analysis, and the results remained qualitatively similar. Fourth, to reduce the potential impact of significant differences in the covariates, we performed entropy balancing, whereby we matched co-opted firms with non-co-opted firms and reran our analysis. The findings persisted. Finally, to provide causal evidence, we performed a difference-in-differences (DID) analysis using plausibly exogenous shocks to board co-option due to involuntary CEO departures and the adoption of the Sarbanes-Oxley Act (SOX). The results continued to hold. Overall, our results show a robust positive association between co-opted boards and excess cash holdings.

In further analysis, we performed a cross-sectional analysis based on proxies for internal and external monitoring and found that higher levels of internal and external monitoring mitigate the documented relationship between a co-opted board and excess cash holdings. First, we examined

the impact of director compensation on this relationship, given that the incentives provided by compensation serve as motivators for board members to monitor firm performance (Yermack, 2004), thereby encouraging greater monitoring efforts, especially in firms with greater agency problems (Jensen & Murphy 1990; Gillette et al., 2003).[5] Indeed, we found that firms with co-opted directors and weak internal monitoring, as reflected by lower director compensation, tend to hold more excess cash. Next, we found that the positive and significant relationship between co-option and excess cash only exists in firms with longer CEO tenure (i.e., those likely to face greater agency problems). We also showed that strong external monitoring, as reflected by high institutional ownership and a high number of analysts following the firm, mitigates the positive association between co-opted directors and excess cash holdings. Finally, to the extent that excess cash is driven by board co-option and the resulting weak monitoring, we expected it to have a negative effect on the market value of excess cash. In support of this conjecture, we found that the interaction between a co-opted board and excess cash lowers the market value of excess cash.

This paper makes the following major contributions to the extant literature: First, it extends recent research on the consequences of captured boards. It shows that co-opted boards tend to compromise the monitoring of management (Zaman et al., 2021). More specifically, firms with board co-option pay lower dividends (Jiraporn & Lee, 2018), are more likely to manipulate earnings (Cassell et al., 2018), and make more arbitrary and erratic decisions (Baghdadi et al., 2020). This paper fills a gap in the literature by documenting a positive relationship between co-opted directors and firms' excess cash holdings.

[5] Our discussion of the relationship between director compensation and internal monitoring acknowledges the multifaceted nature of director compensation and its potentially divergent implications for agency risk and excess cash. On the one hand, Cullinan et al. (2008) and Ye (2014) highlighted the negative effects of stock options, given that the latter increase the likelihood of financial misstatements. On the other hand, Hirshleifer and Thakor (1994) and Maug (1997) found that director compensation enhances monitoring effectiveness, especially in firms with agency problems (Gillette et al., 2003; Jensen & Murphy, 1990; Yermack, 2004).

Second, our paper contributes to the developing research stream that links board co-option to monitoring intensity, agency conflicts, and stakeholder–agent conflicts (Zaman et al., 2021). We show that co-opted board members are less strict monitors, as evidenced by the greater hoarding of excess cash. In line with Bargeron et al.'s (2010) and Cohen et al.'s (2013) findings, we show that board independence tends to mitigate agency conflicts. However, our research diverges from these studies by showing that, despite controlling for board independence, independent co-opted directors still tend to increase excess cash holdings and, in turn, increase agency costs. These results contribute to the ongoing debate on the effectiveness of SOX, which aims to mitigate agency problems by enhancing board independence (Dah et al., 2014). We show that independent directors do not always provide effective monitoring to deter such transgressions, thus providing insights for stakeholders seeking to reduce agency costs.

Third, we contribute to the broader governance literature by exploring how specific governance mechanisms moderate the relationship between board co-option and excess cash. Specifically, we show that the effects of co-opted directors on excess cash vary with factors that capture the strength of internal and external monitoring mechanisms (i.e., director compensation, CEO tenure, analyst coverage, and institutional ownership).

Finally, we contribute to the burgeoning literature on the impact of corporate governance on the value of excess cash. Consistent with previous evidence of how weak corporate governance, such as managerial entrenchment, leads to lower firm value (Dittmar & Mahrt-Smith, 2007), we demonstrate that co-opted directors have negative value consequences, which is a valuable insight for key stakeholders, such as managers, investors, and policymakers.

The rest of the paper is organized as follows: Section 2 reviews the literature and presents our main hypothesis. Section 3 describes the research methodology and data. Section 4 reports our main results regarding the relationship between co-option and excess cash and the results of

various robustness tests. Section 5 discusses what further analysis revealed about how the main internal and external monitoring channels moderate the effect of board co-option on excess cash holdings. Section 6 investigates the effect of board co-option on the value of excess cash. Finally, Section 7 discusses the implications of our findings and presents our conclusions.

2. Literature review and hypothesis development

2.1 Theories of cash holdings and the agency problem of excess cash

Prior theory has advanced three distinct views of corporate cash holdings. First, according to Myers and Majluf's (1984) pecking order theory, firms do not have a target for cash holdings (or capital structure). Instead, to finance their investments, firms primarily rely on internal funds and only raise external funds as a last resort. Therefore, they prefer to hold as much cash as possible. Second, the trade-off theory predicts that firms have cash targets and that the optimal level of cash is the result of a trade-off between the benefits of holding cash, which consists of reducing the probability of facing a liquidity crisis, and the agency costs associated with holding cash (Opler et al., 1999). Finally, Jensen's (1986) free cash flow hypothesis posits that managers hold excess cash to increase their discretionary power. Excess cash may be wasted by investing it in projects with negative net present values (NPVs).

Empirical research provides evidence supporting the free cash flow hypothesis. For example, Myers and Rajan (1998) found that managers obtain private benefits of control, as a result of holding liquid assets. Based on a sample of firms from 45 countries, Dittmar et al. (2003) reported that cash holdings are higher in countries with weak protection of shareholder rights. Importantly, Nikolov and Whited (2014) concluded that cash holdings are 20% higher than is optimal due to agency problems, depressing shareholder value by 6%.

2.2 Co-opted directors and cash holdings

Jensen and Meckling (1976) identified the agency costs that arise when agents (managers) are insufficiently incentivized to maximize shareholder value. The resulting self-interested, opportunistic managerial behavior may take several forms, including hoarding excess cash, investing in negative NPV projects, empire building, and consuming nonpecuniary benefits and other perquisites.

However, agency problems can be mitigated via strong governance, such as intensive monitoring and effective oversight, thus curtailing managers' opportunistic behavior and limiting their consumption of perquisites. Specifically, the board of directors can play a powerful role in disciplining managers (Fama & Jensen, 1983). To build a reputation as efficient monitors, independent board members typically prevent executives from diverting shareholder funds. Therefore, shareholders may be able to rely on outside, independent directors to oversee management and curb agency costs (Jain & Zaman, 2020; Krause et al., 2017).

Consistent with this view, Weisbach (1988) and Bhagat and Bolton (2008) found that outside directors are effective at monitoring, as they increase the likelihood of CEO turnover in the wake of poor performance. By contrast, Boivie et al. (2016) and Dah et al. (2014) found that the presence of independent directors does not lower the likelihood of corporate misconduct. More importantly, Baghdadi et al. (2020) and Coles et al. (2014) showed that even if independent directors are well-qualified, their connectedness with the CEO may compromise their ability to protect shareholder interests. These findings suggest that independent directors are frequently independent in name only.

Why would this be the case? The extant literature has highlighted CEOs' often substantial influence over the appointment of board members (Baghdadi et al., 2020; Coles et al., 2014). Finkelstein and Hambrick (1989) argued that CEOs capture the board by selecting "sympathetic"

directors. Likewise, Hwang and Kim (2009) showed that CEOs tend to push for the appointment of directors with whom they share social ties. Similarly, other studies have demonstrated that CEOs tend to appoint directors with whom they can establish good working relationships (Coles et al., 2014; Wintoki & Xi, 2019).

Such co-opted directors tend to be loyal to the CEO and lax when performing their monitoring duties. For example, Zaman et al. (2021) found that co-opted appointees attend fewer board meetings, propose fewer agenda items, and receive compensation packages that are more generous than the norm in their industry. They also showed that firms with more captured directors are more likely to face financial penalties, providing further evidence that co-opted directors increase agency conflicts. Likewise, co-opted board members not only shield underperforming managers from disciplinary turnover (Coles et al., 2014) but also grant them higher compensation (Morse et al., 2011). In summary, the empirical literature has documented a negative relationship between co-opted board members and the effectiveness of corporate governance.

This brings us to our main research question: Do firms with co-opted boards hold more excess cash? We argue that co-opted directors increase excess cash holdings for the following reasons: First, according to the free cash flow hypothesis (Jensen, 1986), in poorly governed firms, managers hold excess cash to increase their discretionary power. In turn, this increases the likelihood of excess cash being squandered on projects with negative NPVs, thereby exacerbating agency costs. This argument is supported by empirical research confirming that managers hold excess cash for agency motives and private benefits of control (Dittmar et al., 2003; Myers & Rajan, 1998; Nikolov & Whited, 2014). Second, studies on the monitoring behavior of co-opted directors suggest that such directors comply with the wishes of the CEO and management (Coles et al., 2014). We expect that less intensive monitoring by the board will result in greater excess cash holdings. As the fraction of co-opted board members rises, it becomes gradually less likely

that executive decisions will be challenged or scrutinized or that executives will be held to account for holding excess cash. Based on these arguments, we formulated the following hypothesis:

H1: *Corporate excess cash holdings are higher among firms with a greater fraction of co-opted directors.*

3 Data and methodology

3.1 Data and sample

The data used in this study were collected from multiple sources. The data on board co-option were taken from Coles et al. (2014), with updates by Lalitha Naveen.[6] The data on board members' characteristics were taken from ISS Analytics, while data on firm-level accounting variables were taken from Compustat. We retrieved data on analyst coverage and institutional ownership from the Institutional Brokers' Estimate System (I/B/E/S) and Refinitiv 13F, respectively. Our sample period extended from 1996 to 2018, covering 1,917 unique firms and 17,150 firm-year observations.[7] All continuous variables were winsorized at the 1st and 99th percentiles to mitigate the potential impacts of outliers.

3.2 Excess cash

Following previous studies (Dittmar & Mahrt-Smith, 2007; Schauten et al., 2013; Schmidt, 2015), we calculated excess cash via the following two steps: First, we estimated the optimal level of cash that firms should hold according to industry- and firm-level fundamentals. Second, we defined excess cash as the observed or actual cash minus the estimated optimal cash. In other words, excess cash is the residual from the regression estimating the optimal cash holdings level. Following

[6] The data is available on Lalitha Naveen's website: https://sites.temple.edu/lnaveen/data.
[7] We excluded the year 2019 and the subsequent period from our study because of significant changes to corporate cash holdings during the COVID-19 pandemic given the high uncertainty and risk that ensued (e.g., Acharya and Steffen, 2020).

Frésard and Salva (2010), we set excess cash to zero for firm-year observations with negative excess cash. This adjustment was made based on the assumption that a firm operating with negative excess cash is functioning at an optimal level, as it would be unable to operate otherwise.[8] Following Dittmar and Mahrt-Smith (2007), we used the following regression equation for the optimal cash level:

$$Ln(Cash\_NA_{i,t}) = \beta_0 + \beta_1 Ln(NA_{i,t}) + \beta_2 FCF\_NA_{i,t} + \beta_3 NWC\_NA_{i,t} + \beta_4 Industry\ sigma_{i,t} + \beta_5 MV\_NA_{i,t} + \beta_6 RD\_NA_{i,t} + Year\ fixed\ effects + Firm\ fixed\ effects + \varepsilon_{i,t}, \quad (1)$$

where the subscripts *i* and *t* represent the firm and year, respectively. *Cash_NA* is cash to net assets (*NA*), with *Cash* being cash and cash equivalents and *NA* being total assets minus cash and cash equivalents; *FCF_NA* is free cash flow to net assets, with *FCF* being calculated as operating income minus interest and taxes; *NWC_NA* is net working capital to net assets with net working capital being net current assets less current liabilities; *Industry sigma* is the industry average of the standard deviation of *FCF_NA* over the previous 10 years; *MV_NA* is the market value of common stock to net assets with *MV* being the stock price multiplied by the number of shares outstanding plus the book value of total liabilities (the market value is instrumented using the past three-year sales growth; for its detailed calculation, see Dittmar and Mahrt-Smith (2007); and *RD_NA* is the research and development expenditures to net assets, with *RD* being the research and development expenditures (set to zero if missing).

3.3 Board co-option

Following Coles et al. (2014), we defined board co-option as the fraction of board members appointed after the CEO assumed office—i.e., the number of co-opted directors scaled by total

[8] The results hold if we do not replace the negative excess cash observations with zero. See our robustness checks in Section 4.3.

board size. This variable ranges from zero to one, with higher values representing greater board co-option. Following Coles et al. (2014), we used three alternative proxies for board co-option: independent co-option, *Co-option* (*indep*), computed as the number of the independent co-opted directors divided by total board size; tenure-weighted co-option, *Co-option* (*TW*), computed as the ratio of the sum of the tenure of all the co-opted directors to the total tenure of all the board members; and tenure-weighted independent co-option, *Co-option* (*TW indep*), computed as the sum of the tenure of the independent co-opted directors to the total tenure of all the board members.

3.4 Empirical model

We estimated a Tobit model to investigate the impact of a firm's level of board co-option on its excess cash. We used the Tobit model because the dependent variable is truncated at zero.[9] Using an ordinary least squares (OLS) model could have generated bias. Our Tobit model was specified as follows:

$$Excess\ cash_{i,t,} = \beta_0 + \beta_1 Co\text{-}option_{i,t} + \beta_2\ Size_{i,t} + \beta_3 Market\text{-}to\text{-}book_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Cashflow_{i,t} + \beta_6 Capital\ expenditure_{i,t} + \beta_7 RD\_sales_{i,t} + \beta_8 NWC\_TA_{i,t} + \beta_9 Dividend_{i,t} + \beta_{10} Board\ size_{i,t} + \beta_{11} Board\ indep_{i,t} + \beta_{12} Female\ proportion_{i,t} + Year\ effects + Industry\ effects + \varepsilon_{i,t}, \quad (2)$$

where *Excess cash* is computed as the observed cash minus the optimal cash level as estimated by Equation (1); it is set to zero if the firm-year observation has negative excess cash. *Co-option* is defined as above. In the model, we included the following firm characteristics, which have been shown to determine a firm's cash holdings (Cohn & Wardlaw, 2016; Dittmar & Mahrt-Smith, 2007; Tang et al., 2015; Wowak et al., 2015): *Size* is the natural logarithm of total assets; *Market-*

[9] For ease of interpretation, we report the marginal effects at the means for all the regressions using the Tobit model.

to-book is the market-to-book ratio; *Leverage* is total debt divided by total assets; *Cash flow* is cash flow from operations measured as earnings after interest, dividends, and taxes but before depreciation divided by the book value of assets; *Capital expenditures* is capital expenditures measured as the ratio of total capital expenditures to total assets; *RD_sales* is the research and development expenditures (*RD*) divided by total sales; *NWC_TA* is net working capital measured as net current assets minus current liabilities scaled by total assets; *Dividend* is an indicator variable equal to one if the firm paid a dividend in year *t* and zero otherwise. We also controlled for the following board characteristics: *Board size* is the total number of directors; *Board independence* is the ratio of the number of independent directors to the total number of directors; and *Female proportion* is the ratio of the number of female directors to the total number of directors. Detailed variable definitions can be found in the Appendix.

4 Results

4.1 Descriptive analysis

Table I presents descriptive statistics for the main variables. *Excess cash* has a mean value of 0.052, suggesting that, on average, the cash held by U.S. firms is slightly higher than the estimated optimal level of cash. Nevertheless, excess cash exhibited significant variability, with a standard deviation of 0.192. The average ratio of co-opted directors (*Co-option*) is 0.466, which is similar to the average reported in recent research (Jiraporn & Lee, 2018; Zaman et al., 2021). The summary statistics for the financial variables are also in line with the existing literature. The average board has about nine members, which is in line with Mobbs et al.'s (2021) findings, while the average ratio of independent directors is 0.737, suggesting a high degree of board independence. The ratio

of female directors is around 0.119, indicating that male directors dominate U.S. corporate boards.[10]

[Insert Table I about here]

4.2 Baseline regression results

Table II reports the baseline Tobit regression results using excess cash as the main dependent variable and board co-option as the independent variable of interest. For ease of interpretation, we report the marginal effects instead of the coefficients. Column (1) of Table II suggests that co-option is positively and significantly related to excess cash. In terms of economic significance, an increase in co-option by one standard deviation (i.e., 0.315) increases excess cash by approximately 5.5% relative to the mean (i.e., 0.009*0.315 / 0.052 = 5.5%). Therefore, the impact of board co-option on excess cash holdings is significant.

In the remaining columns of Table II, we used three alternative proxies for board co-option to assess the robustness of the results. First, we used the variable *Co-option* (*indep*). The results in column (2) suggest that the main finding continues to hold, supporting the argument that independent co-opted directors monitor less intensively. Next, we considered co-opted directors' tenure by using *Co-option* (*TW*), which considers the possibility that, over time, co-opted board members become even more co-opted, thereby increasing the CEO's influence. The results in column (3) suggest that *Co-option* (*TW*) is positively associated with excess cash at the 5% significance level. Finally, we used *Co-option* (*TW indep*) in column (4), which considers the potentially increasing influence of co-opted independent directors over time. We found a significant (at the 10% level) and positive relationship between co-option and excess cash. Overall, our baseline results support our hypothesis that firms with greater board co-option hold more

[10] The Pearson correlation and the variance inflation factors (VIFs) for each variable are reported in Table A of the Internet Appendix.

excess cash because co-opted directors monitor less effectively, which is consistent with recent evidence (e.g., Zaman et al., 2021).

[Insert Table II about here]

4.3 Robustness checks

4.3.1 Alternative definitions of excess cash

This section examines the robustness of our main findings when using alternative measures of excess cash. First, we employed the alternative measure suggested by Opler et al. (1999)—namely the residual obtained from regressing the cash-to-total assets ratio on conventional explanatory variables (i.e., cash flow to total assets, the market-to-book ratio, net working capital to total assets, the natural logarithm of total assets, capital expenditures to total assets, a dividend indicator variable, research and development expenditures to sales, the industry sigma, and cash acquisitions to total assets). All these variables were constructed as in Opler et al. (1999) and Bates et al. (2009). The regressions controlled for year, industry, and firm fixed effects. We present the results using this alternative measure for excess cash (*Excess cash 2*) in columns (1) to (4) of Table III; they show that the relationship between excess cash and co-opted boards remains positive and significant in all these regressions.

Second, following previous studies (Chen et al., 2020; Subramaniam et al., 2011), in columns (5) to (8), we used *Industry-adjusted cash*, calculated as the difference between a firm's cash ratio and the industry median based on the three-digit Standard Industrial Classification (SIC) codes, as the dependent variable. In columns (9) to (12), we used *Cash to net assets* as another alternative measure. Our results remain qualitatively the same.[11] Overall, these additional tests suggest that our results are not limited to a specific measure of excess cash or cash holdings.

[11] As discussed, in the baseline regressions, we utilized a Tobit model because the dependent variable is truncated at zero. However, truncating the variable at zero may influence the results. To address this, in Table B in the Internet

[Insert Table III about here]

4.3.2 Addressing omitted variable bias and reverse causality

To address potential omitted variable bias and reverse causality, which may have affected the relationship between excess cash and board co-option, we ran a battery of robustness tests; the results are reported in Table IV. Regarding omitted variable bias, our findings may have been influenced by unobserved firm characteristics not accounted for in our regressions. One way of addressing this potential bias is to employ a firm fixed effects model, which controls for time-invariant, unobservable traits over time. However, this approach may not be appropriate for our study, as a fixed effects model essentially focuses on the time series variation in board co-option. However, in our sample, the proportion of co-opted directors is highly persistent over time. Furthermore, applying fixed effects using the Tobit model presents another challenge because fixed effects regressions rely on within-group variation, assuming that the effects being estimated are constant within groups. However, in the Tobit model, the censoring mechanism may vary across entities, which violates the assumption of constant effects. Consequently, using a Tobit fixed effects regression may lead to biased and inconsistent estimates.[12]

Hence, to alleviate concerns about omitted variable bias, we followed Jiraporn and Lee (2018) and included lagged excess cash on the right-hand side of our baseline equation. Including the lagged dependent variable helped mitigate omitted variable bias, as both lagged and contemporaneous excess cash are influenced by the same unobservable characteristics. The results,

Appendix, we also report the results using *Excess cash 3*, which is predicted based on Equation (1), while we do not set negative excess cash observations to zero. The results remained qualitatively unchanged. We also calculated an augmented excess cash measure (*Excess cash 4*) accounting for firm governance, as the latter may significantly influence cash holdings (Dittmar & Mahrt-Smith, 2007; Harford et al., 2008). Specifically, we included three additional governance variables—board size, board independence, and the female director ratio—in Equation (1) and calculated *Excess cash 4* as the residual from this regression (again, we replaced the negative values with zero). Our baseline results remained unchanged when using these alternative measures of excess cash.

[12] Nevertheless, we report the results for the model with the firm fixed effects using the Honore (1992) approach and for the Poisson firm fixed effects regressions in Table C of the Internet Appendix. As anticipated, the fixed effects regression produced an insignificant coefficient on our main variable of interest.

reported in columns (1) to (4) of Panel A of Table IV, showed positive and significant coefficients on all the measures of co-option, suggesting that our inferences were unlikely affected by omitted variable bias.

To alleviate concerns about reverse causality, we performed two tests following recent research (Jiraporn & Lee, 2018). First, in columns (1) to (4) of Panel B of Table IV, we replaced the current levels of the independent and control variables with their lagged levels. The results remained unchanged. Second, we considered only firms in which excess cash holdings changed while the ratio of co-opted directors remained the same for two consecutive years. The rationale behind this test was as follows: for these firms, since the level of board co-option remained constant over time, any changes in excess cash were unlikely to affect board co-option, reducing the likelihood of reverse causality. We reran our baseline regressions using all the different measures for co-opted boards for this subsample of firms. Columns (5) to (8) of Panel B show that the relationship between co-option and excess cash remained positive and significant. Overall, the tests reported in Table IV demonstrate that our baseline results were unlikely to be driven by reverse causality or omitted variable bias.[13]

[Insert Table IV about here]

4.3.3 Entropy balancing

To address any potential selection bias stemming from observed firm-specific heterogeneity, we performed our main analysis using entropy balancing. Entropy balancing is a quasi-matching method that assigns weights to each observation, aiming to make the post-weighting distributional characteristics of the treatment and control groups nearly identical. This process helps ensure

[13] In further analysis reported in Table D in the Internet Appendix, we controlled for additional financial and governance variables that may be correlated with agency conflicts and excess cash: *Tobin's q*, *Firm age*, *Financial constraints*, *Financial distress*, *Cash flow volatility*, *Duality*, *CEO tenure*, *Board tenure*, *Board skills*, *Board attendance*, *Independent female directors*, and *Institutional ownership*. The results remained qualitatively similar, suggesting that our main results were unlikely to have been influenced by time-varying omitted variables.

balance across covariates (Hainmueller, 2012). An important advantage of entropy balancing over matching techniques, such as propensity score matching (PSM), is that it not only facilitates the optimal weighting of the treatment observations but also preserves the original sample size while improving efficiency (e.g., Chapman et al., 2019; Godsell et al., 2023). Indeed, in an untabulated analysis, using PSM results in a significant reduction (of almost 90%) in sample size, which can primarily be attributed to the imbalance between the observations with co-opted directors and those without such directors in the unmatched sample.

We applied entropy balancing based on the absence and presence of co-option using the first three moments of the covariates (i.e., the mean, variance, and skewness) to ensure that the distribution of the baseline control variables did not significantly differ between the co-opted and non-co-opted firms.[14] Panel A of Table V reports the post-entropy balancing mean, variance, and skewness, demonstrating that the differences between the non-co-opted and co-opted firm-year observations were almost negligible and not statistically significant in all cases.

We reestimated Equation (2) using the entropy-balanced observations; the results are reported in Panel B of Table V. We found that the coefficients of all the proxies for board co-option were statistically significant and positive. The results are broadly in line with our baseline finding that firms with co-opted directors hold more excess cash, as predicted by our main hypothesis. They also suggest that our inference is unlikely to be affected by potential sample selection bias.

[Insert Table V about here]

[14] In un-tabulated tests, our main results remain qualitatively the same when we run entropy balancing based on the absence and presence of co-opted directors using the other three measures of co-opted boards, i.e., *Co-option* (*indep*), *Co-option* (*TW*), and *Co-option* (*TW indep*).

4.4 Difference-in-differences analysis

4.4.1 CEO turnover events

To further mitigate potential endogeneity concerns and establish causality, we performed a DID analysis using CEO turnover events as a shock to board co-option, given that the outgoing CEO was instrumental in appointing the co-opted directors. Hence, any unanticipated event that resulted in CEO turnover, such as a CEO's sudden death, would likely have reduced the presence of co-opted directors on the board (Coles et al., 2014; Zaman et al., 2021). We followed previous studies (Fee et al., 2013; Pan et al., 2015, 2018; Shang, 2021) and defined a CEO turnover event as an exogenous event if the CEO died suddenly while in office or if the turnover was involuntary due to illness.[15] We expected the firm's excess cash to decrease following the reduction in *Co-option* due to exogenous CEO turnover.

We first created a treatment group consisting of firms that experienced an exogenous CEO turnover event. We utilized this treatment group and applied entropy balancing based on the covariates in the baseline model—i.e., Equation (2). For the rest of the analysis, we focused on the event window consisting of the three years before and the three years after the CEO turnover event. Accordingly, in the DID analysis, we examined the change in excess cash from the pre-CEO-turnover period (i.e., the three years before the year of the CEO turnover event) to the post-CEO-turnover period (i.e., the three years after the year of the CEO turnover event). Furthermore, to estimate the treatment effect cleanly, we ignored the CEO turnover year. Specifically, we used the following DID model:

$$Excess\ cash_{i,t} = \beta_0 + \beta_1\ CEO\ turnover_{i,t} *\ After_{i,t} + \beta_2\ CEO\ turnover_{i,t} + \beta_3\ After_{i,t} +$$
$$Controls_{i,t} +\ Year\ effects + Industry\ effects +\ \varepsilon_{i,t}. \quad (3)$$

[15] Data on CEO turnover was obtained from Gentry et al. (2021). We focus on CEOs' involuntary departures due to death (departure code 1) and illness (departure code 2). The data are available online at https://zenodo.org/record/4543893#.YrnhlnbP02w.

We set the treatment indicator variable (*CEO turnover*) to one for all years for firms with a CEO turnover event and zero for firms without a CEO turnover event. Next, we set the post-shock indicator variable *After* to one for the period following the CEO turnover event and zero for the years before the CEO turnover event. Finally, we included the interaction *CEO turnover * After*, which captured the impact of the CEO turnover event on excess cash. *Controls* included the control variables from our baseline model based on Equation (2).

Our DID analysis is reported in Table VI. In Panel A, we compare the covariates for the treated firms (i.e., those with a CEO turnover event) and the control firms (i.e., those without CEO turnover) after entropy balancing. The statistics suggest no significant differences between the two groups' post-entropy balancing.[16] In Panel B of Table VI, we report the results of the DID regressions. Columns (1) and (2) show that the coefficient on the interaction *CEO turnover * After* is negative and significant at the 1% level or better, suggesting that exogenous CEO turnover results in a decrease in a firm's excess cash. These results provide further evidence of the causal effect of board co-option on excess cash.

[Insert Table VI about here]

4.4.2 SOX as an exogenous regulatory shock

We used SOX as a second quasi-natural experiment to further mitigate endogeneity concerns and establish a causal link between board co-option and excess cash. The SOX Act requires companies to have a majority of independent directors on their boards, forcing non-compliant firms to appoint new independent directors (Linck et al., 2009). According to Coles et al. (2014), this resulted in an exogenous shock to board co-option. We utilized this shock in the DID procedure proposed by Coles et al. (2014). Specifically, we estimated the following equation:

[16] We used entropy balancing based on the first two moments of covariates (i.e., the mean and variance) as the algorithm does not reach convergence within the specified tolerance and fails to adjust the third-order moment of *Board size*.

$$Excess\ cash_{i,t} = \beta_0 + \beta_1 Co\text{-}option_{i,t} + \beta_2(SOX * Co\text{-}option_{i,t}) + \beta_3(Non\text{-}compliant * Co\text{-}option_{i,t}) + \beta_4(SOX * Non\text{-}compliant * Co\text{-}option_{i,t}) + \beta_5\ SOX + \beta_6\ Non\text{-}compliant + Controls + Year\ effects + Industry\ effects + \varepsilon_{i,t}. \quad (4)$$

SOX is an indicator variable equal to one in the post-SOX period and zero otherwise. *Non-compliant* is an indicator variable equal to one if the firm did not have a majority of independent directors on its board in 2001 and zero otherwise. The $Co\text{-}option$ and control variables are the same as those in Equation (2).

The objective of this DID analysis was to isolate the effect on excess cash directly attributable to board co-option. We were mainly interested in firms that did not have a majority of independent directors in 2001, since this group included firms that were subject to SOX-driven exogenous shocks to board co-option. However, this group also absorbed any SOX effects that did not directly result from the change in board co-option, as SOX may also have affected excess cash through channels other than co-option. In particular, the sum of the coefficients β_1, β_3, and β_4 accounted for the "clean" effect of board co-option, whereas β_2 accounted for the effect of board co-option through the other SOX channels (Coles et al., 2014).

Table VII reports the DID results for Equation (4). In columns (1) to (4), following Jiraporn and Lee (2018), we report the clean effect of each of the four measures of board co-option on excess cash. We found that these effects were positive and significant for all four measures and qualitatively similar to the baseline findings reported in Table II.

In sum, this section showed that it is unlikely that our main inference was affected by endogeneity concerns via a DID analysis exploiting plausibly exogenous CEO turnover events and a quasi-natural experiment based on the passage of SOX. The DID results suggest that the positive and significant relationship between board co-option and excess cash is likely a causal one.

[Insert Table VII about here]

5. Further analysis

5.1 The role of internal monitoring

In this section, we provide evidence of how the strength of internal monitoring, which is proxied using director compensation and CEO tenure, affects how board co-option impacts excess cash. There is conflicting empirical evidence regarding the impact of director compensation on monitoring effectiveness, with some studies suggesting a negative effect and others suggesting a positive one. Among the studies documenting a negative effect, Cullinan et al. (2008) showed that firms whose directors do not receive stock options tend to experience fewer financial misstatements than those compensating their directors with stock options. Similarly, Ye (2014) found that higher compensation for independent directors compromises their independence and diminishes their effectiveness in overseeing financial reporting. This could be because board members who have a personal connection with the CEO before joining the board are more likely to receive discretionary compensation (Fedaseyeu et al., 2018). These findings highlight the potential drawbacks associated with high director compensation, which may inadvertently undermine the monitoring capabilities of the board.

Studies that have found a positive effect include Hirshleifer and Thakor's (1994), which showed that incentive alignment, alongside information noise and external disciplinary measures, such as takeovers, collectively shape board performance. Maug (1997) argued that compensating directors with shares or options effectively aligns their interests with those of shareholders. By aligning directors' incentives more closely to the maximization of shareholder wealth, firms mitigate the risks associated with conflicting interests and enhance the effectiveness of their monitoring mechanisms. Yermack (2004) corroborates this by demonstrating that firms grappling with agency problems tend to rely more heavily on compensation for their outside directors, thereby intensifying the board's focus on improving firm performance. Furthermore, Gillette et al.

(2003) confirmed that incentive compensation motivates directors to exert greater monitoring efforts. This suggests that firms utilize incentive compensation as a mechanism to motivate board members to closely monitor firm performance.

To identify which of these conflicting views has empirical support in our study, we divided our sample firms into those with low (high) director compensation if the average director compensation (*Director compensation*) was lower than or equal to (higher than) the overall median. We then reran our baseline model for the subsamples with low (high) director compensation. The results in Panel A of Table VIII suggest that among firms with lower average director compensation, the impact of board co-option on excess cash is significant and positive. By contrast, among firms with higher director compensation, the coefficient on board co-option was not significant. These results imply that when co-opted directors are not properly compensated, they compromise monitoring by allowing top management to hold more excess cash. Hence, the findings support the efficient contracting hypothesis and suggest that directors align their interests with those of shareholders and effectively monitor managers when they are highly paid.

Next, we investigated how the relationship between board co-option and excess cash holdings varies with CEO power. Prior studies have shown that CEOs' power typically increases with their tenure (Ryan & Wiggins, 2004; Weisbach, 1988). The agency literature posits that CEO power exacerbates incentive problems because powerful CEOs are likely to engage in empire building rather than maximizing shareholder wealth (Adut et al., 2011). Importantly, according to this argument, the effect of board co-option may be more pronounced in the presence of a powerful CEO.

To test the validity of this prediction, we employed *CEO tenure* as a proxy for CEO power. In Panel B of Table VIII, we reran our baseline model for the subsamples of firms with low and

high *CEO tenure*, where low (high) *CEO tenure* refers to firm-year observations that are equal to or lower than (higher than) the overall sample median. The results showed a significant (at the 10% level) and positive coefficient on overall co-opted directors for the subsample of firm-year observations with high CEO tenure. As expected, no significant relationship between co-option and excess cash was observed for the subsample of firm-year observations with low CEO tenure. The same patterns emerged when we used the tenure-weighted measure of overall co-opted directors. Nevertheless, the coefficient on independent co-opted directors (whether tenure-weighted or not) was not significant for either subsample. These findings broadly support the argument that co-opted directors tend to be less vigilant in the presence of high CEO power, as proxied by long CEO tenure.

[Insert Table VIII about here]

5.2 The role of external monitoring

In our final cross-sectional test, we examined whether external monitoring mechanisms moderate the positive relationship between co-opted directors and excess cash holdings. In the presence of co-opted directors, external oversight may still discipline executives (Baghdadi et al., 2020), since such mechanisms help mitigate shareholder-management conflicts, protect shareholder rights, and enhance overall board monitoring (Chen et al., 2015; Jain & Zaman, 2020). Hence, we predicted that the positive relationship between co-option and excess cash holdings would be less pronounced for firms with greater external oversight.

We used two measures of external monitoring: institutional investor ownership and financial analyst coverage. First, institutional investors normally hold a sizable equity stake in a firm and, therefore, have power over top management. Hence, managers are more likely to be responsive to their demands than to those of smaller shareholders. For example, Parrino et al. (2003) found that changes in the institutional ownership structure affect board deliberations about the appointment

of the new CEO after forced CEO turnover. Furthermore, institutional investors tend to be actively involved in changing a firm's governance structure and operations (Smith, 1996; Strickland et al., 1996; Wahal, 2000). Owing to their significant stake in the firm, institutional investors possess an incentive to monitor management, as they may not always have the option to divest their shares from underperforming firms (Gillan & Starks, 2000). Therefore, we predicted that the positive association between excess cash and board co-option would not hold for firms with high institutional ownership.

To test the validity of our conjecture, we classified our sample into firms with low (high) institutional ownership if their institutional ownership was equal to or below (above) the sample median. The results in Panel A of Table IX suggest that the positive association between excess cash and board co-option holds only for the subsample with low institutional ownership. These results are in line with the above prediction and earlier evidence that institutional investors reduce a firm's excess cash holdings through monitoring (Dittmar et al., 2003; Ferreira & Vilela, 2004; Pinkowitz et al., 2006).

There are two main ways in which financial analysts act as external monitors. First, analysts consistently monitor firms' financial statements and directly interact with management, raising questions during earnings announcement conference calls, which can be perceived as a form of direct oversight (Dyck et al., 2010). Second, analysts engage in indirect monitoring by sharing both public and private information with institutional investors and numerous individual investors through various channels, such as research reports and the media (Miller, 2006). This helps investors identify instances of managerial opportunism (Chen et al., 2015). Thus, we expect that the co-opted directors hoard less excess cash in the presence of a larger analyst following.

In Panel B of Table IX, we report the results for the subsamples with a small and large analyst following based on the overall sample median. As expected, we found that the positive association

between excess cash and board co-option held only for the subsample with a small analyst following and, thus, weaker external monitoring.

To sum up, we observed a consistently significant and positive association between board co-option and excess cash for firms characterized by weak external monitoring, as reflected by low institutional ownership and analyst following. Conversely, no such relationship was evident for firms subject to strong external monitoring. These results suggest that external monitoring moderates the positive relationship between board co-option and excess cash.

[Insert Table IX about here]

6. The impact of board co-option on the value of excess cash

Thus far, our analysis suggests that board co-option is positively associated with excess cash. We now examine whether—and, if so, how—board co-option influences the value of excess cash. We used the valuation model developed by Fama and French (1998), and subsequently used by Dittmar and Mahrt-Smith (2007), to estimate the value of excess cash. The model has been used to measure the impact of firm-level characteristics on the value of a firm's cash holdings (e.g., Frésard & Salva, 2010; Huang et al., 2013). Specifically, we computed the impact of board co-option on the value of excess cash by augmenting Equation (4) of Dittmar and Mahrt-Smith (2007), with an indicator variable capturing whether board co-option is high or low. The model included variables that might impact the value of firms' excess cash, including variables accounting for changes in their financial or investment policies and profitability:

$$\frac{MV_{i,t}}{NA_{i,t}} = \beta_0 + \beta_1 \frac{E_{i,t}}{NA_{i,t}} + \beta_2 \frac{\mathrm{d}E_{i,t}}{NA_{i,t}} + \beta_3 \frac{\mathrm{d}E_{i,t+2}}{NA_{i,t}} + \beta_4 \frac{RD_{i,t}}{NA_{i,t}} + \beta_5 \frac{\mathrm{d}RD_{i,t}}{NA_{i,t}} + \beta_6 \frac{\mathrm{d}RD_{i,t+2}}{NA_{i,t}} + \beta_7 \frac{D_{i,t}}{NA_{i,t}} +$$

$$\beta_8 \frac{\mathrm{d}D_{i,t}}{NA_{i,t}} + \beta_9 \frac{dD_{i,t+2}}{NA_{i,t}} + \beta_{10} \frac{I_{i,t}}{NA_{i,t}} + \beta_{11} \frac{dI_{i,t}}{NA_{i,t}} + \beta_{12} \frac{dI_{i,t+2}}{NA_{i,t}} + \beta_{13} \frac{dNA_{i,t}}{NA_{i,t}} + \beta_{14} \frac{dNA_{i,t+2}}{NA_{i,t}} +$$

$$\beta_{15} \frac{dMV_{i,t+2}}{NA_{i,t}} + \beta_{16} Excess\ cash + \beta_{17} Indicator\_co\text{-}option + \beta_{18} Excess\ cash *$$

$$Indicator\_co\text{-}option + Year\ effects + Firm\ fixed\ effects + \varepsilon_{i,t}, \qquad (5)$$

where $dX_{i,t}$ indicates the change in variable X from year $t-2$ to year t and $dX_{i,t+2}$ is the change in variable X from year t to year $t+2$; MV is the firm's market value; NA is net assets; E is the earnings before extraordinary items; RD is research and development expenditures (zero if missing); D is common dividends; I is interest expenses; and *Indicator_Co-option* is an indicator variable equal to one if the firm-year observation is above the median for *Co-option* and zero otherwise.

Table X reports the results from the cash valuation model. In column (1), we present the regression result for firm value on excess cash, incorporating a set of control variables but without including our co-option indicator or its interaction with excess cash. The results reveal that shareholders tend to assign a positive valuation to excess cash, as indicated by the positive and highly significant (at the 1% level) coefficient on *Excess Cash*. This suggests that firms with surplus cash but without co-opted directors are perceived more favorably by investors, potentially due to the flexibility excess cash provides in seizing future growth opportunities and safeguarding against financial distress (Denis, 2011). The value of financial flexibility associated with excess cash seems to outweigh the agency costs it might generate.

In column (2), we extended the analysis by introducing the co-option indicator variable, *Indicator_Co-option*, as well as its interaction with excess cash. This specification allowed us to examine how co-option, as a governance issue, moderates the relationship between excess cash and firm value. The findings show a negative and statistically significant interaction term (at the 1% level), which implies that the positive valuation effect of excess cash diminishes in firms with higher levels of co-option. Specifically, the negative coefficient on the interaction term suggests that as the degree of co-option increases, the value shareholders assign to excess cash decreases, likely due to concerns over potential agency problems or inefficient capital allocation associated with co-opted boards.

These results are consistent with the broader corporate governance literature, which has argued that co-option can weaken the monitoring role of the board, thereby exacerbating the risk of managerial entrenchment or suboptimal cash utilization. Consequently, while excess cash is generally valued by investors, its positive effect is mitigated in firms in which co-option is prevalent, supporting our hypothesis that higher levels of co-option reduce the perceived value of excess cash.

[Insert Table X about here]

7. Conclusion and discussion

Excess cash holdings represent a conundrum for firms, offering both a safety net against financial distress and the potential for managers to waste shareholder funds. Prior research has established a link between weak corporate governance on the one hand and excess cash and lower firm value on the other (e.g., Dittmar & Mahrt-Smith, 2007). Our study contributes to this research by focusing on the effect of co-opted directors on excess cash levels. More specifically, it contributes to a growing body of literature on the economic effects of a large proportion of co-opted directors on firms.

Drawing on a sample of listed U.S. firms over the 1996–2018 period, we found that firms with co-opted directors hold more excess cash. Further analysis demonstrated that excess cash is more of a problem for firms with co-opted directors who have low compensation. Moreover, our findings show that the positive impact of co-option on excess cash varies with CEO power, as this effect was observed only among firms with long CEO tenure. We also found that a higher level of external oversight, as reflected by high institutional ownership and financial analyst coverage, moderates this effect. Finally, we found that the interplay between co-option and excess cash negatively impacts the market value of excess cash.

Our study provides novel evidence on the adverse effects of co-opted boards by showing that corporate boards with greater co-option tend to experience more severe agency problems, reflected in greater excess cash holdings. These findings have significant implications for various stakeholders, including investors, managers, and policymakers. For investors, these results underscore the importance of closely monitoring a board's composition, particularly the presence of co-opted directors. The significantly positive relationship between co-opted directors and excess cash holdings suggests that firms with co-opted boards have weaker governance. Investors should also take heed of such findings, as the latter may indicate a decreased level of oversight, which could have implications for firm value.

Managers should be cognizant of the implications of board composition on corporate financial policies. The observed tendency for co-opted directors to engage in less rigorous monitoring, leading to higher levels of excess cash holdings, highlights the importance of promoting a diverse and independent board that can effectively challenge management decisions and ensure alignment with shareholder interests.

Policymakers should also take note, as our results suggest that more co-opted directors on corporate boards lead to less efficient executive monitoring. The evidence provided by our study suggests the need for improvement in board composition and monitoring practices with a focus on limiting the proportion of co-opted directors on the board at any time.

Finally, our results have policy implications, particularly regarding initiatives such as the Sarbanes-Oxley Act of 2002, which called for an increased number of outside directors on corporate boards. Such policy interventions are based on the premise that independent board members rigorously monitor executives given their reputational and career concerns. However, our findings indicate that not all independent directors are effective monitors: Co-opted directors may exacerbate agency conflicts rather than mitigate them, with implications for cash holdings

and their valuation. Our study highlights the importance of considering co-option in developing corporate governance standards.

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Appendix: Variable definitions

Variables	Definitions	Sources
Dependent variables		
Excess cash	Computed as actual cash minus the predicted optimal level of cash from Equation (1); set to zero if negative.	Authors' calculations based on Dittmar & Marth-Smith (2007)
Excess cash 2	Computed as actual cash minus predicted optimal level of cash based on Opler et al. (1999). They predict the optimal level of cash based on the market-to-book ratio, firm size, cash flow to assets, net working capital to assets, capital expenditures to assets, leverage, industry cash flow risk, dividend payout dummy, and research and development expenditures to sales.	Authors' calculations based on Opler et al. (1999)
Industry-adjusted cash	A firm's cash-to-total assets ratio adjusted by the industry median cash ratio based on the three-digit Standard Industrial Classification (SIC) codes.	Authors' calculations
Cash to NA	Cash divided by net assets.	Authors' calculations
Excess cash 3	Actual cash minus the predicted optimal level of cash from Equation (1).	Authors' calculations based on Dittmar & Marth-Smith (2007)
Excess cash 4	Actual cash minus predicted optimal level of cash as per Dittmar & Marth-Smith (2007), wherein we controlled for additional governance variables, including *Board size*, *Board indep*, and *Female proportion*; set to zero if negative.	Authors' calculations based on Equation (4) of Dittmar & Marth-Smith (2007) augmented with the additional governance variables of *Board size*, *Board indep*, and *Female proportion*
Independent variables		
Co-option	The fraction of directors hired after the appointment of the CEO.	The data were retrieved from https://sites.temple.edu/lnaveen/data/
Co-option (indep)	The fraction of independent directors hired after the appointment of the CEO.	Same as above
Co-option (TW)	The sum of the tenure of the directors hired after the CEO assumed office over the total tenure of the board of directors.	Same as above
Co-option (TW indep)	The sum of the tenure of the independent directors hired after the CEO assumed office over the total tenure of the board of directors.	Same as above
Control variables		
Board independence	The ratio of independent directors scaled by the number of total directors.	ISS (formerly *RiskMetrics*)
Board size	The number of board directors in a firm in a year.	ISS (formerly *RiskMetrics*)
Capital expenditures	The ratio of capital expenditures (#128) to book assets (#6).	Compustat
Cash flow	Earnings after interest, dividends, and taxes but before depreciation divided by book assets [(#13 − #15 − #16 − #21) / #6].	Compustat
Dividend	An indicator variable equal to one if the firm pays a common dividend in year *t*, and zero otherwise.	Compustat
FCF_NA	Free cash flow (FCF) to net assets, with FCF being calculated as operating income minus interest and taxes.	Compustat
Female proportion	Total number of female board members scaled by the overall number of board directors.	ISS (formerly *RiskMetrics*)

Variables	Definitions	Sources
Industry sigma	The industry average of the SD of FCF_NA over the previous 10 years.	
Leverage	Long-term debt (#9) plus debt in current liabilities (#34) divided by book assets (#6).	Compustat
Market-to-book	Market-to-book value; we used the book value of assets (#6) minus the book value of equity (#60) plus the market value of equity (#199 $*$ #25) as the numerator of the ratio and the book value of assets (#6) as the denominator.	Compustat
MV_NA	The market value of the shares (MV) to NA, with MV being the stock price multiplied by the number of shares outstanding plus the book value of total liabilities (the market value is instrumented using the past three-year sales growth; see details in Dittmar & Mahrt-Smith, 2007).	Compustat
NA	Net assets calculated as total assets minus cash and cash equivalents.	Compustat
NWC_TA	Net working capital, defined as current assets (#4) minus current liabilities (#5) minus cash and short-term investments (#1) scaled by total assets.	Compustat
NWC_NA	Net working capital over net assets.	Compustat
RD	Research and development expenditures (#46); set to zero if missing.	Compustat
RD_NA	RD to net assets.	Compustat
RD_sales	RD over sales (#12).	Compustat
Size	Natural logarithm of total assets (#6).	Compustat
Additional variables		
Analyst coverage	Number of analysts covering a particular firm.	Refinitiv I/B/E/S
Board attendance	Total number of board members who have attended less than 75% of the meetings in a year.	ISS (formerly *RiskMetrics*)
Board skills	The ratio of board members who are either professional experts or financial experts.	ISS (formerly *RiskMetrics*)
Board tenure	Average tenure of the board members within a firm.	ISS (formerly *RiskMetrics*)
Cash flow volatility	The SD of the firm's cash flow from operations over the sample period.	Authors' calculations based on Compustat
CEO tenure	Total tenure of the CEO within a firm.	BoardEx
CEO turnover	A treatment indicator variable equal to one for all years for firms with a CEO turnover event and zero for firms without a CEO turnover event. We focused on involuntary CEO turnover due to death (departure code 1) and illness (departure code 2).	From Gentry et al. (2021). The data are available online at https://zenodo.org/record/4543893#.YrnhlnbP02w.
D	Common dividends	Compustat

Variables	Definitions	Sources
Directors' compensation	The annual average total compensation of the board of directors as reported in Securities Exchange Commission (SEC) filings.	Execucomp
Duality	An indicator variable equal to one if the chairman is also the CEO and zero otherwise.	ISS (formerly *RiskMetrics*)
E	Earnings before extraordinary items.	Compustat
Financial constraints	A text-based constraint index taken from Hoberg & Maksimovic (2015).	Text-based financial constraint extracted from http://faculty.marshall.usc.edu/Gerard--Hoberg/MaxDataSite/index.html
Financial distress	Altman's Z-score.	Authors' calculations based on Altman's (1968) Z-Score formula
Firm age	The number of years since the firm first appeared in Compustat.	Authors' calculations based on Compustat
I	Interest expense.	Compustat
Independent female directors	The total number of independent female board members scaled by the total number of board of directors.	ISS (formerly *RiskMetrics*)
Indicator_Co-option	An indicator variable equal to one if the firm-year observation is above the median for *Co-option* and zero otherwise.	Authors' calculations
Institutional ownership	The ratio of shares held by the institutional owners to total outstanding shares.	Refinitiv Institutional Holdings
Non-compliant	An indicator variable equal to one if the firm did not have a majority of independent directors on its board in 2001 and zero otherwise.	Authors' calculations based on ISS (formerly *RiskMetrics*)
SOX	An indicator variable equal to one in the post-SOX period (2002) and zero otherwise.	Authors' calculations
Tobin's q	The sum of the book value of debt and the market value of equity, scaled by book assets.	Authors' calculations based on Compustat

Table I: Descriptive statistics

Variables	N	Mean	SD	1st Perc.	5th Perc.	25th Perc.	Median	75th Perc.	95th Perc.	99th Perc.
Excess cash	17,150	0.052	0.192	0.000	0.000	0.000	0.000	0.049	0.211	0.596
Co-option	17,150	0.466	0.315	0.000	0.000	0.200	0.429	0.727	1.000	1.000
Co-option (indep)	17,150	0.364	0.260	0.000	0.000	0.143	0.333	0.571	0.833	0.889
Co-option (TW)	17,150	0.302	0.322	0.000	0.000	0.043	0.172	0.476	1.000	1.000
Co-option (TW indep)	17,150	0.221	0.234	0.000	0.000	0.029	0.132	0.353	0.721	0.843
Size	17,150	7.602	1.574	4.458	5.237	6.448	7.458	8.637	10.425	11.622
Market-to-book	17,150	2.220	1.607	0.754	0.953	1.259	1.687	2.515	5.466	9.940
Leverage	17,150	0.258	0.188	0.000	0.000	0.110	0.254	0.370	0.585	0.878
Cash flow	17,150	0.097	0.078	−0.216	−0.003	0.057	0.092	0.133	0.227	0.339
Capital expenditures	17,150	0.058	0.051	0.005	0.010	0.025	0.043	0.074	0.161	0.276
RD_sales	17,150	0.042	0.080	0.000	0.000	0.000	0.001	0.047	0.208	0.441
NWC_TA	17,150	0.120	0.180	−0.298	−0.130	−0.009	0.095	0.225	0.459	0.644
Dividend	17,150	0.591	0.492	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Board size	17,150	9.261	2.310	5.000	6.000	8.000	9.000	11.000	13.000	15.000
Board independence	17,150	0.737	0.154	0.250	0.429	0.667	0.778	0.857	0.909	0.923
Female proportion	17,150	0.119	0.103	0.000	0.000	0.000	0.111	0.182	0.300	0.400
Directors' compensation	14,647	1,412.156	1,257.792	161.247	256.41	568.608	1,026.404	1,794.698	4,026.206	6,981.694
CEO tenure	13,107	5.269	5.325	0.00	0.300	1.600	3.600	7.100	16.600	27.400
Institutional ownership	14,514	0.711	.182	0.254	0.386	0.586	0.726	0.843	0.988	1.117
Analyst coverage	14,873	14.845	9.675	2.00	3.00	7.00	12.000	21.000	34.000	45.000

Excess cash is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. *Size* is the natural logarithm of total assets (#6). *Market-to-book* is the market-to-book value, using the book value of assets (#6) minus the book value of equity (#60) plus the market value of equity (#199 ∗ #25) as the numerator of the ratio and the book value of assets (#6) as the denominator. We measured *Leverage* as long-term debt (#9) plus debt in current liabilities (#34) divided by the book value of assets (#6). We measured *Cash flow* as earnings after interest, dividends, and taxes but before depreciation divided by book assets [(#13 − #15 − #16 − #21) / #6]. We measured *Capital expenditures* as the ratio of capital expenditures (#128) to book assets (#6). *RD_sales* was measured as research and development expenditures (#46) over sales (#12) and was set to zero if research and development expenditures (#46) were missing. *NWC_TA* (net working capital) is current assets (#4) minus current liabilities (#5) minus cash and short-term investments (#1). *Dividend* is an indicator variable equal to one if the firm pays a common dividend in year *t* and zero otherwise. *Board size* is the number of directors on a firm's board of directors in a year. *Board independence* is the ratio of independent directors scaled by the number of directors. *Female proportion* is the number of female board members scaled by the total number of directors. *Director compensation* is the average annual director compensation. *CEO tenure* is the total tenure of the CEO within a firm. *Institutional ownership* is the ratio of the number of shares held by institutional owners, while *Analyst coverage* is the number of analysts following a firm in a particular year. All variables are defined in detail in the Appendix.

Table II: Baseline regression results

Variables	(1)	(2)	(3)	(4)
Co-option	0.009***			
	(2.75)			
Co-option (indep)		0.008**		
		(2.07)		
Co-option (TW)			0.009**	
			(2.56)	
Co-option (TW indep)				0.009*
				(1.91)
Size	0.010***	0.010***	0.010***	0.010***
	(7.14)	(7.13)	(7.15)	(7.13)
Market-to-book	0.003*	0.003*	0.003*	0.003*
	(1.93)	(1.95)	(1.91)	(1.94)
Leverage	0.045***	0.046***	0.045***	0.045***
	(5.07)	(5.09)	(5.06)	(5.07)
Cash flow	−0.053**	−0.053**	−0.052**	−0.053**
	(−2.34)	(−2.34)	(−2.33)	(−2.34)
Capital expenditures	−0.040	−0.040	−0.040	−0.039
	(−1.51)	(−1.51)	(−1.52)	(−1.51)
RD_sales	0.046*	0.047*	0.047*	0.047*
	(1.71)	(1.73)	(1.72)	(1.73)
NWC_TA	0.232***	0.232***	0.232***	0.232***
	(10.89)	(10.89)	(10.89)	(10.88)
Dividend	−0.003	−0.003	−0.003	−0.003
	(−1.34)	(−1.40)	(−1.32)	(−1.37)
Board size	−0.001**	−0.001**	−0.001**	−0.001**
	(−2.40)	(−2.40)	(−2.31)	(−2.34)
Board independence	0.012	0.009	0.012	0.010
	(1.20)	(0.87)	(1.22)	(0.96)
Female proportion	−0.006	−0.006	−0.005	−0.006
	(−0.60)	(−0.65)	(−0.53)	(−0.59)
Observations	17,150	17,150	17,150	17,150
Year & industry fixed effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.186	0.185	0.186	0.185

The table shows the Tobit regression results for the relationship between co-opted directors and excess cash. *Excess cash* is defined as cash held by a firm beyond what is needed for its operations or investments, and it is calculated as the actual cash holdings ratio minus the estimated cash holdings ratio. The estimated level of cash is measured using Equation (4) of Dittmar and Marth-Smith (2007), whereas negative excess cash is set to zero. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table III: Alternative definitions of excess cash

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Excess cash 2				Industry-adjusted cash				Cash to net assets			
Co-option	0.031**				0.010**				0.042**			
	(2.00)				(2.05)				(2.05)			
Co-option (indep)		0.034*				0.012*				0.043*		
		(1.84)				(1.90)				(1.78)		
Co-option (TW)			0.035*				0.011**				0.054**	
			(1.88)				(2.00)				(2.23)	
Co-option (TW indep)				0.042*				0.014**				0.062**
				(1.80)				(1.97)				(2.07)
Constant	−0.421***	−0.407***	−0.421***	−0.409***	−0.024	−0.019	−0.024	−0.020	−0.162	−0.142	−0.164	−0.145
	(−4.93)	(−4.83)	(−4.92)	(−4.82)	(−0.75)	(−0.60)	(−0.73)	(−0.61)	(−1.26)	(−1.11)	(−1.27)	(−1.13)
Observations	16,049	16,049	16,049	16,049	17,150	17,150	17,150	17,150	17,150	17,150	17,150	17,150
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.182	0.182	0.182	0.182	0.352	0.352	0.352	0.352	0.363	0.363	0.363	0.363

The table shows the OLS regression results for the relationship between co-opted directors and alternative definitions of excess cash. *Excess cash 2* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is calculated as the actual cash holdings ratio minus the estimated optimal cash holdings ratio. The estimated level of cash is measured as described by Opler et al. (1999). *Industry-adjusted cash* is the cash-to-total assets ratio of the firm, adjusted by the median of the industry cash ratio. *Cash to net assets* is cash divided by net assets, where net assets are total assets minus cash and cash equivalents. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table IV: Addressing reverse causality and omitted variable bias

Panel A: Addressing omitted variable bias				
Variables	**(1)**	**(2)**	**(3)**	**(4)**
	Lagged dependent variable as additional control variable			
Lagged Excess cash	0.127***	0.127***	0.127***	0.127***
	(12.83)	(12.83)	(12.83)	(12.81)
Co-option	0.008***			
	(2.99)			
Co-option (indep)		0.007**		
		(2.32)		
Co-option (TW)			0.009***	
			(2.76)	
Co-option (TW indep)				0.007*
				(1.90)
Observations	14,520	14,520	14,520	14,520
Control variables	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.365	0.365	0.366	0.364

Panel B: Addressing reverse causality								
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
	Lagged independent and control variables				**Co-option unchanged for two consecutive years**			
Lagged co-option	0.009***							
	(2.72)							
Lagged co-option (indep)		0.008**						
		(2.09)						
Lagged co-option (TW)			0.008**					
			(2.41)					
Lagged co-option (TW indep)				0.007				
				(1.56)				
Co-option					0.009**			
					(2.40)			
Co-option (indep)						0.008*		
						(1.82)		
Co-option (TW)							0.011***	
							(2.73)	
Co-option (TW indep)								0.009*
								(1.77)

Observations	14,520	14,520	14,520	14,520	10,005	10,005	10,005	10,005
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.112	0.111	0.111	0.111	0.201	0.201	0.202	0.201

The table shows the regression results for the relationship between co-opted directors and excess cash, which address possible endogeneity arising from reverse causality or omitted variable bias. *Excess cash* is defined as the cash held by firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. Panel A addresses the potential reverse causality issue by running a Tobit regression using the lagged independent and control variables in columns (1) to (4). In columns (5) to (8), we ran Tobit regressions on the subsample of firms for which co-option remained unchanged for two consecutive years. Columns (1) to (4) of Panel B address the omitted variable bias by using the one-year lagged value of excess cash along with the same control variables as those used in the baseline model in Table II. The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table V: Entropy balancing

Panel A: Post-entropy balancing

Variables	Mean			Variance			Skewness		
	Non-co-opted	Co-opted	Diff	Non-co-opted	Co-opted	Diff	Non-co-opted	Co-opted	Diff
Size	7.495	7.494	0.001	2.454	2.454	0.000	0.337	0.336	0.001
Market-to-book	2.089	2.089	0.000	2.382	2.382	0.000	2.927	2.926	0.001
Leverage	0.266	0.266	0.000	0.035	0.035	0.000	0.546	0.545	0.000
Cash flow	0.094	0.094	0.000	0.006	0.006	0.000	-0.383	-0.383	0.000
Capital expenditures	0.059	0.059	0.000	0.002	0.002	0.000	2.108	2.108	0.000
RD_sales	0.036	0.036	0.000	0.005	0.005	0.000	3.003	3.003	0.000
NWC_TA	0.109	0.109	0.000	0.031	0.031	0.000	0.483	0.483	0.000
Dividend	0.631	0.631	0.000	0.233	0.233	0.000	-0.541	-0.542	0.001
Board size	9.101	9.100	0.001	5.345	5.344	0.001	0.580	0.579	0.001
Board independence	0.714	0.714	0.000	0.024	0.024	0.000	-0.960	-0.961	0.001
Female proportion	0.108	0.108	0.000	0.010	0.010	0.000	0.833	0.832	0.000
Observations	1,733	15,417							

Panel B: Entropy-balanced regression

Variables	(1)	(2)	(3)	(4)
Co-option	0.008***			
	(2.64)			
Co-option (indep)		0.008**		
		(2.03)		
Co-option (TW)			0.009***	
			(2.79)	
Co-option (TW indep)				0.010**
				(2.26)
Observations	17,150	17,150	17,150	17,150
Control variables	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.281	0.246	0.281	0.246

The table shows the Tobit regression results for the relationship between co-opted directors and excess cash using entropy balancing. Firm-year observations without co-opted directors are referred to as *Non-co-opted*, while those with co-opted directors are referred to as *Co-opted*. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. Panel A reports the univariate results for both the *Non-co-opted* and *Co-opted* observations and their means and variances. The tests for the differences in the sample means and variances are reported in the columns labeled "Diff." Panel B shows the results for the post-entropy balanced regressions using all the measures for co-opted boards. The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table VI: Difference-in-differences estimation around involuntary CEO turnover events

Panel A: Post-entropy balancing						
Variables	**Mean**			**Variance**		
	CEO turnover	**Control**	**Difference**	**CEO turnover**	**Control**	**Difference**
Size	7.832	7.808	0.024	2.473	2.465	0.008
Market-to-book	2.473	2.466	0.007	3.999	3.988	0.011
Leverage	0.232	0.231	0.001	0.034	0.034	0.000
Cash flow	0.105	0.105	0.000	0.008	0.008	0.000
Capital expenditures	0.063	0.062	0.000	0.004	0.004	0.000
Rd_sales	0.040	0.040	0.000	0.005	0.005	0.000
NWC_TA	0.100	0.100	0.000	0.025	0.025	0.000
Dividend	0.661	0.656	0.005	0.228	0.226	0.002
Board size	9.482	9.453	0.029	5.563	5.546	0.017
Board independence	0.715	0.712	0.002	0.025	0.025	0.000
Female proportion	0.122	0.121	0.000	0.011	0.011	0.000
Observations	56	4,544				

Panel B: Difference-in-differences estimations		
Variables	**(1)**	**(2)**
CEO turnover * After	−0.052***	−0.052***
	(−7.46)	(−7.29)
CEO turnover	0.017***	0.017***
	(3.42)	(3.44)
After	0.009***	0.009***
	(3.86)	(3.79)
Observations	4,600	4,600
Control variables	Yes	Yes
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Firm-level clusters	No	Yes
Pseudo R^2	1.439	1.439

The table shows the results of difference-in-differences estimations around CEO turnover events using Tobit regressions. Matching was carried out using entropy balancing of the baseline control variables. Panel A reports the univariate results for both the CEO turnover and control group observations and their means and variances. The tests for the differences in the sample means and variances are reported in the columns labeled "Difference." Panel B shows the results of the difference-in-differences regressions. *CEO turnover* is an indicator variable equal to one for the firms facing CEO turnover and zero for control group observations in all six years (three years before and three years after CEO turnover). *After* is an indicator variable equal to one in the three years following CEO turnover and zero in the three years before CEO turnover (we ignored the year of CEO turnover in this analysis). *CEO turnover *After* is the interaction between *CEO turnover* and post-CEO turnover years (*After*). In Panel B, the numbers reported represent the marginal effects at the means. Further, the *t*-statistics are reported in parentheses, and the standard errors are clustered at firm level in columns (2) only. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table VII: Difference-in-differences using SOX as a regulatory shock

Variable	(1)	(2)	(3)	(4)
	Clean effects			
Co-option	0.039**			
	(2.48)			
Co-option (indep)		0.045*		
		(1.96)		
Co-option (TW)			0.039**	
			(2.46)	
Co-option (TW indep)				0.054**
				(2.18)
Observations	17,150	17,150	17,150	17,150
Control variables	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.187	0.187	0.187	0.186

This table reports the Tobit regression results showing the effect of co-option on excess cash using a natural experiment. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. We followed the procedure adopted by Coles et al. (2014) and used the difference-in-differences methodology. The table presents estimates of the clean effects for each co-option variable based on Tobit regression using Equation (4), where we include the same control variables as used in Table II. The "clean" effect that can be directly attributed to co-option is represented by the sum of the coefficients $\beta_1, \beta_3,$ and β_4 in Equation (4). The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table VIII: The role of internal monitoring

Panel A: Director compensation								
Variables	**(1)** **Low**	**(2)** **High**	**(3)** **Low**	**(4)** **High**	**(5)** **Low**	**(6)** **High**	**(7)** **Low**	**(8)** **High**
Co-option	0.011**	0.007						
	(2.40)	(1.31)						
Co-option (indep)			0.011*	0.006				
			(1.90)	(0.99)				
Co-option (TW)					0.011**	0.007		
					(2.30)	(1.11)		
Co-option (TW indep)							0.013*	0.005
							(1.95)	(0.67)
Observations	7,324	7,323	7,324	7,323	7,324	7,323	7,324	7,323
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.230	0.190	0.230	0.189	0.230	0.190	0.230	0.189
Panel B: CEO tenure								
Variables	**(1)** **Low**	**(2)** **High**	**(3)** **Low**	**(4)** **High**	**(5)** **Low**	**(6)** **High**	**(7)** **Low**	**(8)** **High**
Co-option	0.004	0.010*						
	(1.06)	(1.69)						
Co-option (indep)			0.005	0.008				
			(0.99)	(1.23)				
Co-option (TW)					0.006	0.010*		
					(1.20)	(1.78)		
Co-option (TW indep)							0.007	0.006
							(1.12)	(0.82)
Observations	6,623	6,484	6,623	6,484	6,623	6,484	6,623	6,484
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.295	0.186	0.294	0.186	0.295	0.186	0.295	0.186

The table shows the Tobit regression results for the relationship between co-opted directors and excess cash using two subsamples based on *Director compensation* and *CEO tenure*. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. We measured *Director compensation* as the annual average total compensation of the board of directors

as reported in Execucomp, and *CEO tenure* was measured using BoardEx. Firm-year observations are divided into low and high subsamples based on the overall median of the *Director compensation* and *CEO tenure*, respectively. The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table IX: The role of external monitoring

Panel A: Institutional ownership								
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Co-option	0.013***	0.003						
	(2.72)	(0.76)						
Co-option (indep)			0.013**	0.005				
			(2.10)	(0.85)				
Co-option (TW)					0.013**	0.006		
					(2.36)	(1.22)		
Co-option (TW indep)							0.013*	0.008
							(1.82)	(1.25)
Observations	7,257	7,257	7,257	7,257	7,257	7,257	7,257	7,257
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.223	0.254	0.222	0.253	0.223	0.254	0.221	0.254
Panel B: Analyst coverage								
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Co-option	0.010**	0.007*						
	(2.31)	(1.71)						
Co-option (indep)			0.009	0.007				
			(1.62)	(1.30)				
Co-option (TW)					0.012**	0.008*		
					(2.52)	(1.74)		
Co-option (TW indep)							0.013**	0.009
							(2.09)	(1.48)
Observations	7,441	7,432	7,441	7,432	7,441	7,432	7,441	7,432
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.190	0.423	0.190	0.422	0.191	0.423	0.190	0.423

The table shows the Tobit regression results for the relationship between co-opted directors and excess cash using two subsamples based on *Institutional ownership* and *Analyst coverage*. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. We measured *Institutional ownership* as the ratio of shares held by the institutional investors to total outstanding shares as reported in the Thomson Refinitiv (13F) database, and *Analyst coverage* (the number of analysts following a firm) was obtained from

the I/B/E/S database. Firm-year observations are divided into low and high subsamples based on the overall median level of *Institutional ownership* and *Analyst coverage*, respectively. The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

Table X: Board co-option and the value of excess cash

Variables	**(1)**	**(2)**
	Market value to net assets	
Excess cash	4.030***	4.614***
	(4.72)	(5.33)
Indicator_Co-option	−0.205***	−0.052
	(−3.42)	(-0.74)
Excess cash * Indicator_Co-option		−3.498***
		(−3.27)
Constant	0.603**	0.532*
	(2.01)	(1.76)
Observations	10,447	10,447
Control variables	Yes	Yes
Year & industry fixed effects	Yes	Yes
Adj R^2	0.544	0.549

The table shows the OLS regression results for the relationship between excess cash and a firm's market value based on the presence of co-option. The dependent variable is the firm's value, defined as *market value to net assets*. *Excess cash* is defined as the cash held by the firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Indicator_Co-option* is an indicator variable equal to one if the firm year observation falls above the median *Co-option* and zero if the firm-year observation is equal to or lower than the median *Co-option*. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the Appendix.

INTERNET APPENDIX TO

Board Co-option and Excess Cash Holdings

Table A: Pearson correlations

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	(16)	VIF
(1) Excess cash	1.000																
(2) Co-option	0.057***	1.000															1.04
(3) Co-option (indep)	0.047***	0.899***	1.000														
(4) Co-option (TW)	0.063***	0.934***	0.810***	1.000													
(5) Co-option (TW indep)	0.052***	0.869***	0.913***	0.900***	1.000												
(6) Size	−0.083***	−0.112***	−0.049***	−0.147***	−0.078***	1.000											1.85
(7) Market-to-book	0.133***	0.087***	0.067***	0.101***	0.081***	−0.172***	1.000										1.45
(8) Leverage	−0.028***	−0.058***	−0.053***	−0.059***	−0.042***	0.294***	−0.149***	1.000									1.24
(9) Cash flow	−0.052***	0.021***	0.027***	0.023***	0.024***	−0.060***	0.375***	−0.190***	1.000								1.44
(10) Capital expenditures	−0.062***	−0.001	−0.025***	−0.003	−0.018**	0.006	0.041***	−0.001	0.231***	1.000							1.14
(11) RD_sales	0.223***	0.093***	0.085***	0.105***	0.095***	−0.206***	0.321***	−0.161***	−0.163***	−0.133***	1.000						1.49
(12) NWC_TA	0.240***	0.084***	0.051***	0.095***	0.059***	−0.403***	0.084***	−0.354***	0.002	−0.198***	0.239***	1.000					1.40
(13) Dividend	−0.088***	−0.152***	−0.108***	−0.184***	−0.141***	0.348***	−0.099***	0.100***	−0.047***	−0.001	−0.325***	−0.168***	1.000				1.32
(14) Board size	−0.099***	−0.127***	−0.114***	−0.181***	−0.148***	0.578***	−0.129***	0.202***	−0.054***	0.004	−0.219***	−0.293***	0.365***	1.000			1.61
(15) Board independence	−0.022***	−0.049***	0.234***	−0.071***	0.161***	0.238***	−0.052***	0.080***	−0.005	−0.104***	0.002	−0.131***	0.126***	0.102***	1.000		1.16
(16) Female proportion	−0.047***	−0.078***	0.019**	−0.117***	−0.039***	0.325***	−0.005	0.133***	0.010	−0.087***	−0.118***	−0.196***	0.194***	0.254***	0.308***	1.000	1.24

This table reports the Pearson correlations between *Excess cash*, *Co-option*, and the control variables used in the main regression. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and set to zero if negative. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. *Size* is the natural logarithm of total assets (#6). *Market-to-book* is the market-to-book value, using the book value of assets (#6) minus the book value of equity (#60) plus the market value of equity (#199 ∗ #25) as the numerator of the ratio and the book value of assets (#6) as the denominator. We measured *Leverage* as long-term debt (#9) plus debt in current liabilities (#34) divided by the book value of assets (#6). We measured *Cash flow* as earnings after interest, dividends, and taxes but before depreciation divided by book assets [(#13 - #15 - #16 - #21) / #6]. We measured *Capital expenditures* as the ratio of capital expenditures (#128) to book assets (#6). *RD_sales* was measured as research and development expenditures (#46) over sales (#12) and was set to zero if research and development expenditures (#46) were missing. *NWC_TA* (net

working capital) is current assets (#4) minus current liabilities (#5) minus cash and short-term investments (#1) scaled by total assets. *Dividend* is an indicator variable equal to one if the firm pays a common dividend in year *t* and zero otherwise. *Board size* is the number of directors on a firm's board in a year. *Board independence* is the ratio of independent directors scaled by the number of directors. *Female proportion* is the number of female board members scaled by the total number of directors. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the main Appendix.

Table B: Considering negative excess cash and augmented excess cash proxies

	Excess cash with negative values (Excess cash 3)				Augmented excess cash (Excess cash 4)			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Co-option	0.024***				0.009***			
	(2.75)				(2.67)			
Co-option (indep)		0.026**				0.008**		
		(2.42)				(1.98)		
Co-option (TW)			0.028***				0.009**	
			(2.87)				(2.56)	
Co-option (TW indep)				0.034***				0.009**
				(2.59)				(1.96)
Constant	−0.497***	−0.486***	−0.497***	−0.487***	-	-	-	-
	(−14.55)	(−14.85)	(−14.58)	(−14.88)	-	-	-	-
Observations	17,150	17,150	17,150	17,150	17,150	17,150	17,150	17,150
Controls variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2/ Pseudo R^2	0.0923	0.0921	0.0925	0.0923	0.184	0.183	0.184	0.184

The table shows the regression results for the relationship between co-opted directors and excess cash. *Excess cash 3* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1). Augmented excess cash (*Excess cash 4*) was measured as the residual arising from Equation (1) augmented by firm-level governance variables—i.e., *Board size*, *Board independence*, and *Female proportion*—to calculate the expected level of the firm's cash holdings; negative excess cash was set to zero. *Co-option* is the fraction of directors hired after the appointment of the CEO. *Co-option* (*indep*) is the fraction of independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of the board of directors. Columns (1) to (4) report the results of the OLS regression using alternate proxies of board *Co-option* as the main independent variable and *Excess cash 3* as the dependent variable. In columns (5) to (8), we replaced *Excess cash 3* with *Excess cash 4* as our main dependent variable and ran a Tobit regression on alternate proxies of board co-option and report the marginal effects at the means in these columns. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the main Appendix.

Table C: Regressions with firm fixed effects

Panel A: Controlling for firm fixed effects using the Honoré (1992) approach				
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Co-option	0.084			
	(1.27)			
Co-option (indep)		0.106		
		(1.46)		
Co-option (TW)			0.083	
			(0.96)	
Co-option (TW indep)				0.098
				(0.96)
Observations	17,150	17,150	17,150	17,150
Control variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Wald Chi^2	59.14***	57.87***	58.39***	57.78***
Panel B: Controlling for firm fixed effects using the Poisson model				
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Co-option	0.120			
	(0.72)			
Co-option (indep)		0.180		
		(0.88)		
Co-option (TW)			0.084	
			(0.48)	
Co-option (TW indep)				0.096
				(0.42)
Observations	16,913	16,913	16,913	16,913
Control variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Wald Chi^2	385.5***	385.7***	385.2***	385.3***

The table shows the Tobit regression results for the relationship between co-opted directors and excess cash, which address possible endogeneity arising from omission of a (time-invariant) variable by controlling for firm fixed effects. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and replaced with zero if negative. *Co-option* is the fraction of directors hired after the appointment of CEO. *Co-option* (*indep*) is the fraction of the independent directors hired after the appointment of the CEO. *Co-option* (*TW*) is the sum of the tenure of the directors hired after the CEO assumes office over the total tenure of the board of directors. *Co-option* (*TW indep*) is the sum of the tenure of the independent directors hired after the CEO assumes office over the total tenure of

the board of directors. Panel A addresses the (time-invariant) omitted variable bias by controlling for firm fixed effects using the Honoré (1992) approach, while Panel B addresses this bias using the Poisson firm fixed effect model. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the main Appendix.

Table D: Additional control variables

Panel A: Additional firm-level control variables					
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	Tobin's q	**Firm age**	**Financial constraints**	**Financial distress**	**Cash flow volatility**
Co-option	0.010***	0.009**	0.010***	0.009**	0.009***
	(2.66)	(2.36)	(2.78)	(2.46)	(2.75)
Tobin's q	−0.038***				
	(−5.50)				
Firm age		−0.000			
		(−1.55)			
Financial constraints			0.000		
			(0.12)		
Financial distress				0.001	
				(0.76)	
Cash flow volatility					−0.037
					(−1.39)
Observations	13,425	13,425	15,529	13,486	17,150
Control variables	Yes	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.212	0.184	0.184	0.183	0.186

Panel B: Additional governance control variables							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
	Duality	**CEO tenure**	**Board tenure**	**Board skills**	**Board attendance**	**Independent female directors**	**Institutional ownership**
Co-option	0.008**	0.010***	0.009***	0.009***	0.009***	0.009***	0.009**
	(2.49)	(2.91)	(2.66)	(2.75)	(2.76)	(2.75)	(2.54)
Duality	0.002						
	(1.03)						
CEO tenure		−0.000					
		(−1.43)					
Board tenure			−0.000				
			(−1.01)				
Board skills				0.002			
				(0.26)			
Board attendance					0.000		
					(0.09)		
Independent female directors						0.009	
						(0.32)	

Institutional ownership							–0.000* (–1.81)
Observations	17,150	17,150	15,992	17,150	17,150	17,150	14,514
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year & industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.186	0.186	0.187	0.186	0.186	0.186	0.205

The table shows the Tobit regression results for the relationship between co-opted directors and excess cash after controlling for additional variables. *Excess cash* is defined as the cash held by a firm beyond what is needed for its operations or investments, and it is computed as actual cash minus the predicted optimal level of cash from Equation (1) and replaced with zero if negative. *Co-option* is the fraction of directors hired after the appointment of CEO. *Tobin's q* is the sum of the book value of debt and the market value of equity scaled by book assets. *Firm age* is the number of years since the firm first appeared in Compustat. *Financial constraints* is the text-based constraints index taken from Hoberg and Maksimovic (2015). *Financial distress* was measured using Altman's Z-score. *Cash flow volatility* is the standard deviation of the firm's cash flow from operations throughout the study. *Institutional ownership* is the ratio of the number of shares held by institutional owners. In Panel B, we controlled for additional governance variables. Specifically, we controlled for *Duality*, *CEO tenure*, *Board tenure*, *Board skills*, *Board attendance*, and *Independent female directors* as additional variables in columns (1) to (6), respectively. The numbers reported represent the marginal effects at the means. Standard errors are clustered at the firm level, and the *t*-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in detail in the main Appendix.