Blockholder and CEO Wealth-Performance Sensitivity

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Abstract

CEO incentive contracts both i) substitute blockholder monitoring by reducing the agency problem and ii) complement blockholder monitoring by increasing the disciplinary effect on CEOs when dissatisfied blockholders exit. I model the relation between managerial incentives and blockholder monitoring and show the substitution effect dominates. It is predicted that blockholders who are monitors are less likely to be in a firm as its CEO incentives increase. Empirically, I find higher CEO incentives indeed lead to lower blockholding and that the negative relation is stronger in firms where blockholder monitoring is more likely. To support the causal claim, I examine the FASB and SEC regulation changes in 2006, which required firms to expense and disclose equity-based CEO pay. Firms' concerns about such expenses and disclosures might reduce CEO incentives but should not directly increase blockholding. I find firms that reduced CEO incentives after the regulation changes had significant increases in blockholding.

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1 Introduction

The separation of ownership and control requires shareholders to monitor managers to reduce the agency costs (Jensen & Meckling, 1976). Large shareholders ("blockholders") have more incentives to monitor, as the free-riding problem is mitigated by the large stakes they hold (Shleifer & Vishny, 1986). Holderness (2009) finds that 96% of U.S. public firms have at least one blockholder. Blockholders can monitor through two general mechanisms: voice and the threat of exit. Voice refers to a spectrum of actions whereby blockholders directly intervene in firm issues.[1] The threat of exit, on the other hand, indirectly pressures managers to consider shareholders' interests. When a dissatisfied blockholder sells, the signal embedded in the sale is likely to decrease the share price (Parrino, Sias, & Starks, 2003; Sias, Starks, & Titman, 2006). The potential of a share price decline disciplines managers whose compensation is linked to the share price.

Linking the CEO's compensation to share price in itself is another way to align the CEO's interest with those of shareholders (Edmans, Gabaix, & Jenter, 2017). CEO incentives, provided by equity-based compensation, can affect blockholder monitoring in two ways. On one hand, higher CEO incentives *complement* blockholder monitoring by making the disciplinary effect on CEOs stronger when dissatisfied blockholders exit (Edmans, 2009; Admati & Pfleiderer, 2009). On the other hand, higher CEO incentives *substitute* blockholder monitoring by reducing the agency problem in the firm (Jensen & Meckling, 1976).

This paper examines which of the two effects of CEO incentives on blockholder monitoring dominates. For blockholders who monitor through voice and do not exit easily, higher CEO incentives substitute their presence, as the need for their voice is reduced. For blockholders who monitor with the threat of exit, CEO incentives can both substitute and complement the threat of exit. As CEO incentives increase, the monitor-and-exit blockholders are more (less) likely to be in the firm if the complementary (substitution) effect dominates. In this paper, I model the relation between

[1]The spectrum, from passive to aggressive, includes voting at shareholder meetings (Iliev & Lowry, 2015), monitoring the board of directors (Liu, Low, Masulis, & Zhang, 2020), negotiating with managers in private (Becht, Franks, Mayer, & Rossi, 2009), submitting shareholder proposals (Gillan & Starks, 2000), and initiating proxy fights or even takeovers (Shleifer & Vishny, 1986). Brav, Jiang, Partnoy, and Thomas (2008) document hedge fund activism and find that these activists "seldom seek control and in most cases are non-confrontational".

managerial incentives and blockholder's threat of exit. I show that the substitution effect outweighs the complementary effect of managerial incentives on the threat of exit. Therefore, no matter a blockholder uses voice or the threat of exit to monitor, it is predicted the blockholder is less likely to be in a firm as its CEO incentives increase. In the empirical analysis of the present study, I focus on blockholder monitoring in general without distinguishing the two monitoring mechanisms.[2] I obtain empirical results that corroborate the negative effect of CEO incentives on the presence of blockholders.

Is there any anecdotal evidence suggesting that blockholders indeed consider CEO incentives when making investment decisions? First, CEO pay is an important piece of information to shareholders as evidenced by the disclosure requirements of regulatory bodies such as the Securities and Exchange Commission (SEC).[3] Second, shareholders pay close attention to CEO pay. It is commonly reported in the media that shareholders boycott 1) when the amount of CEO pay is not justified based on the firm's performance, and 2) when the pay package does not align the interest of the CEO with those of shareholders (e.g., Flood, 2020). Last but not least, activist shareholders use CEO incentives as one of the metrics to evaluate targets. For example, ValueAct Capital, an activist hedge fund, developed a detailed framework to assess the CEO's pay-for-performance sensitivity (Baum, Hale, Morfit, Larcker, & Tayan, 2017).

As the first step in the present study, I extend the threat of exit model of Admati and Pfleiderer (2009) by endogenizing the blockholder's entry decision. In the extended model, the blockholder enters if and only if the incremental payoff for monitoring is positive. The incremental payoff changes with the managerial incentives due to two opposite forces. As the managerial incentives increase: 1) the threat of exit is more effective in inducing the manager's effort, hence higher incremental payoff for monitoring (complementary effect); 2) the manager is less likely to shirk, hence lower incremental payoff for monitoring (substitution effect). I show the substitution effect dominates and that the blockholder's incremental payoff decreases with the managerial incentives. Therefore, it is predicted that blockholders who are monitors are less likely to be in a firm as its managerial incentives increase.

I proceed to finding empirical evidence of this negative relation. In the empirical

[2] In reality, McCahery, Sautner, and Starks (2016) provide survey evidence that both voice and the threat of exit are used in concert by large investors to monitor.
[3] For example, a firm's proxy statement details the forms and amount of CEO pay.

analysis, I have 2 proxies for blockholding in a firm: its blockholder number and total blockholder ownership, calculated based on institutional investors' 13F filings with the SEC. The threshold of being a blockholder is 5% ownership of a firm, which is the SEC reporting threshold for large investors.[4] In the baseline correlational analysis, I look at all blockholders, irrespective of their tendency to monitor. I proxy for CEO incentives using CEO wealth-performance sensitivity ("CEO WPS"), constructed following Edmans, Gabaix, and Landier (2009). There are 3 forms of CEO WPS depending on the utility and production functions of the CEO: Percent−Percent, Dollar−Dollar, and Dollar−Percent WPS. I adopt all 3 for robustness. Regressions of blockholding on lagged CEO WPS show that the correlation between blockholding and CEO WPS is significantly negative and is robust to different proxies for blockholding and different forms of CEO WPS. In terms of the economic magnitude, a one-standard-deviation increase in CEO WPS is associated with at most a 0.076 (0.8%) decrease in blockholder number (total blockholder ownership). This is consistent with the notion that higher CEO incentives substitute blockholder monitoring. I then regress Tobin's Q, which proxies for firm value, on lagged blockholding, lagged CEO WPS, and their interaction term. I find that the coefficient of lagged CEO WPS is significantly positive across all specifications. The coefficient of the interaction term, on the other hand, is significantly negative across all specifications. The results suggest that the incentive alignment of a firm's CEO and shareholders is positively associated with firm value, and this positive association is stronger with less blockholder's presence in the firm. This is also consistent with the substitution between CEO incentives and blockholder monitoring to enhance firm value.

There is heterogeneity across blockholders in terms of their tendency to monitor. Rather than to monitor, some blockholders might be in the firm to match an index or to capture predicted stock returns. Pure indexing is unlikely to drive the negative relation between CEO incentives and blockholding. First of all, average investors are unlikely to become blockholders of a public firm by indexing in the first place. To illustrate the point, the total market capitalization of S&P 500 is 21.03 trillion USD at the end of 2018. The portfolio value of an S&P 500 indexer would have to exceed 1.05 trillion USD to hold more than 5% of an S&P 500 firm, which is unlikely for

[4]In the U.S., a shareholder of a publicly-held firm, when reaching 5% ownership, has to file either Schedule 13D or 13G with the SEC to disclose the purpose of holding among other details.

average investors. Second, due to the nature of indexing, an indexer's stake in an index constituent firm is unlikely to change with the firm's CEO incentives significantly. Lastly, I have tried excluding BlackRock, Vanguard, and State Street, which are the "Big Three" asset managers in the index fund industry, from the sample firms' shareholder bases. The negative correlation between blockholding and CEO WPS is still significant. I cannot rule out the possibility that blockholders are in the firm to capture predicted stock returns. However, to the extent that CEO incentive alignment helps secure the predicted returns, such blockholders would prefer higher CEO incentives. Thus, the existence of such blockholders in the sample firms should work against me finding any negative relation between CEO incentives and blockholding.

I then zoom in on firms where blockholder monitoring is more likely. I find that the negative relation between CEO incentives and blockholding is stronger 1) when a firm's past performance is worse, which indicates higher monitoring payoff, and 2) when a firm's blockholders have a track record of explicitly stating the intention to influence firm control by filing Schedule 13D with the SEC ("frequent 13D filers"). These cross-sectional results help support that it is because of the reduced need for monitoring that blockholders are less present in a firm as its CEO incentives increase.

There are endogeneity concerns about the effect of CEO incentives on blockholding: 1) blockholders can shape CEO incentives (Hartzell & Starks, 2003; Clifford & Lindsey, 2016); 2) an omitted firm characteristic can affect both CEO incentives and blockholding. To mitigate the endogeneity concerns, I look at two regulation changes in 2006: 1) the Financial Accounting Standards Board (FASB) required firms to expense the fair value of equity-based pay to employees; 2) the SEC required firms to disclose the fair value of equity-based pay to each top executive. Before the regulation changes, option grants could be recorded at zero intrinsic value and were preferred by firms (Carter, Lynch, & Tuna, 2007). Since the regulation changes, firms have reduced option grants and increased restricted stock grants to preserve CEO incentives (Hayes, Lemmon, & Qiu, 2012; Edmans et al., 2017). Nonetheless, CEO incentives were still likely to decrease for firms that did not increase restricted stock grants sufficiently due to the concerns about the expenses and disclosures of equity-based pay. Such concerns, on the other hand, were unlikely to increase blockholding directly. Therefore, to support the causal effect of CEO incentives on blockholding, I examine whether firms that

reduced CEO incentives had higher blockholding after the regulation changes.

With the two regulation changes defined as the "event", I calculate the 3-year pre-event average CEO WPS and 3-year post-event average CEO WPS for each firm. I then calculate the difference to proxy for the change in CEO WPS around the event. I define the "treated" ("control") group as those with negative (non-negative) changes in CEO WPS around the event. To see the changes in blockholding for the two groups, I first calculate the 3-year pre-event average blockholding and 3-year post-event average blockholding for each firm. I then calculate the difference to proxy for the change in blockholding around the event. Consistent with the negative effect of CEO incentives on blockholding, the treated group on average had significant increases in blockholding after the event, while the control group did not have any significant change in blockholding. In addition to the comparison between the treated and control groups, I also plot the change in blockholding against the change in CEO WPS around the event in the full sample and find a generally negative relation. I then proceed to a difference-in-differences ("DiD") analysis. The baseline DiD regression results show that being in the treated group after the event is associated with at most 0.152 more blockholders and 1.4% higher blockholder ownership. To support the validity of the DiD analysis, I first check the common trend assumption by running the augmented DiD regression following Angrist and Pischke (2008). I do not find any violation of the common trend assumption. I then match the treated and control groups in the baseline DiD regression using the propensity score of treatment (Imbens, 2015). I run the DiD regression using the matched sample and find similar results as in the baseline. To substantiate the claim that accounting and disclosure concerns led to firms' decreases in CEO incentives, which in turn led to increases in blockholding, I run the baseline DiD regression in two subsamples with high and low concerns and find the DiD results are stronger for the high-concern subsample.

I conduct several robustness checks. First, I further control for firm characteristics that could affect both blockholding and CEO WPS but not included in the baseline correlational and DiD analyses. The negative relation between blockholding and CEO WPS still holds. Second, I control for the possible confounding effect of the 2007-09 Global Financial Crisis and I find the same negative relation between blockholding and CEO WPS. Lastly, I run the DiD regression using pseudo-shocks and I do not find

significant effects of the pseudo-shocks on blockholding.

This paper contributes to the blockholder governance literature by theoretically deriving and empirically testing the substitution effect of CEO incentives on blockholder monitoring. The substitution is conceptually straightforward for blockholders who monitor through voice, as their interventions are less needed when CEO-shareholder interests are more aligned. The extant threat of exit models, on other other hand, have only suggested the complementary effect of managerial incentives on blockholder monitoring (Admati & Pfleiderer, 2009; Edmans, 2009). I extend the model of Admati and Pfleiderer (2009) and endogenize blockholder's entry. This allows me to incorporate the substitution effect of managerial incentives on the threat of exit and derive the dominance of the effect.

This paper also fits into the large literature on the substitution and complement between different corporate governance mechanisms. Both Giroud and Mueller (2010) and Atanassov (2013) find product market competition substitutes takeover threat. Denis and Serrano (1996) find the presence of outside blockholders complements a firm's internal control. Hadlock and Lumer (1997) find internal control and takeover threat complement each other.

Lastly, this paper contributes to the literature on blockholder's influence on CEO compensation by completing the picture of blockholder's involvement process: blockholders are attracted by firms with originally lower CEO incentives; after being present in the firm, blockholders might reshape CEO compensation to improve firm value. Hartzell and Starks (2003) find that blockholders' preferences drive and increase CEO pay-for-performance sensitivity. Clifford and Lindsey (2016) find that blockholders who are actively monitoring tend to increase the equity portion of CEO pay after entering the firm.

2 A Sequential Game

Two studies have provided theoretical frameworks for blockholder monitoring through the threat of exit. Admati and Pfleiderer (2009) model a setting in which the firm manager can take either good or bad actions. Good actions are those that improve the long-term firm value but impose a cost on the manager. Bad actions hurt the long-term firm value but provide a private benefit to the manager. Managerial compensation is

tied to both short-term and long-term share prices. The utility of the manager thus depends on the private costs (benefits), the short-term share price, and the long-term firm value. A blockholder is able to gather information about managerial actions and will sell her stake if she concludes that the actions, or lack thereof, are sufficiently harmful to shareholders. The resultant reduction in the short-term share price disciplines the manager. Thus, the presence of a blockholder can reduce the agency costs.

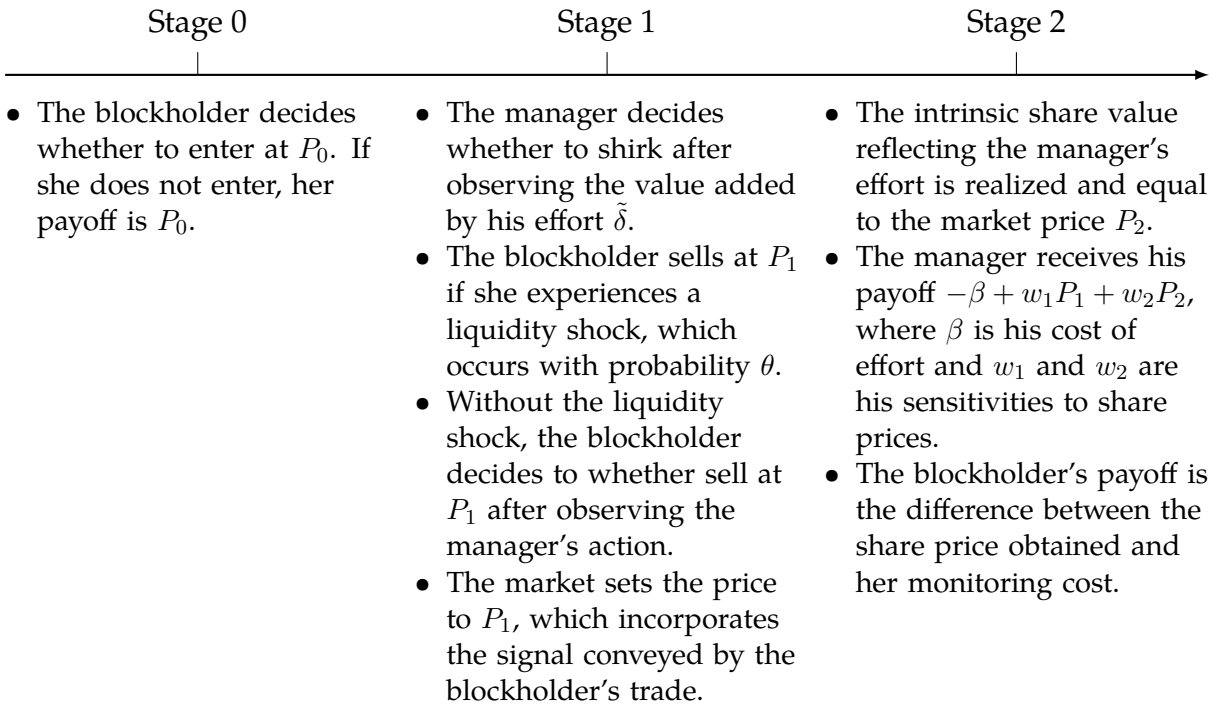
Edmans (2009) models how the presence of a non-controlling blockholder can alleviate the manager's myopic decision-making. In Edmans' model, the blockholder is important when the public signal about the firm (e.g., earnings) is negative. The negative public signal could be due to either managerial failure or value-enhancing development that temporarily reduces profit. The blockholder collects costly private information about the actual cause and sells if the firm is indeed overvalued. The interim share price, impacted by the blockholder's decision to exit or not, is reflective of the firm's fundamental value rather than the negative public signal. With the blockholder in the firm, the manager is less concerned about the short-term public signal and more willing to undertake long-term projects.

A common assumption made by Admati and Pfleiderer (2009) and Edmans (2009) is that there exists a blockholder in the initial period, i.e., the blockholder's entry is not determined within the model. Building on the framework of Admati and Pfleiderer (2009) and endogenizing the blockholder's entry decision, I provide a sketch of a sequential game in this section to examine the relation between the managerial incentives and the incremental payoff to the blockholder for entering and monitoring.[5]

Assume there are a potential blockholder and a firm manager, both of whom are risk-neutral players in a sequential game. For expositional clarity, I use the female (male) pronouns to refer to the blockholder (manager). Assume perfect information, namely the previous action of the other player is observed perfectly before a player makes the next move. There are 3 stages of the game based on when the firm's share prices are realized: stage 0, 1, and 2. The initial share price of the firm at stage 0 is P_0. Assume the blockholder's payoff is equal to the share price obtained by her. The manager's payoff is $-\beta+w_1P_1+w_2P_2$, where β is the private cost of effort if not shirking

[5] Admati and Pfleiderer (2009) have several models, which are categorized based on 1) the type of action taken by the manager, and 2) the amount of information observed by the blockholder. I extend the specific model where the manager can take a good action that adds value and the blockholder observes the manager's action only.

and is positive; P_1 is the share price at stage 1; P_2 is the share price at stage 2; w_1 and w_2 are the manager's sensitivities to the prices at the two stages ("managerial incentives") and are both positive.[6]



Timeline of the Sequential Game

At stage 0, the blockholder decides whether to enter the firm at P_0, which is the expected share value without blockholder monitoring.[7] If she did not enter, she would keep the money and her payoff would be P_0. If the blockholder is in the firm, both players act at stage 1, with the blockholder acting after the manager. The manager chooses whether to shirk or not at stage 1. Note that the phrase "not shirk" is used interchangeably with "work" in the sequential game. The intrinsic share value without the manager's effort is v. The value added by the manager's effort $\tilde{\delta}$ has a continuous

[6] w_1 and w_2 are exogenous in the model as the focus of the present study is on how managerial incentives affect the presence of blockholders who monitor. It is natural to think that the blockholder would try to shape the managerial incentives *after* she enters the firm. In addition, expecting the entrance of the blockholder, the firm might also set the managerial incentives differently than if no blockholder is expected to be present. The exogeneity of w_1 and w_2 in the model, however, is consistent with the empirical design in the present study. In the empirical analysis later on, I try to find variations in CEO incentives that are not related to blockholders and test the casual effect of CEO incentives on the presence of blockholders.

[7] I assume the blockholder is able to enter at a price that does not incorporate the prospect of her monitoring. Maug (1998) models a blockholder who monitors randomly and shows that the blockholder can enter the firm at a price lower than the intrinsic value of the firm. The discount is required by small shareholders who face adverse selection. In practice, it is fair to think that the blockholder's intention of monitoring becomes clearer to the market over time.

distribution $f(\cdot)$ with support on $[0, \overline{\delta}]$, where $\overline{\delta}$ is positive and possibly infinite.[8] The manager observes the value added by his effort before making the decision. His action α is thus a function of $\tilde{\delta}$: $\alpha(\tilde{\delta}) = 0$ indicates the event of shirking; $\alpha(\tilde{\delta}) = 1$ denotes the event of working. There exists a threshold $x \in (0, \overline{\delta}]$, at or above which it is worthwhile for the manager to work. That is, $\alpha(\tilde{\delta}) = 1$ for all $\tilde{\delta} \geqslant x$ and $\alpha(\tilde{\delta}) = 0$ otherwise. The proof is provided in Appendix A3. The value of the manager's decision is thus $\alpha(\tilde{\delta})\tilde{\delta}$. Denote the threshold of working in the absence of the blockholder as $x^{No\,B}$ and the threshold in the presence of the blockholder as x^B. x^B is less than $x^{No\,B}$. The proof is provided in Appendix A3. Intuitively, the blockholder's presence disciplines the manager by expanding the range of values of $\tilde{\delta}$ where the manager works.

The blockholder suffers a liquidity shock with probability $\theta \geqslant 0$ at stage 1. The blockholder also observes the manager's action at stage 1 (i.e., shirking or not) before trading. The blockholder is assumed to be able to costlessly monitor whether the manager works. The purpose of this assumption is to simplify the blockholder's payoff expressions in the game. The case where monitoring is costly is the one of substance, as will become clear later, and is discussed in Appendix A4 when analyzing the rationality of the blockholder's entry decision.[9] If the liquidity shock occurs, it will force the blockholder to sell, irrespective of the manager's action. If the liquidity shock does not occur, the blockholder will sell if the expected share value based on her information is less than P_1. Assume share liquidity is high enough that the price impact of the blockholder's sale is only due to the information embedded in the sale.[10] In equilibrium, the blockholder sells if and only if the manager shirks, in the absence of the liquidity shock. The proof is provided in Appendix A2. Since P_1 reflects the blockholder's trading decision, it can take one of two values: $v + E_s$, which is the market's expectation of the share value at stage 2, knowing that the blockholder has exited; $v + E_{ns}$, which is the market's expectation of the share value at stage 2, knowing

[8] The manager requires a compensation even in the case of shirking. Thus, $\tilde{\delta}$ can be viewed as the value added net of the manager's compensation. That is, in the event of shirking, the net value added is 0; in the event of working, the net value added is positive.

[9] Apart from the monitoring cost after having entered the firm, there is also likely to be costs to the blockholder associated with forming a block, e.g., transaction costs and costs related to the lack of diversification. As shown later, the incremental payoff to the blockholder decreases with the managerial incentives. Such block formation costs will further reduce the likelihood of a positive net incremental payoff and thus the likelihood of the blockholder's entry.

[10] Limited share liquidity reduces the effectiveness of the blockholder's threat of exit, as noted by both Admati and Pfleiderer (2009) and Edmans (2009), by limiting the amount the blockholder can sell upon receiving negative private information.

that the blockholder has stayed. As the market would know for sure that the manager did not shirk, if the blockholder stayed,

$$E_{ns} = \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)$$

where $\mathbb{E}$ is the expectation operator. Then it can be derived that

$$E_s = \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$$

The derivations of E_{ns} and E_s are provided in Appendix A1.

The intrinsic share value reflecting the manager's effort, or lack thereof, is equal to the market price P_2 at stage 2. The payoffs to the blockholder and the manager are realized at stage 2. The decision tree in Figure 1 depicts the sequential game between the blockholder (B) and the manager (M), where the blockholder pressures the manager only through the threat of exit. In the decision tree, N denotes "nature" that determines the realization of $\tilde{\delta}$. Nodes connected by the dashed line are in the same information set. Note that the liquidity shock that might occur to the blockholder at stage 1 is not depicted explicitly in the decision tree. When solving for the equilibrium, one should keep in mind that the blockholder will exit in the event of receiving a liquidity shock, regardless of the manager's action. The pairs p_B and p_M (shown in square brackets) denote the expected payoffs for each sequence of actions to the blockholder and the manager, respectively. δ^B ($\underline{\delta}^B$) refers to the realized value of $\tilde{\delta}$ at stage 2, conditional on $\tilde{\delta} \geqslant x^B$ ($\tilde{\delta} < x^B$). $\delta^{No\,B}$ denotes the realized value of $\tilde{\delta}$ at stage 2, conditional on $\tilde{\delta} \geqslant x^{No\,B}$. To reiterate, the realized value of $\tilde{\delta}$ is observed and factored into the expected payoff by the manager before he takes action. The specific expressions of the pairs p_B and p_M are as follows:

- $p_{B0} = v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})$;
  $p_{M0} = (w_1 + w_2)v + Pr(\tilde{\delta} \geqslant x^{No\,B})[w_1\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B}) + w_2\delta^{No\,B} - \beta]$;
- $p_{B1} = v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)$; $p_{M1} = -\beta + w_1(v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)) + w_2(v + \delta^B)$;
- $p_{B2} = v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$; $p_{M2} = -\beta + w_1(v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + w_2(v + \delta^B)$;
- $p_{B3} = v$; $p_{M3} = w_1(v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)) + w_2 v$;

- $p_{B4} = v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$; $p_{M4} = w_1(v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + w_2 v$;
- $p_{B5} = v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)$; $p_{M5} = -\beta + w_1(v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)) + w_2(v + \underline{\delta}^B)$;
- $p_{B6} = v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$; $p_{M6} = -\beta + w_1(v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + w_2(v + \underline{\delta}^B)$;
- $p_{B7} = v$; $p_{M7} = w_1(v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)) + w_2 v$;
- $p_{B8} = v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$; $p_{M8} = w_1(v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + w_2 v$;

The tie-breaking assumptions are as follows: 1) the blockholder does not enter when she is indifferent between entering or not; 2) the manager does not shirk when he is indifferent between shirking or not; 3) the blockholder exits when she is indifferent between exiting or not. The rationality of the two players' decisions is as follows:

- At stage 0, the blockholder enters if

$$Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) > Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})$$

  - at stage 1, the manager works if $\tilde{\delta} \geqslant x^B$ and, having observed the manager work, the blockholder retains her stake;
  - at stage 1, the manager shirks if $\tilde{\delta} < x^B$ and, having observed the manager shirk, the blockholder sells her stake.[11]

- At stage 0, the blockholder does not enter if

$$Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) \leqslant Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})$$

  - at stage 1, the manager works if $\tilde{\delta} \geqslant x^{No\,B}$;
  - at stage 1, the manager shirks if $\tilde{\delta} < x^{No\,B}$.

The derivations of the decision rationality are given in Appendix A2, A3, and A4. Note that the second inequality regarding the blockholder's entry decision at stage 0 cannot hold without monitoring cost. That is, if the blockholder can monitor costlessly, she would always enter the firm. In the case where blockholder monitoring is costly, as

[11] This is a separating equilibrium of the subgame where the blockholder enters. The blockholder can perfectly distinguish whether the value added by the manager is above or below the manager's threshold of working based on the manager's action.

discussed in Appendix A4, the second inequality can hold, as the incremental payoff net of monitoring cost can be non-positive.

The main extension to the model in Admati and Pfleiderer (2009) is the endogeneity of the blockholder's entry decision at stage 0. As x^B is less than $x^{No\,B}$, intuitively, the blockholder enters if and only if she can increase the value of the firm and, as a result, her payoff through inducing the effort exerted by the manager over a greater range of values of $\tilde{\delta}$. It is worth noting that I have modeled the presence of the blockholder at stage 0 as a result of a newcoming blockholder's entry. Alternatively, it could also be a result of an existing blockholder's decision not to exit at stage 0. In the alternative scenario, the blockholder decides whether to exit at stage 0 by comparing the payoff if exiting *before the manager takes action* and the payoff if staying and monitoring the manager.[12] The two alternative scenarios are fundamentally equivalent and lead to the same payoffs for both the blockholder and the manager.

Two forces affect how the incremental payoff for the blockholder's entry changes with the managerial incentives. First, the effectiveness of the threat of exit is positively associated with the managerial incentives, as indicated by a lower x^B with higher managerial incentives (see Appendix A4). That is, the blockholder is more able to induce the manager's effort when the managerial incentives are higher, hence a higher incremental payoff for the blockholder's entry. Second, the severity of the agency problem is negatively associated with the managerial incentives, as indicated by a lower $x^{No\,B}$ with higher managerial incentives (see Appendix A4). A more incentivized manager is less likely to shirk, hence a lower incremental payoff for the blockholder's entry. I call the first (second) force the "complementary" ("substitution") effect of managerial incentives on blockholder monitoring. If the complementary (substitution) effect plays the dominant role, the incremental payoff for the blockholder's entry, and thereby the likelihood of entry, increases (decreases) with the managerial incentives.

To solve for the relation between the managerial incentives and the incremental payoff for the blockholder's entry explicitly, further assumptions are made as follows:

- $\tilde{\delta}$, the value added by the manager's effort, has a uniform distribution with support on $[0, \overline{\delta}]$;

[12] Note that an existing blockholder's decision to exit or not at stage 0 is before the manager takes action at stage 1. If the blockholder does not exit at stage 0, she monitors the manager's action at stage 1 and then decides whether to exit at stage 1. Only the exit at stage 1 constitutes the threat of exit mechanism.

- There is no liquidity shock, i.e., $\theta = 0$;
- The manager's sensitivities to the prices at the two stages are equal, i.e., $w_1 = w_2 = w$.

I show that, consistent with the dominant role of the substitution effect, the incremental payoff for the blockholder's entry unambiguously decreases with the managerial incentives:

$$\frac{\partial \Delta p_B}{\partial w} = \frac{-5\beta^2 - 2\beta\bar{\delta}w}{9\bar{\delta}w^3} < 0$$

where Δp_B denotes the incremental payoff for the blockholder's entry. The derivation is given in Appendix A4. Figure 2 illustrates what happens when the substitution effect dominates. When managerial incentives increase, the manager's thresholds of working, both with and without the blockholder present, will decrease. However, $x^{No\,B}$ decreases by more (from $x_1^{No\,B}$ to $x_2^{No\,B}$) than x^B (from x_1^B to x_2^B). As a result, the value added by blockholder monitoring, represented by the distance between x^B and $x^{No\,B}$, shrinks (from the the green to the blue line). It is thus predicted that a blockholder is less likely to enter and monitor a firm as its managerial incentives increase, because the blockholder's incremental payoff net of the monitoring cost is less likely to be positive.

3 Hypotheses and Data

The null and alternative hypotheses of the empirical test in the present study are as follows:

- H_0: CEO incentives in place do not affect blockholding.
- H_1: CEO incentives in place affect blockholding.

If the null is rejected and the effect of CEO incentives on blockholding is negative (positive), it is consistent with the substitution (complementary) effect of CEO incentives on blockholder monitoring.

The data sources are Compustat for firm characteristics, ExecuComp for CEO information including compensation, CRSP for stock price, return, and trading volume,

Thomson Reuters S34 for investment company holdings,[13] Kenneth French's web-based data library for the monthly factor data,[14] Thomson Reuters S12 for individual mutual fund holdings, a list of SEC Schedule 13D and 13G filings kindly provided by Kate Volkova for identifying blockholders who are frequent 13D filers,[15] I/B/E/S for analyst forecasts, CRSP Mutual Fund Database for individual mutual fund characteristics, and Institutional Investor Services for information on the board of directors and for corporate governance provisions.[16]

To obtain the sample for the correlational analysis in Section 4, I first merge Compustat and Execucomp to obtain firm-year observations that combine CEO compensation and other firm characteristics. I then merge Thomson Reuters S34 with the Compustat-Execucomp dataset to further integrate investor holding information. Note that Thomson Reuters S34 data is on a quarterly basis, while Compustat-Execucomp data is on an annual basis. Specifically, Thomson Reuters S34 reports the effective holdings of each reporting investor at the end of each calendar quarter. To match the data on a one-to-one basis, I keep only the December holdings in Thomson Reuters S34, considering that the calendar dates of most annual observations in the Compustat-Execucomp dataset are in December (about 71%). I further require a firm-year observation to have non-missing values for all variables listed on Table 1. The resultant sample is at the intersection of Compustat, Execucomp, and Thomson Reuters S34. The sample period is from 1993 to 2018. Table 1 gives the summary statistics. The sample for the difference-in-differences ("DiD") analysis in Section 5 is further restricted by requiring a firm to have observations both before and after the DiD event, which is defined in detail later in Section 5.1.

To proxy for CEO incentives, I construct CEO wealth-performance sensitivity ("CEO WPS") following Edmans et al. (2009). There can be 3 forms of CEO WPS depending

[13] The investment companies include banks, insurance companies, parents of mutual funds, pension funds, university endowments, and numerous other types of professional investment advisors, which are required to file the 13F form with the SEC every quarter.

[14] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[15] The data-collection procedure is detailed in Schwartz-Ziv and Volkova (2021).

[16] The "Governance Legacy" database is used to obtain provisions up to and including 2006 and the "Governance" database is used for provisions after 2006.

on both the utility function and production function of the CEO:

$$Percent - Percent\ WPS = ln(\frac{\Delta Wealth}{\Delta ln(Firm\ Value)} \times \frac{1}{Wage})$$
$$Dollar - Dollar\ WPS = ln(\frac{\Delta Wealth}{\Delta Firm\ Value})$$
$$Dollar - Percent\ WPS = ln(\frac{\Delta Wealth}{\Delta ln(Firm\ Value)})$$

I adopt all 3 forms of CEO WPS in the empirical tests for robustness. To proxy for blockholding, I adopt both blockholder number and total blockholder ownership, i.e., the sum of the percentage ownership held by all blockholders. Both blockholding proxies are calculated based on institutional investors' 13F filings with the SEC. There has not been a theoretical basis for the threshold of being a blockholder. I define a blockholder as a shareholder with at least 5% ownership in the firm, which is the SEC reporting threshold for large shareholders. As the present study examines how a firm's CEO incentives affect its blockholding, to make sure that CEO incentives can be observed before blockholders decide on their stakes in the firm, I look at CEO incentives in year $t-1$ and the blockholding in year t.

4 Correlational Analysis

In this section, I look at the correlation between blockholding and CEO WPS, as well as how this correlation is associated with firm value. In the baseline analysis in Section 4.1, I look at all blockholders, irrespective of their tendency to monitor. I then discuss the heterogeneity of the tendency to monitor across blockholders and zoom in on firms where blockholders are more likely to monitor in Section 4.3.

4.1 Baseline Analysis

First, I plot the average blockholding and average lagged CEO WPS of all firms in each year to see how they have evolved generally. Observe in Figure 3 that both blockholder number and total blockholder ownership have been trending upwards in general, consistent with the rising prominence of blockholders documented by Holderness (2016). Looking at CEO WPS in Figure 4, the increase from mid-1990s to early 2000s was largely attributable to the surge of option grants in executive compensation (Edmans et al., 2017). Shue and Townsend (2017) note that during this period, the other forms of

executive compensation did not adjust to offset option's impacts on total pay level and pay-for-performance sensitivity. Notice in Figure 4 that there was a break in the upward trend of CEO WPS in 2006. I argue the trend break was related to two regulation changes that went into effect in 2006: 1) FAS 123(R) by the FASB that required firms to expense the fair value of equity-based pay to employees; 2) the SEC reform that required firms to disclose the fair value of equity-based pay to each top executive. The two regulation changes reduced the accounting appeal of option grants, which had been typically recorded at zero intrinsic value. If firms were concerned about the expenses and disclosures related to equity-based CEO pay, they might experience negative changes in CEO incentives, due to the reduced use of option grants and the imperfect replacement with restricted stock grants. The accounting and disclosure concerns, on the other hand, were unlikely to increase a firm's blockholding directly. Observe in Figure 4 that the average CEO WPS is lower after the regulation changes in 2006, and this is true even after the 2007-09 Global Financial Crisis. This is in contrast to the unchanged average CEO pay-for-performance sensitivity found by Hayes et al. (2012), whose sample period only extends to 2008. In Section 5, I examine whether the reductions in CEO WPS increased blockholding after the regulation changes in an effort to support the causal effect of CEO incentives on blockholding.

To have a crude sense of the correlation between blockholding and CEO WPS, in each year, I divide the firms into quintiles based on lagged Dollar−Percent WPS. I compute the mean and median blockholding of each quintile in each year first and then average the quintile means and medians across all years. I then plot the (time-series) average quintile means and medians of blockholding against CEO WPS quintile. The relation depicted should be interpreted as the average of the annual cross-sectional correlations. Observe in Figure 5 that the correlation is generally negative.[17] This is consistent with the substitution effect of CEO incentives on blockholder monitoring.

To examine the correlation between blockholding and CEO WPS with more clarity,

[17] Though no test has been done about the possibility of a non-monotonic relation, it can be observed that the increase from the 1st to the 2nd quintile is relatively small. In addition, this is without controlling for the other firm characteristics that could be simultaneously correlated with both blockholding and CEO WPS.

I proceed to a regression analysis. The regression form is as follows:

$$Blockholding_{i,t} = \beta_1 WPS_{i,t-1} + X_{i,t-1}\gamma + c_i + v_t + \epsilon_{i,t} \quad (1)$$

where subscripts i and t denote firm i and year t; $Blockholding_{i,t}$ is either blockholder number or total blockholder ownership; $WPS_{i,t-1}$ is CEO wealth-performance sensitivity; $X_{i,t-1}$ is a vector of control variables motivated by Edmans, Fang, and Zur (2013); c_i and v_t are the firm and year fixed effects, respectively.[18] Table 2 shows the estimation results with blockholder number as the dependent variable. The coefficients of lagged CEO WPS are significantly negative in all specifications. In terms of the economic magnitude, one-standard-deviation increases in Percent−Percent, Dollar−Dollar, and Dollar−Percent WPS are associated with 0.047, 0.045, and 0.076 decreases in blockholder number, respectively (column 2, 4, and 6).

I then look at the correlations between blockholding and the control variables as indicated in Table 2. The coefficents of Size are negative, possibly because it costs less and thereby easier to accumulate a block stake in a smaller firm. The negative coefficients of Sales Growth and ROA are consistent with the notion that firms with more potentials for improvement are more attractive to blockholders. Illiquidity also has negative coefficients, consistent with Maug (1998) and Edmans (2009) that liquidity helps the formation of blocks. The negative coefficients of Leverage are consistent with the substitution between creditors and blockholders in terms of monitoring and disciplining management. Jensen (1986) argues that the use of debt could reduce the free cash flows available for management to exploit. Diamond (1984) shows in his model that financial intermediaries are better positioned than individual lenders to monitor borrowers due to the diversification of the borrowers within a financial intermediary. Borrowers' covenant violations give creditors rights to accelerate, restructure, or terminate a debt agreement (Beneish & Press, 1993). Thus, it is possible that blockholders hold less of firms with higher leverage, where the payoff for additional monitoring is lower. On the other hand, it could also be that creditors are less willing to lend to firms with more blockholders, whose interests diverge from those of creditors (Jensen

[18] I have also tried including industry fixed effect, using the Fama-French 48 industry definition, instead of firm fixed effect. The significantly negative relation between blockholding and CEO WPS discussed later still hold.

& Meckling, 1976). Credit rating is positively associated the debt capacity of a firm. Empirical evidence suggests that blockholding in a firm is negatively associated with both the entity's credit rating (Ashbaugh-Skaife, Collins, & LaFond, 2006) and the security-specific credit rating (Bhojraj & Sengupta, 2003).

With total blockholder ownership as the dependent variable (Table 3), the negative correlation between blockholding and CEO WPS is still significant. One-standard-deviation increases in Percent−Percent, Dollar−Dollar, and Dollar−Percent WPS are associated with 0.5%, 0.5%, and 0.8% decreases in total blockholder ownership, respectively (column 2, 4, and 6). The signs of the control variable coefficients are basically the same as in Table 2, though the coefficients of Leverage and Illiquidity become statistically insignificant.

The negative correlation between blockholding and CEO WPS is consistent with blockholder's motive to be in a firm where the CEO needs to be monitored and disciplined. Higher CEO incentives substitute blockholder monitoring by reducing the agency problem in the firm. Note that this substitution is straightforward for blockholders who monitor through voice, i.e., more aligned CEO-shareholder interests, less need for shareholder interventions. When it comes to blockholder monitoring through the threat of exit, there is also a complementary effect of managerial incentives on the effectiveness of the threat of exit (Admati & Pfleiderer, 2009; Edmans, 2009). In Section 2, I extend the threat of exit model of Admati and Pfleiderer (2009) and show the substitution effect dominates the complementary effect.

The observed negative correlation between blockholding and CEO WPS is in contrast to Hartzell and Starks (2003), where higher institutional ownership concentration is associated with higher managerial incentives. They attribute the positive relation to the "clientele effect", according to which institutional investors' preferences drive the changes in managerial incentives. The Hartzell-Starks sample period is from 1991 to 1996. I examine a longer sample period from 1993 to 2018. The Hartzell-Starks measure of managerial incentives is constructed from the executives' annual compensation. CEO WPS, on the other hand, also accounts for the incentives provided by the options and stocks already held by the CEO. Most importantly, Hartzell and Starks (2003) consider how institutional investors alter a firm's executive compensation after being present in the firm. The present study, on the other hand, examines how a firm's CEO

incentives in place affect blockholders' decision to be in the firm in the first place. Both are integral parts of blockholder's involvement process: blockholders are attracted to firms with originally low CEO incentives (the present study) and then reshape CEO incentives to improve firm value and generate returns (Hartzell & Starks, 2003).

The endogeneity issue needs to be addressed to support the causal effect of CEO incentives on blockholding. For example, there could be an omitted variable that affects both blockholding and CEO WPS. Reverse causality is also possible. Fahlenbrach (2009) has CEO incentives as the dependent variable and institutional ownership as the explanatory variable and shows a negative correlation between the two. He argues that higher institutional ownership means more outside monitoring, hence less need for high-powered compensation contracts. The negative correlation shown in both Fahlenbrach (2009) and the present study indicates the substitution between CEO incentive contracts and outside investor monitoring in corporate governance. In Section 5, I make attempts to mitigate the endogeneity concerns.

4.2 Firm Value Regressions

Next, I look at how the negative correlation between blockholding and CEO incentives shown in Section 4.1 is associated firm value. I use Tobin's Q as a proxy for firm value and regress it on lagged CEO WPS, lagged blockholding, as well as their interaction term. The regression form is as follows:

$$\begin{aligned} Tobin's\ Q_{i,t} = {} & \beta_1 WPS_{i,t-1} + \beta_2 Blockholding_{i,t-1} + \beta_3 WPS_{i,t-1} \times Blockholding_{i,t-1} \\ & + X_{i,t-1}\gamma + c_i + v_t + \epsilon_{i,t} \end{aligned} \tag{2}$$

where subscripts i and t denote firm i and year t; $X_{i,t-1}$ is a vector of control variables motivated by Bharath, Jayaraman, and Nagar (2013); c_i and v_t are the firm and year fixed effect, respectively. Table 4 shows the estimation results with blockholder number as the blockholding proxy. Observe that the coefficients of all 3 forms of CEO WPS are significantly positive. The coefficients of the interaction terms, on the other hand, are all significantly negative. Together, they suggest that 1) Aligning CEO-shareholder interest is positively associated with firm value; 2) this positive association is weaker when there are more blockholders in the firm. Based on the multi-variable regression

results (column 2, 4, and 6) in Table 4, having one more blockholder in the firm is associated with a 4.47% to 13.64% reduction in the positive correlation between CEO WPS and firm value.[19] Using total blockholder ownership as the blockholding proxy (Table 5) conveys the same idea. The results in Table 4 and 5 further corroborate the substitution between CEO incentive contracts and blockholder's presence to reduce agency costs.

It is also noticeable that, unlike CEO WPS, blockholding proxies per se do not have significant coefficients across Table 4 and 5. Despite the growing prominence of blockholders (Holderness, 2016; Schwartz-Ziv & Volkova, 2021), there has been weak evidence of blockholders' direct effects on firm value and policies. Holderness and Sheehan (1988) do not find much difference in investment policies, accounting rates of return, and firm value between majority-owned and diffusely held firms. McConnell and Servaes (1990) find that outside blockholder ownership does not have an independent effect on firm value in their cross-sectional analysis.

There have been empirical studies addressing the lack of blockholder impact on firm value and policies. For instance, the type of a blockholder matters when it comes to implementing firm policy changes. Cronqvist and Fahlenbrach (2008) explicitly account for blockholder heterogeneity at the individual blockholder level and find significant blockholder fixed effects. They find that at least certain categories of blockholders (e.g., activists, pension funds, and VC funds) invest into a firm to influence its policies (e.g., investment, dividend payout, and executive compensation) and to improve its value. Schwartz-Ziv and Volkova (2021) find that blockholder diversity, which increases with the number of blockholders, can be detrimental to firm performance as different types of blockholders have diverged objectives.

Theoretically, Edmans (2009) shows in his threat of exit model that the relation between firm value and blockholding is hump-shaped. In his model, a blockholder has to maintain a significant position in the firm for the threat to be non-trivial. However, too large a block prevents efficient trading and thus the revelation of information to the market.[20] As market efficiency contributes positively to real efficiency, namely firm

[19] This is calculated from dividing the coefficients of the interaction terms by the coefficients of CEO WPS.

[20] Following the insider trading model of Kyle (1985), Edmans (2009) assumes there are 3 parties involved in the trading process: a blockholder with private information about the firm's intrinsic value, uninformed noise traders who trade randomly, and a market maker who sets price based on the

value, the optimal block size that maximizes firm value is finite. Such a hump-shaped relation could be a reason why blockholders have insignificant direct effects on firm value, as the effect is usually modelled linearly.

On the other hand, in the voice models of Shleifer and Vishny (1986) and Maug (1998), the relation between firm value and blockholding is monotonically positive. A larger block gives a blockholder more control rights, which are then exercised to improve firm value. Therefore, for blockholders who mostly intervene in firm issues directly, the insignificant impact of blockholders on firm value is more likely to be explained by realistic complications such as blockholder heterogeneity (Cronqvist & Fahlenbrach, 2008; Schwartz-Ziv & Volkova, 2021).

4.3 Blockholder Heterogeneity

There is heterogeneity across blockholders when it comes to the tendency to monitor. To further support that it is because of the reduced need for monitoring that blockholders are less present when CEO incentives are higher, I first discuss the possible motives of blockholders when they invest. I then examine if the negative relation is more pronounced where blockholder monitoring is more likely.

4.3.1 Investing Motives of Blockholders

Generally speaking, there can be 3 possible motives of blockholders when they invest: indexing, capturing predicted stock returns, and monitoring. Indexing means that an investor makes the investment for the sole purpose of matching a diversified index. Is it likely for an investor to become a blockholder by purely indexing? To illustrate the likelihood, suppose:

- the total market capitalization of all constituent firms in an index named Z is V_Z;
- the market capitalization of a constituent firm named A in index Z is V_A;
- the total asset value of a fund named Y that is designated to match its portfolio composition to index Z is V_Y.

aggregate quantities traded. Noise traders provide camouflage for the blockholder and thus reduce (not eliminate) the price impact of the blockholder's trade. As the stake of the blockholder gets larger, there are fewer noise traders that the blockholder can trade against, hence less monitoring and trading by the blockholder.

How large does V_Y have to be for fund Y to accumulate 5% of firm A by matching index Z? The answer would be 5% of V_Z. To put this into perspective, at the end of 2018, the total market capitalization of S&P 500 is 21.03 trillion USD while the average asset value of mutual funds in the Thomson Reuters mutual fund universe is 2.23 billion USD, which is only 0.01% of the total market capitalization of S&P 500. Even if I consider the mutual fund family under the same management company, the magnitude of the total asset value is still too small. For instance, at the end of 2018, the sum of the total assets of index funds reported by BlackRock in the merged dataset of Thomson Reuters S12 and CRSP Mutual Fund Database is 619.30 billion USD, which is about 2.94% of the total market capitalization of S&P 500. BlackRock has long been the largest asset manager in the world (Walker, 2018). Thus, it seems unlikely for an average investor to become a blockholder of a public firm by purely indexing. Furthermore, because of the nature of indexing, an indexer's presence in an index constituent firm should be relatively independent of the firm's CEO incentives. The existence of indexer-blockholders in the sample firms would work against me finding any relation between blockholding and CEO WPS. Lastly, I have also tried excluding BlackRock, Vanguard, and State Street, which are the "Big Three" asset managers in the index fund industry from the sample firms' shareholder bases. The negative correlation between blockholding and CEO WPS shown in Section 4.1 is still significant. The results are not tabulated for brevity. In addition, the DiD results reported later on in Section 5.2 are also not affected materially by the exclusion of the Big Three. Overall, the observed negative relation between blockholding and CEO WPS is unlikely driven by indexer-blockholders.

Another possible motive for a blockholder to buy into a firm is that the blockholder has predicted the firm to have superior performances in the future. However, since these "forecaster-blockholders" themselves do not exert any effort to monitor, to the extent that CEO incentive alignment helps realize the predicted superior performances, these blockholders would prefer higher CEO incentives. Thus, the existence of forecaster-blockholders in the sample firms would also work against me finding a negative relation between blockholding and CEO WPS.

4.3.2 Payoff for Blockholder Monitoring

A firm's blockholders are more likely to monitor if the payoff for monitoring is higher. To gauge the likelihood of a positive payoff for blockholder monitoring, I calculate a

firm's abnormal returns prior to when the firm's blockholding is observed. I assume that lower abnormal returns in the past indicate a higher chance that the blockholder's payoff for monitoring the firm is positive. I have the following regression form:

$$Blockholding_{i,t} = \beta_1 WPS_{i,t-1} + \beta_2 Perform_{i,t-1} + \beta_3 WPS_{i,t-1} \times Perform_{i,t-1} + X_{i,t-1}\gamma + c_i + v_t + \epsilon_{i,t} \quad (3)$$

where $Perform_{i,t-1}$ is the sum of the monthly abnormal returns in years up to year $t-1$ (inclusive). Specifically, I adopt 2 alternative measures: the sum of a firm's monthly abnormal returns in 1 year up to year $t-1$ ("1-year performance") and the sum in 3 years up to year $t-1$ ("3-year performance").[21] All the other terms are the same as in Regression (1). Monthly abnormal returns are calculated based on the Carhart (1997) 4-factor model. For each month, the factor loadings are estimated using the monthly returns in up to 36 months prior to the month. The coefficients of interest are β_1, which indicates the relation between a firm's blockholding and CEO WPS, and β_3, which indicates how the aforementioned relation changes with the firm's past performance. If the negative relation between CEO incentives and blockholding is indeed driven by blockholder monitoring, β_1 should be negative and β_3 should be positive. That is, there is a negative relation between a firm's blockholding and CEO WPS and the relation is stronger when the firm has worse past performances, i.e., the payoff for monitoring now is more likely to be positive.

Table 6 shows the multi-variable estimation results for Regression (3). From column 1 to 3 (column 4 to 6), blockholder number (total blockholder ownership) is the dependent variable. In Panel A, I use the 1-year performance to proxy for the likelihood of a positive monitoring payoff. Consistent with blockholder monitoring, the coefficient of CEO WPS in Panel A is significantly negative in all columns, while the coefficient of the interaction term is significantly positive in all columns. In Panel B, I use the 3-year performance to proxy for the likelihood of a positive monitoring payoff. The results convey a similar message as in Panel A.

[21] I have also tried the 2-year performance as an alternative measure of $Perform_{i,t-1}$. The estimation results for Regression (3) are qualitatively the same as using the 1-year and 3-year performances.

4.3.3 Frequent 13D Filers

Investors are required to file Schedule 13D (13G) with the SEC if their ownership of a publicly-held firm reaches 5% and if they intend to be active (passive) in influencing the firm's control.[22] To further support the notion that blockholder monitoring is driving the negative relation between a firm's blockholding and CEO incentives, I run the following regression:

$$\begin{aligned} Blockholding_{i,t} = \beta_1 WPS_{i,t-1} + \beta_2 Activism_{i,t} + \beta_3 WPS_{i,t-1} \times Activism_{i,t} \\ + X_{i,t-1}\gamma + c_i + v_t + \epsilon_{i,t} \end{aligned} \tag{4}$$

where $Activism_{i,t}$ is a dummy variable that equals to 1 if firm i has at least one blockholder who is a "frequent 13D filer" in any quarter of year t and 0 otherwise.[23] A frequent 13D filer is an investor who has filed the SEC Schedule 13D for at least 4 times with respect to any firm up until year t (inclusive).[24] I only count blockholders' initial Schedule 13D filings during the period from August 1995 to February 2017, which is the sample period of the dataset kindly provided by Kate Volkova.[25] I use the presence of a frequent 13D filer in a firm to proxy for the increased likelihood of blockholder monitoring. All the other terms in Regression (4) are the same as in Regression (1). The coefficient of interest is β_3, which indicates how the relation between a firm's blockholding and CEO WPS changes when there are frequent 13D filers in the firm. β_3 is predicted to be negative, if the negative relation between a firm's blockholding and CEO incentives is indeed driven by blockholder monitoring.

[22] See https://www.law.cornell.edu/cfr/text/17/240.13d-1 for the eligibility and requirements for filing Schedule 13D and 13G.

[23] I have also tried using 2 continuous measures based on Schedule 13D filings: firm i's maximum quarterly number of frequent 13D filers and maximum quarterly total ownership of frequent 13D filers in year t. I have also tried a relative measure based on both Schedule 13D and 13G filings constructed as follows: 1) I calculate a blockholder's cumulative numbers of Schedule 13D and 13G filings; 2) I divide the cumulative number of Schedule 13D by the sum of the two cumulative filing numbers ("investor-level 13D ratio"); 3) I take the average of the investor-level 13D ratio for a firm to get firm-level 13D ratio; 4) I obtain the maximum quarterly firm-level 13D ratio in year t. This relative measure could proxy for the monitoring intensity of a blockholder. The estimation results using all 3 alternative activism measures above for Regression (4) are qualitatively the same as using the frequent 13D filer dummy.

[24] Since the sample of frequent 13D filers becomes smaller as the frequency goes up, I use 4 times to define "frequent" to ensure a decent sample size (2,041 investor-year observations). I have also tried using 5 times, which reduces the investor-year observations to 1,281. The results are qualitatively similar.

[25] In addition to filing the initial Schedule 13D, a blockholder has to file an amendment to Schedule 13D "if any material change occurs in the facts set forth in the Schedule 13D". See https://www.law.cornell.edu/cfr/text/17/240.13d-2 for details.

Table 7 shows the multi-variable estimation results for Regression (4). From column 1 to 3 (column 4 to 6), blockholder number (total blockholder ownership) is the dependent variable. Observe that the coefficient of the interaction term is significantly negative in all columns. When there are frequent 13D filers present in the firm, one-standard-deviation increases in Percent−Percent, Dollar−Dollar, and Dollar−Percent WPS are associated with 0.083, 0.095, and 0.079 (0.6%, 0.7%, and 0.7%) further decreases in blockholder number (total blockholder ownership), respectively. The coefficent of CEO WPS is still all negative and largely significant but is weaker, both economically and statistically, compared to the corresponding results in Table 2 and 3. The results in Table 7 should lend further support to the blockholder monitoring explanation of the negative relation between CEO incentives and blockholding.

5 Difference-in-Differences Analysis

5.1 DiD Design

To support the causal effect of CEO incentives on blockholding, I utilize two regulation changes related to CEO incentives that went into effect in 2006. The first one is FAS 123(R) introduced by the FASB that required firms to expense the fair value of equity-based pay to all employees. The second one is the SEC reform that required firms to disclose the fair value of equity-based pay to each top executive. Before the introduction of FAS 123(R), option grants were favored over restricted stocks by firms due to their preferential accounting treatment (Carter et al., 2007). Namely, firms could choose to expense the intrinsic values or the fair values of option grants.[26] Under the intrinsic value method, by granting options with exercise prices at or above the underlying stock prices, firms could avoid recording any compensation expenses for options. Since the two regulation changes, firms have reduced option grants and increased restricted stock grants in compensation packages (Edmans et al., 2017). The values of options and restricted stocks are both sensitive to firm value; substituting options with restricted stocks could help maintain managerial incentives. The substitution, however, was unlikely perfect for firms that were concerned about the expenses and disclosures related

[26] Intrinsic value of an option refers to the payoff of the option if it were exercised immediately. Fair value of an option is determined in the market transaction and is calculated from pricing models such as the Black-Scholes model.

to equity-based CEO pay. For firms with such concerns, CEO incentives were still likely to decrease after the regulation changes. The accounting and disclosure concerns, on the other hand, were unlikely to increase a firm's blockholding directly. Motivated by this, I examine whether the reductions in CEO incentives increased blockholding after the regulation changes to mitigate the endogeneity concern.

With the two regulation changes defined as the "event", I calculate the 3-year pre-event average CEO WPS and 3-year post-event average CEO WPS for each firm.[27] I then subtract the pre-event average CEO WPS from the post-event average CEO WPS to proxy for the change in CEO WPS around the event. I assign those with negative (non-negative) changes in CEO WPS around the event into the "treated" ("control") group.[28] Strictly speaking, this is not a conventional DiD design, where the control group should not be targeted by the regulation changes at all. The identification strategy adopted in the present study is termed as "DiD-Continuous" by Atanasov and Black (2016) and is typically used to assess whether a universal shock affects firms with different reactions or sensitivities to the shock differently. For instance, Chetty and Saez (2005) try to establish the causality from dividend taxation to firm's dividend payout using the 2003 tax reform in the U.S. that cut dividend tax to a uniform level of 15%. As the tax cut was applicable to all firms, the authors proxy the sensitivity to the shock with the tax status of firms' institutional shareholders. That is, firms with more taxable (non-taxable) institutional investors would be affected to a greater (less) extent by the tax cut, and are thus the treated (control) group.

An important identification assumption in the DiD-Continuous design is that a firm's shock reaction or sensitivity, which is used to assign the firm into the treated or control group, is not just a proxy for another firm characteristic that affects the outcome of interest. I argue this is likely to hold in the present study, as the reductions in CEO WPS were largely due to firms' accounting and disclosure concerns, which were unlikely to increase blockholding directly. I further provide support for the iden-

[27] The pre-event average CEO WPS is calculated by taking the mean of WPS over 2004, 2005, and 2006. The post-event average WPS is calculated by taking the mean of WPS over 2007, 2008, and 2009. When there is missing data, I use the next closest observation instead. For example, if a firm has a missing observation for the year 2006, I calculate the pre-event average by taking the mean over 2003, 2004, and 2005.

[28] I have also tried using the change in the 5-year average CEO WPS around the event to define the treated and control groups. The baseline DiD results still hold. I have also tried restricting the sample period to the windows used to calculate the change in CEO WPS, e.g., 3 years before and after event, the baseline DiD results still hold.

tification assumption by controlling for various firm characteristics in the baseline DiD regression in Section 5.2 and in the robustness check in Section 6.1. I also show the treated and control groups' common movements of blockholding before the event in Section 5.3. To further improve the comparability of the treated and control groups, I match the two groups in Section 5.4 with the propensity score of treatment.

To define the event time, I follow Shue and Townsend (2017). Specifically, FAS 123(R) was effective for financial years ending after June 15th, 2006, and the SEC disclosure requirement was effective for financial years ending after December 15th, 2006. Therefore, I dropped all observations between these two dates, and define the observations with calendar dates before June 15th, 2006 as pre-event observations, and those with calendar dates after December 15th, 2006 as post-event observations.

5.2 Baseline DiD Results

If the negative effect of CEO incentives on blockholding were true, the blockholding of the firms in the treated group would increase after the event, while the blockholding of those in the control group would not. To get a glimpse of whether this is the case, I first calculate the 3-year pre-event average blockholding and 3-year post-event average blockholding for each firm.[29] I then subtract the pre-event average blockholding from the post-event average blockholding to proxy for the change in blockholding around the event. For both the treated and control groups, I calculate the mean of the change in blockholding in each group to see how blockholding in each group changes on average around the event. The results are shown in Table 8. Observe the blockholding in the treated group increased on average after the event, and the increase is statistically significant for 5 out 6 cases.[30] The change in blockholding in the control group does not have a uniform direction in Table 8 and is not significantly different from 0 in all but one case. Instead of dividing firms into two groups based on the sign of the change in CEO WPS, I divide firms into quintiles based on the change in CEO WPS around the event and calculate the mean change in CEO WPS in each quintile. I then calculate the mean and median blockholding in each quintile and plot them against the mean change

[29] The pre-event average blockholding is calculated by taking the mean of blockholding over 2005, 2006, and 2007. The post-event average blockholding is calculated by taking the mean of blockholding over 2008, 2009, and 2010. Blockholding is one-year lagged behind CEO WPS to ensure blockholders can observe CEO WPS before making decisions about their stakes in the firm.

[30] With 2 proxies for blockholding and 3 forms of WPS used to divide the treated and control groups, there are 6 possible combinations.

in CEO WPS. As shown in Figure 6, there is generally a negative relation between the change in blockholding and the change in CEO WPS around the event.

I then proceed to the baseline DiD regression, which has the following regression form:

$$Blockholding_{i,t} = c_i + v_t + \lambda w_{i,t-1} + X_{i,t-1}\gamma + \epsilon_{i,t} \tag{5}$$

where subscripts i and t denote firm i and year t; $Blockholding_{i,t}$ is either blockholder number or total blockholder ownership; c_i and v_t are the firm and year fixed effects;[31] $w_{i,t-1}$ is the dummy variable for the treated group after the event ("DiD term"); $X_{i,t-1}$ is a vector of control variables motivated by Edmans et al. (2013). The individual terms of the treated dummy and the post-event dummy are omitted as they are absorbed by the firm and year fixed effects. Note that the DiD term $w_{i,t-1}$ is 1-year lagged behind the blockholding to ensure CEO WPS can be observed by blockholders before they decide on their stakes in the firm. Since the treated group consists of those with decreases in CEO WPS around the event, if the negative effect of CEO incentives on blockholding is true, the coefficient λ in Regression (5) is predicted to be positive. The results of the regression with blockholder number as the dependent variable are shown in Table 9. Consistent with the prediction, the coefficients of the DiD term are positive across all specifications and are significant in most cases. In terms of the economic magnitude, being in the treated group after the event is associated with 0.107 to 0.152 more blockholders, based on the significant multi-variable results (column 2 and 6) in Table 9. Looking at Table 10, where total blockholder ownership is the dependent variable, the message is similar to that obtained in the previous table. Here, based on the significant multi-variable results (column 4 and 6), being in the treated group after the event is associated with 1.1% to 1.4% higher blockholder ownership.

5.3 Common Trend

A "common trend" assumption is required to identify the treatment effect in a DiD analysis. In the present study, the treatment effect is represented by λ in Regression (5). A visual inspection of the blockholding trends of the treated and control groups helps

[31] I have also tried including industry fixed effect, using the Fama-French 48 industry definition, instead of firm fixed effect. The results do not differ qualitatively from those shown in Table 9 and 10.

improve the confidence in the similarity between the two groups. I plot the simple-average blockholding trends of the two groups. Observe in Figure 7 that, before the event time (i.e., the dashed vertical lines in the figure), there was not much difference in blockholding for most years.

To support the common trend assumption formally, I run an augmented DiD regression following Angrist and Pischke (2008). The regression form is as follows:

$$Blockholding_{i,t} = c_i + v_t + \sum_{\tau=0}^{m} \lambda_{-\tau} w_{i,t-\tau} + \sum_{\tau=1}^{q} \lambda_{+\tau} w_{i,t+\tau} + X_{i,t-1}\gamma + \epsilon_{i,t} \qquad (6)$$

This model allows for: m lagged (post-treatment) effects λ_{-1}, λ_{-2}, $\cdots$, λ_{-m}; q lead (anticipatory) effects λ_{+1}, λ_{+2}, $\cdots$, λ_{+q}; the immediate effect of treatment λ_0. The other terms are as defined in Regression (5). While the lagged effects indicate the delayed responses to the treatment, which are worth being explored in their own rights, the lead effects signal the violation of the common trend assumption. Significant lead effects would suggest that the regulation changes have "effects" on blockholding in periods before these changes actually occur. This would in turn suggest that the treated and control groups do not have common movements before the regulation changes.

I include 3 lead effects, 3 lagged effects, and the immediate effect in Regression (6). They are the coefficients of the interactions between the treated dummy and the lead, lagged, and immediate indicators, respectively. Figure 8 shows the point estimates of the effect of being in the treated group on a firm's blockholding over time. 95% confidence intervals are plotted around the point estimates. Observe that being in the treated group before the event (Year 0) has no significant effect on a firm's blockholding. This lends further support to the common trend assumption. The detailed estimation results of the augmented DiD regression can be found in Table 11.

5.4 Propensity-Score Matching

To further improve the comparability of the treated and control groups, I match the treated and control groups in the baseline DiD analysis using the propensity score of treatment, calculated based on the control variables included in the baseline DiD

regression, i.e., Regression (5).[32] Before the matching, I check the two groups' overlap in the control variable distributions to inspect the differences between the two groups in the control variables (Imbens, 2015). Due to the panel structure of the dataset, I first take the pre-event 3-year average of each control variable included in the baseline DiD analysis. For both the treated and control groups, I then calculate the within-group means and standard deviations of the pre-event 3-year average of each control variable. The within-group means are then compared to judge the differences between the treated and control groups. Rather than looking at the t-statistic for testing the null hypothesis of no difference in the within-group mean between the treated and control groups, Imbens (2015) proposes to use the "normalized difference" as a scale-free and sample-size-free way of assessing overlap.[33] I compute both the t-statistics of the differences in the within-group means between the treated and control groups, as well as the normalized differences. Table 12 summarizes the results. None of differences in the within-group means is significant at the 10% level. Moreover, none of the absolute values of the normalized differences is greater than 0.3, which is the threshold of judging significant differences proposed by Imbens (2015). Thus, the two groups' overlap in the control variables seems quite good based on Table 12. Figure 9 depicts the distributions of the propensity score of treatment calculated based on the same control variables.[34] The largely overlapping densities of the (unmatched) treated and control groups also indicate the two groups are not too different.

Next, I re-run the DiD regression using the propensity-score matched sample. Imbens (2015) proposes two methods to match the treated and control groups:

- When there are a large number of observations in the control group relative to

[32] I have also tried matching on additional control variables, specifically, those included in Panel A of Table C2. The results are qualitatively similar.

[33] The normalized difference is defined by Imbens (2015) as the difference in the within-group mean of a particular control variable between the treated and control groups divided by the square root of the average within-group variance of the same control variable.

[34] The propensity score is estimated using a stepwise procedure proposed by Imbens and Rubin (2015), where a subset of the control variables in the baseline DiD regression are included in the propensity score estimation. The first-order terms of the control variables to be included are determined first. The second-order terms of the control variables whose first-order terms have been included are then selected and included in the estimation. The term-selection procedure works as follows. First, a base regression model is chosen arbitrarily. Then in each step, a new term is added to the regression model. To determine whether the new term is included in the final estimation of the propensity score, a likelihood ratio test is conducted comparing the regression models with and without the term. If the test statistic is greater than the critical value, the new term is included. Following Imbens (2015), critical values of 1 and 2.71 are used for selecting the first-order and second-order terms, respectively.

the number of the treated ones, each treated unit is matched to a control unit that has the closest estimated propensity score. This is called "matching without replacement".

- When the numbers of observations in the treated and control groups are close, drop those with extreme values of estimated propensity score in both groups.

Since the treated and control groups in the present study have similar sizes (see Table 8), I match the two groups by dropping the observations with extreme values of estimated propensity score in both groups (i.e., < 0.1 or > 0.9).[35] I then re-run the DiD regression using the matched sample. The results are shown in Table 13 and 14. Note that both the coefficients of the DiD term and the numbers of observation are close to those in the baseline DiD results (Table 9 and 10). This is because the treated and control groups in the baseline analysis are similar in the firm characteristics included as controls in the baseline DiD regression and thus not many observations are dropped when matching. This should provide further confidence that the treated and control groups in the baseline are otherwise similar except for the differential changes in CEO WPS and in blockholding.

5.5 Financial Reporting Concerns and CEO WPS

I argue that if firms were concerned about the expenses and disclosures related to equity-based CEO pay, they would reduce CEO incentives, which would in turn increase blockholding after the event. Carter et al. (2007) note that, due to such concerns, "only approximately 20% of ExecuComp firms granted restricted stocks to their CEOs between 1995 and 2001, while approximately 80% granted options during that period".

I define "financial reporting concerns" as firms' concerns about the possible negative effects of various accounting treatments on earnings. I construct the empirical proxies for financial reporting concerns following Carter et al. (2007). The construction of the empirical proxies are detailed in Appendix B. The 3 empirical proxies are "Fin Concern (Objective)", "Fin Concern (External Fin)", and "Fin Concern (Covenant)", representing firms' concerns about earnings due to the need to beat performance objectives, to raise external capital, and to comply with debt covenants, respectively. I di-

[35] Crump, Hotz, Imbens, and Mitnik (2008) propose a detailed method to determine the thresholds for "extreme values" on both sides of the estimated propensity score distribution, and suggest that 0.1 and 0.9 are a good approximation to the optimal thresholds based on their simulation results.

vide the sample based on firms' financial reporting concerns and conduct the baseline DiD analysis again in the subsamples.[36] Those in the "high" ("low") subsample have above-median (below-median) pre-event average values for at least 2 out of 3 financial-reporting-concern proxies. The baseline DiD results should be more pronounced for firms in the "high" subsample, where the decreases in CEO WPS are more likely to be driven by financial reporting concerns. Consistently, Table 15 shows that the coefficients of the DiD term are significantly positive only in the "high" subsample.

6 Robustness Checks

6.1 Additional Control Variables

As the first robustness check, I further control for other time-varying firm characteristics that could affect both blockholding and CEO WPS but not included in the baseline correlational and DiD analyses, i.e., Regression (1) and (5). These firm characteristics include: firm age; CEO tenure; CEO total pay; CEO turnover; CEO risk-taking incentives (vega), which also changed significantly around the event in the present study (Hayes et al., 2012; Mao & Zhang, 2018); board size (Yermack, 1996); board independence (Rosenstein & Wyatt, 1990); financial reporting concerns; the E index and dual-class share structure, which measure the external governance quality (Bebchuk, Cohen, & Ferrell, 2009). See Appendix B for detailed variable definitions and construction procedures. The results for correlational and DiD regressions with additional controls are shown in Table C1 and Table C2, respectively. In addition, I have also tried including CEO fixed effect, as the unobservable CEO characteristics might also affect both blockholding the CEO equity-based pay. The results for both correlational and DiD regressions with CEO fixed effect are shown in Table C3. As can be observed in the tables, further controlling for the above variables do not change the negative relation found between blockholding and CEO WPS in the present study.

[36] Instead of dividing the sample based on financial reporting concerns, I have also tried a triple difference-in-differences specification by interacting the treated dummy, the post-event dummy, and a dummy for high financial reporting concerns. The results do not change qualitatively.

6.2 The Global Financial Crisis

The timing of the FASB and SEC regulation changes was close to the onset of the Global Financial Crisis ("GFC"). I provide further results to support that the validity of the negative relation between CEO incentives and blockholding found in the present study is not eroded by the GFC. First of all, year fixed effect is included in all regressions in the present study and should absorb any firm-invariant effects of the GFC. Second, for the GFC to have differential effects on the blockholding of the treated and control groups in the DiD analysis, there has to be a GFC-related omitted variable that correlates with both CEO incentives and blockholding in opposite directions. Firm performance might be such a variable: bad performance reduces CEO equity-based pay and makes the firm's shares cheap to buy. I control for a firm's accounting performance such as ROA and Sales Growth in the baseline DiD results (Table 9 and 10). I further control for stock performance, proxied by the 1-year and 3-year performance measures defined in Section 4.3.2, the DiD results (not tabulated for brevity) do not change qualitatively. Third, Figure 8 shows that the effect of the FASB and SEC regulation changes persists through the GFC, as evidenced by the significantly positive effects in Year 3, which is around 2010. Lastly, since the GFC should not have any lasting impact on the structure of CEO pay, I have also tried removing the firm-year observations from 2007 to 2009, i.e., the GFC period, from the sample. The results from re-running Regression (1) and (5), which are not tabulated for brevity, are qualitatively the same as the baseline correlational and DiD results, respectively.

6.3 Pseudo-Shocks

Another concern is that, instead of due to the FASB and SEC regulation changes, it is only by chance that the differential changes in blockholding of the treated and control groups are observed around that point of time. That is, the same results could also be obtained using other random time points as the event. To mitigate this concern, I use 1996, 1998, 2000, and 2002 as pseudo-shocks, respectively, and re-run Regression (5) in the subsample before the true event time (Atanasov & Black, 2016). The specifications are the same as the multi-variable ones in Table 9 and 10, except for the replacement of the true event with the pseudo-shocks. The results are not tabulated for brevity. With 4 pseudo-shocks, 2 blockholding proxies, and 3 forms of CEO WPS, I have 24 multi-

variable specifications. The coefficient of the DiD term is not significant in any case. This should alleviate the concern that the baseline DiD results are totally random.

7 Conclusion

Blockholders are important in corporate governance. CEO incentives can both substitute and complement blockholder monitoring. I model the interaction between the two effects and derives the dominance of the substitution effect. Empirically, I find blockholders are indeed more attracted to firms with lower CEO incentives. This paper has implications on a firm's CEO compensation and ownership structure. For example, a firm might not need to worry about not having high-powered CEO compensation, as blockholders are likely to be in the firm as monitors. A firm with high-powered CEO compensation but unrealized potential might not get much help from blockholders, who could perceive the firm as correctly valued. The firm should consider replacing the CEO to improve performance and/or moderating the incentive contracts to attract blockholders to the firm as monitors. On the other hand, if a firm thinks that it is already on the right track and does not want to constantly deal with blockholders' requests, which could be distracting, a firm should make good use of incentive contracts.

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Figures and Tables

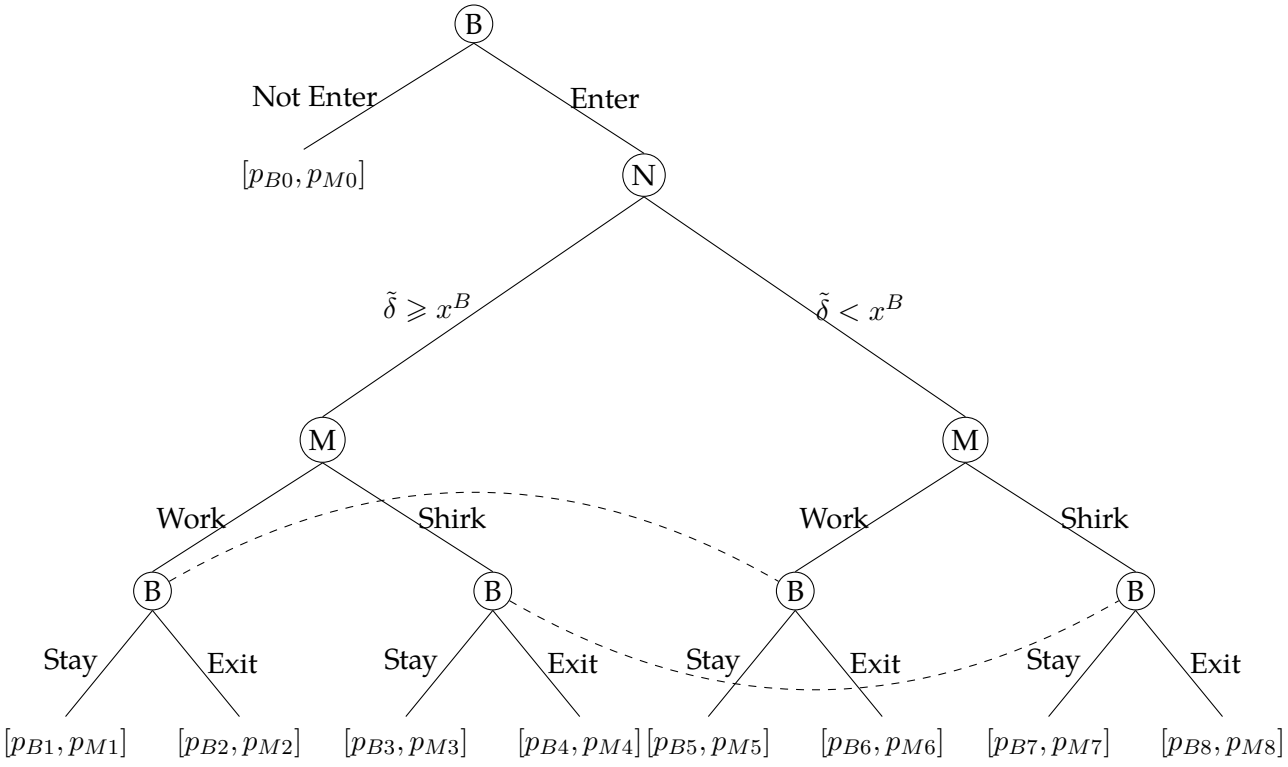


Figure 1: A Sequential Game with the Threat of Exit Only

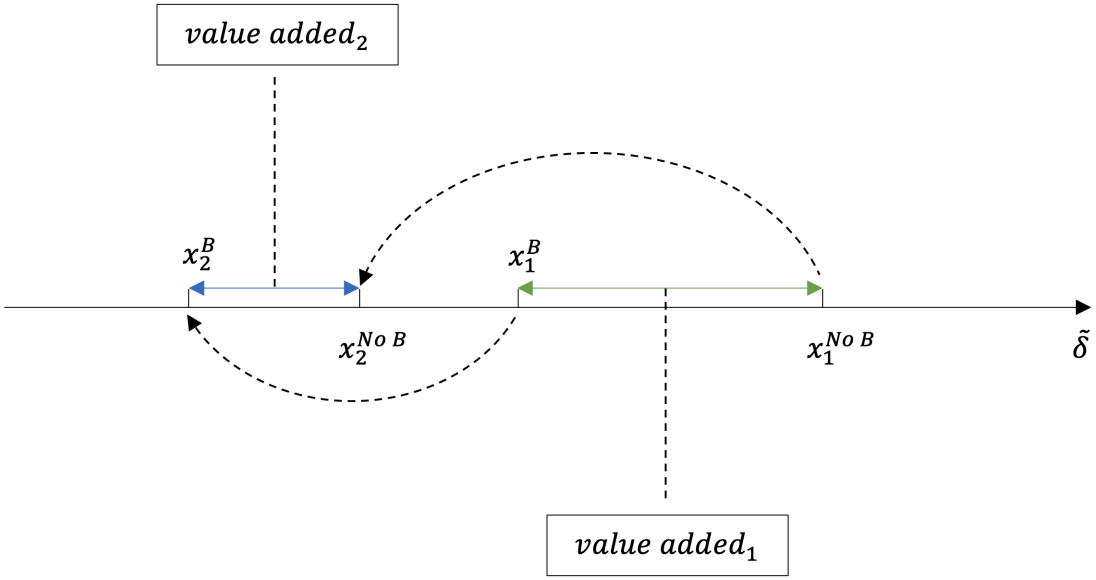


Figure 2: Managerial Incentives and Blockholder Monitoring x^B ($x^{No\ B}$) is the manager's threshold of working with (without) the blockholder's presence. As the managerial incentives increase, x^B goes from x_1^B to x_2^B; $x^{No\ B}$ goes from $x_1^{No\ B}$ to $x_2^{No\ B}$. The distances between x^B and $x^{No\ B}$ represent the values added by blockholder monitoring, and consequently, the blockholder's incremental payoffs for monitoring.

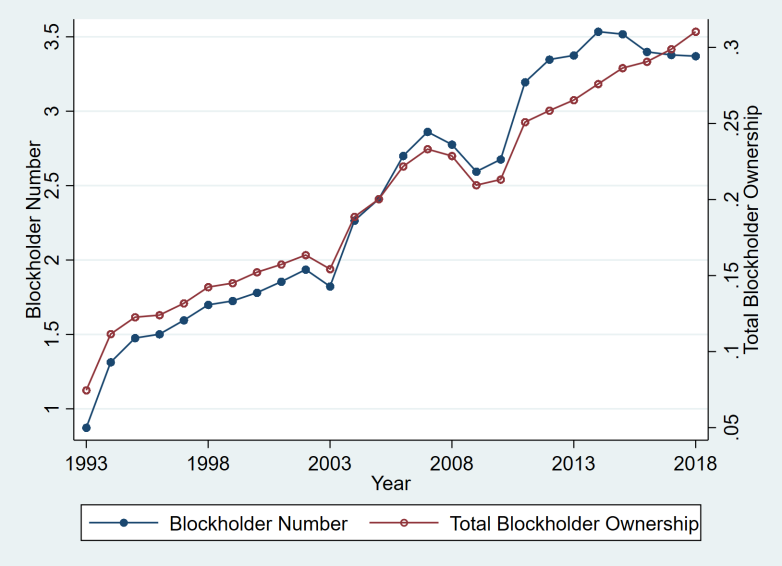


Figure 3: Blockholding Trend. A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. Blockholder number is the number of blockholders; total blockholder ownership is the sum of percentage ownership by all blockholders. Blockholding is averaged each year in the plot.

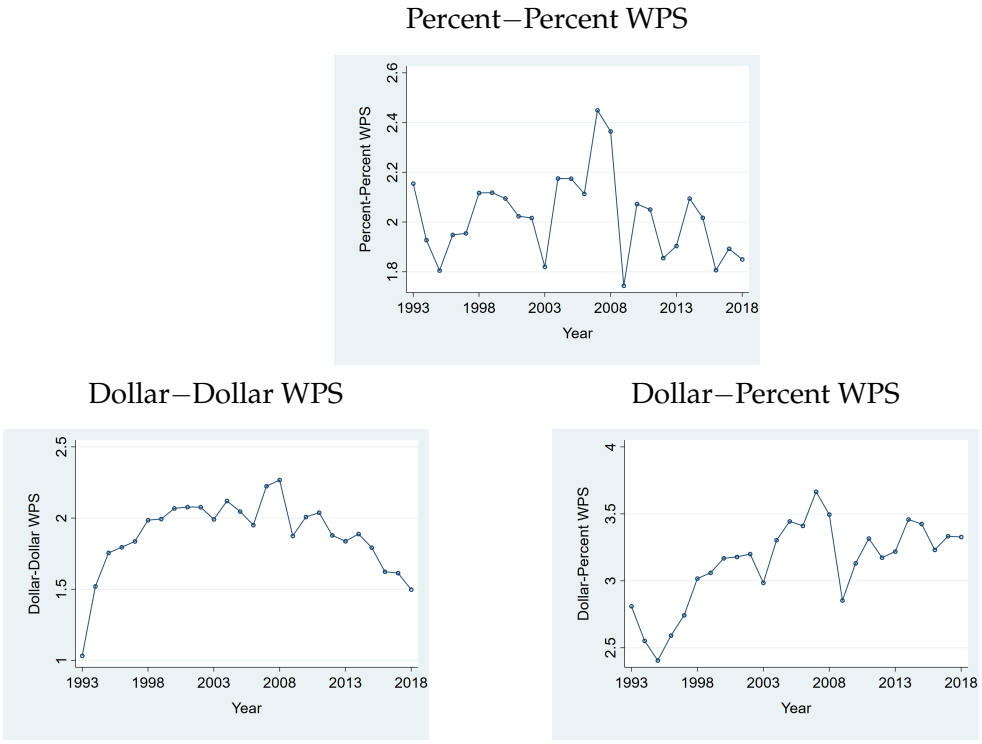


Figure 4: CEO WPS Trend. CEO wealth-performance sensitivity ("CEO WPS") comes in 3 forms: Percent−Percent (top panel), Dollar−Dollar (bottom-left panel), and Dollar−Percent (bottom-right panel) WPS. The detailed definitions are given in Table 1. CEO WPS is averaged each year in the plot. Since the main relation of interest is that between the CEO WPS in year $t-1$ and the blockholding in year t, CEO WPS is 1-year lagged in the plot. For example, corresponding to year 2008 in the plot, CEO WPS is at the end of 2007.

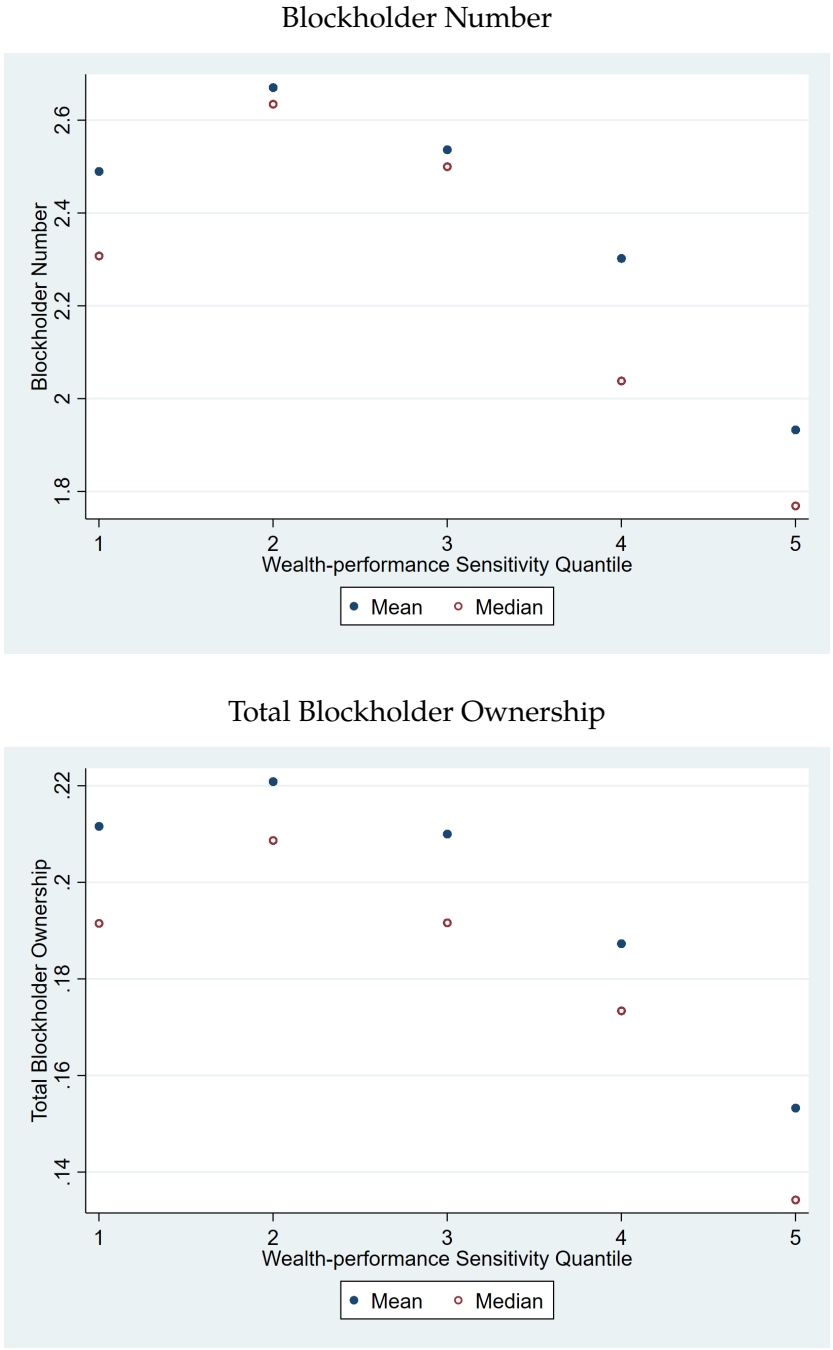
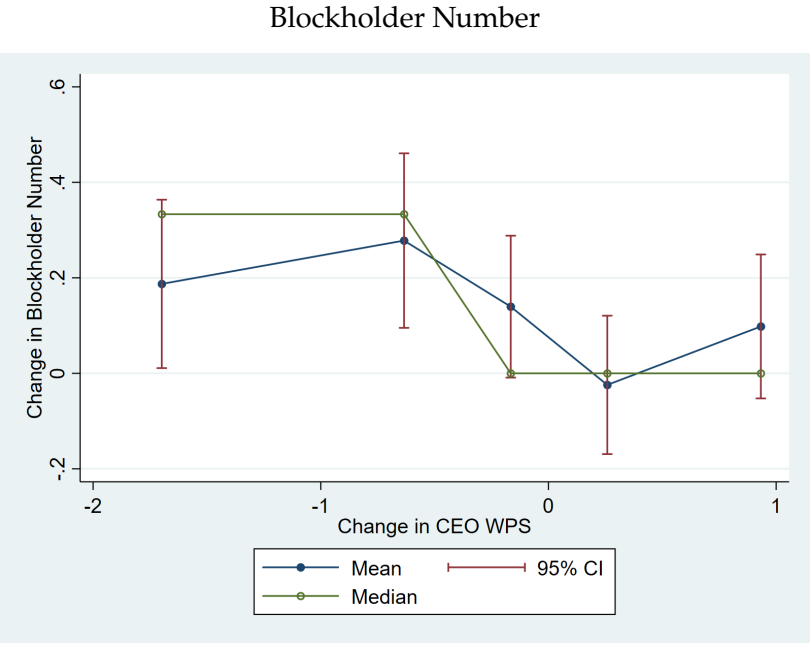


Figure 5: Blockholding against Dollar−Percent WPS. A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. Blockholder number (top panel) is the number of blockholders; total blockholder ownership (bottom panel) is the sum of percentage ownership by all blockholders. Dollar−Percent WPS = $\ln(\Delta\text{Wealth}/\Delta\ln(\text{Firm Value}))$. Firms in each year are divided into quintiles based on lagged WPS. Given the panel date structure, I compute the mean and median blockholding of each quintile in each year first and then average the quintile means and medians across all years. They are then plotted against the quintile. For the purpose of interpretation, the relation depicted is the average of the annual cross-sectional correlations between blockholding and Dollar−Percent WPS.



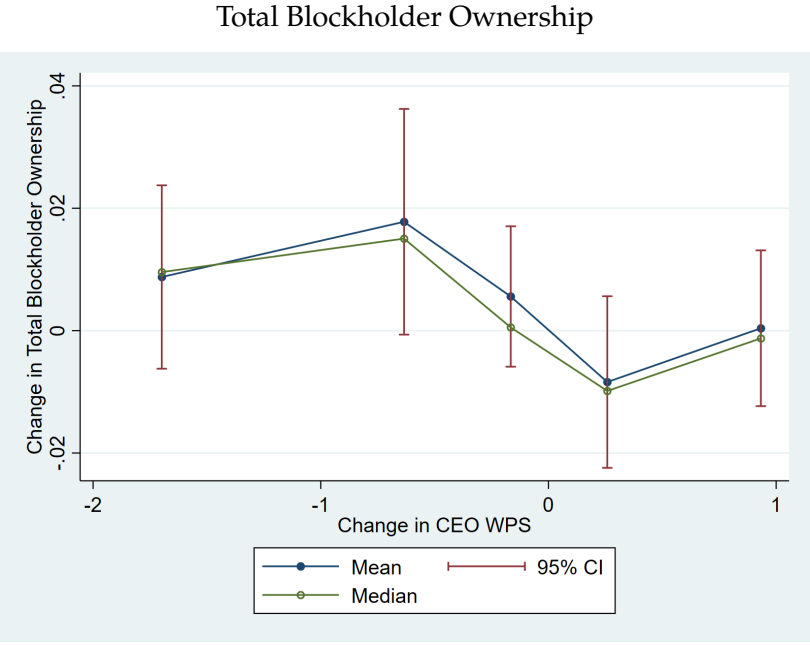
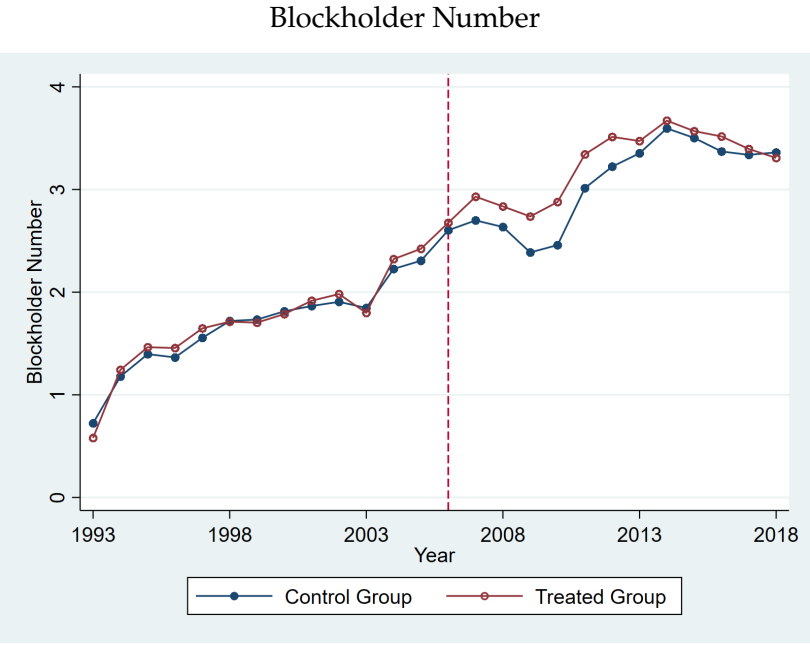


Figure 6: Change in Blockholding against Change in Dollar−Percent WPS around the Event. A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. Blockholder number (top panel) is the number of blockholders; total blockholder ownership (bottom panel) is the sum of percentage ownership by all blockholders. Dollar−Percent WPS = $\ln(\Delta\text{Wealth}/\Delta\ln(\text{Firm Value}))$. The event is the FASB and SEC regulation changes in 2006. I divide firms into quintiles based on the change in CEO WPS around the event and calculate the mean change in CEO WPS within each quintile. I then calculate the mean and median of the change in blockholding around the event in each quintile and plot them against the mean change in CEO WPS.



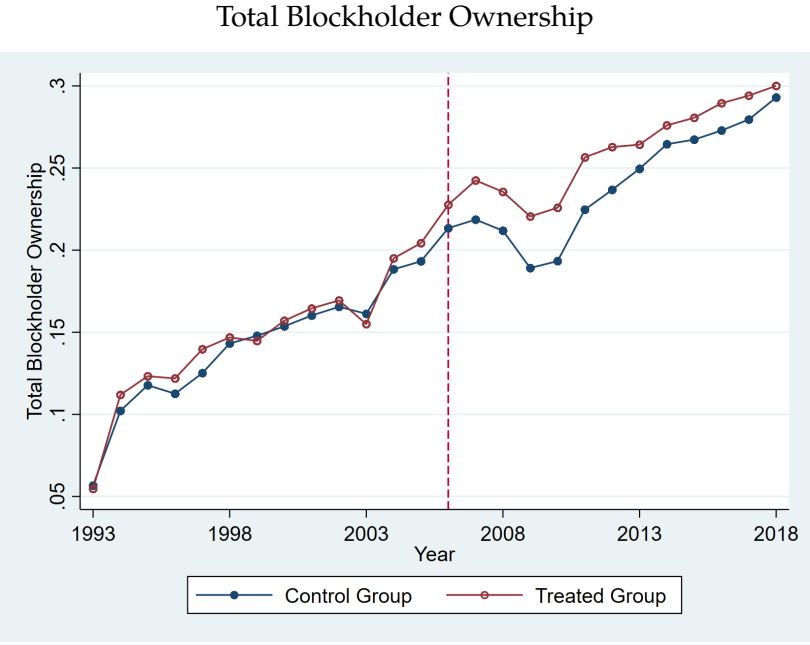
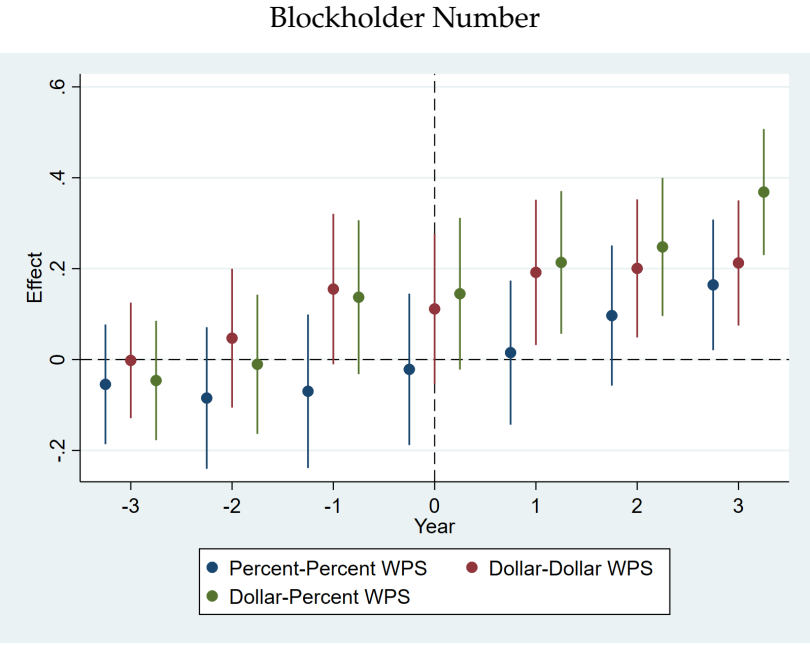


Figure 7: Blockholding Trends of the Treated and Control Groups based on Dollar−Percent WPS. A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. Blockholder number (top panel) is the number of blockholders; total blockholder ownership (bottom panel) is the sum of percentage ownership by all blockholders. Dollar−Percent WPS = $\ln(\Delta\text{Wealth}/\Delta\ln(\text{Firm Value}))$. The event is the FASB and SEC regulation changes in 2006. Those with negative (non-negative) changes in Dollar−Percent WPS around the event are in the treated (control) group. For each year, the simple-average blockholding is calculated for the treated and control groups, respectively. The average blockholding of the two groups are then plotted over time. Note that before the event (indicated by the dashed vertical line), there was not much difference in blockholding between the two groups for most years.



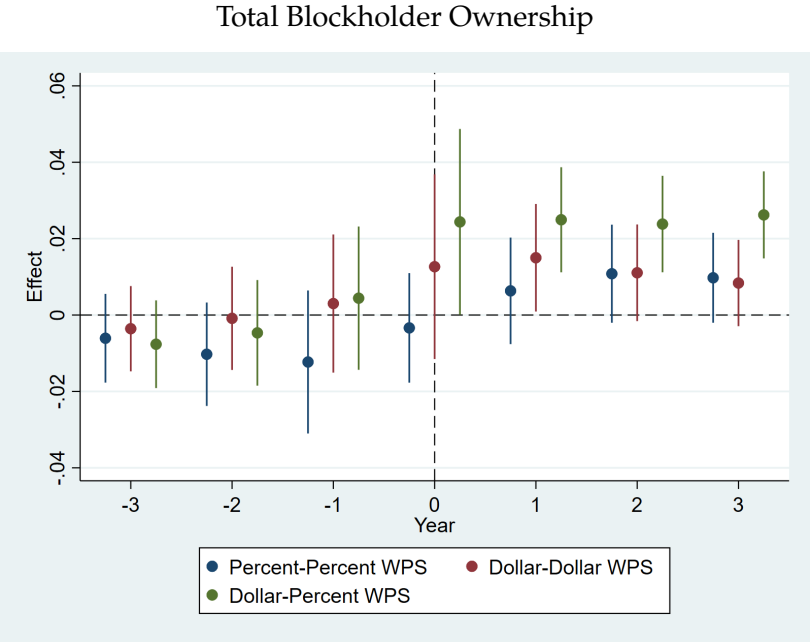


Figure 8: Augmented DiD - Dynamic Effects of the Event. A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. Blockholder number (top panel) is the number of blockholders; total blockholder ownership (bottom panel) is the sum of percentage ownership by all blockholders. CEO wealth-performance sensitivity ("CEO WPS") comes in 3 forms: Percent−Percent, Dollar−Dollar, and Dollar−Percent WPS. The detailed definitions are given in Table 1. The event is the FASB and SEC regulation changes in 2006. Those with negative (non-negative) changes in CEO WPS around the event are in the treated (control) group. The dynamic effects of being in the treated group are plotted. 95% confidence intervals are plotted around the point estimates of the effect. Note that before the event (Year 0), being in the treated group has no significant effect on a firm's blockholding.

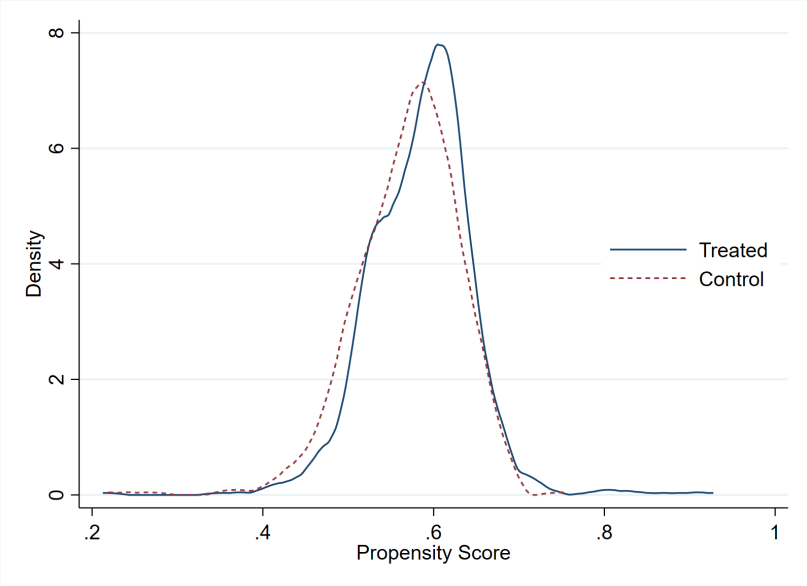


Figure 9: Propensity Score Overlap based on Dollar−Percent WPS. Dollar−Percent WPS = ln(ΔWealth/Δln(Firm Value)). Those with negative (non-negative) changes in Dollar−Percent WPS around the FASB and SEC regulation changes in 2006 are in the treated (control) group. The propensity score is calculated based on a subset of linear and second-order terms of Size, Sales Growth, ROA, Leverage, Dividend Yield, R&D, and Illiquidity. Detailed variable definitions are given in Appendix B. The distributions of the propensity scores of the treated and control groups are plotted without trimming the sample through matching.

Table 1: Summary Statistics of Firm Characteristics

This table presents number of observations ("N"), mean, standard deviation ("SD"), 5^{th} percentile ("P5"), 25^{th} percentile ("P25"), median ("P50"), 75^{th} percentile ("P75"), and 95^{th} percentile ("P95") for each variable. The full sample consists of annual firm-level observations at the intersection of Compustat, Execucomp, and Thomson Reuters S34 from 1993 to 2018. "Percent−Percent WPS" = ln[(ΔWealth/Wage)/Δln(Firm Value)], "Dollar−Dollar WPS" = ln(ΔWealth/ΔFirm Value), and "Dollar−Percent WPS" = ln(ΔWealth/Δln(Firm Value)). A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. "Blockholder Number" is the number of blockholders in the firm. "Total Block Ownership" is the aggregate ownership of all blockholders in the firm. For the other variables, detailed definitions are given in Appendix B. "Size", "Sales Growth", "ROA", "Dividend Yield", "R&D", and "Capital Expenditure" are winsorized at 1% and 99%. "Leverage" is winsorized at 99%.

	N	Mean	SD	P5	P25	P50	P75	P95
Percent−Percent WPS	31095	2.0166	1.5146	-0.1621	1.1148	1.8899	2.7642	4.7076
Dollar−Dollar WPS	31095	1.9069	1.6646	-0.8995	0.8440	1.9955	3.0090	4.5817
Dollar−Percent WPS	31095	3.1852	1.6453	0.5755	2.1540	3.1665	4.2353	5.8214
Blockholder Number	31095	2.5905	1.6607	0.0000	1.0000	2.0000	4.0000	5.0000
Total Block Ownership	31095	0.2119	0.1472	0.0000	0.1066	0.1979	0.3014	0.4683
Tobin's Q	31095	2.0055	1.5233	0.9365	1.1633	1.5439	2.2636	4.6390
Size	31095	7.2216	1.5960	4.7285	6.1422	7.1560	8.2980	10.0371
Sales Growth	31095	0.1264	0.4026	-0.1987	-0.0039	0.0740	0.1800	0.5298
ROA	31095	0.1279	0.1156	0.0030	0.0796	0.1266	0.1812	0.2954
Leverage	31095	0.5549	0.2627	0.1638	0.3822	0.5538	0.7068	0.9193
Dividend Yield	31095	0.0135	0.0203	0.0000	0.0000	0.0062	0.0208	0.0475
R&D	31095	0.0353	0.0755	0.0000	0.0000	0.0000	0.0382	0.1702
Illiquidity	31095	0.0261	0.1607	0.0001	0.0004	0.0017	0.0075	0.0776
Capital Expenditure	31095	0.0512	0.0548	0.0016	0.0171	0.0357	0.0663	0.1550
Fixed Assets	31095	0.2634	0.2343	0.0101	0.0755	0.1909	0.3927	0.7609

Table 2: Regress Blockholder Number on CEO WPS

The sample period is from 1993 to 2018. The dependent variable is blockholder number in year t, with blockholder defined as a shareholder who holds at least 5% of a firm. The explanatory variable of main interest is CEO wealth-performance sensitivity ("CEO WPS") in in year $t-1$, which comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. All control variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
CEO WPS	-0.035***	-0.031***	-0.024*	-0.027**	-0.054***	-0.046***
	(-3.50)	(-3.09)	(-1.92)	(-2.14)	(-4.69)	(-3.92)
Size		-0.077**		-0.086***		-0.062*
		(-2.40)		(-2.67)		(-1.94)
Sales Growth		-0.080***		-0.082***		-0.076***
		(-3.17)		(-3.23)		(-3.00)
ROA		-0.520***		-0.524***		-0.483***
		(-3.60)		(-3.62)		(-3.37)
Leverage		-0.203**		-0.205**		-0.222***
		(-2.44)		(-2.45)		(-2.68)
Dividend Yield		0.089		0.130		-0.094
		(0.14)		(0.20)		(-0.15)
R&D		-0.016		-0.035		-0.001
		(-0.07)		(-0.15)		(-0.00)
Illiquidity		-0.247***		-0.244***		-0.262***
		(-2.73)		(-2.70)		(-2.89)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31095	31095	31095	31095	31095	31095
Adjusted R^2	0.208	0.211	0.208	0.211	0.209	0.211

Table 3: Regress Total Blockholder Ownership on CEO WPS

The sample period is from 1993 to 2018. The dependent variable is total blockholder ownership in year t, with blockholder defined as a shareholder who holds at least 5% of a firm. The explanatory variable of main interest is CEO wealth-performance sensitivity ("CEO WPS") in in year $t-1$, which comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. All control variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
CEO WPS	-0.004***	-0.003***	-0.003**	-0.003**	-0.006***	-0.005***
	(-4.44)	(-3.70)	(-2.54)	(-2.42)	(-5.64)	(-4.40)
Size		-0.007**		-0.008**		-0.005
		(-2.05)		(-2.36)		(-1.56)
Sales Growth		-0.007***		-0.008***		-0.007***
		(-3.25)		(-3.33)		(-3.08)
ROA		-0.046***		-0.046***		-0.042***
		(-3.42)		(-3.46)		(-3.18)
Leverage		-0.007		-0.007		-0.009
		(-0.77)		(-0.78)		(-0.99)
Dividend Yield		0.040		0.045		0.022
		(0.64)		(0.72)		(0.34)
R&D		-0.005		-0.007		-0.004
		(-0.22)		(-0.32)		(-0.16)
Illiquidity		-0.002		-0.002		-0.003
		(-0.17)		(-0.14)		(-0.31)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31095	31095	31095	31095	31095	31095
Adjusted R^2	0.156	0.158	0.155	0.158	0.157	0.159

Table 4: Firm Value, Blockholder Number, and CEO WPS

The sample period is from 1993 to 2018. The dependent variable is Tobin's Q in year t. The definition is given in Appendix B. The explanatory variable of main interest is the interaction term between blockholder number ("Block Num") and CEO wealth-performance sensitivity ("CEO WPS"), both in year $t-1$. Blockholder is defined as a shareholder who holds at least 5% of a firm. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. All control variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
Block Num×CEO WPS	-0.019***	-0.016***	-0.020***	-0.015***	-0.011**	-0.008*
	(-4.18)	(-3.38)	(-4.80)	(-3.73)	(-2.41)	(-1.76)
CEO WPS	0.143***	0.133***	0.137***	0.110***	0.166***	0.179***
	(8.12)	(7.61)	(8.27)	(6.96)	(9.63)	(10.80)
Block Num	0.002	-0.010	0.003	-0.011	0.005	-0.011
	(0.22)	(-0.89)	(0.30)	(-1.03)	(0.32)	(-0.82)
Size		-0.273***		-0.242***		-0.333***
		(-5.20)		(-4.50)		(-6.39)
Sales Growth		0.126**		0.129**		0.108*
		(2.05)		(2.11)		(1.79)
Capex		1.937***		1.987***		1.650***
		(5.50)		(5.60)		(4.79)
R&D		3.412***		3.461***		3.331***
		(4.65)		(4.70)		(4.59)
Fixed Assets		-0.309		-0.339		-0.184
		(-1.48)		(-1.61)		(-0.88)
Leverage		0.598**		0.588**		0.695***
		(2.57)		(2.51)		(3.07)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28005	28005	28005	28005	28005	28005
Adjusted R^2	0.064	0.098	0.060	0.093	0.071	0.111

Table 5: Firm Value, Total Blockholder Ownership, and CEO WPS

The sample period is from 1993 to 2018. The dependent variable is Tobin's Q in year t. The definition is given in Appendix B. The explanatory variable of main interest is the interaction term between total blockholder ownership ("Total Block Own") and CEO wealth-performance sensitivity ("CEO WPS"), both in year $t-1$. Blockholder is defined as a shareholder who holds at least 5% of a firm. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. All control variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
Total Block Own×CEO WPS	-0.206***	-0.171***	-0.206***	-0.158***	-0.121**	-0.092*
	(-3.98)	(-3.35)	(-4.32)	(-3.32)	(-2.45)	(-1.89)
CEO WPS	0.138***	0.130***	0.132***	0.106***	0.163***	0.179***
	(7.89)	(7.54)	(7.87)	(6.54)	(9.61)	(10.88)
Total Block Own	-0.033	-0.165	-0.013	-0.172	0.010	-0.154
	(-0.25)	(-1.24)	(-0.10)	(-1.38)	(0.06)	(-0.95)
Size		-0.277***		-0.246***		-0.335***
		(-5.26)		(-4.57)		(-6.41)
Sales Growth		0.124**		0.128**		0.106*
		(2.03)		(2.09)		(1.77)
Capex		1.934***		1.985***		1.643***
		(5.50)		(5.59)		(4.77)
R&D		3.398***		3.438***		3.319***
		(4.62)		(4.67)		(4.57)
Fixed Assets		-0.304		-0.333		-0.178
		(-1.45)		(-1.58)		(-0.86)
Leverage		0.603***		0.594**		0.699***
		(2.60)		(2.54)		(3.09)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28005	28005	28005	28005	28005	28005
Adjusted R^2	0.064	0.098	0.060	0.093	0.071	0.111

Table 6: Payoff for Blockholder Monitoring

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) in year t from column 1 to 3 (column 4 to 6). Blockholder is defined as a shareholder who holds at least 5% of a firm. CEO wealth-performance sensitivity ("CEO WPS") comes in 3 forms: Percent−Percent (%−%), Dollar−Dollar ($−$), and Dollar−Percent ($−%) WPS. The detailed definitions are given in Table 1. "Perform" is the sum of the monthly abnormal returns in the 1 year (Panel A) and 3 years (Panel B) prior to year t. Monthly abnormal returns are calculated based on the Carhart (1997) 4-factor model. For each month, the factor loadings are estimated using the monthly returns in up to 36 months prior to the month. The same control variables as in Table 2 and 3 are included. All control variables are 1-year lagged behind the dependent variable. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel A: 1-Year Performance					
CEO WPS×Perform	0.013***	0.017***	0.013**	0.001***	0.002***	0.001**
	(3.97)	(2.84)	(2.37)	(4.07)	(2.70)	(2.45)
CEO WPS	-0.028***	-0.025*	-0.042***	-0.003***	-0.003**	-0.004***
	(-2.76)	(-1.93)	(-3.50)	(-3.27)	(-2.03)	(-3.90)
Perform	-0.100***	-0.106***	-0.092***	-0.010***	-0.010***	-0.009***
	(-4.43)	(-3.77)	(-3.16)	(-4.85)	(-4.03)	(-3.47)
Observations	30334	30334	30334	30334	30334	30334
Adjusted R^2	0.212	0.211	0.212	0.160	0.160	0.161
	Panel B: 3-Year Performance					
CEO WPS×Perform	0.006***	0.015***	0.006**	0.001***	0.002***	0.001***
	(3.39)	(3.29)	(2.46)	(4.52)	(3.54)	(3.38)
CEO WPS	-0.027***	-0.022*	-0.039***	-0.003***	-0.002*	-0.004***
	(-2.60)	(-1.72)	(-3.18)	(-3.08)	(-1.81)	(-3.53)
Perform	-0.072***	-0.100***	-0.066***	-0.008***	-0.010***	-0.007***
	(-4.14)	(-4.27)	(-3.15)	(-4.99)	(-4.73)	(-3.85)
Observations	30334	30334	30334	30334	30334	30334
Adjusted R^2	0.212	0.212	0.212	0.161	0.161	0.162
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: Frequent 13D Filers

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) in year t from column 1 to 3 (column 4 to 6). Blockholder is defined as a shareholder who holds at least 5% of a firm. CEO wealth-performance sensitivity ("CEO WPS") in year $t-1$ comes in 3 forms: Percent−Percent (%−%), Dollar−Dollar ($−$), and Dollar−Percent ($−%) WPS. The detailed definitions are given in Table 1. "Activism" is a dummy variable that equals to 1 if a firm has at least 1 blockholder who is a "frequent 13D filer" in any quarter of year t and 0 otherwise. A frequent 13D filer is an investor who has filed the SEC Schedule 13D for at least 4 times with respect to any firm up until year t (inclusive). I only count blockholders' initial Schedule 13D filings during the period from August 1995 to February 2017, which is the sample period of the dataset kindly provided by Kate Volkova. All control variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
CEO WPS×Activism	-0.055***	-0.057***	-0.048**	-0.004*	-0.004**	-0.004**
	(-2.71)	(-2.77)	(-2.37)	(-1.91)	(-2.13)	(-2.18)
CEO WPS	-0.022**	-0.018	-0.036***	-0.003***	-0.002*	-0.004***
	(-2.12)	(-1.39)	(-2.99)	(-2.92)	(-1.77)	(-3.54)
Activism	0.744***	0.767***	0.783***	0.063***	0.066***	0.068***
	(13.49)	(12.80)	(10.18)	(12.08)	(11.61)	(9.47)
Size	-0.058*	-0.067**	-0.045	-0.005	-0.006*	-0.004
	(-1.84)	(-2.10)	(-1.41)	(-1.57)	(-1.85)	(-1.10)
Sales Growth	-0.075***	-0.076***	-0.071***	-0.007***	-0.007***	-0.007***
	(-2.99)	(-3.05)	(-2.84)	(-3.09)	(-3.16)	(-2.94)
ROA	-0.472***	-0.480***	-0.440***	-0.042***	-0.042***	-0.038***
	(-3.27)	(-3.33)	(-3.07)	(-3.14)	(-3.20)	(-2.91)
Leverage	-0.235***	-0.236***	-0.250***	-0.010	-0.010	-0.011
	(-2.84)	(-2.86)	(-3.04)	(-1.08)	(-1.10)	(-1.28)
Dividend Yield	0.076	0.121	-0.088	0.038	0.044	0.022
	(0.12)	(0.19)	(-0.14)	(0.63)	(0.71)	(0.36)
R&D	-0.004	-0.031	0.010	-0.004	-0.007	-0.003
	(-0.02)	(-0.13)	(0.04)	(-0.18)	(-0.29)	(-0.12)
Illiquidity	-0.260***	-0.256***	-0.277***	-0.003	-0.003	-0.005
	(-3.01)	(-2.98)	(-3.25)	(-0.27)	(-0.24)	(-0.44)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31095	31095	31095	31095	31095	31095
Adjusted R^2	0.228	0.228	0.228	0.177	0.177	0.178

Table 8: Changes in CEO WPS and Blockholding around the Event

The sample period is from 1993 to 2018. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes (the "event"). Treatment is defined based on Percent−Percent WPS, Dollar−Dollar WPS, and Dollar−Percent WPS in Panel A, Panel B, and Panel C, respectively. The detailed definitions of the 3 forms of CEO WPS are given in Table 1. A blockholder in a firm is defined as a shareholder with at least 5% ownership of the firm. I have 2 proxies for blockholding: blockholder number and total blockholder ownership. For each panel, I first calculate the 3-year pre-event average blockholding and 3-year post-event average blockholding for each firm. I then subtract the pre-event from the post-event average blockholding to proxy for the change in blockholding around the event (e.g., "ΔBlockholder Number"). I then calculate the means of the change in blockholding for both the treated and control groups. A similar procedure is followed to calculate the change in CEO WPS around the event (e.g., "ΔPercent−Percent WPS"). "N" is the number of firms in the group; "Mean" is the average within the group; "SD" is the standard deviation within the group; "t-stat" is the t-statistic for testing the null that the mean equals to zero.

Panel A: Percent−Percent WPS

	Treated				Control			
	N	Mean	SD	t-stat	N	Mean	SD	t-stat
ΔPercent−Percent WPS	729	-0.8806	0.8425	-28.2234	477	0.6147	0.5712	23.5038
ΔBlockholder Number	729	0.1582	1.3537	3.1556	477	0.1017	1.1622	1.9107
ΔTotal Blockholder Ownership	729	0.0059	0.1247	1.2745	477	0.0032	0.0991	0.7080

Panel B: Dollar−Dollar WPS

	Treated				Control			
	N	Mean	SD	t-stat	N	Mean	SD	t-stat
ΔDollar−Dollar WPS	677	-0.7625	0.7031	-28.2177	529	0.4712	0.4927	21.9958
ΔBlockholder Number	677	0.1777	1.3412	3.4483	529	0.0822	1.1991	1.5772
ΔTotal Blockholder Ownership	677	0.0106	0.1140	2.4197	529	-0.0026	0.1164	-0.5061

Panel C: Dollar−Percent WPS

	Treated				Control			
	N	Mean	SD	t-stat	N	Mean	SD	t-stat
ΔDollar−Percent WPS	698	-0.8658	0.7693	-29.7305	508	0.5660	0.5160	24.7225
ΔBlockholder Number	698	0.2137	1.3613	4.1475	508	0.0289	1.1549	0.5635
ΔTotal Blockholder Ownership	698	0.0119	0.1218	2.5845	508	-0.0049	0.1048	-1.0560

Table 9: Difference-in-Differences - Blockholder Number

The sample period is from 1993 to 2018. The dependent variable is blockholder number. Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. The explanatory variable of main interest is Treated×Post-Reform, which corresponds to $w_{i,t-1} = 1$ in Regression (5). All explanatory variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
Treated×Post-Reform	0.133**	0.107*	0.099	0.086	0.190***	0.152**
	(2.18)	(1.77)	(1.57)	(1.38)	(3.07)	(2.47)
Size		-0.119***		-0.122***		-0.111***
		(-3.09)		(-3.17)		(-2.90)
Sales Growth		-0.113***		-0.113***		-0.112***
		(-3.20)		(-3.20)		(-3.18)
ROA		-0.905***		-0.909***		-0.904***
		(-4.31)		(-4.32)		(-4.32)
Leverage		-0.135		-0.131		-0.136
		(-1.20)		(-1.15)		(-1.20)
Dividend Yield		0.318		0.323		0.267
		(0.36)		(0.37)		(0.30)
R&D		0.423		0.414		0.425
		(1.14)		(1.12)		(1.16)
Illiquidity		-0.420**		-0.421**		-0.430***
		(-2.53)		(-2.53)		(-2.59)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20593	20593	20593	20593	20593	20593
Adjusted R^2	0.244	0.250	0.244	0.250	0.245	0.250

Table 10: Difference-in-Differences - Total Blockholder Ownership

The sample period is from 1993 to 2018. The dependent variable is total blockholder ownership. Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. The explanatory variable of main interest is Treated×Post-Reform, which corresponds to $w_{i,t-1} = 1$ in Regression (5). All explanatory variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
Treated×Post-Reform	0.009	0.006	0.012**	0.011*	0.018***	0.014**
	(1.48)	(1.07)	(2.07)	(1.87)	(3.04)	(2.48)
Size		-0.009**		-0.009**		-0.008**
		(-2.33)		(-2.37)		(-2.12)
Sales Growth		-0.012***		-0.012***		-0.012***
		(-3.42)		(-3.40)		(-3.39)
ROA		-0.079***		-0.078***		-0.078***
		(-4.03)		(-4.00)		(-4.02)
Leverage		-0.001		-0.000		-0.001
		(-0.04)		(-0.02)		(-0.06)
Dividend Yield		0.048		0.048		0.043
		(0.59)		(0.58)		(0.52)
R&D		0.013		0.012		0.014
		(0.37)		(0.34)		(0.37)
Illiquidity		-0.014		-0.014		-0.015
		(-0.93)		(-0.95)		(-0.99)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20593	20593	20593	20593	20593	20593
Adjusted R^2	0.174	0.179	0.174	0.179	0.175	0.180

Table 11: Augmented DiD (Common Trend Assumption)

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) from column 1 to 3 (column 4 to 6). Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. %−%, $−$, and $−% denote the sample is divided based on Percent−Percent, Dollar−Dollar, and Dollar−Percent WPS. The detailed definitions of CEO WPS are given in Table 1. I include 3 lead effects, 3 lagged effects, and the immediate effect in Regression (6). They are the coefficients of the interactions between Treated and the lead, lagged, and immediate indicators, respectively. For example, Treated×1-Year-Lead corresponds to $w_{i,t+1} = 1$ in Regression (6) and represents firms in the treated group observed 1 year before the regulation changes. The coefficients of main interest are the lead effects. The same control variables as in Table 9 and 10 are included. All control variables are 1-year lagged behind the dependent variable. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
Treated×3-Year-Lead	-0.002	-0.055	-0.046	-0.004	-0.006	-0.008
	(-0.03)	(-0.81)	(-0.69)	(-0.63)	(-1.03)	(-1.31)
Treated×2-Year-Lead	0.047	-0.085	-0.010	-0.001	-0.010	-0.005
	(0.60)	(-1.07)	(-0.13)	(-0.13)	(-1.49)	(-0.66)
Treated×1-Year-Lead	0.155*	-0.070	0.137	0.003	-0.012	0.004
	(1.84)	(-0.81)	(1.59)	(0.33)	(-1.29)	(0.46)
Treated×Immediate	0.111	-0.022	0.145*	0.013	-0.003	0.024**
	(1.32)	(-0.26)	(1.70)	(1.03)	(-0.46)	(1.97)
Treated×1-Year-Lagged	0.192**	0.015	0.214***	0.015**	0.006	0.025***
	(2.35)	(0.19)	(2.67)	(2.09)	(0.89)	(3.56)
Treated×2-Year-Lagged	0.201***	0.097	0.248***	0.011*	0.011*	0.024***
	(2.59)	(1.23)	(3.20)	(1.72)	(1.65)	(3.70)
Treated×3-Year-Lagged	0.212***	0.164**	0.369***	0.008	0.010	0.026***
	(3.03)	(2.24)	(5.21)	(1.46)	(1.63)	(4.52)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20593	20593	20593	20593	20593	20593
Adjusted R^2	0.250	0.250	0.251	0.179	0.179	0.181

Table 12: Overlap of the Treated and Control Groups

The sample period is from 1993 to 2018. The treated group (column 1 to 3) consists of those with negative changes in Dollar−Percent WPS around the FASB and SEC regulation changes, and those with non-negative changes in Dollar−Percent WPS belong to the control group (column 4 to 6). The detailed definition of Dollar−Percent WPS is given in Table 1. To see how well the two groups overlap over the firm characteristics included as control variables in the baseline DiD analysis, I first calculate the pre-event 3-year average of each control variable of each firm. For both treated and control groups, I then compute the within-group means and standard deviations of the pre-event 3-year average of each control variable. The detailed control variable definitions are given in Appendix B. "N" is the number of firms in the group; "Mean" refers to the average within the group; "SD" is the standard deviation within the group; "Diff-in-Mean" is the difference in the means of the two groups; "t-stat" is the t-statistic for testing the null of no difference in the means of the two groups; "Norm Diff" is the normalized difference proposed by Imbens (2015).

	Treated			Control					
	N	Mean	SD	N	Mean	SD	Diff-in-Mean	t-stat	Norm Diff
Size	698	7.2012	1.5371	508	7.3007	1.5835	-0.0996	-1.0914	-0.0638
Sales Growth	698	0.1725	0.2201	508	0.1582	0.1600	0.0143	1.3084	0.0744
ROA	698	0.1297	0.1322	508	0.1302	0.0942	-0.0006	-0.0844	-0.0048
Leverage	698	0.5424	0.3074	508	0.5280	0.2397	0.0144	0.9118	0.0521
Dividend Yield	698	0.0109	0.0165	508	0.0095	0.0136	0.0014	1.6167	0.0928
R&D	698	0.0306	0.0607	508	0.0358	0.0588	-0.0052	-1.4904	-0.0867
Illiquidity	698	0.0105	0.0581	508	0.0168	0.0859	-0.0063	-1.4306	-0.0858

Table 13: Difference-in-Differences - Blockholder Number (Matched)

The sample period is from 1993 to 2018. The dependent variable is blockholder number. Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. The sample is trimmed by matching the treated and control groups using the propensity score. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. The explanatory variable of main interest is Treated×Post-Reform, which corresponds to $w_{i,t-1} = 1$ in Regression (5). All explanatory variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
Treated×Post-Reform	0.133**	0.104*	0.101	0.086	0.191***	0.152**
	(2.17)	(1.71)	(1.61)	(1.38)	(3.08)	(2.48)
Size		-0.115***		-0.118***		-0.111***
		(-2.98)		(-3.03)		(-2.90)
Sales Growth		-0.117***		-0.124***		-0.112***
		(-3.28)		(-3.47)		(-3.18)
ROA		-1.025***		-0.987***		-0.908***
		(-4.61)		(-4.49)		(-4.34)
Leverage		-0.073		-0.064		-0.135
		(-0.61)		(-0.53)		(-1.19)
Dividend Yield		0.203		0.220		0.259
		(0.23)		(0.25)		(0.29)
R&D		0.431		0.433		0.410
		(1.14)		(1.14)		(1.10)
Illiquidity		-0.440***		-0.433***		-0.429***
		(-2.65)		(-2.60)		(-2.58)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20552	20552	20483	20483	20587	20587
Adjusted R^2	0.245	0.250	0.244	0.250	0.245	0.250

Table 14: Difference-in-Differences - Total Blockholder Ownership (Matched)

The sample period is from 1993 to 2018. The dependent variable is total blockholder ownership. Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. The sample is trimmed by matching the treated and control groups using the propensity score. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. The explanatory variable of main interest is Treated×Post-Reform, which corresponds to $w_{i,t-1} = 1$ in Regression (5). All explanatory variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
Treated×Post-Reform	0.009	0.006	0.012**	0.011*	0.018***	0.014**
	(1.48)	(1.01)	(2.09)	(1.85)	(3.04)	(2.49)
Size		-0.009**		-0.009**		-0.008**
		(-2.21)		(-2.24)		(-2.12)
Sales Growth		-0.012***		-0.013***		-0.012***
		(-3.55)		(-3.71)		(-3.38)
ROA		-0.091***		-0.086***		-0.078***
		(-4.49)		(-4.29)		(-4.04)
Leverage		0.007		0.008		-0.001
		(0.53)		(0.59)		(-0.05)
Dividend Yield		0.035		0.040		0.042
		(0.43)		(0.48)		(0.51)
R&D		0.015		0.014		0.012
		(0.39)		(0.37)		(0.32)
Illiquidity		-0.016		-0.015		-0.015
		(-1.08)		(-1.05)		(-0.99)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20552	20552	20483	20483	20587	20587
Adjusted R^2	0.174	0.180	0.174	0.180	0.175	0.180

Table 15: Difference-in-Differences - Financial Reporting Concern

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) from column 1 and 2 (column 3 and 4). Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in Dollar−Percent WPS around the FASB and SEC regulation changes. The detailed definition of Dollar−Percent WPS is given in Table 1. Treated equals to 1 for firms in the treated group and 0 otherwise. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. The explanatory variable of main interest is Treated×Post-Reform, which corresponds to $w_{i,t-1} = 1$ in Regression (5). "High" ("Low") refers to the subsample with high (low) financial reporting concerns. All explanatory variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	Blockholder Number		Total Blockholder Ownership	
	(High)	(Low)	(High)	(Low)
Treated×Post-Reform	0.231**	0.044	0.017**	0.010
	(2.58)	(0.48)	(1.97)	(1.17)
Size	-0.084	-0.133**	-0.004	-0.012**
	(-1.53)	(-2.29)	(-0.71)	(-2.31)
Sales Growth	-0.102**	-0.092	-0.009	-0.012***
	(-2.17)	(-1.63)	(-1.64)	(-2.59)
ROA	-0.801***	-1.085***	-0.075***	-0.089***
	(-2.83)	(-3.37)	(-2.65)	(-3.07)
Leverage	-0.168	-0.110	-0.003	0.005
	(-1.21)	(-0.56)	(-0.19)	(0.25)
Dividend Yield	0.995	-0.485	0.139	-0.036
	(0.68)	(-0.43)	(1.09)	(-0.32)
R&D	0.245	0.839	-0.028	0.081
	(0.57)	(1.19)	(-0.62)	(1.22)
Illiquidity	-0.383	-0.441**	0.046	-0.027
	(-0.90)	(-2.07)	(1.11)	(-1.61)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	9411	9114	9411	9114
Adjusted R^2	0.276	0.253	0.177	0.200

Appendix

A Derivations related to the Sequential Game

A1 Market price upon the blockholder's action

Using B to denote the blockholder and M to denote the manager,

$$E_{ns} = \mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\text{B stays})$$

where $\mathbb{E}$ is the expectation operator. Denote the threshold of working in the presence of the blockholder as x^B. Conditional on the blockholder's staying, there must have not been a liquidity shock and the manager must have worked. Thus,

$$\begin{aligned} E_{ns} &= \mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\tilde{\delta} \geqslant x^B) \\ &= \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) \end{aligned} \tag{A-1}$$

On the other hand,

$$E_s = \mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\text{B sells})$$

The blockholder sells either because of a liquidity shock or, in the absence of the liquidity shock, because of having observed the manager shirk. Denote the event of liquidity shock as LS, it follows

$$\begin{aligned} E_s &= Pr(\text{LS and M does not shirk}|\text{B sells})\mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\text{LS and M does not shirk}) \\ &\quad + Pr(\text{LS and M shirks}|\text{B sells})\mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\text{LS and M shirks}) \\ &\quad + Pr(\text{No LS and M shirks}|\text{B sells})\mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\text{No LS and M shirks}) \\ &= \frac{\theta Pr(\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}\mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\tilde{\delta} \geqslant x^B) + \frac{\theta Pr(\tilde{\delta} < x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}\mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\tilde{\delta} < x^B) \\ &\quad + \frac{(1-\theta)Pr(\tilde{\delta} < x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}\mathbb{E}(\alpha(\tilde{\delta})\tilde{\delta}|\tilde{\delta} < x^B) \\ &= \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} \end{aligned} \tag{A-2}$$

A2 The rationality of the blockholder's decision

When the blockholder observes that the manager has shirked, the price at which she can sell is $v + E_s$, which is non-less than v, the expected payoff to the blockholder if she continued to stay. Thus, the blockholder would sell if she observed the manager shirk.

When the blockholder observes that the manager has worked, the price at which she can sell is $v + E_s$, while the expected payoff if she continued to stay is $v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)$. Based on Expression (A-2) and comparing the two:

$$\begin{aligned}
(v + E_s) - (v + \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)) &= E_s - \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) \\
&= \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)(\frac{\theta Pr(\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} - 1) \\
&= \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{\theta Pr(\tilde{\delta} \geqslant x^B) - (\theta + (1-\theta)(1 - Pr(\tilde{\delta} \geqslant x^B)))}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} \\
&= \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{\theta Pr(\tilde{\delta} \geqslant x^B) - (1 - (1-\theta)Pr(\tilde{\delta} \geqslant x^B))}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} \\
&= \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{Pr(\tilde{\delta} \geqslant x^B) - 1}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} \\
&< 0 \qquad \text{(A-3)}
\end{aligned}$$

Thus, the blockholder would stay if she observed the manager work.

A3 The rationality of the manager's decision

First, look at the case where the blockholder is absent. Denote the threshold of working in the absence of the blockholder as $x^{No\,B}$. For a particular realization of $\tilde{\delta}$, δ, if the manager shirked, the expected payoff would be

$$p_{M_s} = w_1(v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})) + w_2 v \qquad \text{(A-4)}$$

If he worked, the expected payoff would be

$$p_{M_w} = -\beta + w_1(v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})) + w_2(v + \delta) \qquad \text{(A-5)}$$

Comparing Expression (A-4) and (A-5) to see when the manager prefers to work:

$$-\beta + w_1(v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B}))$$

$$+w_2(v+\delta) - [w_1(v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})) + w_2 v] \geqslant 0$$

$$w_2\delta \geqslant \beta$$

$$\delta \geqslant \beta/w_2 \tag{A-6}$$

Thus, $x^{No\,B} = \beta/w_2$. The manager would work, even in the absence of the blockholder, if Expression (A-6) is satisfied.

Now consider the case where the blockholder is present. If the manager shirked, the blockholder would exit. The manager's expected payoff based on Expression (A-2) is

$$p_{M_s} = w_1(v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + w_2 v \tag{A-7}$$

If the manager worked, the blockholder would still sell upon the liquidity shock. Based on Expression (A-1) and (A-2), the manager's expected payoff if working is

$$\begin{aligned} p_{M_w} &= -\beta + w_1[v + \theta(\frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + (1-\theta)(\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B))] + w_2(v+\delta) \\ &= -\beta + w_1[v + \frac{[\theta^2 Pr(\tilde{\delta} \geqslant x^B) + (\theta - \theta^2) + (1-\theta)^2(1 - Pr(\tilde{\delta} \geqslant x^B))]\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}] \\ &+ w_2(v+\delta) \\ &= -\beta + w_1[v + \frac{[(1-\theta) - (1-2\theta)Pr(\tilde{\delta} \geqslant x^B)]\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}] + w_2(v+\delta) \end{aligned} \tag{A-8}$$

Comparing Expression (A-7) and (A-8) to see when the manager prefers to work:

$$-\beta + w_1[v + \frac{[(1-\theta) - (1-2\theta)Pr(\tilde{\delta} \geqslant x^B)]\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}] + w_2(v+\delta) \geqslant$$

$$w_1(v + \frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}) + w_2 v$$

$$-\beta + w_1\frac{[(1-\theta) - (1-2\theta)Pr(\tilde{\delta} \geqslant x^B)]\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} + w_2\delta \geqslant w_1\frac{\theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$$

$$w_2\delta \geqslant \beta + w_1\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{(\theta+1-2\theta)Pr(\tilde{\delta} \geqslant x^B) - (1-\theta)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$$

$$w_2\delta \geqslant \beta + w_1\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{(1-\theta)(Pr(\tilde{\delta} \geqslant x^B) - 1)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}$$

$$\delta \geqslant \beta/w_2 + w_1\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{(1-\theta)(Pr(\tilde{\delta} \geqslant x^B) - 1)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}/w_2 \tag{A-9}$$

Therefore,

$$x^B = \beta/w_2 + w_1\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B)\frac{(1-\theta)(Pr(\tilde{\delta} \geqslant x^B) - 1)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)}/w_2$$

The manager would work, in the presence of the blockholder, if Expression (A-9) is satisfied. Note that the second term on the right-hand side of Expression (A-9) is non-positive. Comparing Expression (A-6) and (A-9), it follows that the threshold for the manager to work when the blockholder is present is lower than when she is absent. The blockholder thus disciplines the manager in the sense that the manager would exert effort for a greater range of values of $\tilde{\delta}$.

A4 The blockholder's entry decision with monitoring cost

Assume that the blockholder incurs a private cost c when monitoring the manager. Since the firm value in the case where the blockholder enters but does not monitor is essentially the same as in the case where the blockholder is absent, I only consider the blockholder's decision to enter and monitor versus the decision not to enter.

If the blockholder does not enter, she gets to keep the money equivalent to the share price at stage 0, which is the market's expectation of the firm value in the absence of the blockholder. The expected payoff to the blockholder if not entering is

$$p_{B_n} = v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B}) \tag{A-10}$$

Based on Expression (A-1) and (A-2), if the blockholder entered and monitored, the expected payoff would be

$$\begin{aligned} p_{B_e} &= v + [\theta + (1-\theta)Pr(\delta < x^B)]E_s + (1-\theta)Pr(\delta \geqslant x^B)E_{ns} - c \\ &= v + \theta Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) + (1-\theta)Pr(\delta \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) - c \\ &= v + Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) - c \end{aligned} \tag{A-11}$$

Comparing Expression (A-10) and (A-11) to see when the blockholder would enter:

$$v + Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) - c > v + Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B})$$

$$c < Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) - Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B}) \tag{A-12}$$

The blockholder would only enter when Expression (A-12) is satisfied, that is, when the cost of monitoring is smaller than the value added by the presence of the blockholder. Note that $c = 0$ represents the case where the information collection is costless to the blockholder, i.e., the blockholder is endowed with the private information.

The difference between p_{B_e} and p_{B_n} will be the incremental payoff to the blockholder if she enters and monitors. We denote this incremental payoff as Δp_B. To see how Δp_B changes with the managerial incentives in closed form, further assumptions are made as follows:

- The valued added by the manager's effort has a uniform distribution with support on $[0, \overline{\delta}]$;
- There is no liquidity shock, i.e., $\theta = 0$;
- The manager's sensitivities to the prices at the two stages are equal, i.e., $w_1 = w_2 = w$.

Then the incremental payoff to the blockholder can be expressed as follows:

$$\begin{aligned}
\Delta p_B &= Pr(\tilde{\delta} \geqslant x^B)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) - Pr(\tilde{\delta} \geqslant x^{No\,B})\mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^{No\,B}) - c \\
&= \frac{\overline{\delta} - x^B}{\overline{\delta}} \times \frac{\overline{\delta} + x^B}{2} - \frac{\overline{\delta} - x^{No\,B}}{\overline{\delta}} \times \frac{\overline{\delta} + x^{No\,B}}{2} - c \\
&= \frac{\overline{\delta}^2 - (x^B)^2 - \overline{\delta}^2 + (x^{No\,B})^2}{2\overline{\delta}} - c \\
&= \frac{(x^{No\,B})^2 - (x^B)^2}{2\overline{\delta}} - c
\end{aligned} \tag{A-13}$$

From Expression (A-6) and (A-9), we also have

$$x^{No\,B} = \frac{\beta}{w_2} = \frac{\beta}{w} \tag{A-14}$$

$$
\begin{aligned}
x^B &= \beta/w_2 + w_1 \mathbb{E}(\tilde{\delta}|\tilde{\delta} \geqslant x^B) \frac{(1-\theta)(Pr(\tilde{\delta} \geqslant x^B) - 1)}{\theta + (1-\theta)Pr(\tilde{\delta} < x^B)} / w_2 \\
&= \frac{\beta}{w_2} + \frac{w_1}{w_2} \times \frac{\overline{\delta} + x^B}{2} \times \frac{\frac{\overline{\delta} - x^B}{\overline{\delta}} - 1}{1 - \frac{\overline{\delta} - x^B}{\overline{\delta}}} \\
&= \frac{\beta}{w_2} + \frac{w_1}{w_2} \times \frac{\overline{\delta} + x^B}{2} \times (-1)
\end{aligned}
$$

Observe there is x^B on both sides of the equation above. Rearranging the equation and solving for x^B, we have

$$
x^B = \frac{2\beta - w_1\overline{\delta}}{2w_2 + w_1} = \frac{2\beta - w\overline{\delta}}{3w} \tag{A-15}
$$

Plugging both (A-14) and (A-15) into (A-13), we have

$$
\begin{aligned}
\Delta p_B &= \frac{(\frac{\beta}{w})^2 - (\frac{2\beta - w\overline{\delta}}{3w})^2}{2\overline{\delta}} - c \\
&= \frac{\frac{\beta^2}{w^2} - \frac{(4\beta^2 - 4\beta w\overline{\delta} + w^2\overline{\delta}^2)}{9w^2}}{2\overline{\delta}} - c \\
&= \frac{\frac{9\beta^2 - (4\beta^2 - 4\beta w\overline{\delta} + w^2\overline{\delta}^2)}{9w^2}}{2\overline{\delta}} - c \\
&= \frac{5\beta^2 + 4\beta w\overline{\delta} - w^2\overline{\delta}^2}{18\overline{\delta}w^2} - c
\end{aligned} \tag{A-16}
$$

Take the first-order derivative of (A-16) with respect to w, we have

$$
\begin{aligned}
\frac{\partial \Delta p_B}{\partial w} &= \frac{\partial(\frac{5\beta^2 + 4\beta w\overline{\delta} - w^2\overline{\delta}^2}{18\overline{\delta}w^2} - c)}{\partial w} \\
&= \frac{\partial(\frac{5\beta^2}{18\overline{\delta}w^2})}{\partial w} + \frac{\partial(\frac{4\beta w\overline{\delta}}{18\overline{\delta}w^2})}{\partial w} \\
&= \frac{\partial(\frac{5\beta^2}{18\overline{\delta}w^2})}{\partial w} + \frac{\partial(\frac{2\beta}{9w})}{\partial w} \\
&= \frac{0 - 5\beta^2(36\overline{\delta}w)}{324\overline{\delta}^2 w^4} + \frac{0 - 2\beta \times 9}{81w^2} \\
&= \frac{-5\beta^2}{9\overline{\delta}w^3} - \frac{2\beta}{9w^2} \\
&= \frac{-5\beta^2 - 2\beta\overline{\delta}w}{9\overline{\delta}w^3} < 0
\end{aligned} \tag{A-17}
$$

Notice that none of β, $\overline{\delta}$ and w is negative. Therefore, the inequality (A-17) holds unambiguously. Intuitively, the blockholder is less likely to enter and monitor the firm when the managerial incentives are higher, as the incremental payoff to the blockholder

is less likely to be positive.

The inequality (A-17) is driven by two forces: 1) the threat of exit depends on the managerial incentives to be effective (complementary effect), and 2) the agency problem is less severe when the managerial incentives are high, hence less need for blockholder monitoring (substitution effect). To see the complementary effect, we know the disciplinary power of the blockholder's presence manifests as lowering the manager's threshold of working, i.e., $x^B < x^{No\,B}$. Using (A-15) as the expression for x^B and taking the first-order derivative with respect to the managerial incentive w, we have

$$\frac{\partial x^B}{\partial w} = \frac{-2\beta}{3w^2} < 0 \tag{A-18}$$

which indicates a stronger disciplinary effect of the blockholder's presence with higher managerial incentives.

To see the substitution effect, note that the size of the agency problem without the blockholder in the firm is positively correlated with the magnitudes of $x^{No\,B}$. Using (A-14) as the expressions for $x^{No\,B}$ and taking the first-order derivative with respect to the managerial incentive w, we have

$$\frac{\partial x^{No\,B}}{\partial w} = \frac{-\beta}{w^2} < 0 \tag{A-19}$$

which represents the substitution effect of managerial incentives on blockholder monitoring: the agency problem is less severe as the managerial incentives increase, even without the blockholder's presence. Notice that (A-19) is greater than (A-18) in magnitude. That is, the manager's thresholds of working, both with and without the blockholder's presence, decrease with managerial incentives. The threshold without the blockholder's presence, however, decreases by more, indicating the dominance of the substitution effect.

B Variable Definition

The detailed definitions of the variables in Table 1 and in Section 6.1 are as follows. Note that CEO wealth-performance sensitivity and blockholding proxies are defined in the main body of the paper, as well as in Table 1, and are thus not reiterated here.

Tobin's Q: (market value of common equity + total asset value - book value of common equity)/total asset value.

Size: the natural logarithm of net sales in million dollars. Note that using the natural logarithm of total asset value as the proxy for Size in Regression (1) and (5) generates results that are similar to those currently reported for the 2 regressions.

Sales Growth: net sales/1-year lagged net sales - 1.

ROA: operating income before depreciation/total asset value.

Leverage: (total asset value - book value of common equity)/total asset value.

Dividend Yield: (dividends paid to common equity + dividends paid to preferred equity)/(market value of common equity + redemption value of preferred equity).

R&D: research and development expense/1-year lagged total asset value.

Illiquidity: the natural logarithm of (1 + illiquidity ratio). The illiquidity ratio is calculated as the average ratio of the daily absolute return to the dollar trading volume on that day in a year, following Amihud (2002). I scale the dollar trading volume by 1/1,000,000. A higher value of Illiquidity means a stock is less liquid.

Capital Expenditure: capital expenditures/total asset value.

Fixed Assets: net property, plant and equipment/total asset value.

Firm Age: the number of years since the firm first showed up in either Compustat or CRSP database, whichever is earlier.

CEO Tenure: the number of years the CEO has served in the firm.

CEO Total Pay: salary, bonus, restricted stock, stock options (using Black-Scholes), long-term incentive payouts, and all other compensation.

CEO Turnover: a dummy variable that equals to 1 if there is a CEO turnover and 0 otherwise.

CEO Risk-Taking Incentives (vega): the natural logarithm of the total vega of all option grants (current and past) held by the CEO.

E Index: adding 1 point for every 1 of the 6 IRRC provisions the firm has in place. The 6 IRRC provisions are staggered board, limits to amend bylaws, limits to amend charter,

supermajority approval of takeover, golden parachute, and poison pill.

Dual-class Shares: a dummy variable that equals to 1 if a firm has dual-class shares and 0 otherwise.

Board Size: the number of directors on the board.

Board Independence: the proportion of independent directors on the board of directors.

Financial Reporting Concern: I construct the empirical proxies for financial reporting concerns following Carter et al. (2007). A firm is likely to have greater financial reporting concerns if the firm needs to 1) meet analyst expectations or to beat its own past performance; 2) comply with debt covenants; 3) access external capital market. Carter et al. (2007) first select raw variables that are relevant to each scenario, respectively, and put them through the principal component analysis ("PCA") to reduce the dimensions. The raw variables selected by Carter et al. (2007) are: 1) the proportion of quarters in a given fiscal year where the firm's EPS is no less than that of the same quarter in the prior fiscal year; 2) the proportion of quarters in a given fiscal year where the firm meets analysts' quarterly EPS forecasts; 3) the firm's debt-to-asset ratio; 4) the extent to which the firm accesses the equity markets in the upcoming year; 5) the extent to which the firm accesses the debt markets in the upcoming year. Unlike Carter et al. (2007), I do not set negative values of 4) and 5) to 0, as there is no obvious economic rationale. They then construct the empirical proxies for financial reporting concerns based on the PCA output. Specifically, they adopt 2 factors with eigenvalues greater than 1 from the PCA. To use the two adopted factors in their empirical tests, they reconstruct each factor by equally weighting the standardized raw variables that load the factor with an absolute value greater than 0.45. Starting from the same raw variables and using the same eigenvalue threshold of 1 as in Carter et al. (2007), I adopt 3 factors from the PCA. I then reconstruct them following Carter et al. (2007). The 3 factors are **Fin Concern (Objective)**, **Fin Concern (External Fin)**, and **Fin Concern (Covenant)**, reconstructed from raw variables that proxy for meeting performance objectives, raising external capital, and complying with covenants.

C Additional Tables

Table C1: Regress Blockholding on CEO WPS with Additional Controls

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) in year t from column 1 to 3 (column 4 to 6). Blockholder is defined as a shareholder who holds at least 5% of a firm. CEO wealth-performance sensitivity ("CEO WPS") in year $t-1$ comes in 3 forms: Percent−Percent (%−%, column 1, 4), Dollar−Dollar ($−$, column 2, 5), and Dollar−Percent ($−%, column 3, 6) WPS. The detailed definitions are given in Table 1. Panel A includes additional control variables related to CEO characteristics; Panel B further includes those related to board characteristics; Panel C further includes those related to financial reporting concerns; Panel D further includes those related to external governance quality (managerial entrenchment). All control variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. The main control variables in Table 2 and 3 are also included but not tabulated for brevity. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel A: CEO Controls					
CEO WPS	-0.065***	-0.040**	-0.065***	-0.007***	-0.004**	-0.007***
	(-4.14)	(-2.36)	(-4.17)	(-4.93)	(-2.50)	(-4.97)
Firm Age	0.064***	0.063***	0.064***	0.005***	0.005***	0.005***
	(14.10)	(13.93)	(14.10)	(12.02)	(11.79)	(12.02)
CEO Tenure	-0.005**	-0.006**	-0.005**	-0.000	-0.000**	-0.000
	(-2.08)	(-2.53)	(-2.07)	(-1.56)	(-2.14)	(-1.55)
CEO Total Pay	-0.089***	-0.034**	-0.024	-0.009***	-0.003*	-0.002
	(-4.10)	(-2.09)	(-1.48)	(-4.52)	(-1.96)	(-1.19)
CEO Turnover	-0.033	-0.020	-0.033	-0.003	-0.001	-0.003
	(-1.22)	(-0.75)	(-1.23)	(-1.24)	(-0.60)	(-1.25)
CEO Vega	0.027***	0.022**	0.027***	0.002***	0.002**	0.002***
	(2.86)	(2.46)	(2.87)	(2.93)	(2.36)	(2.94)
Observations	26573	26573	26573	26573	26573	26573
Adjusted R^2	0.205	0.204	0.205	0.152	0.150	0.152
	Panel B: CEO & Board Controls					
CEO WPS	-0.050***	-0.045**	-0.051***	-0.006***	-0.005**	-0.006***
	(-2.71)	(-2.20)	(-2.74)	(-3.89)	(-2.53)	(-3.93)
Firm Age	0.031***	0.031***	0.031***	0.002**	0.002**	0.002**
	(3.65)	(3.61)	(3.64)	(2.49)	(2.49)	(2.49)
CEO Tenure	-0.003	-0.003	-0.003	-0.000	-0.000	-0.000
	(-0.97)	(-1.08)	(-0.95)	(-0.36)	(-0.71)	(-0.35)
CEO Total Pay	-0.045*	-0.001	0.004	-0.006***	-0.001	0.000
	(-1.80)	(-0.06)	(0.24)	(-2.81)	(-0.39)	(0.08)
CEO Turnover	-0.014	-0.011	-0.015	-0.001	-0.000	-0.001
	(-0.46)	(-0.37)	(-0.47)	(-0.34)	(-0.03)	(-0.35)
CEO Vega	0.029***	0.028***	0.029***	0.003***	0.003***	0.003***
	(2.71)	(2.62)	(2.72)	(3.12)	(2.88)	(3.13)
Board Size	-0.010	-0.010	-0.010	-0.001	-0.001	-0.001
	(-1.08)	(-1.06)	(-1.08)	(-1.19)	(-1.13)	(-1.19)
Board Independence	0.121	0.119	0.121	0.008	0.007	0.008
	(0.91)	(0.89)	(0.91)	(0.62)	(0.59)	(0.62)
Observations	20109	20109	20109	20109	20109	20109
Adjusted R^2	0.182	0.181	0.182	0.127	0.126	0.127

(*continued*)

Table C1: Regress Blockholding on CEO WPS with Additional Controls - *continued*

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel C: CEO, Board, & Fin Concern Controls					
CEO WPS	-0.056***	-0.044*	-0.056**	-0.007***	-0.004**	-0.007***
	(-2.58)	(-1.89)	(-2.57)	(-3.41)	(-1.98)	(-3.42)
Firm Age	0.039***	0.039***	0.039***	0.002**	0.002**	0.002**
	(3.65)	(3.65)	(3.65)	(2.26)	(2.30)	(2.26)
CEO Tenure	-0.000	-0.001	-0.000	-0.000	-0.000	-0.000
	(-0.14)	(-0.33)	(-0.14)	(-0.02)	(-0.44)	(-0.02)
CEO Total Pay	-0.039	0.010	0.017	-0.005*	0.001	0.002
	(-1.27)	(0.40)	(0.69)	(-1.73)	(0.51)	(0.97)
CEO Turnover	0.010	0.017	0.010	-0.000	0.001	-0.000
	(0.23)	(0.39)	(0.23)	(-0.03)	(0.32)	(-0.04)
CEO Vega	0.026**	0.024*	0.026*	0.003**	0.003**	0.003**
	(1.96)	(1.88)	(1.96)	(2.50)	(2.36)	(2.50)
Board Size	-0.010	-0.010	-0.010	-0.001	-0.001	-0.001
	(-0.84)	(-0.82)	(-0.84)	(-0.99)	(-0.95)	(-0.99)
Board Independence	-0.004	-0.009	-0.004	-0.001	-0.002	-0.001
	(-0.03)	(-0.06)	(-0.03)	(-0.07)	(-0.11)	(-0.06)
Fin Concern (Objective)	-0.160***	-0.161***	-0.160***	-0.016***	-0.016***	-0.016***
	(-9.61)	(-9.63)	(-9.61)	(-9.23)	(-9.27)	(-9.23)
Fin Concern (External Fin)	-0.033	-0.034	-0.033	-0.001	- 0.001	-0.001
	(-1.11)	(-1.14)	(-1.11)	(-0.24)	(-0.28)	(-0.24)
Fin Concern (Covenant)	0.121**	0.121**	0.121**	0.013***	0.013***	0.013***
	(2.37)	(2.38)	(2.37)	(2.86)	(2.90)	(2.86)
Observations	11527	11527	11527	11527	11527	11527
Adjusted R^2	0.189	0.189	0.189	0.139	0.138	0.139

(*continued*)

Table C1: Regress Blockholding on CEO WPS with Additional Controls - *continued*

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel D: CEO, Board, Fin Concern, & Entrench Controls					
CEO WPS	-0.098***	-0.069***	-0.098***	-0.010***	-0.006***	-0.010***
	(-4.09)	(-2.66)	(-4.08)	(-4.52)	(-2.63)	(-4.53)
Firm Age	0.042***	0.042***	0.042***	0.002**	0.002**	0.002**
	(3.82)	(3.83)	(3.83)	(2.24)	(2.28)	(2.25)
CEO Tenure	-0.001	-0.002	-0.001	0.000	-0.000	0.000
	(-0.28)	(-0.70)	(-0.28)	(0.02)	(-0.54)	(0.03)
CEO Total Pay	-0.104***	-0.018	-0.007	-0.009***	-0.001	0.000
	(-3.06)	(-0.68)	(-0.28)	(-3.14)	(-0.35)	(0.16)
CEO Turnover	-0.032	-0.019	-0.032	-0.004	-0.002	-0.004
	(-0.68)	(-0.40)	(-0.69)	(-0.91)	(-0.53)	(-0.92)
CEO Vega	0.062***	0.054***	0.062***	0.007***	0.006***	0.007***
	(3.64)	(3.35)	(3.64)	(3.81)	(3.57)	(3.81)
Board Size	-0.011	-0.010	-0.011	-0.001	-0.001	-0.001
	(-0.85)	(-0.81)	(-0.85)	(-0.95)	(-0.89)	(-0.95)
Board Independence	-0.078	-0.087	-0.078	0.002	0.001	0.002
	(-0.43)	(-0.48)	(-0.43)	(0.11)	(0.06)	(0.12)
Fin Concern (Forecast)	-0.146***	-0.147***	-0.146***	-0.014***	-0.014***	-0.014***
	(-8.07)	(-8.13)	(-8.07)	(-7.18)	(-7.25)	(-7.17)
Fin Concern (External Fin)	-0.045	-0.044	-0.045	-0.002	- 0.002	-0.002
	(-1.36)	(-1.34)	(-1.36)	(-0.69)	(-0.67)	(-0.70)
Fin Concern (Covenant)	0.135**	0.130*	0.135**	0.014**	0.013**	0.014**
	(1.99)	(1.92)	(1.99)	(2.24)	(2.18)	(2.24)
E Index	0.004	0.006	0.004	-0.000	-0.000	-0.000
	(0.16)	(0.23)	(0.16)	(-0.18)	(-0.10)	(-0.17)
Dual-Class	-0.115	-0.118	-0.115	0.001	0.001	0.001
	(-0.61)	(-0.63)	(-0.61)	(0.06)	(0.04)	(0.06)
Observations	9798	9798	9798	9798	9798	9798
Adjusted R^2	0.196	0.195	0.196	0.142	0.140	0.142
Main Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table C2: Difference-in-Differences with Additional Controls

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) from column 1 to 3 (column 4 to 6). Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1, 4), Dollar−Dollar ($−$, column 2, 5), and Dollar−Percent ($−%, column 3, 6) WPS. The detailed definitions are given in Table 1. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. Panel A includes additional control variables related to CEO characteristics; Panel B further includes those related to board characteristics; Panel C further includes those related to financial reporting concerns; Panel D further includes those related to external governance quality (managerial entrenchment). All explanatory variables are 1-year lagged behind the dependent variable. The detailed control variable definitions are given in Appendix B. The main control variables in Table 9 and 10 are also included but not tabulated for brevity. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel A: CEO Controls					
Treated×Post-Reform	0.111*	0.100	0.173***	0.006	0.013**	0.016**
	(1.70)	(1.48)	(2.60)	(0.90)	(2.00)	(2.57)
Firm Age	0.053***	0.054***	0.052***	0.004***	0.004***	0.004***
	(9.79)	(9.68)	(9.29)	(8.64)	(7.98)	(7.93)
CEO Tenure	-0.009***	-0.009***	-0.009***	-0.001***	-0.001***	-0.001***
	(-3.43)	(-3.40)	(-3.33)	(-3.13)	(-2.97)	(-2.96)
CEO Total Pay	-0.059***	-0.054***	-0.052**	-0.004**	-0.004**	-0.004**
	(-2.84)	(-2.62)	(-2.50)	(-2.39)	(-2.22)	(-2.12)
CEO Turnover	0.007	0.007	0.007	0.000	0.000	0.000
	(0.23)	(0.23)	(0.22)	(0.13)	(0.12)	(0.12)
CEO Vega	0.028**	0.027**	0.029**	0.002**	0.002**	0.002**
	(2.46)	(2.45)	(2.54)	(2.14)	(2.31)	(2.34)
Observations	17813	17813	17813	17813	17813	17813
Adjusted R^2	0.240	0.240	0.240	0.168	0.168	0.169
	Panel B: CEO & Board Controls					
Treated×Post-Reform	0.064	0.091	0.158**	0.003	0.012*	0.016***
	(0.97)	(1.33)	(2.31)	(0.55)	(1.95)	(2.62)
Firm Age	0.021**	0.020**	0.017**	0.001	0.001	0.001
	(2.49)	(2.44)	(2.02)	(1.59)	(1.25)	(0.94)
CEO Tenure	-0.006**	-0.006*	-0.006*	-0.000	-0.000	-0.000
	(-1.97)	(-1.86)	(-1.81)	(-1.47)	(-1.23)	(-1.24)
CEO Total Pay	-0.027	-0.023	-0.020	-0.002	-0.002	-0.002
	(-1.18)	(-1.02)	(-0.89)	(-1.23)	(-1.07)	(-0.95)
CEO Turnover	0.022	0.022	0.022	0.002	0.002	0.002
	(0.61)	(0.62)	(0.62)	(0.70)	(0.72)	(0.71)
CEO Vega	0.032***	0.033***	0.034***	0.003**	0.003***	0.003***
	(2.76)	(2.81)	(2.89)	(2.57)	(2.75)	(2.79)
Board Size	-0.010	-0.010	-0.010	-0.001	-0.001	-0.001
	(-0.91)	(-0.90)	(-0.93)	(-0.65)	(-0.63)	(-0.68)
Board Independence	-0.035	-0.035	-0.025	0.003	0.003	0.004
	(-0.23)	(-0.23)	(-0.16)	(0.23)	(0.23)	(0.30)
Observations	14589	14589	14589	14589	14589	14589
Adjusted R^2	0.203	0.204	0.204	0.132	0.132	0.133

(*continued*)

Table C2: Difference-in-Differences with Additional Controls - *continued*

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel C: CEO, Board, & Fin Concern Controls					
Treated×Post-Reform	0.047	0.102	0.180**	0.001	0.013*	0.015**
	(0.63)	(1.32)	(2.34)	(0.08)	(1.68)	(2.20)
Firm Age	0.032***	0.031***	0.027**	0.002*	0.001	0.001
	(3.10)	(2.98)	(2.58)	(1.81)	(1.37)	(1.24)
CEO Tenure	-0.003	-0.002	-0.002	-0.000	-0.000	-0.000
	(-0.81)	(-0.66)	(-0.62)	(-0.73)	(-0.44)	(-0.50)
CEO Total Pay	-0.020	-0.015	-0.012	-0.002	-0.001	-0.001
	(-0.72)	(-0.55)	(-0.44)	(-0.68)	(-0.51)	(-0.47)
CEO Turnover	0.045	0.045	0.045	0.004	0.004	0.004
	(0.92)	(0.91)	(0.91)	(0.85)	(0.84)	(0.84)
CEO Vega	0.028**	0.030**	0.031**	0.003**	0.003***	0.003***
	(2.20)	(2.28)	(2.35)	(2.46)	(2.60)	(2.63)
Board Size	-0.009	-0.008	-0.009	-0.001	-0.001	-0.001
	(-0.65)	(-0.62)	(-0.66)	(-0.52)	(-0.49)	(-0.54)
Board Independence	-0.099	-0.102	-0.089	-0.005	-0.005	-0.004
	(-0.55)	(-0.57)	(-0.50)	(-0.29)	(-0.32)	(-0.24)
Fin Concern (Forecast)	-0.153***	-0.153***	-0.152***	-0.015***	-0.015***	-0.015***
	(-8.16)	(-8.14)	(-8.09)	(-7.42)	(-7.30)	(-7.34)
Fin Concern (External Fin)	-0.039	-0.039	-0.040	-0.002	- 0.002	-0.002
	(-1.14)	(-1.14)	(-1.15)	(-0.68)	(-0.67)	(-0.69)
Fin Concern (Covenant)	0.131**	0.131**	0.131**	0.012**	0.012**	0.012**
	(2.26)	(2.26)	(2.26)	(2.45)	(2.45)	(2.45)
Observations	8711	8711	8711	8711	8711	8711
Adjusted R^2	0.208	0.208	0.209	0.142	0.143	0.143

(*continued*)

Table C2: Difference-in-Differences with Additional Controls - *continued*

	Blockholder Number			Total Blockholder Ownership		
	(%−%)	($−$)	($−%)	(%−%)	($−$)	($−%)
	Panel D: CEO, Board, Fin Concern, & Entrench Controls					
Treated×Post-Reform	0.019	0.087	0.155*	-0.000	0.014*	0.014**
	(0.24)	(1.06)	(1.89)	(-0.01)	(1.67)	(1.98)
Firm Age	0.032***	0.031***	0.027**	0.002*	0.001	0.001
	(3.01)	(2.86)	(2.49)	(1.83)	(1.34)	(1.26)
CEO Tenure	-0.003	-0.003	-0.003	-0.000	-0.000	-0.000
	(-0.97)	(-0.82)	(-0.79)	(-0.88)	(-0.56)	(-0.66)
CEO Total Pay	-0.022	-0.019	-0.017	-0.001	-0.001	-0.001
	(-0.78)	(-0.67)	(-0.58)	(-0.45)	(-0.30)	(-0.27)
CEO Turnover	0.012	0.012	0.013	-0.000	-0.000	-0.000
	(0.23)	(0.24)	(0.25)	(-0.04)	(-0.02)	(-0.02)
CEO Vega	0.032**	0.034**	0.036**	0.004**	0.004***	0.004***
	(2.11)	(2.24)	(2.33)	(2.57)	(2.67)	(2.76)
Board Size	-0.014	-0.014	-0.014	-0.001	-0.001	-0.001
	(-0.98)	(-0.96)	(-0.99)	(-1.00)	(-0.96)	(-1.01)
Board Independence	-0.031	-0.031	-0.020	0.007	0.007	0.008
	(-0.15)	(-0.15)	(-0.10)	(0.38)	(0.38)	(0.44)
Fin Concern (Forecast)	-0.144***	-0.143***	-0.143***	-0.014***	-0.014***	-0.014***
	(-7.02)	(-7.00)	(-6.96)	(-6.11)	(-6.03)	(-6.06)
Fin Concern (External Fin)	-0.054	-0.054	-0.055	-0.002	-0.003	-0.003
	(-1.44)	(-1.45)	(-1.48)	(-0.79)	(-0.81)	(-0.83)
Fin Concern (Covenant)	0.152**	0.153**	0.155**	0.015**	0.015**	0.016**
	(1.99)	(1.99)	(2.02)	(2.19)	(2.23)	(2.24)
E Index	0.021	0.021	0.022	0.000	0.000	0.000
	(0.71)	(0.70)	(0.73)	(0.13)	(0.11)	(0.15)
Dual-Class	-0.068	-0.069	-0.070	0.005	0.005	0.004
	(-0.32)	(-0.32)	(-0.33)	(0.25)	(0.25)	(0.24)
Observations	7488	7488	7488	7488	7488	7488
Adjusted R^2	0.213	0.214	0.214	0.141	0.142	0.142
Main Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table C3: CEO Fixed Effect

The sample period is from 1993 to 2018. The dependent variable is blockholder number (total blockholder ownership) in Panel A and C (Panel B and D). Blockholder is defined as a shareholder who holds at least 5% of a firm. The treated (control) group consists of those with negative (non-negative) changes in CEO wealth-performance sensitivity ("CEO WPS") around the FASB and SEC regulation changes. Treated equals to 1 for firms in the treated group and 0 otherwise. Note that treatment is defined differently depending on which CEO WPS it is based on. CEO WPS comes in 3 forms: Percent−Percent (%−%, column 1-2), Dollar−Dollar ($−$, column 3-4), and Dollar−Percent ($−%, column 5-6) WPS. The detailed definitions are given in Table 1. Post-Reform equals to 1 for firms observed after the regulation changes and 0 otherwise. All explanatory variables are 1-year lagged behind the dependent variable. The same control variables as in the main correlational and DiD analyses (e.g., Table 2 and 9) are added (where applicable) but not tabulated for brevity. Robust t-statistics adjusted for firm-level clustering are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

	%−%	%−%	$−$	$−$	$−%	$−%
	Panel A: Correlational - Blockholder Number					
CEO WPS	-0.018	-0.015	-0.017	-0.017	-0.040***	-0.035**
	(-1.60)	(-1.31)	(-1.18)	(-1.14)	(-2.90)	(-2.50)
Observations	31095	31095	31095	31095	31095	31095
Adjusted R^2	0.126	0.128	0.126	0.128	0.127	0.128
	Panel B: Correlational - Total Blockholder Ownership					
CEO WPS	-0.002**	-0.002*	-0.002	-0.002	-0.005***	-0.004***
	(-2.20)	(-1.73)	(-1.63)	(-1.47)	(-3.78)	(-3.11)
Observations	31095	31095	31095	31095	31095	31095
Adjusted R^2	0.094	0.096	0.094	0.096	0.096	0.096
	Panel C: DiD - Blockholder Number					
Treated×Post-Reform	0.103	0.085	0.091	0.080	0.208**	0.169**
	(1.27)	(1.05)	(1.10)	(0.97)	(2.53)	(2.06)
Observations	20593	20593	20593	20593	20593	20593
Adjusted R^2	0.143	0.146	0.143	0.146	0.144	0.147
	Panel D: DiD - Total Blockholder Ownership					
Treated×Post-Reform	0.005	0.004	0.011	0.009	0.020**	0.016**
	(0.71)	(0.50)	(1.34)	(1.20)	(2.56)	(2.12)
Observations	20593	20593	20593	20593	20593	20593
Adjusted R^2	0.098	0.102	0.099	0.102	0.100	0.102
Controls	No	Yes	No	Yes	No	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
CEO Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes