The Interactive Effect of Monitoring and Incentive Alignment on Agency Costs

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ABSTRACT

The effectiveness of monitoring and incentive alignment as mechanisms for controlling agency costs have been explored separately and in combination, with monitoring substituting for weaknesses in incentive alignment and vice versa; this equates to positive substitution when describing how monitoring and incentive alignment interact to influence shareholder agency costs. We draw upon behavioral agency theory and findings from finance research to offer further theoretical insight into how these mechanisms interact to influence agency costs. Our results suggest that CEO earnings management aimed at preserving their equity wealth (an incentive alignment mechanism) is accentuated by higher levels of concentrated institutional ownership, thereby imposing agency costs on less informed investors. Thus, in addition to being substitutes in controlling agency costs, as previously suggested, monitoring may accentuate the perverse effects of incentive alignment, equating to negative reinforcement, rather than positive substitution. Yet this effect is negated in the absence of CEO power due to dual occupation of the board and CEO roles. We discuss implications of these findings for theory and practice.

Keywords: agency theory, executive compensation, CEO decision making, incentive alignment
THE INTERACTIVE EFFECT OF MONITORING AND INCENTIVE ALIGNMENT ON AGENCY COSTS

Governance scholars have long thought of incentive alignment and monitoring as the primary mechanisms for controlling agency costs (e.g., Eisenhardt, 1989; Jensen & Meckling, 1976; Nyberg et al., 2010). However, evidence on their effectiveness in controlling agency costs has been mixed at best. For instance, while some scholars suggest that stock option grants to CEOs create substantial costs for shareholders (c.f. Jensen, 2004; Sanders & Hambrick, 2007), others suggest that equity aligns the interests of managers with shareholders (Boyd & Solarino, 2016; Nyberg et al., 2010) and contribute to efficient principal-agent contracting (Core, Guay & Thomas, 2005). Correspondingly, monitoring by institutional shareholders has been associated with less accurate financial reporting (Bushee, 2001), anti-takeover provisions, and lower probability of takeover (Davis & Stout, 1992; Frankforter, Berman & Jones, 2000); yet other studies have found that concentrated ownership, such as in the form of institutional ownership, is generally associated with positive firm outcomes (Boyd & Solarino, 2016). The resulting dialectic over the effectiveness of these mechanisms has left significant ambiguity as to how these mechanisms influence agency costs.

A criticism that one could level at past research examining the effectiveness of incentive alignment and monitoring in limiting agency costs is that little effort has been devoted to examining how these mechanisms interact to shape shareholder outcomes (cf. Tosi et al., 1997). The observation of Tosi and colleagues (1997) two decades ago, that the interaction is complex, holds important implications for corporate governance, and requires more nuanced and refined analysis, remains valid today. Prior research has considered whether incentive alignment and monitoring: (1) separately control managerial opportunism in an additive sense (one is good, both are better) (e.g., Jensen & Meckling, 1976; Tosi & Gomez-Mejia, 1994), (2) have separate
perverse effects, creating agency costs (for stock options, see Sanders & Hambrick, 2007; for concentrated ownership, see Davis & Stout, 1992; Frankforter et al., 2000); and (3) can substitute for one another, such that weaknesses in one are compensated for by strength in the other when attempting to control agency costs (Tosi et al., 1997; Zajac & Westphal, 1994). These three views of how these mechanisms impact agency costs ignore a fourth option in which the perverse effects of one (e.g., incentive alignment) are accentuated—negatively reinforced—by the other (i.e., monitoring). Table 1 illustrates this research gap.

In this study, we draw on behavioral agency theory and the empirical findings of governance research (from financial economics and accounting) to analyze the aforementioned *perverse interactive consequences* of incentive alignment and monitoring. We find empirical support for our predictions, providing several important theoretical contributions. First, we elucidate a dark side to the interaction of the popular governance mechanisms of incentive alignment and monitoring not previously considered. Second, we advance behavioral agency and governance research by demonstrating (1) an alternate mechanism (earnings management) available to the CEO to palliate the risks inherent to their firm-specific wealth; and (2) counter-intuitively, that the CEO has greater opportunity to engage in self-serving earnings management when subject to more intensive monitoring (as reflected in more concentrated institutional ownership). Our findings also challenge prior research that found CEOs are less deviant in their accounting choices as the number of options held increases (Zhang et al., 2008). Refining this view, we find that stock options lead to more, not less, deviant behavior, such that CEOs are more likely to use earnings management as their option wealth increases. Taken together, our findings underline additional considerations for boards of directors when anticipating the cost to the shareholder of stock option grants (incentive alignment) in combination with concentrated...
ownership (monitoring).

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Insert Tables 1 and 2 about here
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THEORY AND HYPOTHESES

The Agency Problem

Conflict between agent and principal has long been a concern for agency scholars, dating back to Berle and Means’ (1932) insightful description of the problem posed by widely dispersed shareholders, unable to perfectly observe the behavior of opportunistic managerial agents. This research highlighted the agency costs likely to be imposed on the principal-shareholder as a result of goal divergence and risk profile divergence with their managerial agent, given the manager has the latitude to pursue private goals that may be achieved at cost to the principal. Agency scholars have since devoted considerable attention to exploring costs incurred by shareholders due to the self-serving behavior of manager-agents (the agent-principal, or Type I agency problem). This prediction is driven by assuming: (1) managers and shareholders have divergent interests and risk profiles, and (2) the managerial agent is opportunistic and will pursue private interests at the expense of shareholders (Eisenhardt, 1989). Positivist agency scholars explored mechanisms that could mitigate the costs imposed upon shareholders associated with the opportunistic behavior of their manager-agent. This led to a search for optimal contracts and predicting risk behavior associated with different types of agent contracts (e.g., Core & Guay, 1999). In particular, this research has focused upon: (1) the role of incentive alignment mechanisms, with an emphasis on the use of equity based pay (c.f. Coffee, 1998; Holmstrom, 1979; Jensen & Murphy, 1990); and (2) the use of monitoring, with a focus on board scrutiny of management behavior (c.f. Beatty & Zajac, 1994; Westphal, 1999).
**Incentive alignment.** The classic form of incentive alignment offered by agency scholars has been through ensuring that the manager is also, at least to some degree, the owner of the firm (Jensen & Meckling, 1976). According to this perspective, awarding equity to the manager incentivizes shareholder maximizing behavior and minimizes misconduct (Armstrong et al., 2015; Eisenhardt, 1989). Despite the compelling logic that equity ownership aligns the goals of agent and principal, empirical results examining the consequences of equity ownership has produced mixed results. On the one hand, evidence has been provided that changes in wealth of managers and shareholders are successfully aligned due to equity grants (Nyberg et al., 2010). Meta-analysis has shown that, on average, there is a positive relationship between insider (executive) stock ownership accounting and market performance (Boyd & Solarino, 2016). This is consistent with an efficient contracting hypothesis suggesting that compensation contracts—that include equity grants to the CEO—can jointly maximize shareholder and CEO wealth (e.g., Holmstrom, 1979; Fama & Jensen, 1983; Murphy, 1999). Yet on the other hand, CEO stock option ownership has been associated with more extreme negative firm performance outcomes, due to excessive CEO risk taking. This is explained by assuming agents share in the upside of risk taking but not the downside loss exposure, encouraging speculative risk taking (Jensen, 2004; Sanders & Hambrick, 2007). In addition, others have argued that the compensation contract is not designed at arms-length, thus allowing the CEO to expropriate wealth from shareholders through equity grants and other forms of compensation (Bebchuk & Fried, 2006). Similarly, the opportunistic manipulation of earnings information to increase the value of equity suggests that executives game reported earnings along with their compensation contract and equity grants to maximize personal wealth at the expense of shareholders (Healy & Wahlen, 1999). Thus, the debate regarding the efficacy of granting equity to the CEO in order to achieve incentive alignment between agent and principal is
far from settled, leaving unanswered questions regarding the conditions under which incentive alignment mechanisms achieve their intended goal.

**Monitoring.** Jensen and Meckling (1976) argued that monitoring is necessary whenever there is separation of ownership and management, as described in the classic agency problem. Positivist agency scholars have also proposed monitoring as an alternate mechanism for limiting agent opportunism by directly observing and controlling agent behavior (Gomez-Mejia et al., 1987; Eisenhardt, 1989; Tosi et al., 1999). The board of directors are argued to perform a monitoring function on behalf of the firm’s shareholders (Zajac & Westphal, 1996). Monitoring is also argued to be stronger when there are more independent (outsider, or non-executive) directors (Morck et al., 1988) and when the CEO is not also the chairman (Boyd, 1994). For instance, monitoring by an independent chair limits the ability of the CEO to negotiate higher compensation (Boyd, 1994). In addition to indirect monitoring by shareholders through the board, shareholders may more directly monitor the management team. For instance, monitoring effectiveness and intensity is likely to increase with the concentration of ownership, since larger shareholdings increase the efficiency of direct monitoring by shareholders of the CEO and the top management team. Those concentrated shareholders have both the power—typically due to board seats—and financial incentive to invest in direct CEO monitoring, while also applying pressure on the entire management team, leading to the mitigation of agency costs associated with opportunistic managerial agents (c.f. Shleifer & Vishny, 1986; Huddart, 1993; Connelly et al., 2010).

Institutional ownership has been a focus of research examining agent monitoring and its consequences, due to the significance of institutional investors and their demonstrated influence upon firm behaviors and outcomes (Boyd & Solarino, 2016; The Economist, 2013). Regarding the consequences of institutional ownership and the associated monitoring, a meta-analysis of prior
research finds that, on average, institutional ownership is positively related to accounting and marketing performance (Boyd & Solarino, 2016). This is consistent with the view that institutional investors are diligent in monitoring CEOs to ensure they focus more on economic performance and less on opportunistic behavior (McConnell & Servaes, 1990; Shleifer & Vishny, 1986). However, in contrast to the view that institutional ownership is positive for firm outcomes, institutional investors may be associated with anti-takeover provisions that interfere with market discipline through takeovers (Davis & Stout, 1992; Frankforter et al., 2000) and are often fixated on short-term results to the detriment of long-term performance (Demirag, 1998). Monitoring through the directors appointed or elected by shareholders can also be compromised if those directors act in self-interest. For example, directors’ firm risk taking has been associated with director option compensation, an effect that is argued to be stronger than the CEO’s risk response to their stock options (Deutsch et al., 2010). The confusion over the efficacy of monitoring in controlling CEO opportunism may also be due to endogeneity problems with studies examining the relationship between institutional ownership and firm performance. Given that institutional investors are diligent in selecting high quality investments (Klein & Zur, 2009) and gravitate to stocks with superior corporate governance (Chung & Zhang, 2011), superior performance may attract ownership concentration rather than being a product of shareholder monitoring.

**Interaction of incentive alignment and monitoring.** Despite the extensive examinations of incentive alignment and monitoring as mechanisms for controlling shareholder agency costs, there has been limited attention to first, their possible perverse effects on agency costs or second, their potential interaction in controlling or exacerbating agency costs. That is, while the vast majority of positivist agency research has assumed that these mechanisms are additive, only a few studies have examined alternative forms of interaction. Given that both mechanisms are present –
to some degree – in virtually all organizational settings, examining their joint interaction would seem critical to fully understanding their disparate and joint effects.

Where scholars have considered the interaction of incentive alignment and monitoring, they generally consider the how these mechanisms may substitute for one another, suggesting that one will compensate for the other. For example, monitoring is typically stronger when incentive alignment is not in place, and vice versa (Beatty & Zajac, 1994; Rediker & Seth, 1995; Zajac & Westphal, 1994). Yet, substitution of monitoring for incentive alignment is argued to lead to suboptimal results for shareholders, given monitoring is typically less effective than incentive alignment in mitigating agency costs (Tosi et al., 1997). Examining the positive reinforcing effects of incentive alignment and monitoring, Hartzell and Starks (2003) found that incentive alignment, as reflected by pay-performance sensitivity of the managerial agent, was stronger in the presence of greater institutional ownership, suggesting that incentive alignment and monitoring (associated with institutional ownership) interact positively to influence firm performance. While these studies have made progress in examining the interaction of monitoring and incentive alignment, Tosi and colleagues’ (1997) insight that the interaction is poorly understood and yet is critical to our understanding of corporate governance, highlights the need for further study. In particular, agency research is yet to explore how the interaction of monitoring and incentive alignment may lead to reinforcing perverse effects. Drawing on behavioral agency theory, we examine how the presence of one mechanism may increase the severity of earnings management practices.

The remainder of our paper is structured as follows. First, we will explore the behavioral agency literature and finance research exploring earnings management, the role of CEO stock ownership, institutional investors, and the influence of concentrated owners. Second, we extend behavioral agency theory to develop predictions regarding the relationships between incentive
alignment in the form of CEO stock options, monitoring associated with institutional ownership, 
and agency costs associated with the use of earnings management. Third, we explore the role of 
CEO power as a contingency influencing the mechanisms we describe in the earlier hypotheses.

**Behavioral Agency Theory**

Behavioral agency research infused classical agency theory and its assumptions with 
empirically grounded behavioral decision research and, in particular, the findings of prospect 
theory and its concepts of framing, loss aversion and endowment. A key contribution to this 
research is the behavioral agency model (BAM) which describes an agent (e.g., the CEO) as loss 
averse, as opposed to risk averse, allowing for an agent’s risk preferences to range from risk averse 
Drawing on the concepts of loss aversion and endowment, the BAM proposes that loss averse 
agents will begin to endow the value of firm-specific wealth into calculations of personal wealth 
and in so doing, seek to protect that wealth from loss. Wealth is described as endowed when it is 
included in an individual’s estimates of their personal wealth (Thaler, 1980). Thus, in the case of a 
CEO holding firm equity or stock options, as the value of this wealth increases, it creates risk 
bearing since the value of this endowed wealth is subject to loss due to both their own investment 
choices on behalf of the firm as well as exogenous economic turbulence. This risk bearing 
encourages a gain framing mindset that can produce behaviors that seek to preserve their existing 
firm-specific wealth. In other words, as their equity wealth increases, the CEO will prefer risk 
reducing alternatives over wealth creating opportunities that would have been desirable for a risk 
neutral shareholder in order to protect accumulated firm-specific wealth (Wiseman & Gomez-
Mejia, 1998). The BAM therefore underlines the possibility that equity based pay has the potential 
to exacerbate the agent’s risk aversion and the agency costs associated with avoidance of value-
adding projects. Research built from this model has demonstrated its validity by finding that strategic risk taking is negatively related to the intrinsic value of CEO option wealth (Devers et al., 2008; Larraza-Kintana et al., 2007; Martin et al., 2013).

Empirical behavioral agency research remains nascent and has been primarily focused on various indicators that purportedly measure risk taking such as R&D investments and capital expenditures (e.g., Devers et al., 2008; Martin, Gomez-Mejia & Wiseman, 2013). We extend this research to the study of deviant behaviors by CEOs (earnings management), resulting from the joint effects of monitoring and managerial incentives.

**Incentive Alignment and Earnings Management**

Earnings management is the *use of judgment* in financial reporting and transaction structuring to *mislead other stakeholders* or influence contractual outcomes (Healy & Wahlen, 1999). Earnings management provides an ideal empirical context to examine agency costs associated with attempts at incentive alignment—that is, aligning incentives of agent (CEO) with the goals of the principal (shareholder)—through granting the CEO equity. Refer to Table 2 for a selection of studies exploring the opportunistic use of earnings management by the CEO.

Shareholders with less incentive to observe management actions are unlikely to be privy to the earnings management decision and therefore are vulnerable to making ill-informed choices based on deceptive earnings reports, given the CEO can use earnings management to mask actual firm performance (Healy & Wahlen, 1999; Leuz, Nanda & Wysocki, 2003). Since CEOs are assumed to be privy to earnings management decisions (Zhang et al., 2008), they may enjoy the short-term benefits of earnings management while also avoiding any downside consequences of that action. Given that the firm’s stock price—and any stock-based compensation held by CEOs—is likely to fall in response to any sign that a firm may not meet market expectations (e.g., De Bondt & Thaler,
CEOs may engage in earnings management in order to avoid disappointing market expectations. Earnings management is more likely to be used in less developed markets and the cost to the firm’s stakeholders is reflected in a negative relationship between accrual quality and earnings persistence (Dechow & Dichev, 2002). Thus, earnings management can be a double-edged sword for shareholders given that it can both: directly limit near-term declines in shareholder value and yet create costs in the long-term for uninformed stakeholders as a result of information asymmetry.

The role of the CEO in attempting to opportunistically manage the firm’s risk profile is well documented in behavioral agency research (e.g., Wowak, Gomez-Mejia & Steinbech, in press). We note above how BAM predicts that risk bearing (wealth-at-risk of loss) will encourage executive actions that limit risks to this wealth, even at the expense of pursuing more wealth. Earnings management provides CEOs with a powerful lever for limiting losses to their equity wealth. Indeed, earnings management may be viewed as a viable alternative to adjusting the firm’s strategy when anticipating a near-term earnings decline, because unlike strategic investments that are associated with uncertain longer-term performance implications, earnings management should have a direct and more immediate effect on insulating stock prices from earnings volatility and the declines likely to result from disappointing financial markets. The CEO’s focus on short-term earnings, possibly at the expense of longer-term consequences of earnings management is explained by the concept of myopic loss aversion, suggesting that CEOs focus attention on protecting wealth in the present to the detriment of wealth in the future (Benartzi & Thaler, 1995; Thaler et al., 1997). This occurs because anticipated losses in the future are valued less than losses in the present.
In sum, we argue that CEOs are likely to consider earnings management as a lever for preventing losses to equity wealth in the short-term (Bergstresser & Philippon, 2006; Cheng & Warfield, 2005; Cornett et al., 2008; O’Connor et al., 2006). In sum, earnings management allows the CEO to preserve the value of their accumulated equity wealth. This suggests that as the CEO’s equity wealth increases, they will make greater use of earnings management to protect that wealth.

HYPOTHESIS 1: CEO equity wealth will be positively related to the use of earnings management.

Concentrated Ownership, Institutional Monitoring and Earnings Management

Research examining the relationship between institutional ownership and earnings management has produced mixed results. On the one hand, higher levels of institutional ownership have been associated with less use of accounting earnings management (Koh, 2003; Rajgopal et al., 2002) and less use of R&D cuts as a means of achieving earnings targets (the latter is referred to as a proxy for real earnings management) (Bushee, 1998). Conversely, low levels of institutional ownership have been associated with higher levels of earnings management (Koh, 2003) and firms with higher levels of institutional ownership are more likely to take actions that avoid negative earnings surprises (Matsumoto, 2002). Other studies have suggested no significant relationship between institutional ownership and earnings management (Siregar & Utama, 2008).

We suggest that in order to advance this discourse, it is necessary to consider how institutional ownership accentuates the CEO risk bearing explored in the prior hypothesis as antecedent to earnings management, thereby acknowledging how incentive alignment may incentivize earnings management.

Institutional investors and their intensive monitoring play an important role in shaping CEO behavior and risk bearing through their demands that firms report consistent earnings growth. Concentrated institutional investors are likely to exert pressure on the CEO for two reasons. First,
in institutional investors have a fiduciary responsibility to generate positive returns on their investments (Rappaport, 2011) and in the event of under-performance relative to benchmarks or competitors, significant fund outflows are likely, leading to lower fees (Rappaport, 2011; Smith, 1996). Second, institutional investors tend to be larger and more sophisticated investors who typically buy large blocks of shares, providing them with significant leverage over the firm’s management (Hoskisson et al., 2002). They have greater access to senior management (Smith, 1996) and have the power to influence the CEO; their voice within the firm also increases as their ownership stake increases (Gillan & Starks, 2000; Hoskisson et al., 2002; Pound, 1992).

Institutional investors are argued to be particularly adept at monitoring CEOs (Schleifer & Vishny, 1986) and have increasing motivation to monitor CEOs as their investment in the firm grows. Institutional investors are also likely to have sophisticated expertise devoted to interpreting and forecasting firm financials, which has been used to explain why institutional investors are associated with less earnings management (Cornett et al., 2008). Given the motivation and vigilance of monitoring by institutional investors, it is not surprising that CEO dismissal in response to declining performance (cf. Jenter & Kanaan, 2015) is more common following share price declines when institutional owners have a larger stake (Warner, Watts & Wruck, 1988). That is, the relationship between declining firm performance and CEO dismissal is likely to be stronger in the presence of institutional shareholders. Dismissing the CEO in an attempt to improve the performance of their investment may also be seen as a better option relative to exiting the investment, given that selling large blocks of shares can depress the stock price (Chan & Lakonishok, 1993).

Vulnerability to dismissal accentuates CEO risk bearing given the possibility of future income loss becomes increasingly likely (Cruz et al., 2010). In the event of dismissal, the CEO
also will anticipate wealth loss given they typically forfeit their unvested (unexercisable) stock options (Devers et al., 2008; Laux, 2012) and have the timelines for exercising vested options truncated (Yermack, 2006). To reduce the risk of dismissal, CEOs may turn to earnings management. Earnings management provides a tool that can apply “window dressing” to reported financial performance and forestall the earnings disappointments that could lead to CEO dismissal. Though earnings management can create risk for the CEO if this action is later revealed, that risk is often in the distant future and detection of earnings management is difficult and costly (Hazarika, Karpoff & Nahata, 2012); while failure to respond to earnings disappointments today carries immediate risk for the CEO. Myopically loss averse CEOs are thus likely to prefer actions that reduce employment risk today even if the negative consequences of this action are greater in the future (Benartzi & Thaler, 1995; Thaler et al., 1997).

As threats to employment rise due to increasing institutional presence, loss averse CEOs are likely to increasingly pursue tactics that limit performance disappointments through such tactics as earning management. This is especially likely if CEOs endow some portion of anticipated future earnings (e.g., base salary) into calculations of wealth (Wiseman & Gomez-Mejia, 1998). Thus, instead of compensating for weak incentive alignment, as suggested by prior research (cf. Tosi et al., 1997), we suggest that monitoring intensity may aggravate the perverse effects of CEO risk bearing, leading to greater self-serving behavior in the form of earnings management that assists in preserving their wealth. Indeed, as noted above, myopic loss aversion would suggest that individuals will risk larger losses in the future to avoid smaller losses in the present (Benartzi & Thaler, 1995; Thaler et al., 1997). It follows that increases in the CEO’s use of earnings management in response to changes in the value of their equity wealth are likely to be larger in the presence of more highly concentrated institutional investors. Thus, we predict that
monitoring reinforces (accentuates) the aberrant effect of incentive alignment on agency costs associated with CEO earnings management described in Hypothesis 1.

HYPOTHESIS 2: Concentration of institutional ownership accentuates (positively moderates) the positive relationship between CEO equity wealth and earnings management.

Concentrated Ownership, CEO Power and Earnings Management

An alternative form of agent monitoring (to the pressure exerted by institutional investors) is the presence of an independent (non-CEO) board chair (Lorsch & MacIver, 1989). The board serves as the primary internal control mechanism for ensuring the CEO acts in the interests of the shareholders (Fama & Jensen, 1983). If the CEO chairs the board, control over CEO opportunism and perquisite consumption is weaker (Hambrick & Finkelstein, 1987; Morck, Shleifer & Vishny, 1989), their compensation higher (Boyd, 1994), and they are more likely to manage earnings (Klein, 2002; Peasnell, Pope & Young, 2000, 2005; Xie, Davidson & DaDalt, 2003). Interestingly, the power associated with CEO duality may be encouraged by vigilant boards (such as those dominated by outsiders), given it promotes strong leadership (Finkelstein & D’Aveni, 1994). This may be because a clearer hierarchy within a board is reflected in superior firm performance (He & Huang, 2011). The power and decision making authority that comes with duality is argued to also come with greater responsibility and accountability, given CEO duality has been associated with higher turnover due to poor firm performance (Cannella & Lubatkin, 1993; Harrison, Torres & Kukalis, 1988), making it unlikely duality improves job security. In a review of the CEO duality literature, Krause and colleagues (2014: 268) conclude that “the literature has produced almost no evidence suggesting that CEO duality reduces a board’s ability to hold its CEO accountable.”

The above literature suggests that duality enables the CEO to pursue their own agenda due to greater power and influence over firm decision-making, yet that power does not reduce their
vulnerability to dismissal. Hence, the CEO’s earnings management objectives—accentuated by higher levels of concentrated institutional ownership—are more likely to be achieved when the CEO has the power provided by duality. This suggests that, in order to consider the perverse interactive effects (negative reinforcement) of monitoring and incentive alignment upon earnings management, it is necessary to consider CEO power relative to the remainder of the board.

**HYPOTHESIS 3:** The positive moderation of the relationship between CEO equity wealth and earnings management by concentrated institutional ownership is stronger when there is CEO occupation of the board chair role (duality) relative to when there is not.

**METHODOLOGY**

We obtain the data for this study from the ExecuComp, Compustat, Thomson Reuters, and ISS/Risk Metrics databases between 1995 and 2014 (inclusive). Compustat provides 10-K report data for publicly traded corporations, which provides us with data concerning the firm’s balance sheet and income statement that is necessary to calculate discretionary accruals (our measure of earnings management; see below). ExecuComp database contains proxy statement data from a large number of publicly traded firms, detailing executive compensation, including equity ownership, of the firm’s top executives. ExecuComp provides us with the data concerning CEO equity wealth (or risk bearing) associated with the stock and stock options. These two databases have been commonly used to gather the firm and CEO level data in the behavioral agency literature (e.g., Devers et al., 2008; Martin et al., 2013). Thomson Reuters provides details of institutional ownership and ISS/Risk Metrics provides data for board composition. The sample included 12,284 firm year observations.

**Dependent Variable**

Earnings management is our proxy for opportunistic CEO behavior, reflecting classic agency problems within the firm due to the separation of ownership and management. Earnings
management is widely recognized as an example of opportunistic behavior by the managerial agent (e.g., Baiman, 1990; Davidson et al., 2004; Dechow & Sloan, 1991; Holthausen et al., 1995; Klein, 2002; Xie et al., 2003). The ubiquity of earnings management in practice has been a catalyst for this research stream (Peasnell et al., 2005). Healy’s (1985) study of the link between earnings management (using accruals) and the bonus structure of the CEO was followed by research emphasizing that earnings management is a classic example of an agency problem (given agent opportunism exacerbates information asymmetry; Baiman, 1990). The idea that earnings management—or earnings accuracy more generally—was belatedly introduced to the management literature by Davidson and colleagues (2004), who noted that “earnings management may exacerbate agency problems.”

We use discretionary accruals as our measure of earnings management using the modified Jones model developed by Dechow et al. (1995). Accruals are expenses and revenues that are included in the profit calculation, but have not yet been settled in cash. Given judgment is often involved to estimate an accrual (that is, a discretionary accrual), they are commonly used to ensure the CEO gets the desired earnings result (Healy, 1985). For instance, discretion is necessary to estimate the proportion of inventory they hold that they may never sell or debtors they may never collect, for which they should accrue an inventory write-off or bad-debt write-off (respectively) expense. It is these types of accruals that we are attempting to measure. To do so, we estimate the total accruals that the firm has used in a given year and then estimate the accruals that are less likely to involve the use of judgement (non-discretionary accruals [NDA]). The difference between these two then gives us our estimate of the discretionary accruals (DAs): accruals that allow the CEO to apply judgment, typically undetected by the board (Hazarika et al., 2012).
Consistent with Jones and the modifications introduced for the modified Jones model, we first estimate total accruals (TA) and NDAs, controlling for firm performance, and then calculate DAs as the difference between the NDAs and total accruals. Consistent with prior earnings management studies, we take the absolute value of DAs (e.g., Bartov, Gul & Tsui, 2000; Cohen, Dey & Lys, 2008). The modified Jones model calculation for NDAs is:

$$\text{NDA}_t = \alpha_1 (1/A_{t-1}) + \alpha_2 (\Delta \text{REV}_t - \Delta \text{REC}_t) + \alpha_3 (\text{PPE}_t) \quad (1)$$

Where:

- $\Delta \text{REV}_t$ = revenues in year t less revenues in year t-1, scaled by total assets at t-1;
- $\Delta \text{REC}_t$ = receivables in year t less receivables in year t-1, scaled by total assets at t-1;
- $\text{PPE}_t$ = gross property plant and equipment in year t, scaled by total assets at t-1;
- $A_{t-1}$ = total assets at t-1; and
- $\alpha_1, \alpha_2, \alpha_3$ = firm specific parameters.

Estimates of $\alpha_1, \alpha_2, \alpha_3$ are generated using the following model:

$$\text{TA}_t = a_1 (1/A_{t-1}) + a_2 (\Delta \text{REV}_t - \Delta \text{REC}_t) + a_3 (\text{PPE}_t) + e \quad (2)$$

Where $a_1, a_2, a_3$ denote the OLS estimates of $\alpha_1, \alpha_2, \alpha_3$ and TA is total accruals scaled by lagged total assets. We require a minimum of six years of data for each firm to be included in the model. Consistent with previous studies of earnings management (Healy, 1985; Jones, 1991), total accruals (TA) are calculated as:

$$\text{TA}_t = (\Delta \text{CA}_t - \Delta \text{CL}_t + \Delta \text{Cash}_t + \Delta \text{STD}_t - \text{Dep}_t) / A_{t-1} \quad (3)$$

Where:

- $\Delta \text{CA}$ = change in current assets;
- $\Delta \text{CL}$ = change in current liabilities;
- $\Delta \text{Cash}$ = change in cash and cash equivalents;
- $\Delta \text{STD}$ = change in short-term debt (included in current liabilities);
- Dep = depreciation and amortization expense; and
- $A$ = total assets.
DAs are then calculated by deducting NDA from TA. Note that similar to NDA and TA, DA is scaled by lagged total assets and is calculated as below for firm \(i\) in year \(t\):

\[
DA_{it} = TA_{it} - NDA_{it}
\]  

(3)

Dechow et al. (1995) established that the modified Jones model described above exhibits the most power in detecting earnings management, out of a range of competing earnings management models. The modified Jones model is also significant in predicting qualified audit reports (Bartov et al., 2000), further deeming this model to be a useful predictor of earnings quality and earnings management. Hence, we use DAs as a proxy for earnings management and agency costs.

**Independent Variables**

Concentrated institutional ownership is measured using the Herfindahl-Hirschman index of concentration for institutional owners for each firm from Thomson Reuters’ stock ownership summary data (Cadman, Klasa & Matsunaga, 2010; Kim & Lu, 2011). This variable captures both the number of institutional investors and the size of their investment. Prior research has found that this variable is positively related to the influence and importance of institutional investors over the CEO. Higher concentrations of shareholdings allow institutional investors to exert more influence as they are less likely to be muted by other powerful shareholders and more likely to have the incentive to communicate their interests to the CEO (Cadman et al., 2010). We prefer institutional ownership as our proxy for CEO monitoring for two reasons. First, institutional ownership is a common proxy for the intensity of monitoring of the CEO; hence, we are building on a large body of agency research that has used the same approach to exploring monitoring in the context of the agency problem (e.g., Fich, Harford & Tran, 2015; McCahery, Sautner & Starks, 2016; Schnatterly, Shaw & Jennings, 2008). Second, institutional shareholders have a presence on the
share registries of most publicly listed firms globally, underlining their influence and the need for further understanding of their impact upon agency costs (Boyd & Solarino, 2016).

*CEO equity wealth* is measured in terms of both option values and the value of the shares held. Option value is calculated using the number of exercisable and unexercisable options from past option grants, multiplied by their corresponding spread on the final day of the fiscal year (from ExecuComp, consistent with Devers et al., 2008; Larraza-Kintana et al., 2007; Martin et al., 2013). This equates to the intrinsic value of CEO stock options and is positively related to CEO risk bearing, or option wealth-at-risk of loss in the event of share price declines. *Share wealth* (value of shares held) is calculated as the number of shares held multiplied by the share price at fiscal year-end.

*CEO power* is measured using CEO duality, which is a binary variable coded as one for the CEO occupying the chair of the board of directors and zero otherwise (O’Connor et al., 2006).

We control for both firm related and other characteristics shown to influence discretionary accruals, based on recent studies exploring earnings management (e.g., Cohen & Zarowin, 2010) and reviews of the earnings management research (Healy & Wahlen, 1999). These include *firm size* (total sales), *accounting performance* (ROA), leverage (total debt), book to market ratio, *performance volatility* measured using standard deviation of ROA over the prior 5-year period (given higher performance variability is likely to lead to higher levels of discretionary accruals), and *liquidity* (measured as [Current Assets plus Inventory minus Current Liabilities] / [Current Assets]). Given we are predicting CEO risk behavior; we also draw from the behavioral agency literature to identify variables that also influence CEO risk bearing. At the CEO level, we also control for variables argued to influence CEO risk preferences, including CEO tenure, CEO cash compensation (bonus and salary; Devers et al., 2008) and CEO age, which have been found to
influence agent risk preferences (Larraza-Kintana et al., 2007). We also control for other forms of risk behavior that influence CEO risk bearing by creating risk for the CEO, in the form of strategic risk taking (based on factor analysis of R&D, capital expenditure and long-term debt; Devers et al., 2008; Martin et al., 2013). We also control for industry and year with dummies.

We also attempted to control for board independence using measures of board structure (presence of outside directors), however, the outsider ratio was an insignificant predictor and the power of the study was severely impaired (we lose about 25% of the sample N when using this control) due to the number of missing values of board outsiders. When we do control for board outsiders using the smaller sample, our models with a significantly lower N continue to show support for H1, plus H2 and H3 for CEO risk bearing associated with value of shares held.

Finally, we do not lag the independent variables given our theory suggests that the CEO will attempt to manage earnings in response to the risk bearing in the current period in order to prevent the loss in value of those options. Thus, we measure CEO equity wealth as close as possible to the earnings announcement (end of fiscal year), given the CEO’s current wealth will be affected by any change in the share price that is associated with earnings announcements (that usually occur within one month of fiscal year end). This approach of concurrent independent and dependent variables is consistent with accounting research examining the relationship between CEO compensation and earnings management, surprises and manipulation (e.g., Cheng & Warfield, 2005). In the context of CEO power, the contemporaneous influence of exogenous variables is demonstrated to be empirically stronger than the alternatives (fit of the model deteriorates with subsequent lags; Daily & Johnson, 1997). Following this lead, subsequent research examining the effects of CEO power have used independent variables contemporaneously
(Buyl, Boone, Hendriks & Matthyssens, 2011; Dowell et al., 2011). All continuous variables were standardized prior to estimation of our models.

**Estimation and Procedures**

Ordinary least squares (OLS) models using panel data often have the problem of heteroskedastic error terms and autocorrelation that can lead to biased and inconsistent results (Certo & Semadeni, 2006; Bliese, 2000; Kenny & Judd, 1986). This leads to the question of whether fixed or random effects models are most appropriate when estimating panel models (Certo & Semadeni, 2006; Halaby, 2004). To deal with this question we used Hausman (1978) specification tests on the regressions for the hypotheses and fixed effects models were found to be appropriate ($\chi^2=52.49$, $p<0.05$). Thus, our models were estimated with `xtreg` in STATA with fixed effects (fe); we did so with the firm as the grouping variable. Non-binary variables have been standardized with a mean of zero.

**RESULTS**

The correlation matrix and descriptive statistics for the un-standardized variables are shown in Table 3. Table 4 shows the results of estimations of models including control variables, main effects models and a model with interactions. Table 5 enables the testing of Hypothesis 3 by splitting the interaction models into samples where CEO duality exists and where it does not.

We split the interaction models into models interacting stock options with concentrated ownership and shares with concentrated ownership separately in Tables 4 and 5 due to the collinearity created by the positive correlation between option and share values in addition to the collinearity introduced by the interaction terms. Looking across the regression models of Table 4,
R-squared for within-firm variance is around 0.07. R-squared statistics of this magnitude are common in models predicting accruals in the accounting literature (e.g., Collins & Hribar, 2002; Ashbaugh, LaFond & Mayhew, 2003; Bergstresser & Philippon, 2003; Chen, Lin & Lin, 2010).

Hypothesis 1 predicts CEO equity wealth is positively related to earnings management. We test this for two forms of CEO equity wealth: stock option and share wealth. Consistent with the prediction, the main effect of CEO option wealth—the accumulated value of the CEO’s stock options—is significant and positive (b=0.04; p<0.001, Model 3, Table 4) in the Main Effects model predicting earnings management. These results suggest that for every one standard deviation increase in the value of CEO option wealth, earnings management increases by approximately 28% (which is the main effect divided by average discretionary accruals, or 0.04/0.14) of the average (level of DAs) used by firms in our sample. This increase equates to an increase in DAs of approximately $360 million (note that our measure of DAs is calculated as a proportion of total assets). The main effect for share wealth is not significant (Model 2, Table 4); suggesting that in order to understand the effect of share wealth, it may be necessary to consider its relation in the context of other factors (see below).

Consistent with Hypothesis 2’s prediction, the interaction between institutional ownership concentration and CEO equity wealth is significant and positive for option wealth (b=0.02; p<0.05, Model 3, Table 4) and with share wealth (b=0.04; p<0.001, Model 4, Table 4). The interaction is depicted graphically in Figure 1. This graph shows a stronger positive relationship between earnings management and CEO option wealth at higher levels of concentrated institutional ownership. An increase of one standard deviation in concentrated institutional ownership accentuates the effect of CEO option wealth by a further 14% of average earnings management—equating to approximately an extra $180 million (on average) in DAs. We conclude that
institutional ownership accentuates the effect of CEO risk bearing in the form of employment risk, as opposed to substituting for or neutralizing risk bearing’s effect (c.f. for a review of the types of interactions, Podsakoff et al., 1996).

Hypothesis 3 predicts that the accentuation effect predicted by Hypothesis 2 is contingent upon CEO power. For this prediction to hold, the accentuation of concentrated institutional ownership upon the positive relationship between CEO equity wealth and earnings management should be present when the CEO holds the board chair role and absent otherwise. Table 4 shows this prediction holds for CEO option and share wealth, given the interaction of CEO option wealth and concentrated institutional ownership is significant and positive (b=0.03; p<0.05, Model 1, Table 5) when duality exists; yet it is not significant in the absence of CEO duality (Model 2, Table 5). In the case of shares, the same hypothesis is supported, given the interaction of CEO share wealth with concentrated institutional ownership is significant and positive (b=0.05; p<0.01, Model 3, Table 5) when there is CEO duality and is nonsignificant in the absence of CEO duality (Model 4, Table 5). In both cases (option wealth and share wealth), the differences between the interaction coefficients is statistically significant at p<0.001. We conclude that in the absence of CEO duality, monitoring by institutional shareholders is less likely to lead to an accentuation of the perverse effects of CEO equity incentives.

Robustness tests. For Hypothesis 3, we use two alternate measures of CEO power vis-à-vis the remainder of the board by using outsider-ratio (proportion of the board who are outside directors) and board size as an alternate measure. Outsiders on the board are argued to have greater influence as they are not beholden to the CEO for their own jobs as executives (Klein, 2002).
Regarding board size, an argument has been made that larger boards are less effective in monitoring CEOs due to coordination and free-riding problems, thus giving CEOs more power (Jensen, 1993; Lipton & Lorsch, 1992), which may be reflected in longer tenure (Bergh et al., 2016). Our results using above and below median sub-samples for both of these alternate proxies of CEO power provide support for Hypothesis 3 for CEO option values in the case of board independence and CEO share values in the case of board size. That is, the interaction of CEO option wealth and concentrated institutional ownership was significantly more positive for below median independent boards relative to above median, while the interaction of CEO equity wealth and concentrated institutional ownership was significantly more positive for above median boards relative to below median. The lower levels of support for Hypothesis 3 relative to when we use CEO duality is possibly due to the reduced model size (about 25% smaller than the samples shown in Tables 4 and 5).

Wu-Hausman tests suggested that endogeneity of CEO option wealth was a problem, although CEO share wealth was not—not surprisingly, the latter was not significant as a main effect. Hence, we controlled for endogeneity of CEO option wealth by performing a two stage least squares estimation using the number of options granted in the year and share price as the instrument. The F-statistic in the first stage was 264.09. The Sargan statistic in both the main effect and interaction models (p=0.42, p=0.44 and p=0.39 respectively) failed to reject the null hypothesis that the instrumental variables are exogenous. Further, the main effect of option wealth (Table 4, Model 2) and interaction coefficients (Table 5, Models 3 and 4) remained significant, indicating that our results are robust to controlling for endogeneity.

**DISCUSSION AND CONCLUSION**

This study has aimed at advancing agency research through theoretically and empirically
examining the implications of incentive alignment and monitoring for agency costs created by CEO earnings management. Our findings are twofold: (1) CEO equity wealth is positively related to the use of earnings management; (2) the CEO’s use of earnings management to preserve their equity wealth will be accentuated when the concentration of institutional ownership is higher; (3) the accentuation effect is stronger when there is CEO duality and higher levels of independent directors. We now elaborate on the theoretical insights provided by these findings.

Our finding that monitoring by concentrated owners accentuates earnings management associated with incentive alignment provides interesting insights into long-standing questions within agency research regarding the interactive effects of concentrated ownership and incentive alignment. Agency research has long explored the individual effects of incentive alignment and monitoring: the two primary mechanisms offered by agency scholars for controlling the costs of managerial opportunism (Eisenhardt, 1989). The interactive effects of these two mechanisms has also gained the attention of agency scholars (albeit briefly), with the prevailing view that substitution is the operative form of the interaction, with monitoring substituting for weak incentive alignment and vice versa (Gomez-Mejia et al., 2010; Tosi et al., 1997; Zajac & Westphal, 1994). We advance this research by demonstrating that: (1) when both governance mechanisms are present, one may accentuate the effect of the other; (2) the accentuating effect of their joint presence can increase rather than decrease managerial opportunism in the form of earnings management; and (3) allowing CEOs to hold the position of board chair further aggravates the perverse effects resulting from these dual mechanisms. Thus, while incentive alignment and monitoring may be substitutive when combining to alleviate the costs associated with managerial opportunism (Tosi et al., 1997; Zajac & Westphal, 1994), their perverse effects are likely to be accentuating when both are present (refer Table 1).
Our study contributes to the behavioral agency literature by demonstrating an alternate means by which an agent may limit risk of loss to their equity wealth. This research has generally tested the BAM’s prediction of a negative relationship between CEO risk bearing and risk taking through exploring strategic risk as the lever available to the CEO to reduce their risk to firm-specific (equity) wealth (e.g., Devers et al., 2008; Kish-Gephart & Campbell, 2015; Larraza-Kintana et al., 2007; Martin et al., 2013). We have demonstrated that the CEO can also reduce firm-specific risk—associated with equity wealth—by limiting the risk of share price decline through earnings management. In doing so, we provide impetus for behavioral agency research to explore a broader range of agency problems, beyond the strategic levers that have attracted our attention to date. Further, we demonstrate that, to predict agent risk behavior, it is also useful to understand CEO power (as reflected by board characteristics) and the motives of large and influential shareholders.

Our results concerning CEO duality highlight the effectiveness of separating the CEO and chair roles for limiting opportunistic CEO behaviors. This provides the insight that perverse behaviors that are incentivized by intensive shareholder monitoring can be offset by restricting the CEO’s power within the firm to behave opportunistically through the use of earnings management. Hence, we highlight that while monitoring by concentrated shareholders can accentuate agency costs, monitoring by an independent board chair can negate those costs. Taken together, these additional insights provide important boundary conditions for our theory. The findings regarding CEO duality connect with a recent refreshed interest in the dual occupation of CEO and chair roles (e.g. Krause et al., 2014) amid a re-examination of governance systems post the global financial crisis. Specifically, our results offer evidence of the negative consequences of duality. Our results concerning board size provide further nuance to our understanding of the consequences of larger
boards. While the resources that more board members provide may directly improve firm performance, leading to positive direct performance effects (Bergh et al., 2016), our findings suggest that the board size—due to its impact upon CEO power—may have negative consequences for shareholders as a result of earnings management.

A question emerges from our study regarding whether the costs associated with earnings management are borne solely by minority investors, creating a Type II agency cost (given the larger shareholder benefits at the expense of minority shareholder) or whether concentrated institutional shareholders also bear costs of misinformation due to earnings management. Two scenarios present themselves. In the first, institutional investors are complicit in earnings management given they have superior knowledge regarding the extent of earnings management. In the second scenario, institutional investors lack private knowledge about the extent of earnings management and share a similar fate as minority shareholders. Regarding the first scenario, well-informed institutional investors may accept CEO management of earnings since this avoids an immediate downgrade of their investment’s value, which could negatively affect the fund manager’s bonus. Being aware of CEO earnings management would also allow them to make an informed decision to reduce their investment in order to limit future losses when the underlying causes of the performance problems that led to the use of earnings management are later revealed.

In the second scenario, where institutional investors are ignorant of the extent of earnings management, the agency costs are also (at least partially) borne by concentrated shareholders. This seems less likely given the motivation and expertise of large institutional investors to observe and understand the drivers of reported earnings (Jiang & Anandarajan, 2009). If size of holdings correlates with awareness of managerial actions then the long-term consequences of earnings management would be largely borne by minority investors creating a Type II agency problem in
which both institutional investors and minority investors enjoy the short-term benefits of earnings management, though only minority investors bear the costs of future earnings restatements (Teoh et al., 1998). Agency research could benefit from further research examining: (1) the extent to which costs of information asymmetry due to earnings management are borne by both concentrated and minority shareholders; and (2) the interactive (substitutive or enhancing) role of monitoring and incentive alignment in shaping those costs.

Finally, our findings refine prior theorizing regarding earnings management and the use of equity based pay as an incentive alignment mechanism. For example, Zhang et al. (2008) used prospect theory’s problem framing to explain a negative relationship between the number of in-the-money options a CEO holds and fraudulent use of earnings management (defined as earnings manipulation). That study found that the more options held by the CEO, the less likely this individual will use unlawful (or fraudulent) accounting practices, necessitating earnings restatements. Similarly, O’Connor et al. (2006) demonstrated a negative relationship between stock option valuations and fraudulent accounting practices. We extend this work by drawing on behavioral agency theory to explain that incentive alignment may still encourage deviant, though lawful, CEO behavior (Dechow et al., 1995; Pincus et al., 1988). This challenges predictions that less deviant behavior is associated with more in-the-money options (Zhang et al., 2008). Importantly, our extension of this literature also suggests that the effect of in-the-money vested options on deviant behavior may be accentuated rather than controlled by the presence of concentrated institutional investors.

From a practical perspective, our study highlights to regulators, policy makers, boards of directors, and shareholders the importance of considering an additional cost associated with granting of CEO equity—a cost that is accentuated when ownership is more consolidated and the
CEO also holds the position of board chair. For policy makers, we have provided evidence that the presence of a large institutional shareholder (an increasing empirical reality; Boyd & Solarino, 2016) can exacerbate the costs associated with CEO stock options, as reflected by the accuracy of financial reporting. This builds a stronger case against concessional tax status to stock options, questions the advantages of institutional investors for corporate governance, and highlights to auditors the need for additional vigilance when there is the combination of executives with considerable option wealth and institutional ownership. Our study also provides guidance for shareholders as to when they should be more vigilant regarding the use of earnings management and especially minority shareholders, when they are aware of the presence of institutional shareholders and CEO duality. Our study provides a framework that allows shareholders to predict when they should exercise greater prudence, or perhaps use a larger discount factor, due to the use of stock options and the presence of highly concentrated institutional shareholders.

**Future Directions and Limitations**

Earnings management is likely to create costs for an array of other firm stakeholders, including regulators and society more generally. Hence this research could benefit in the future from examining these wider agency costs associated with both incentive alignment and monitoring. Future research could also examine how stronger monitoring of CEOs might encourage other deviant CEO behaviors aimed at reducing employment risk (c.f. Larraza-Kintana et al., 2007) in the presence of risk bearing, including escalation of commitment (Zardkoohi, 2004), swinging for the fences (Sanders & Hambrick, 2007), the use of poison pills (Rhee & Fiss, 2014), or the establishment of self-serving directorate interlocks (Zona et al., in press). Hence, agency scholars could further explore those additional costs imposed upon other stakeholders. We examine one operationalization of CEO monitoring (concentrated institutional ownership);
although this is possibly the most commonly used by agency scholars, it would be interesting to know more about how other large shareholders influence the efficacy of incentive alignment. Equally, it would be interesting to examine different operationalizations of agency costs (such as different types of perquisite consumption) to see if the agency problems we predict can be used to anticipate a broader range of costs to shareholders. It would be interesting to explore further whether the CEO trades off power for incentives or favorable compensation contract terms in their negotiations with the board. While we do not address this research question, it would be interesting to explore how CEOs weigh the utility associated with power against the financial and emotional consequences of the financial rewards and risk bearing associated with their incentives. Finally, our research highlights to governance scholars the importance of large sample sizes that may be necessary to detect nuanced results with important implications for understanding the implications of governance mechanisms.

**Conclusion**

We conclude that monitoring is likely to accentuate the perverse effects of incentive alignment in the context of agency costs associated with earnings management. The CEO perceives higher levels of risk bearing as a result of higher levels of option wealth, yet their subjective assessment of risk bearing is likely to intensify when institutional investors exert pressure for earnings and share price returns. Holding the position of board chair provides the CEO with the power to act on their loss aversion through the use of earnings management. Hence, when considering how the operation of one governance mechanism (such as monitoring) impacts on the operation of the other (incentive alignment), one needs to look beyond the substitutive positive effects that have previously dominated our view of their interactive effects.
REFERENCES


*Econometrica, 47*: 262-291.


<table>
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<tr>
<th>Governance Mechanisms</th>
<th>Main (Additive) Effects of Incentive Alignment and Monitoring</th>
<th>Interactive Effects of Incentive Alignment and Monitoring – substitutive</th>
<th>Interactive Effects of Incentive Alignment and Monitoring – non-substitutive</th>
</tr>
</thead>
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<td>Increase Agency Costs</td>
<td>Davis &amp; Stout, 1992; Frankforter, Berman &amp; Jones, 2000 (for monitoring); Sanders &amp; Hambrick, 2007 (incentive alignment)</td>
<td>No findings to date</td>
<td>The gap we aim to fill. Monitoring from institutional investors accentuates perverse effects of incentive alignment, yet this accentuation is neutralized by an independent board chair.</td>
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<td>Decrease Agency Costs</td>
<td>Jensen &amp; Meckling, 1976 (incentive alignment); Jensen &amp; Murphy, 1990 (incentive alignment); Tosi &amp; Gomez-Mejia, 1994; He &amp; Huang, 2011 (monitoring)</td>
<td>Rediker &amp; Seth, 1995; Tosi et al., 1997; Zajac &amp; Westphal, 1994 (substitutive positive effects)</td>
<td>Hartzell &amp; Starks, 2003 (interactive positive effects)</td>
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<td>Theoretical Foundations</td>
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<td>Healy, 1985</td>
<td>Journal of Accounting &amp; Economics</td>
<td>Agency theory</td>
<td>CEOs manage earnings to improve the probability that they will receive their bonus.</td>
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<td>De Angelo, 1986</td>
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<td>CEO sale of their shares follows periods of higher use of income increasing earnings management.</td>
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<td>O’Connor, Priem, Coombs &amp; Gilley, 2006</td>
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<td>Agency theory</td>
<td>The value of stock options is negatively related to fraudulent reporting. The CEO’s interests are argued to become more aligned with the shareholder as their options gain value.</td>
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<td>Harris &amp; Bromiley, 2007</td>
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<td>Agency theory and behavioral theory of the firm</td>
<td>The proportion of CEO pay from stock options positively influences the probability of fraudulent financial reporting.</td>
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<td>Zhang, Bartol, Smith, Pfarrer &amp; Khanin, 2008</td>
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<td>Agency theory and prospect theory</td>
<td>The higher the number of out-of-the-money options the higher the likelihood of fraudulent financial reporting.</td>
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<td>Jiang, Petroni &amp; Wang, 2010</td>
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<td>Agency theory</td>
<td>CEOs and CFO equity compensation can both be linked to earnings management.</td>
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<td></td>
<td>Mean</td>
<td>S.D.</td>
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<tr>
<td>----------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>1 Earnings management</td>
<td>0.14</td>
<td>0.18</td>
<td>1.00</td>
</tr>
<tr>
<td>2 Firm size^a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Firm performance</td>
<td>0.04</td>
<td>0.11</td>
<td>-0.04</td>
</tr>
<tr>
<td>4 ROA SD (5 year)</td>
<td>0.06</td>
<td>0.08</td>
<td>0.11</td>
</tr>
<tr>
<td>5 Leverage^b</td>
<td>2,822</td>
<td>6,008</td>
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</tr>
<tr>
<td>6 Book to market ratio</td>
<td>0.47</td>
<td>0.39</td>
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<td>7 Strategic risk</td>
<td>-0.01</td>
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<tr>
<td>8 Firm liquidity</td>
<td>0.66</td>
<td>0.42</td>
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<td>9 CEO age</td>
<td>55.66</td>
<td>7.35</td>
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<td>10 CEO duality</td>
<td>0.49</td>
<td>0.50</td>
<td>0.01</td>
</tr>
<tr>
<td>11 CEO tenure</td>
<td>7.08</td>
<td>7.43</td>
<td>-0.01</td>
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<tr>
<td>12 CEO cash compensation^b</td>
<td>1,089</td>
<td>876</td>
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<td>13 CEO share wealth^b</td>
<td>51,417</td>
<td>165,549</td>
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<td>14 Concentrated Institutional Ownership (CIO)</td>
<td>0.07</td>
<td>0.09</td>
<td>0.04</td>
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<td>15 CEO option wealth (CEORB)^b</td>
<td>11,402</td>
<td>24,604</td>
<td>0.02</td>
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</table>

N=12,298

**Key:**

Where the absolute value of the correlation is greater than 0.015, the correlation is significant at p<0.01.

a: Millions dollars

b: Thousands dollars
## TABLE 4: DEPENDENT VARIABLE EARNINGS MANAGEMENT

<table>
<thead>
<tr>
<th></th>
<th>Controls</th>
<th>Main Effect</th>
<th>Interactions: Stock Options</th>
<th>Interactions: Shares</th>
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<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Firm size</td>
<td>-0.07†</td>
<td>-0.07*</td>
<td>-0.08*</td>
<td>-0.08*</td>
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<tr>
<td>Firm performance</td>
<td>0.02*</td>
<td>0.02†</td>
<td>0.02</td>
<td>0.02</td>
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<tr>
<td>ROA SD (5 year)</td>
<td>0.09***</td>
<td>0.09***</td>
<td>0.09***</td>
<td>0.09***</td>
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<tr>
<td>Leverage</td>
<td>-0.07†</td>
<td>-0.07†</td>
<td>-0.07†</td>
<td>-0.07†</td>
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<tr>
<td>Book to market ratio</td>
<td>-0.04**</td>
<td>-0.03†</td>
<td>-0.03†</td>
<td>-0.03†</td>
</tr>
<tr>
<td>Strategic risk</td>
<td>0.09*</td>
<td>0.10*</td>
<td>0.10*</td>
<td>0.10†</td>
</tr>
<tr>
<td>Firm liquidity</td>
<td>-0.09***</td>
<td>-0.09***</td>
<td>-0.09***</td>
<td>-0.09***</td>
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<tr>
<td>CEO age</td>
<td>0.02†</td>
<td>0.03</td>
<td>0.03*</td>
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<td>CEO duality</td>
<td>-0.00</td>
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</tr>
<tr>
<td>CEO option wealth</td>
<td>0.04***</td>
<td>0.04***</td>
<td>0.04**</td>
<td></td>
</tr>
<tr>
<td>CEO option wealth x CIO</td>
<td></td>
<td>0.02*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO share wealth x CIO</td>
<td></td>
<td>0.04***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.32*</td>
<td>-0.28*</td>
<td>-0.28*</td>
<td>-0.28*</td>
</tr>
<tr>
<td>R squared within</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>R squared between</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>N</td>
<td>12,284</td>
<td>12,284</td>
<td>12,284</td>
<td>12,284</td>
</tr>
</tbody>
</table>

Key:

- *** denotes p value of less than .001; ** denotes p value of less than .01; * denotes p value of less than .05; † denotes p value of less than .1;
- Industry and year dummies are included in the regressions but not listed. Change in R squared as the models go to the right is significant at p<0.001 for all models and measures of R squared.
### TABLE 5: DEPENDENT VARIABLE EARNINGS MANAGEMENT WITH AND WITHOUT CEO DUALITY

<table>
<thead>
<tr>
<th></th>
<th>Stock Options</th>
<th>Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Duality</td>
<td>No Duality</td>
</tr>
<tr>
<td>Firm size</td>
<td>-0.04</td>
<td>-0.12*</td>
</tr>
<tr>
<td>Firm performance</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>ROA SD (5 year)</td>
<td>0.10***</td>
<td>0.80***</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.13*</td>
<td>0.01</td>
</tr>
<tr>
<td>Book to market ratio</td>
<td>-0.07**</td>
<td>0.00</td>
</tr>
<tr>
<td>Strategic risk</td>
<td>0.17**</td>
<td>-0.04</td>
</tr>
<tr>
<td>Firm liquidity</td>
<td>-0.08*</td>
<td>-0.10**</td>
</tr>
<tr>
<td>CEO age</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO tenure</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>CEO cash compensation</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>CEO share value</td>
<td>0.00</td>
<td>-0.01</td>
</tr>
<tr>
<td>Concentrated Institutional Ownership (CIO)</td>
<td>0.03</td>
<td>-0.02</td>
</tr>
<tr>
<td>CEO option wealth</td>
<td>0.04*</td>
<td>0.07***</td>
</tr>
<tr>
<td>CEO option wealth x CIO</td>
<td>0.05**</td>
<td>-0.02</td>
</tr>
<tr>
<td>CEO share wealth x CIO</td>
<td></td>
<td>0.04**</td>
</tr>
</tbody>
</table>

Constant: -0.41*** -0.25 -0.41*** -0.26

R squared within: 0.07 0.07 0.07 0.07

R squared between: 0.11 0.09 0.12 0.09

N: 5,992 6,292 5,992 6,292

Key:
*** denotes p value of less than .001; ** denotes p value of less than .01; * denotes p value of less than .05; † denotes p value of less than .1;
Industry and year dummies are included in the regressions but not listed.
Figure 1: CEO Option Risk Bearing x Concentrated Institutional Ownership

Earnings Management

10th percentile  90th percentile

CEO Option Risk Bearing

-0.350
-0.300
-0.250
-0.200
-0.150
-0.100
-0.050
0.000

Low Concentrated Ownership (10%)
High Concentrated Ownership (90%)