Institutional Monitoring Of Sticky CEO Compensation

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ABSTRACT

This study examines the monitoring role of institutional investors in both mitigating the degree of downward-sticky CEO compensation and alleviating the undesirable effects of the sticky compensation on shareholder wealth. Particularly, we parallel the literature on "pay for performance" and institutional monitoring role to critically examine the measure of fluctuating pay-for-performance sensitivity, re-characterize the asymmetric compensation-performance link, and then capture managerial rent extraction. We find that sticky CEO compensation is significantly and negatively associated with firm value. Further, we find that institutional ownership decreases the compensation stickiness in underperforming firms and ameliorates its value-deteriorating effect.

Keywords: Pay-For-Performance Sensitivity; CEO Compensation Stickiness; Institutional Monitoring; Managerial Power Theory

INTRODUCTION

Traditional agency theory has viewed performance-related compensation as important in mitigating conflicts of interest between Chief Executive Officer (CEO) and shareholders (Jensen & Meckling, 1976; Holmstrom, 1979; Grossman & Hart, 1983; Jensen & Murphy, 1990; Murphy 1998; Core, Holthausen & Larcker, 1999; Iyengar, Williams & Zampelli, 2005). Hence, managerial power theorists (hereafter "MPTs") raise the distortion issue in the compensation-performance link (Gaver & Gaver, 1998; Adut, Cready & Lopez, 2003; Garvey & Milbourn, 2006; Jackson, Lopez & Reitenga, 2008; Fang, 2009; Wenliang, Hong & Peixian, 2011; Chen, Liu & Peng, 2014b). They draw on the worldwide, pervasive phenomenon of downward-sticky performance-related compensation: paying managers "without performance". Unfortunately, although MPTs have investigated the existence of downward-sticky CEO compensation as managerial rent seeking, no evidence has been found on the sticky compensation effect on firm value.

Monitoring by institutional investors is well recognized as a corporate governance mechanism playing a potentially important role in shaping the compensation-performance link. Hartzell and Starks (2003) examine the institutional monitoring roles on executive compensation,[1] finding a strong association between the concentration of institutional investors and pay-for-performance sensitivity (hereafter "PPS").[2] A stream of subsequent studies on the relationship between monitoring institutions and PPS in listed firms in the United States (e.g., Almazan, Hartzell & Starks, 2005; Van Essen, Otten & Carberry, 2015), United Kingdom (Ozkan, 2011), and Australia (Schultz, Tian & Twite, 2013) provide evidence consistent with the findings of Hartzell and Starks (2003).[3] Their theoretical underpinning seems dependent on the active monitoring hypothesis, first formalized by Shleifer and Vishny (1986). Shleifer and Vishny (1986) find that institutional shareholders have strong intention to monitor corporate performance through their voting right. Consistent with Shleifer and Vishny (1986), subsequent empirical studies explore the association between monitoring institutions and firm value, and indicate a positive link between them in the United States (McConnell &

[1] Following Hartzell and Starks (2003), Almazan et al. (2005) discover a relationship between institutions' influence on executive compensation sensitivity and the level of compensation when institutions have lower monitoring costs.
[2] From a different angle, Zeng, Yuan, and Zhang (2011) investigate the effect of institutional shareholdings on executive compensation structures, which mitigate agency problems between majority and minority shareholders in China.
[3] In contrast, Jiang, Habib, and Smallman (2009) provide evidence that high institutional ownership has a negative effect on PPS for the New Zealand equity market. They focus on New Zealand institutions' passive monitoring role due to insufficient minority shareholder protection and less-stringent litigation.

Servaes, 1990; Burkart, Gromb & Panunzi, 1997; Han & Suk, 1998; Choi & Sias 2012), Korea (Park, Jung & Lee, 2013), Malaysia (Wahab, How & Verhoeven, 2007), and Thailand (Hsu & Wang, 2014; Thanatawee, 2014).[4]

However, the aforementioned literature, specifically, Hartzell and Starks (2003), Almanzan, Hartzell, and Starks (2005), and Schultz et al. (2013), indubitably interpret increased PPS as resulting from institutional monitoring. However, if the change in CEO compensation has a non-linear relationship to change in performance, the average PPS in the prior literature is *not constant*. In other words, the prior PPS measure as a proxy for either low or high agency costs has *bias* because it captures, on average, both sides of the changes in performance. Moreover, a stronger PPS when firm performance increases (Δ Performance > 0) may not evidence a mitigated agency problem as it burdens shareholders with incremental costs. Considering the rationale provided in the literature, preventing PPS from decreasing when firm performance declines (Δ Performance < 0) may be evidence of efficient monitoring, suggesting that monitoring institutions control "pay without performance". Therefore, it needs to explicitly incorporate the pay-without-performance problem in an analytical model to investigate the monitoring effect of institutional investors. Thus, the limitations we have identified suggest the use of CEO compensation stickiness (hereafter "CCS") as a measure to capture a manager's rent-extraction behavior.

This study first tests whether our CCS estimate negatively affects shareholder value; we then investigate whether institutional investors monitor downward-sticky compensation arrangements and induce managers to enhance shareholder wealth. Our analyses use a sample of 6,748 firm-year observations, from 1993 to 2015, in United States capital markets. Our first result suggests that CCS reduces shareholder value, thus implying that sticky compensation fails to motivate CEOs under their contracts. Next, the results report that higher institutional ownership alleviates CCS as well as its negative effects on firm value.

Overall, this study provides new evidence on institutional investors' monitoring role by examining not only the relationship between institutional ownership and CCS but also the alleviating effect of the potentially negative association between CCS and firm value. Our contributions are threefold. First, our paper re-characterizes the asymmetric compensation-performance link and convincingly describes the institutional investors' monitoring role in preventing distortion of CEO compensation schemes. Second, this study complements the agency literature by exploring not only the value-deteriorating effect of CCS (which has become a pervasive phenomenon as an agency problem stemming from the extension of managerial power) but also the role of institutional owners in mitigating its undesirable effect on firm value.

The rest of this paper is organized as follows. Section 2 reviews prior theories and develops our hypotheses. Section 3 describes our sample and research designs. Section 4 presents the results. Section 5 concludes the study.

THEORY AND HYPOTHESES

The *optimal contracting hypothesis*, based on agency theory (Jensen & Meckling, 1976; Holmstrom, 1979; Grossman & Hart, 1983; Jensen & Murphy, 1990; Abowd, 1990; McConaughy & Mishra, 1996; Murphy, 1998; Core et al., 1999; Iyengar et al., 2005), posits that CEO compensation schemes should align with corporate performance to provide CEOs with efficient incentives to maximize shareholder value. By measuring PPS, Jensen and Murphy (1990) and Abowd (1990) find that the change of PPS is positively associated with the change in shareholder wealth. Subsequent studies have provided consistent evidence (e.g., Aggarwal & Samwick, 1999; McConaughy & Mishra, 1996; Iyengar et al., 2005; Matolcsy & Wright, 2011).

While optimal contracting theorists postulate a fair-trade contract platform between the board and its executives in selecting pay arrangements, Crystal (1991) and Monks and Minow (2008) raise the salient point that top managers tend to distort the board's role when setting CEO compensation schemes. Similarly, Newman (2000) posits that CEOs tend to select compensation committee members in their own best interests. The *managerial power hypothesis* (e.g., Newman, 2000; Bertrand & Mullainathan, 2001; Bebchuk, Fried & Walker, 2002; Bebchuk & Fried, 2003, 2005) postulates that compensation schemes are likely to be shaped by managerial influence. The hypothesis explains how

[4] In contrast, a few studies provide ambiguous or conflicting evidence regarding the monitoring improvement of institutions in relation to firm value (Craswell, Taylor & Saywell, 1997; Faccio & Lasfer, 2000; Navissi & Naiker, 2006; Mollah, Farooque & Karim, 2012).

managerial influence shapes the CEO compensation landscape, and how its influence on compensation might impose substantial costs on shareholders. As several researchers have recognized, some compensation arrangement features reflect managerial rent seeking, rather than the provision of efficient incentives (Blanchard, Lopez-de-Silanes & Shleifer, 1994; Yermack, 1997; Bertrand & Mullainathan, 2001).

MPTs, following managerial power hypothesis, have investigated the substantial pervasiveness of CCS (Gaver & Gaver, 1998; Adut et al., 2003; Garvey & Milbourn, 2006; Jackson et al., 2008; Fang, 2009; Wenliang et al., 2011; Chen et al., 2014b). CCS, defined as the degree to which CEO compensation is less sensitive to a decrease than an increase in corporate performance, is further explained as a distortion by managerial power of the board's role in compensation setting especially when corporate performance worsens. The performance-related CEO compensation is aimed for CEOs' incentive to be aligned with company's performance, but it does not seem to work when the company performs poorly. For example, Gaver and Gaver (1998) find that CEOs in United States-listed companies receive a bonus when their company's performance improves, but are not subject to penalties when their company's performance declines. Subsequent studies have confirmed the stickiness characteristic of compensation (e.g., Garvey & Milbourn, 2006; Jackson et al., 2008). By discussing the work of Leone, Wu, and Zimmerman (2006) examining the link between CEO cash compensation and stock returns, Dechow (2006) addresses potential alternative explanations from a managerial power perspective.[5] In this context, Fang (2009), Wenliang et al. (2011), Chen, Peng, Liu, and Xu(2014a), and Chen et al. (2014b) suggest that CEO compensation in Chinese-listed companies exhibits stickiness. In particular, Wenliang et al. (2011) document that executive pay has greater stickiness in firms in which managers have more power.

While MPTs postulate that this distorted compensation-performance link burdens shareholders with excess costs (Gaver & Gaver, 1998; Adut et al., 2003; Garvey & Milbourn, 2006; Jackson et al., 2008; Fang, 2009; Wenliang et al., 2011; Chen et al., 2014a, b), little has been empirically known about the value-aggravating effects of sticky CEO compensation. We expect that downward-sticky compensation under firm's unfavorable circumstances not only induces costly, excessive compensation, but also fails to motivate managers to work diligently, thereby ultimately reducing shareholder value (see HI). Thus, we propose the following:

HI: Higher CEO compensation stickiness exhibits weaker stock price performance.

More importantly, we are interested in institutional monitoring role in the distortion of CEO incentive arrangements. The corporate governance theory emphasizes that shareholders can block CEO compensation schemes that are not at arm's length. According to Shleifer and Vishny (1986) and Huddart (1993), large outside shareholders, such as institutional investors, play a monitoring role in controlling errant management behavior. Chen, Harford, and Li (2007) demonstrate that independent, long-term institutions' concentrated holdings can monitor behavior. Some papers about "institutional activism" argue that institutional investors actively and effectively monitor. (e.g., O'Barr & Conley, 1992; Karpoff, 1999; Gillan & Starks2000). For example, Hartzell and Starks (2003) and Almazan et al. (2005) suggest, concerning institutional monitoring and executive compensation, that institutional ownership concentration is associated with pay-for-performance sensitivity, thereby mitigating the agency problem between shareholders and management. Additionally, Chung and Wang (2014) and Chung, Liu, Wang, and Zykaj (2015) find that long-term institutional monitoring is positively associated with a sound capital structure and strong firm performance by F-Score, respectively.

Accordingly, institutional concentration is viewed as a strong force to control managerial influence in all facets of the pay-setting process.[6] Increased institutional ownership confers greater power to block distorted CEO compensation

[5] Leone et al. (2006) suggest that CEO cash compensation more sensitively reacts to negative than positive stock returns.

[6] Relevantly, significant regulatory changes have occurred to enable shareholders to have a greater say on CEOs' compensation, which is often referred to as "say-on-pay" regulation (Cai & Walking, 2011; Ertimur, Ferri & Oesch, 2013; Kimbo & Xu, 2016). Many countries and regions, including the United States, the United Kingdom, the European Union, Australia, and China have introduced rules, regulations, or legislation to enable large shareholders to have a greater say in CEO compensation, or say-on-pay regulations, which led to increased shareholder activism. Due to these regulatory changes, a new stream of academic research on say-on-pay regulations has exploded in all leading academic accounting journals. Specifically, many studies have examined a governance mechanism related to say-on-pay regulations (Conyon & Sadler, 2010; Ferri & Maber, 2013; Albuquerque, Carter & Lynch, 2015; Hooghiemstra, Kuang & Qin, 2015; Alissa, 2015). However, most public firms in the United States have widely dispersed ownership, which makes direct contract negotiations infeasible for shareholders, and to date the shareholder majority vote by say-on-pay regulations may still be restrictive in the United States.

arrangements, particularly when the firm underperforms. Institutional investors can challenge the board's decisions on downward-rigid compensation schemes by filing a derivative suit alleging that the firm has been harmed by the board's decisions. Monitoring institutions can also attempt to shape CEO compensation by using their voting rights to reject or approve stock option plans, blocking management's influence on the board, and thereby reducing potential CCS during firm underperformance (see HII-a).

We further anticipate that institutional investors engage in corporate governance to enhance firm value by playing an active monitoring role.[7] Increased institutional ownership implicitly motivates executives with reduced managerial power, as they are exposed to a higher dismissal risk when the firm underperforms. Higher institutional ownership increases the threat of derivative litigation and, in some cases, the board's ability to vote against executive stock option plans when the firm underperforms.[8] Related studies (Morck, Shleifer & Vishny, 1988; McConnell & Servaes, 1990; Burkart et al., 1997; Woidtke, 2002; Choi & Sias, 2012; Park et al., 2013) examine the relationship between institutional monitoring and firm value. For instance, Burkart et al. (1997) find that large shareholders enhance firm value by monitoring agencies' errant behavior. Park et al. (2013) investigate institutional governance funds' improvement effects on firm value. In this regard, institutional investors, by substituting for managerial incentives, may restrain stock deterioration stemming from the moral hazard problem posed by sticky pay, even though they cannot directly control pay without performance. Thus, the monitoring of institutional investors should alleviate the possibly negative effect of the compensation stickiness on firm value (see HII-b). Therefore, we propose the following:

HII-a: A higher institutional concentration mitigates the degree of CEO compensation stickiness.

HII-b: Institutional ownership alleviates the unfavorable relationship between the compensation stickiness and stock price performance.

VARIABLES, METHOD, AND DATA

Data

Our CEO compensation data are obtained from Execucomp, an executive compensation database that reports total yearly salaries, bonuses, long-term incentives, stock and option grants, and other compensation for up to five top-level executives with at least two consecutive years of coverage. Firm characteristics are obtained from the Center for Research in Securities Prices (CRSP) and COMPUSTAT databases, and institutional ownership data from Thomson Financial, which obtains data on quarterly institutional holdings from Form 13F filings. We exclude all finance and utility firms (SIC codes 6000–6999 and 4900–4949) because these industries are systematically different from the others. After merging Execucomp's executive compensation data, our sample consists of 6,748 firm-year observations, based on firms included in the S&P 1500 index, and those removed from the index, but still traded, between 1993 and 2015.[9]

[7] The growth in institutional presence can affect firms vis-à-vis their trading behavior (Siconolfi, 1992). Specifically, Frino, Jones, Lepone, and Wong (2014) suggest that institutional market behavior around bankruptcy announcements can potentially enhance participants' equitable market practices.
[8] The board of directors is in charge of determining the top executives' compensation structure in most public corporations.
[9] Execucomp includes only about 2,500 firms included in the S&P 1500 index, and firms excluded from the index but still traded, which limits our sample.

CCS Specifications and Consequent Firm Value

Following Jackson et al. (2008), we test for the asymmetric sensitivity of CEO compensation to corporate performance by performing ordinary least square regressions (OLS) of change in CEO bonus compensation (*ΔBonus*) on the changes in return on assets and control variable.[10] The estimated OLS regression model is as follows:

$$\Delta Bonus_{i,t} = \beta_0 + \beta_1 \times \Delta PROA_{i,t} + \beta_2 \times \Delta PROA_{i,t} + \Sigma\beta_c \times Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $\Delta Bonus_{i,t}$ is the natural logarithm of (CEO cash bonus compensation/ lagged CEO bonus) for firm *i* in year *t*; $\Delta PROA_{i,t}$ is *ΔROA* if *ΔROA* is greater than 0 and 0 otherwise. *ΔROA* is defined as the natural logarithm of (return on assets / lagged return on assets) for firm *i* in year *t* where return on assets is calculated as income before extraordinary items divided by lagged total asset[11]; and $\Delta NROA_{i,t}$ is *ΔROA* if *ΔROA* is less than 0 and 0 otherwise for firm *i* in year *t*. Thus, conditional on significantly positive coefficients of β_1 and β_2, a significantly smaller β_2 than β_1 suggests compensation stickiness, indicating a smaller compensation reaction when ROA decreases. $Controls_{i,t}$ is defined as follows: 1) $\Delta ASSET_{i,t}$ is the natural logarithm of (book value of assets / lagged book value of assets) for firm *i* in year *t*; 2) $\Delta SALE_{i,t}$ is the natural logarithm of (sales / lagged sales) for firm *i* in year *t*; 3) $\Delta I\_ROA_{i,t}$ is the industry average of the natural logarithm of (return on assets / lagged return on assets) for firm *i* in year *t*; 4) year-fixed effects; and 5) Fama-French 48 industry-fixed effects. Regarding the main controls, Schaefer (1998) demonstrates that a CEO's pay-performance sensitivity may decrease with firm size, merely because the relevant management team's size decreases with the size of the firm. Jensen and Murphy (1990) suggest that pay-performance sensitivity is greater in a small firm than a large one. Murphy (1985) finds that executive pay strongly and positively relates to growth in firm sales, arguing that previous cross-sectional studies omitted important variables that strongly skewed their results.

We then verify *HII-a* by adding the interaction of institutional ownership to the specification estimating the degree of CCS. We consider institutional investor ownership as a proxy variable capturing the intensity of institutional monitoring. For each firm-year observation with a corresponding CEO bonus compensation, we utilize the most recent quarterly institutional ownership, which is at least one year before the fiscal year-end month that the CEO compensation is calculated[12] This tactic provides institutions sufficient time to monitor the CEO compensation structure.

We expect the β_5 coefficient in Equation 3 to be positive if pay stickiness decreases with institutional concentration, resulting from active monitoring of compensation arrangements by institutional shareholders:

$$\Delta Bonus_{i,t} = \beta_0 + \beta_1 \times \Delta PROA_{i,t} + \beta_2 \times \Delta PROA_{i,t} + \beta_3 \times IO_{i,t} + \beta_4 \times \Delta PROA_{i,t} \times IO_{i,t} + \beta_5 \times \Delta PROA_{i,t} \times IO_{i,t} + * \Sigma\beta_c \times Controls_{i,t} + \varepsilon_{i,t} \quad (2)$$

where $IO_{i,t}$ is a dummy variable whose value is equal to 1 if total institutional ownership, calculated as the total number of shares held by all institutions scaled by the all outstanding shares for firm *i* at the end of year *t – 1 ,* is greater than its mean value of our final sample and 0 otherwise; and other variables are as defined in Equation (1).

Next, we process empirical models that relate sticky CEO compensation to Tobin's Q (*TobinQ*) and stock returns (*Return*), respectively, to test *HI*. We modify Easton and Harris' (1991) regression, widely used in empirical literature on the value relevance of accounting as follows:

[10] The results with the regression model with the level of CEO bonus compensation (*Bonus*) as the dependent variable and the level of return on assets as our main independent variables are qualitatively similar to our main regression results.

[11] The results with alternative measures of return on asset by using different incomes such as net income and comprehensive income are not qualitatively different from our main regression results.

[12] Institutions report their holdings in the 13F filings every quarter. Hence, December 2003 is the most recent quarter-end that is one year before February 2005.

$$TobinQ_{i,t}\left({}_{or}Return_{i,t}\right) = \beta_0 + \beta_1 \times Non - Sticky\ \Delta Bonus_{\ i,t} + \beta_2 \times Non - Sticky\ \Delta Bonus_{\ i,t} + \varepsilon_{i,t} \quad (3)$$

where *Q* is the industry-adjusted Tobin's Q, computed by market value of assets divided by book value of assets for firm *i* in year *t*; $Return_{i,t}$ is the annualized stock return for firm *i* in year *t*; $Non\text{-}Sticky\ \Delta Bonus_{i,t}$ is $\Delta Bonus_{i,t}$ if the time-series regression estimate for $\Delta NROA$ of equation (1) for firm *i* is greater than its mean value of our final sample and 0 otherwise; and $Sticky\ \Delta Bonus_{i,t}$ is $\Delta Bonus_{i,t}$ if the time-series regression estimate for $\Delta NROA$ of equation (1) for firm *i* is less than its mean value of our final sample and 0 otherwise. Thus, if stock investors discount the sticky bonus compensation as we hypothesize in *HI*, the coefficient of β_2 will be insignificant conditioned on significantly positive β_1.

Furthermore, we test *HII-b* by decomposing $Sticky\ \Delta Bonus_{i,t}$ in Equation (2) into those with and without high institutional ownership as seen Equation (4).

$$TobinQ_{i,t}\left({}_{or}Return_{i,t}\right) = \beta_0 + \beta_1 \times Non - Sticky\ \Delta Bonus_{\ i,t} + \beta_2 \times \overline{w}\ High\ IO + \beta_3 \times Non - Sticky\ \Delta Bonus_{\ i,t}\ w/\ Low\ IO + \varepsilon_{i,t} \quad (4)$$

where $Sticky\ \Delta Bonus_{i,t}\ w/\ High\ IO$ is *Sticky* Δ*Bonus* if *IO* is 1 and 0 otherwise; ; and other variables are as defined in Equation 1; $Sticky\ \Delta Bonus_{i,t}\ w/\ Low\ IO$ is *Sticky* Δ*Bonus* if *IO* is 0 and 0 otherwise; ; and other variables are as defined in Equation 2. In light of HII-b, institutional ownership is expected to mitigate the possible negative effect of sticky CEO compensation on firm value. Thus, the β_2 coefficient Equation (4) is expected to be significant and positive given that the β_3 coefficient remains insignificant.

EMPIRICAL RESULTS

Descriptive Statistics

Table 1 displays descriptive statistics for the full 1993–2015 sample. The average of *ΔBonus*, or the rate of change in CEOs' cash bonus compensation, is 0.100, representing a 10% increase from the previous period. The mean values of *ΔPROA* and *ΔNROA* are positive (0.313) and negative (-0.280), respectively, as consistent with their definitions. The mean value of *IO* is 0.839, indicating that 83.9% of firm-year observations in our final sample are highly invested by institutions. It may because our sample firms consist of relatively large-sized firms listed on S&P 1500 index. The mean of *Non-Sticky* Δ*Bonus* (0.058) is greater than it of *Sticky* Δ*Bonus* (0.042) as they defined. Interestingly, the mean of *Sticky* Δ*Bonus w/ High IO* (0.046) is greater than it of *Sticky* Δ*Bonus w/ Low IO* (0.011), implying that high institutional ownership alleviates the CEO bonus stickiness.

Table 1. Descriptive statistics of dependent/independent variables

	N	Mean	Median	Std. Dev.	Q1	Q3
Dependent variables						
Δ*Bonus*	6,748	0.100	0.118	0.694	-0.188	0.456
TobinQ	6,721	1.695	1.176	1.863	0.691	2.011
Return	5,697	0.170	0.121	0.393	-0.101	0.388
Independent variables						
Δ*PROA*	6,748	0.313	0.039	0.610	0.000	0.352
Δ*NROA*	6,748	-0.280	0.000	0.621	-0.275	0.000
IO	6,748	0.839	1.000	0.368	1.000	1.000
Non-Sticky Δ*Bonus*	6,748	0.058	0.000	0.519	0.000	0.141
Sticky Δ*Bonus*	6,748	0.042	0.000	0.466	0.000	0.095
Sticky Δ*Bonus w/ High IO*	6,748	0.046	0.000	0.477	0.000	0.031
Sticky Δ*Bonus w/ Low IO*	6,748	0.011	0.000	0.206	0.000	0.000
Δ*Asset*	6,748	0.130	0.091	0.186	0.011	0.208
Δ*Sale*	6,748	0.125	0.103	0.174	0.023	0.211
Δ*I_ROA*	6,748	0.058	0.272	2.580	-0.547	1.207

Note: This table summarizes the descriptive statistics of the dependent/independent variables investigated for the empirical analysis of this study. It presents the number of observations, mean, median, standard deviation, 25th percentile, and 75th percentile values. The four databases used in this study are Center for Research in Securities Prices (CRSP), COMPUSTAT, Execucomp, and Thomson Financial over the period of 1993-2015. Variables shown in this table are defined in Appendix.

Correlations

Table 2 presents the Pearson (above the diagonal) and Spearman (below the diagonal) correlations among of the dependent/independent variables of our interest investigated for the empirical analysis of this study. It firstly shows that *ΔBonus* is positively correlated with Δ*PROA* and Δ*NROA*, respectively though the correlation between *ΔBonus* and Δ*PROA* is stronger than it between *ΔBonus* and Δ*NROA*. The difference confirms the existence of the downward compensation stickiness in our sample firms. Second, it also shows that *IO* is positively correlated with Δ*NROA* while the correlation between *IO* and Δ*PROA* is not statistically significant, indicating that institutions play a role of alleviating the downward compensation stickiness. Third, in terms of the effect of compensation stickiness on firm valuation, *ΔBonus* is positively correlated with *TobinQ* and *Return*, respectively, implying that stock market investors positively evaluate high sensitive CEO bonus compensation. However, it also shows that the positive correlation between *ΔBonus* and *TobinQ* (or *Return*) is greater for *Non-Sticky ΔBonus* than *Sticky ΔBonus* as confirmed by the stronger correlation between *Non-Sticky ΔBonus* and *TobinQ* (or *Return*) than the correlation between *Sticky ΔBonus* and *TobinQ* (or *Return*). Moreover, *Sticky* Δ*Bonus w/ High IO* is positively correlated with *TobinQ* and *Return*, respectively, and the correlations are stronger than those among *Sticky* Δ*Bonus w/ Low IO*, *TobinQ* and *Return*, implying that the negative effect of sticky CEO compensation is alleviated by the monitoring of institutions.

Table 2. Correlation matrix

#	Variables	N	1	2	3	4	5
1	*ΔBonus*	6,748		0.041	0.045	0.141	0.120
				(0.001)	(0.001)	(0.000)	(0.000)
2	*TobinQ*	6,721	0.049		-0.003	0.018	0.103
			(0.000)		(0.826)	(0.133)	(0.000)
3	*Return*	5,697	0.054	-0.003		0.017	0.029
			(0.000)	(0.813)		(0.188)	(0.028)
4	*ΔPROA*	6,748	0.245	0.041	0.056		0.231
			(0.000)	(0.001)	(0.000)		(0.000)
5	*ΔNROA*	6,748	0.230	0.143	0.074	0.853	
			(0.000)	(0.000)	(0.000)	(0.000)	
6	*IO*	6,748	-0.022	0.099	0.025	-0.005	0.015
			(0.066)	(0.000)	(0.057)	(0.683)	(0.207)
7	*Non-Sticky ΔBonus*	6,748	0.610	0.061	0.043	0.177	0.209
			(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
8	*Sticky ΔBonus*	6,748	0.683	0.030	0.038	0.148	0.125
			(0.000)	(0.013)	(0.005)	(0.000)	(0.000)
9	*Sticky ΔBonus w/ High IO*	6,748	0.613	0.031	0.038	0.139	0.118
			(0.000)	(0.011)	(0.005)	(0.000)	(0.000)
10	*Sticky ΔBonus w/ Low IO*	6,748	0.251	0.013	0.004	0.044	0.042
			(0.000)	(0.302)	(0.768)	(0.000)	(0.001)

#	Variables	N	6	7	8	9	10
1	*ΔBonus*	6,748	-0.019	0.017	0.741	0.680	0.290
			(0.111)	(0.175)	(0.000)	(0.000)	(0.000)
2	*TobinQ*	6,721	0.041	-0.012	0.020	0.022	-0.002
			(0.001)	(0.339)	(0.102)	(0.065)	(0.864)
3	*Return*	5,697	0.021	0.020	0.029	0.029	-0.001
			(0.118)	(0.123)	(0.031)	(0.029)	(0.920)
4	*ΔPROA*	6,748	-0.010	0.045	0.095	0.097	0.014
			(0.431)	(0.000)	(0.000)	(0.000)	(0.243)
5	*ΔNROA*	6,748	0.048	-0.002	0.029	0.033	-0.005
			(0.000)	(0.848)	(0.019)	(0.007)	(0.705)
6	*IO*	6,748		-0.021	-0.011	0.042	-0.126
				(0.091)	(0.359)	(0.001)	(0.000)
7	*Non-Sticky ΔBonus*	6,748	-0.008	-0.255	-0.010	-0.009	-0.005
			(0.517)	(0.000)	(0.410)	(0.473)	(0.682)
8	*Sticky ΔBonus*	6,748	-0.019	0.229		0.917	0.393
			(0.114)	(0.000)		(0.000)	(0.000)
9	*Sticky ΔBonus w/ High IO*	6,748	0.087	0.191	0.908		-0.005
			(0.000)	(0.000)	(0.000)		(0.660)
10	*Sticky ΔBonus w/ Low IO*	6,748	-0.211	0.089	0.394	-0.018	
			(0.000)	(0.000)	(0.000)	(0.131)	

Estimates for CCS

We adopt CCS, defined as lower PPS when performance declines to mitigate the aforementioned biases. The degree of CCS reflects the magnitude of CEOs' extracted rents.

Table 3 notes the CCS estimates. Models 1 and 2 present the coefficient estimates for the OLS regression model. For Equation (1), we run both the basic sticky model (considering only year-fixed and industry-fixed effects) and the controlled model (with all controls). The results of Models 1 and 2 in Table 3 indicate an asymmetric compensation change relative to the ROA change from year $t-1$ to year t. That is, the coefficients on $\Delta PROA$ and $\Delta NROA$ are all significantly positive but the coefficient on $\Delta PROA$ is greater than the coefficient on $\Delta NROA$. The difference is also statistically confirmed by the F-value at the bottom. Models 3 and 4 in Table 4 present the coefficient estimates for

the Fama-MacBeth cross-sectional regression,[13] indicating that the results are qualitatively similar in both the basic sticky and controlled models. The results also note significantly positive coefficients on Δ*PROA* and Δ*NROA* though the coefficient on Δ*PROA* is greater than the coefficient on Δ*NROA*. This reconfirms that pay-for-performance sensitivity is greater for firms that outperform than those that underperform. The CCS phenomenon is robust regarding our estimation methods, consistent with results in the literature (e.g., Garvey & Milbourn, 2006; Jackson et al., 2008).

Table 3. Revisiting the pay-for-performance sensitivity

Independent variables	Dependent variable: Δ*Bonus*							
	OLS regression				Fama-McBeth regression			
	[Model 1]		[Model 2]		[Model 3]		[Model 4]	
Δ*PROA*	0.138	(9.81)***	0.130	(9.18)***	0.108	(3.57)***	0.101	(3.05)***
Δ*NROA*	0.094	(6.77)***	0.084	(6.08)***	0.086	(3.36)***	0.079	(3.05)***
Δ*Asset*			0.041	(0.72)			0.122	(1.90)*
Δ*Sale*			0.319	(5.13)***			0.253	(2.60)**
Δ*I_ROA*			-0.003	(-0.96)			0.491	(1.65)
Intercept	-0.029	(-0.35)	-0.040	(-0.49)	0.015	(0.12)	0.050	(0.15)
Year-fixed-effects	Yes		Yes		No		No	
Fama-French 48 Industry -Fixed Effects	Yes		Yes		Yes		Yes	
N	6,748		6,748		6,748		6,748	
Adjusted-R^2	0.053		0.059		-		-	
F-value from the test: ΔPROA - ΔNROA > 0		[4.07]**		[4.23]**				

Note: This table reports the conventional pay-for-performance sensitivities based on 6,748 firm-year observations over the period of 1993-2015. The *t*-statistics are reported in parentheses. Variables shown in this table are defined in Appendix. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively.

The Effects of Institutional Governance on CCS

Table 4 presents the univariate and multivariate results examining the impact of institutional monitoring on compensation stickiness. Panel A of Table 4 shows the result of univariate *t*-test comparing the level of compensation stickiness, as measured by the time-series regression estimate for Δ*NROA* of Equation (1) for firm *i*, between firms with high and low institutional ownerships. It shows that the coefficient on Δ*NROA* is greater for the firms with high institutional ownerships than those with low institutional ownerships, implying that institutions alleviate the downward compensation stickiness as we expect.

Panel B of Table 4 shows the multivariate regression results. Before estimating Equation (2). We perform subsample analyses by dividing our sample into those with high and low institutional ownership. The regression results are presented in Models 1 and 2 in Table 4. The coefficients of Δ*NROA* in Models 1 and 2 are all significantly positive while the coefficient in Model 1 is greater than in Model 2. The difference address that institutions play a role of alleviating the downward compensation stickiness. It is also confirmed by the result in Model 3. The coefficient on Δ*NROA*IO* is significantly positive, confirming that institutions accelerate the relation between Δ*NROA* and Δ*Bonus*. Overall, all these results indicate that CEO compensation for performance is less sticky in firms with a higher concentration of institutional ownership.

[13] We estimate separate annual regressions following Fama and MacBeth (1973) to alleviate the standard errors stemming from cross-sectional dependence.

Table 4. Impact of institutional monitoring on compensation stickiness

Panel A: Univariate t-test

w/ High *IO*		w/ Low *IO*		Difference	
N	**Mean**	**N**	**Mean**	**High-Low**	**(t-stat)**
5,659	0.4844	1,089	0.4564	0.028	(1.69)*

Panel B: OLS regression results

Independent variables	Dependent variable: Δ*Bonus*					
	w/ High *IO*		w/ Low *IO*		Full sample	
	[Model 1]		[Model 2]		[Model 3]	
Δ*PROA*	0.147	(9.48)***	0.052	(1.48)	0.042	(1.26)
Δ*NROA*	0.097	(6.09)***	0.054	(1.79)*	0.045	(1.59)
IO					-0.053	(-1.84)*
Δ*PROA*IO*					0.105	(2.83)***
Δ*NROA*IO*					0.054	(1.69)*
Δ*Asset*	0.029	(0.46)	0.137	(1.01)	0.044	(0.76)
Δ*Sale*	0.390	(5.59)***	0.018	(0.12)	0.316	(5.07)***
Δ*I_ROA*	-0.003	(-0.81)	-0.002	(-0.22)	-0.003	(-0.88)
Intercept	-0.029	(-0.33)	-0.318	(-1.02)	0.008	(0.09)
Year-fixed-effects	Yes		Yes		Yes	
Fama-French 48 Industry -Fixed Effects	Yes		Yes		Yes	
N	5,659		1,089		6,748	
Adjusted-R^2	0.069		0.014		0.061	

Note: This table presents the results examining the impact of institutional monitoring on compensation stickiness. Panels A and B show the estimation results from univariate t-test and OLS regression analysis, respectively. The *t*-statistics are reported in parentheses. Variables shown in this table are defined in Appendix. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively.

Value Relevance of CCS

Table 5 presents the estimation results for Equation (3) and (4). Panels A and B use *TobinQ* and *Return* as the dependent variable, respectively. In Panel A, Model 1 shows that the coefficient on Δ*Bonus* is significantly positive, implying that stock market participants positively evaluate sensitive CEO bonus compensation. Then, we decompose Δ*Bonus* into sticky and non-sticky Δ*Bonus* by using the time-series regression estimate for Δ*NROA* of equation (1) for firm *i*. The regression results is presented in Model 2. It shows that the coefficient on *Non-Sticky* Δ*Bonus* is significantly positive while the coefficient on *Sticky* Δ*Bonus* is not statistically significant, indicating that the positive evaluation on sensitive CEO bonus compensation by stock market investors are mainly driven by non-sticky CEO bonus compensation. Finally, we decompose the *Sticky* Δ*Bonus* once again into those with high (*Sticky* Δ*Bonus w/ High IO*) and low institutional ownerships (*Sticky* Δ*Bonus w/ Low IO*). Given that stock market investors discount the Sticky CEO bonus compensation, the significantly positive coefficient on *Sticky* Δ*Bonus w/ High IO* implies that the discount is alleviated by the institutional investors' monitoring effect. Similar results are also found in Panel B with *Return* as the dependent variable. That is, the coefficient on Δ*Bonus* is significantly positive in Model 1 but it is only significant for *Non-Sticky* Δ*Bonus* in Model 2. Also, the coefficient on *Sticky* Δ*Bonus w/ High IO* is significantly positive while the coefficient on *Sticky* Δ*Bonus w/ Low IO* is not statistically significant. In sum, our empirical analyses confirm the negative valuation on sticky CEO compensation structure by stock market investors and the role of active monitoring by institutional shareholders in mitigating both CEO compensation stickiness and its value-deteriorating effect.

Table 5. Value relevance of compensation stickiness

Panel A: Dependent variables is *TobinQ*

Independent variables	[Model 1]		[Model 2]		[Model 3]	
Δ*Bonus*	0.109	(3.61)***				
Non-Sticky Δ*Bonus*			0.168	(3.76)***	0.168	(3.76)***
Sticky Δ*Bonus*			0.062	(1.54)		
Sticky Δ*Bonus w/ High IO*					0.078	(1.79)*
Sticky Δ*Bonus w/ Low IO*					-0.028	(-0.27)
Intercept	1.821	(8.82)***	1.825	(8.84)***	1.822	(8.83)***
N	6,721		6,721		6,721	
Adjusted-R^2	0.185		0.186		0.186	

Panel B: Dependent variables is *Return*

Independent variables	[Model 1]		[Model 2]		[Model 3]	
Δ*Bonus*	0.015	(2.08)**				
Non-Sticky Δ*Bonus*			0.018	(1.65)*	0.031	(2.73)***
Sticky Δ*Bonus*			0.013	(1.35)		
Sticky Δ*Bonus w/ High IO*					0.022	(2.21)**
Sticky Δ*Bonus w/ Low IO*					-0.009	(-0.10)
Intercept	0.045	(0.91)	0.045	(0.92)	0.167	(31.91)***
N	5,697		5,697		5,697	
Adjusted-R^2	0.056		0.056		0.002	

Note: This table presents the results examining the value relevance of compensation stickiness. Panels A and B show the estimation results with *TobinQ* and *Return* as the dependent variables, respectively. The *t*-statistics are reported in parentheses. Variables shown in this table are defined in Appendix. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively.

Robustness Tests

So far, we measure CEO compensation stickiness by using the absolute value of the time-series regression estimate for Δ*NROA* of Equation (1) for firm *i*, following Jackson et al. (2008)'s model. As a robustness test, we alternatively define CEO compensation stickiness by using following regression model.

$$\Delta Bonus_{i,t} = \beta_0 + \beta_1 \times \Delta ROA_{i,t} + \beta_2 \times DD_{it} + \beta_3 \times \Delta ROA_{i,t} \times DD_{it} + \Sigma\beta_c \times Controls_{i,t} + \varepsilon_{i,t} \quad (5)$$

where $\Delta Bonus_{i,t}$ is the natural logarithm of (CEO bonus compensation / lagged CEO bonus compensation) for firm *i* in year *t*; $\Delta ROA_{i,t}$ is the natural logarithm for (return on assets / lagged return on assets) for firm *i* in year *t*; and $DD_{i,t}$ is a dummy variable, equal to 1 if the return on assets in year *t* is lower than 1 in year *t – 1,* and 0 otherwise. $Controls_{i,t}$ is defined as the same in Equation (1). In this equation, conditional on a significantly positive coefficient β_1, a significantly negative β_3 coefficient suggests compensation stickiness, indicating a smaller compensation reaction when ROA decreases, comparing to when ROA increases. Therefore, we create *Stickiness*, a dummy variable whose value is equal to 1 if the time-series regression estimate for *ΔROA*DD* in Equation (5) for firm *i* is less than or equal to 0, and 0 otherwise.

Then, we re-estimate the Equations (3) and (4) with the alternative stickiness measure. Table 6 presents the regression results. Consistent with the results in Table 5, the result in Model 1 shows that the coefficient on Δ*Bonus* is significantly positive, implying that stock market participants positively evaluate sensitive CEO bonus compensation. In Model 2, we find that the coefficient on *Non-Sticky* Δ*Bonus* is significantly positive while the coefficient on *Sticky* Δ*Bonus* is not statistically significant, indicating that stock market investors discount the sticky CEO bonus compensation. Finally, Model 3 addresses that the coefficient on *Sticky* Δ*Bonus w/ High IO* becomes significantly positive while the coefficient on *Sticky* Δ*Bonus w/ Low IO* remain insignificant. It implies that the discount on sticky CEO bonus compensation by stock market investors is alleviated by the institutional investors' monitoring effect.

Table 6. Value relevance of Stickiness by using another definition

	Dependent variables: *TobinQ*					
Independent variables	**[Model 1]**		**[Model 2]**		**[Model 3]**	
ΔBonus	0.110	(3.36)***				
Non-Sticky ΔBonus			0.173	(3.59)***	0.029	(2.66)***
Sticky ΔBonus			0.057	(1.28)		
Sticky ΔBonus w/ High IO					0.024	(2.36)**
Sticky ΔBonus w/ Low IO					-0.112	(-1.09)
Intercept	1.684	(73.36)***	1.684	(73.38)***	0.168	(31.93)***
N	6,748		6,748		6,748	
Adjusted-R^2	0.002		0.071		0.002	

Note: By defining compensation stickiness from Table 5, this table presents the results examining the value relevance of compensation stickiness. In this table, stickiness is alternatively calculated by using the time-series regression estimate for ΔROA *DD of equation (5) for firm *i*. The *t*-statistics are reported in parentheses. Variables shown in this table are defined in Appendix. ***, **, and * indicate the statistical significance at the 1%, 5%, and 10% level, respectively.

CONCLUSION

The literature (Hartzell & Starks, 2003; Almazan et al., 2005) suggests that institutional ownership concentration is positively associated with sensitivity to CEO compensation. Extending this finding to address the substantial problem of sticky CEO compensation, we posit that active monitoring by institutional shareholders, contrary to the optimal contracting theory, alleviates the deteriorating effect of sticky compensation arrangements on shareholder wealth.

Our primary findings are as follows: First, our panel regression results indicate that CEO compensation stickiness has a significantly negative association with Tobin's Q and annualized stock returns. This implies that sticky compensation arrangements reduce shareholder wealth. Second, we find that a higher concentration of institutional ownership induces lower CCS, indicating that institutional shareholders play an active monitoring role in sticky compensation arrangements. Finally, we conduct a panel regression using a modified specification with an institutional interaction term. The findings are consistent with the prediction that institutional ownership alleviates the aggravating effect of CCS on firm value.

Our results collectively lend empirical support to the active-monitoring hypothesis, which states that institutional shareholders mitigate both compensation stickiness and its value-deteriorating effect.

AUTHOR BIOGRAPHIES

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APPENDIX

Definition of dependent/independent variables	
Dependent variables	
ΔBonus	Natural logarithm of (CEO bonus compensation / lagged CEO bonus compensation) for firm *i* in year *t*.
TobinQ	Industry adjusted Tobin's Q computed by market value of assets divided by book value of assets for firm *i* in year *t*.
Return	Annualized cumulative stock return for firm *i* in year *t*.
Independent variables	
Δ*PROA*	ΔROA if ΔROA > 0, and 0 otherwise. ΔROA is defined as the natural logarithm of (return on assets / lagged return on assets) for firm *i* in year *t* where return on asset (ROA) is calculated as income before extraordinary items divided by lagged total asset.
Δ*NROA*	ΔROA if ΔROA < 0, and 0 otherwise. ΔROA is defined as the natural logarithm of (return on assets / lagged return on assets) for firm *i* in year *t* where ROA is calculated as income before extraordinary items divided by lagged total asset.
IO	1 if institutional ownership is greater than its mean from the Thomson Financial over the period of 1993-2015 and 0 otherwise.
Non-Sticky Δ*Bonus*	*ΔBonus* if the time-series regression estimate for Δ*NROA* of Equation (1) for firm *i* is greater than its mean value and 0 otherwise.
Sticky Δ*Bonus*	*ΔBonus* if the time-series regression estimate for Δ*NROA* of Equation (1) for firm *i* is less than its mean value and 0 otherwise.
Sticky Δ*Bonus w/ High IO*	*Sticky* Δ*Bonus* if *IO* is 1 and 0 otherwise.
Sticky Δ*Bonus w/ Low IO*	*Sticky* Δ*Bonus* if *IO* is 0 and 0 otherwise.
Δ*Asset*	Natural logarithm of (book value of assets / lagged book value of assets) for firm *i* in year *t*.
Δ*Sale*	Natural logarithm of (sales / lagged sales) for firm *i* in year *t*.
Δ*I_ROA*	Industry average of natural logarithm of (return on assets / lagged return on assets) for firm *i* in year *t*.

Note: This table describes the definitions of key variables in this study. Firm characteristics are obtained from the CRSP and COMPUSTAT databases, executive pay is from Execucomp, and institutional ownership is from Thomson Financial over the period of 1993-2015The sample excludes financial and utility firms. All continuous variables are winsorized at the top and bottom 1 percent level.