Heads I Win, Tails You Lose: Institutional Monitoring on Executive Pay Rigidity

Paul Moon Sub Choi

Ewha Womans University, Korea

Chune Young Chung

Chung-Ang University, Korea

JiHoon Hwang

University of Arizona

Chang Liu

California State University, Sacramento

Abstract

Agency theory argues that pay for performance alleviates the conflict of interest between managers and shareholders. Furthermore, the literature finds that institutional monitoring tends to promote the performance–pay linkage, thus aligning the two parties’ incentives. We find that executive compensation rigidity is negatively and significantly associated with firm value. Moreover, ownership by long-term institutional investors reduces the pay rigidity of top managers in underperforming firms, thus decreasing the value-destroying effect of the rigidity. Overall, these results reaffirm the role of institutional monitoring in mitigating managerial rent extraction.

JEL Classification: G23, G34, J33, M41

Acknowledgements

Chung (correspondence) can be contacted at bizfinance@cau.ac.kr; School of Business Administration, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul 06974, Korea; tel.: +82-2-820-5544. Special thanks are due to William Elliott (the Editor) and an anonymous referee. We also thank Warren Bailey, Lucian A. Bebchuk, Joung Hwa Choi, Ji-Woong Chung, Yaniv Grinstein, Byoung-Hyoun Hwang, Rajkamal Iyer, Andrew Karolyi, Hyunseob Kim, Y. Han (Andy) Kim, Jaehoon Lee, Bala Maniam, Jiangang Peng, and seminar participants at Hunan University (Changsha, Hunan, China), ISESS 2018 (Okinawa, Japan), and RICBFM 2019 (Kota Kinabalu, Malaysia). Part of this research was conducted while Choi was a visiting scholar at the Samuel Curtis Johnson Graduate School of Management, Cornell University, funded by the grant provided by the Fulbright Scholarship Program. This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2018S1A5A2A01029148). The authors contributed equally to this work. Standard disclaimer rules apply, and all errors are our own.

Heads I Win, Tails You Lose: Institutional Monitoring on Executive Pay Rigidity

Abstract

Agency theory argues that pay for performance alleviates the conflict of interest between managers and shareholders. Furthermore, the literature finds that institutional monitoring tends to promote the performance–pay linkage, thus aligning the two parties’ incentives. We find that executive compensation rigidity is negatively and significantly associated with firm value. Moreover, ownership by long-term institutional investors reduces the pay rigidity of top managers in underperforming firms, thus decreasing the value-destroying effect of the rigidity. Overall, these results reaffirm the role of institutional monitoring in mitigating managerial rent extraction.

JEL Classification: G23, G34, J33, M41

I. Introduction

Incentive compensation has long been a pivotal internal governance mechanism. Compensation policies that closely tie managerial emoluments to firm performance are deemed effective schemes that align the interests of corporate executives and outside shareholders, thus reducing agency costs (Core, Holthausen, and Larcker 1999; Grossman and Hart 1983; Hölmstrom 1979; Jensen and Meckling 1976; Jensen and Murphy 1990; Murphy 1999). However, performance-related pay is called into question when managers receive increasingly outsized compensation packages that are not justified by the growth of their firms (Crystal 1991; Blanchard, Lopez-de-Silanes, and Shleifer 1994; Bebchuk and Grinstein 2005). Moreover, the problem is exacerbated by the downward rigidity of pay-for-performance sensitivity (PPS), known as “pay without performance,” which implies that executive compensation does not diminish proportionally following poor firm performance (Garvey and Milbourn 2006; Gaver and Gaver 1998; Shaw and Zhang 2010). Some studies argue that the reduced PPS and pay without performance arise from the proclivity of top managers for rent extraction and directors’ inability to engage in arm’s length negotiations with managers over chief executive officer (CEO) compensation (Bebchuk, Fried, and Walker 2002; Bebchuk and Fried 2004). In a weakly governed firm, executives tend to receive non-performance-based pay, and incentive-based pay (e.g., stock options) is more likely to be timed opportunistically (e.g., Core, Holthausen, and Larcker 1999; Bertrand and Mullainathan 2001; Yermack 1997; Bebchuk, Grinstein, and Peyer 2010). In this article, we investigate whether institutional investors can ameliorate the suboptimal executive pay structures observed in corporate America and how these institutions are associated with shareholder value.

The prominent role of institutional investors in corporate governance has been well documented in the literature as their ownership of U.S. equities has increased steadily over time.

Shleifer and Vishny (1986) contend that large equity stakes held by institutional investors allow them to engage in shareholder activism, which provides sufficient benefits to overcome the associated costs. Extending this theoretical work, numerous empirical studies suggest that institutional investors can effect positive changes in corporate policies and internal governance structures (e.g., Chen, Harford, and Li 2007; Appel, Gormley, and Keim 2016; Liu, Chung, Sul, and Wang 2018; Harford, Kesckes, and Mansi 2018). Not surprisingly, the role of executive compensation as a major incentive-aligning scheme has been scrutinized closely. Evidence suggests that institutional investors not only prefer certain compensation structures, but also actively influence pay levels, PPS, and the pay-setting process through channels such as increasing the independence of the board compensation committee and sponsoring “say-on-pay” proxy campaigns (e.g., Hartzell and Starks 2003; Almazan, Hartzell, and Starks 2005; Chowdhury and Wang 2009; Ertimur, Ferri, and Muslu 2011; Ozkan 2011; Shin and Seo 2011). Improved pay structures lead to higher shareholder value and better firm performance.

However, a notable gap in the literature is the limited attention paid to the asymmetric nature of PPS. On the one hand, high PPS is not necessarily associated with improved shareholder value, particularly if shareholders are disproportionately burdened with excessive executive compensation or if executives’ pay responds as much to lucky market movements as it does to performance attributable to managerial success (Bertrand and Mullainathan 2001; Blanchard, Lopez-de-Silanes, and Shleifer 1994). On the other hand, when executives reap upside benefits from stellar performance, but are immune to downside operational losses, they tend to take unnecessary risks at the expense of shareholder value. In this study, we fill this void in the literature by adopting a new framework that specifically addresses downward executive compensation rigidity (ECR).

We first corroborate the evidence on the existence of ECR and test whether it negatively affects shareholder value. Then, we examine whether institutional monitoring constrains downward-rigid pay arrangements and how this affects shareholder wealth. Our analysis is based on a sample of 11,294 firm-year observations of U.S. firms from 1995 to 2012. The empirical findings are as follows. First, executive pay is more responsive when firms experience earnings increases versus decreases, which exemplifies the existence of ECR. Second, ECR undermines shareholder value, suggesting that downward-rigid compensation arrangements fail to incentivize executives to act in the best interests of shareholders. Third, a higher level of monitoring by institutions, measured by their ownership stake in a firm, reduces ECR and its negative effects on firm value. In particular, we show that institutions with long-term horizons and large shareholdings are effective in monitoring ECR and mitigating its adverse effects.

Overall, we provide new evidence on the monitoring role of institutional investors by examining the interplay between ECR, institutional ownership, and firm value. Our contributions to the literature are threefold. First, we substantiate the asymmetric, downward-rigid link between pay and performance (i.e., ECR) and confirm its value-destroying effect. Owing to the limited attention paid to ECR, few prior studies empirically differentiate between negative and positive PPS. In addition, the literature does not provide a consistent explanation for the existence of ECR. For example, Leone, Wu, and Zimmerman (2006) assume that a board has sufficient discretion when determining CEO pay and assert that cash compensation for CEOs is more sensitive to negative stock returns than it is to positive stock returns. With regard to the findings of Leone, Wu, and Zimmerman, Dechow (2006) indicates that managerial influence may drive the determination of executive pay. Garvey and Milbourn (2006), Gaver and Gaver (1998), and Shaw and Zhang (2010) also report a downward rigidity of CEO compensation and imply that the agency problem

may affect CEO pay, largely in favor of executives.¹ Here, we examine the effect of an accounting-based performance measure (change in return on assets [ROA]) on total CEO compensation and present empirical evidence that the substantial influence of executives over the board in terms of setting pay engenders ECR. Thus, we contribute to the literature by showing the negative relation between ECR and firm value, confirming that the agency problem leads to ECR.

Second, we identify the role of institutional investors in reducing the agency costs associated with ECR. In this case, our study is closely related to the literature (e.g., Shin and Seo 2011) in that we link institutional ownership to executive compensation and focus on the heterogeneity of institutional investors. However, several key differences remain. Shin and Seo (2011) do not examine asymmetry in PPS, which is necessary to provide a more nuanced view of the source of managerial opportunism in compensation. In addition, we believe that our classification of institutional heterogeneity based on an investment horizon is more relevant in determining institutional investors' incentives to monitor. In particular, Shin and Seo examine public pension funds and mutual funds separately, finding that ownership by the former is negatively associated with CEO PPS. They attribute this to a pension fund's fiduciary duty to invest prudently and to the concern that high PPS leads to greater risk taking (possibly excessively) by the CEO. However, this concern should be less significant when institutional investors can mitigate the downward rigidity of executive compensation, which Shin and Seo do not account for. This is because CEOs should be more cautious when their pay may suffer if the firm becomes distressed. Last, we extend the sample in Shin and Seo to provide updated evidence of institutional monitoring in the post–

¹Shue and Townsend (2017) present an alternative and complementary explanation for the excessive rise in CEO compensation. They find empirical evidence that the rigidity in the number of options granted to executives contributes to the existence of ECR. When stock prices rise rapidly, the number rigidity engenders fast growth in the value of the options granted. Shue and Townsend further note that this number rigidity may arise from cognitive biases or a lack of sophistication in valuing options.

Sarbanes–Oxley period, which is characterized by heightened awareness and a more favorable environment in which shareholders can engage in corporate governance.

Third, we elaborate on our research by showing that institutional investors with a long-term horizon are more likely to engage in active monitoring and, thus, constrain the downward rigidity of CEO compensation. Bushee (2001) asserts that “dedicated” institutions with large stakes in investee firms and a low turnover (i.e., a long-term horizon) are less focused on short-term results and pay greater attention to future firm value. This incentivizes such institutions to monitor and influence managers to improve their firms’ corporate governance. We find empirical evidence that institutions with long-term horizons mitigate ECR and its adverse effect on firm value.

II. Theory and Hypotheses

Rooted in agency theory, the optimal contracting hypothesis posits that executive compensation should stem from firm performance to incentivize top managers to maximize shareholder value (Abowd 1990; Core, Holthausen, and Larcker 1999; Grossman and Hart 1983; Hölmstrom 1979; Jensen and Meckling 1976; Jensen and Murphy 1990; McConaughy and Mishra 1996; Murphy 1999). Consistent with this conjecture, many studies present evidence that firms pursue optimal compensation contracts that are closely tied to their own and their rival’s performance (Core and Guay 1999; Aggarwal and Samwick 1999). Moreover, these performance-related contracts motivate executives to make strategic changes and to improve their firms’ corporate social responsibility, which ultimately lead to improved market performance (Abowd 1990; McConaughy and Mishra 1996; Carpenter 2000; Deckop, Merriman, and Gupta 2006).

Although the optimal contracting hypothesis assumes arm’s length bargaining between the board of directors and a firm’s executives in the pay-setting process, Crystal (1991) and Monks and Minow (2008) argue that top managers can effectively manipulate the board’s role in

determining executive pay. For instance, entrenched CEOs usually appoint friendly compensation committee members who are loyal to the CEO, rather than to the shareholders. In this regard, the managerial power hypothesis predicts that pay schemes are the direct outcome of, rather than the solution to, the agency problem and executive rent extraction (Bebchuk, Fried, and Walker 2002; Bebchuk and Fried 2003, 2004; Bertrand and Mullainathan 2001). In this context, Bebchuk and Grinstein (2005) and Bertrand and Mullainathan (2001) present evidence that executive pay increases far beyond industry-adjusted firm growth and that it increases as the result of favorable market movements (“pay for luck”) as much as it does from firm-specific performance (“pay for performance”). Additionally, Yermack (1997) and Bebchuk, Grinstein, and Peyer (2010) show that incentive options are usually granted opportunistically to allow profitable exercises for executives. Shin (2013) shows that powerful CEOs affect the pay-setting process and exploit peer benchmarking.

Downward ECR, or pay without performance, is defined as the degree to which executive pay is less sensitive to a decrease in firm performance than it is to an increase. When executives are rewarded for good firm performance, but are shielded from punishment when the firm underperforms, they have an incentive to take unnecessary risks at the expense of shareholders (i.e., “gambling with other people’s money”). Despite this possibility of alarming consequences, there is a lack of research on ECR. A few accounting studies focus on the cash component of CEO compensation, finding mixed evidence on cash ECR. For example, Leone, Wu, and Zimmerman (2006) show that CEO cash compensation is actually more sensitive to negative stock returns than to positive stock returns, which they rationalize in terms of the efficient ex post settling up of CEO pay. In contrast, both Gaver and Gaver (1998) and Shaw and Zhang (2010) find evidence of rigid CEO cash compensation when a firm experiences a loss in earnings. In the finance field, Garvey

and Milbourn (2006) link CEO pay to market movements and show that CEOs lose less pay from bad luck than they gain from good luck. Bettis et al. (2018) assert that the recent rise in the use of performance-vesting provisions in equity-based executive compensation is crucial to aligning managerial incentives with shareholders' interests. Note that we do not argue that optimal PPS is symmetric, because a certain degree of downside protection of executive compensation may serve as a retention device for talented managers and/or encourage risk taking by inherently risk-averse executives.² However, we expect that excessively downward-rigid pay results from managerial rent seeking and undermines shareholder value. Thus, we hypothesize as follows:

H1: Higher rigidity of executive pay leads to lower stock price performance.

More important, we clarify the role of institutional investors in monitoring and constraining distorted executive incentive arrangements. In most public corporations, the board of directors is responsible for determining the compensation of the CEO and other top executives. Typically, the board adopts a multiyear compensation program that includes an option plan that limits the total amount of stock-based rewards that can be provided to senior executives and lower level employees. However, Bebchuk, Fried, and Walker (2002) point out that powerful CEOs at the helm of modern corporations make arms' length bargaining difficult for the board and likely render executive compensation contracts suboptimal. In this context, large external shareholders, such as institutional investors, are expected to help control errant managerial behavior (Huddart 1993; Shleifer and Vishny 1986). For example, Chen, Harford, and Li (2007) find that independent long-term institutions with large holdings are effective in monitoring corporate mergers. Chung and Wang (2014) and Chung et al. (2015) show that monitoring by institutional investors is positively

²To the extent that executives are paid with stock options, they are already protected from the downside. Murphy (2013) shows that more than half of the total compensation for a typical S&P 500 CEO was accounted for by options in 2000.

associated with a sound capital structure, engendering strong firm performance. Gillan and Starks (2000) and Karpoff (2001), among others, document the success of active institutions in effecting positive changes through shareholder proxy votes. With respect to executive compensation, Almazan, Hartzell, and Starks (2005) and Hartzell and Starks (2003) show that institutional ownership is positively associated with PPS and that it mitigates the agency problem between shareholders and management.

Institutional investors can reduce downward ECR via various channels. For example, they can submit shareholder proposals at annual shareholder meetings that aim to improve executive compensation plans, nominate more independent directors to the board, or remove interlocking directors and limit CEO–chairman duality (Bebchuk 2003; Ertimur, Ferri, and Oesch 2013; Gillian and Starks 2000; Smith 1996).³ Accordingly, we expect institutional ownership to affect the pay-setting process in favor of shareholders (Albuquerque, Carter, and Lynch 2015; Alissa 2015; Cai and Walking 2011; Conyon and Sadler 2010; Ferri and Maber 2013; Hooghiemstra, Kuang, and Qin 2015). Thus, we hypothesize as follows:

H2a: A high level of institutional ownership reduces the degree of executive pay rigidity.

We further anticipate that the active monitoring role of institutional investors in corporate governance enhances firm value.⁴ Increased institutional ownership likely leads to a higher risk of dismissal and to a greater threat of derivative litigation against underperforming executives. Under institutional monitoring, the board is expected to work more independently from managerial influence in terms of setting executive pay. Several studies provide evidence of an overall positive association between institutional monitoring and firm value (Burkart, Gromb, and Panunzi 1997;

³We thank the editor, William Elliott, for his comment in this regard. Further, we provide an analysis of the ECR-reducing channel via institutional investors' presence on the board of directors in Appendix C.

⁴Michael Siconolfi, "At Morgan Stanley, Analysts Were Urged to Soften Harsh Views," *Wall Street Journal* (July, 14, 1992), pp. A1, A6.

Choi and Sias 2012; McConnell and Servaes 1990; Mørck, Shleifer, and Vishny 1988; Woidtke 2002). In summary, we contend that institutional monitoring should reduce the negative effect of ECR on firm value, yielding the following hypothesis:

H2b: *Institutional ownership mitigates the adverse relation between pay rigidity and stock price performance.*

III. Variables, Methods, and Data

Institutional Ownership

Following the literature, we designate a firm's level of institutional ownership, specified as the quarterly ratio of the number of shares held by institutions to the total number of shares outstanding, as a proxy for the extent of institutional monitoring. Because not all institutional investors monitor and discipline the firms they own, we decompose shareholdings into those held by monitoring and nonmonitoring institutions. Institutions with a long-term investment horizon are committed to monitoring, in which case subsequent reductions in ECR are expected to improve the firm's operational and financial performance (Chen, Harford, and Li 2007; Chung et al. 2015; Yan and Zhang 2009). Following Yan and Zhang (2009), we classify institutions with low (high) portfolio turnover as having a long-term (short-term) horizon by sorting the institutions in each quarter t into terciles, based on their average portfolio turnover over the previous four quarters. The quarterly portfolio turnover (churn rate) is computed as follows:

$$CR_{k,t} = \min(Buy_{k,t}, Sell_{k,t}) / \left(\sum_{i=1}^{N_k} \frac{S_{k,i,t}P_{i,t} + S_{k,i,t-1}P_{i,t-1}}{2} \right), \quad (1)$$

where $Buy_{k,t}$ and $Sell_{k,t}$ are aggregate purchases and sales, respectively, by investor k in quarter t ; $P_{i,t-1}$ and $P_{i,t}$ are the share prices for firm i at the end of quarters $t-1$ and t , respectively; and $S_{k,i,t-1}$ and $S_{k,i,t}$ are the numbers of shares of company i held by investor k at the end of

quarters $t-1$ and t , respectively. Short-term institutional ownership (SIO) denotes institutional ownership in the top quarterly portfolio turnover tercile whereas long-term institutional ownership (LIO) represents holdings by institutions in the bottom tercile.

ECR and Firm Value

In the model used to estimate PPS, we test for the asymmetric sensitivity of executive pay to corporate performance by incorporating a dummy variable to capture a decrease in the performance of a firm (equation (2) below). Following Sloan (1993) and Leone, Wu, and Zimmerman (2006), we employ *ROA*, defined as net income scaled by total assets at the beginning of the year, as the operating performance measure. A decrease in *ROA* from year $t-1$ to year t indicates a deterioration in performance. In equation (2), conditional on a positive and significant coefficient β_1 , a negative and significant β_3 coefficient suggests pay rigidity (i.e., a smaller pay sensitivity when *ROA* decreases):

$$\Delta Pay_{it} = \beta_0 + \beta_1 \Delta ROA_{it} + \beta_2 DD_{it} + \beta_3 \Delta ROA_{it} \times DD_{it} + \sum \beta_c Controls_{it} + \epsilon_{it}. \quad (2)$$

Equation (2) follows Jackson, Lopez, and Reitenga (2008), in which the relation between the change in executive pay and the change in ROA is analyzed while controlling for differences in executive-specific factors between firms. Here, ΔPay_{it} is the natural logarithm of the ratio of total executive pay to lagged total executive pay for firm i in year t ; ΔROA_{it} is the natural logarithm of the ratio of ROA to lagged ROA for firm i in year t ; and DD_{it} is an indicator of poor performance, which equals 1 if the ROA in year t is less than that in year $t-1$, and 0 otherwise. Then, $Controls_{it}$ is a group of control variables, defined as follows. First, $\Delta Assets_{it}$ is the natural logarithm of the ratio of the book value of assets to the lagged book value of assets for firm i in year t . Schaefer (1998) demonstrates that a CEO's PPS may decrease with firm size, merely because the size of the relevant management team shrinks in proportion. In contrast, Jensen

and Murphy (1990) suggest that the PPS is greater in a small firm than in a large firm. Second, $\Delta Sales_{it}$ is the natural logarithm of the ratio of sales to lagged sales for firm i in year t . Murphy (1985) finds that executive pay is positively associated with the growth in sales, contending that previous cross-sectional studies have omitted important variables, which has strongly skewed their results. Third, ΔI_ROA_{it} is the industry average of the natural logarithm of the ratio of ROA to lagged ROA for firm i in year t . Finally, we obtain the year and Fama and French (1997) 48-industry fixed effects.

Extending Easton and Harris's (1991) specification to test Hypothesis H1, we identify empirical models that relate rigid executive pay to stock returns and to Tobin's Q (Tobin 1969). In equation (3), the effect of ECR is captured by the coefficient β_3 , where a negative sign reflects an erosion in firm performance as a result of ECR:

$$Return_{it} \text{ or } Q_{it} = \beta_0 + \beta_1 CI_{it} + \beta_2 \Delta CI_{it} + \beta_3 Rigidity_{it} + \epsilon_{it}, \quad (3)$$

where $Return_{it}$ is the annualized stock return for firm i in year t ; Q_{it} is industry-adjusted Tobin's Q, computed as the market value of assets divided by the book value of assets for firm i in year t ; CI_{it} is comprehensive income (CI) for firm i in year t , normalized by the stock price at the end of year $t-1$; ΔCI_{it} is the ratio of CI to lagged CI for firm i in year t , normalized by the stock price at the end of year $t-1$; and $Rigidity$ is a dummy variable equal to 1 if the time-series coefficient estimate of the interaction term $\Delta ROA_{it} \times DD_{it}$ in equation (2) for firm i in year t is less than or equal to zero, and 0 otherwise. These key variables in our empirical tests are defined in Appendix A.

Verifying H2a requires that we incorporate institutional ownership into the estimation model for ECR (equation (2)). According to a sizable body of literature, institutional ownership serves as a proxy for the intensity of institutional monitoring. For each firm-year observation, we

obtain the most recent quarterly institutional ownership that is at least one year before the fiscal year-end when executive pay is computed. For example, for a firm observed in the fiscal year that ended in February 2010, the annual executive pay covers February 2009 to February 2010, and we obtain the corresponding institutional ownership in December 2008.⁵ This ensures that monitoring institutions have sufficient time to influence the executive pay structure. We expect the coefficient β_5 in equation (4) to be positive if pay rigidity decreases in the presence of institutional ownership, owing to the active monitoring of pay arrangements by institutional shareholders:

$$\begin{aligned}\Delta Pay_{it} = & \beta_0 + \beta_1 \Delta ROA_{it} + \beta_2 DD_{it} + \beta_3 \Delta ROA_{it} \times DD_{it} \\ & + \beta_4 IO_{i,t-1} + \beta_5 \Delta ROA_{it} \times DD_{it} \times IO_{i,t-1} + \beta_{etc.} Other\ Interaction\ Terms_{it} \\ & + \sum \beta_c Controls_{it} + \epsilon_{it},\end{aligned}\tag{4}$$

where $IO_{i,t-1}$ is total institutional ownership, computed as the number of shares held by all institutions divided by the shares outstanding for firm i in year $t-1$. We also use $SIO_{i,t-1}$ and $LIO_{i,t-1}$, which measure institutional ownership by short-term and long-term institutions, respectively, for firm i in year $t-1$ in place of $IO_{i,t-1}$ to incorporate the heterogeneity of institutional monitoring. The remaining variables are defined in the same way as in equation (2).

Finally, testing H2b necessitates that we identify the effect of the interaction between ECR and institutional monitoring on firm value. In equation (5), institutional ownership is expected to mitigate the possible negative effect of rigid executive pay on firm value if $\beta_3 < 0$ and $\beta_4 > 0$:

$$Return_{it} \text{ or } Q_{it} = \beta_0 + \beta_1 CI_{it} + \beta_2 \Delta CI_{it} + \beta_3 Rigidity_{it} + \beta_4 Rigidity_{it} \times IO_{i,t-1} + \epsilon_{it},\tag{5}$$

where all variables are defined as above.

Data and Descriptive Statistics

⁵Institutions report their holdings in their 13F filings every quarter. Hence, December 2008 is the most recent quarter-end one year before February 2010.

The primary source of our executive compensation data is ExecuComp,⁶ from which we obtain total annual salaries, bonuses, long-term incentives, stock and option grants, and other types of compensation for up to five top-level executives, with at least two consecutive years of coverage. Firm characteristics are acquired from the Center for Research in Securities Prices (CRSP) and Compustat databases. Institutional ownership data are procured from Thomson Reuters, which compiles data on quarterly institutional holdings from Form 13F filings.⁷ We exclude all financial (Standard Industrial Classification [SIC] codes 6000–6999) and utility (SIC codes 4900–4949) firms because these industries are highly regulated. We obtain Fama and French’s (1997) 48-industry classifications from Kenneth French’s website.⁸ After consolidating data from various sources, our final sample comprises 11,294 firm-year observations of S&P 1500 firms for 1995–2012.

Table 1 presents descriptive statistics for the full sample. The average rate of change in total executive pay (ΔPay) is .063, indicating a 6.3% annual increase. Then, ΔROA and ΔCI are negative, on average, showing that both ROA and accounting earnings decreased during the same period. These results imply that although average executive compensation has increased, average corporate earnings have deteriorated. More important, mean *Rigidity* captured by the time-series regression estimate of $\Delta ROA \times DD$ is, on average, positive (.5257), revealing that performance-related pay is rigid overall. Mean total institutional ownership is 67.49%, implying that institutions, on average, hold 67.49% of a firm’s outstanding shares, of which long-term

⁶There may be a backfilling bias in the ExecuComp database that affects the magnitude of PPS estimates and, thus, the coefficients of the regressions that use these estimates (Gillan et al. 2018).

⁷Under Section 13F of the Securities Exchange Act of 1934, all institutional investors with US\$100 million or more under management are required to report all equity positions greater than 10,000 shares or US\$200,000 to the U.S. Securities and Exchange Commission at the end of each quarter.

⁸http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_49_ind_port.html

(short-term) institutions account for 20.48% (15.2%). The large holdings of monitoring institutions (i.e., LIO) grant them sufficient voting rights to influence corporate decisions.

[Insert Table 1 about here.]

IV. Main Results

Pay for Performance or Pay Without Performance and Firm Value

Examining the link between corporate performance and executive compensation, many studies employ the following proxy for PPS (Almazan, Hartzell, and Starks 2005; Hartzell and Starks 2003), which is derived as the slope coefficient (β) of the following regression model:

$$\Delta Pay_{it} = \alpha + \beta \cdot \Delta Shareholder\ Wealth_{it} + \epsilon_{it}, \quad (6)$$

where, for firm i , ΔPay_{it} is the change in executive pay between years $t-1$ and t , and $\Delta Shareholder\ Wealth_{it}$ is the change in shareholder wealth over the same period.

Panel A in Table 2 shows a positive correlation between changes in market capitalization and total executive pay for both increases ($\Delta Market\ Capitalization > 0$) and decreases ($\Delta Market\ Capitalization < 0$) in firm value. Panel B shows panel regressions of the change in total executive pay on the change in market capitalization. Model 1 revisits the PPS model used in the literature (equation (6)), where the estimated PPS is positive and significant ($\hat{\beta} = .1079$; $t = 12.61$). Then, we rerun the PPS model based on the direction of the change in firm value in models 2 and 3, where the PPS estimate is positive and significant in both models. However, note that the magnitude is smaller on the downside when firm value decreases ($\Delta Market\ Capitalization < 0$; model 3) than it is on the upside ($\Delta Market\ Capitalization > 0$; model 2), hinting at possible asymmetry in the PPS. In model 4, we interact the change in market capitalization with a dummy variable (MC_Dummy) that indicates whether the firm value is increasing (equal to 1) or decreasing (equal to 0). The negative and significant coefficient estimate of the interaction term

$(\Delta \text{Market Capitalization} \times MC_Dummy)$ indicates that executive pay responds asymmetrically to different realizations of firm performance: the PPS value is significantly lower when the market value of equity decreases than when it increases. This implies nonlinearity in the PPS measure with respect to firm value and indicates a bias in the positive association documented in the literature when nonlinearity is not accounted for.

[Insert Table 2 about here.]

According to traditional agency theory, a higher PPS value mitigates agency costs. However, scholars on managerial power note that the pervasive nature of downward ECR (i.e., excessive pay for executives in underperforming firms) erodes shareholder wealth (e.g., Bebchuk and Fried 2004). Accordingly, a low PPS value understates the agency problem, particularly when corporate earnings deteriorate. The downward-rigid compensation is apparent in our PPS estimates reported in Panel B of Table 2, as suggested by the negative coefficient of the interaction term in model 4.

We define ECR, or pay without performance, as lower PPS when the firm value decreases than that when it increases. The degree of ECR reflects the magnitude of executives' rent extraction and is measured by asymmetric PPS on the downside. Table 3 summarizes the estimation results for ECR based on equation (2), where a change in executive pay is related to a change in a firm's operating performance. Here, we consider the change in a firm's operating performance (ROA) instead of the change in shareholder wealth, because shareholder wealth is highly volatile and thus not regarded as a stable gauge of executive performance. In addition, we focus on the way in which executives' direct performance is associated with their compensation contracts. Based on panel regressions by year and the Fama–French (1997) 48-industry fixed effects, and controlling for clustered standard errors (Peterson 2009), models 1 and 2 suggest that the overall compensation

of executives in the sample firms increases with improvements in the firms' performance. Given the positive and significant coefficient estimate (β_1) of the change in ROA (ΔROA), the negative and strong coefficient of the interaction term ($\Delta ROA \times DD$) with the "poor performance" dummy (DD) corroborates the existence of pay without performance (ECR).⁹ The Fama–MacBeth (1973) regressions reported in models 3 and 4 provide an interpretation qualitatively equivalent to models 1 and 2. In summary, these outcomes confirm that PPS is greater for firms that perform well than for those that underperform, which exemplifies the existence of the ECR phenomenon and is consistent with findings documented in the literature (Garvey and Milbourn 2006).

[Insert Table 3 about here.]

Based on equation (3), models 1 and 2 (see Table 4) establish the value-destroying effect of ECR using panel regressions of stock returns (model 1) and industry-adjusted Tobin's Q (model 2), controlling for Petersen's (2009) robust standard errors. We find that the impacts (coefficient estimates) of ECR (*Rigidity*) are both economically and statistically negative, implying that pay without performance has a severe detrimental effect on shareholder wealth. This occurs regardless of whether institutional ownership is identified as being long term (monitoring) (model 2) or short term (transient) (model 1). The Fama–MacBeth (1973) regressions of stock returns and Tobin's Q with the same specifications are presented in models 3 and 4, respectively, and provide largely identical inferences. Thus, the results in Table 4 support H1.

[Insert Table 4 about here.]

⁹As a robustness check, we provide an alternative definition of DD as a dummy variable that equals 1 if the current year's ROA is 10% or 20% lower than that of the previous year. Though unreported for brevity, we still find that PPS is greater for firms that perform well than it is for those that underperform, which is consistent with the findings in Table 3. In addition, we use the return on equity (ROE) measure instead of ROA as an additional robustness test and find qualitatively equivalent results as in Table 3. These results are available upon request.

Institutional Investors, ECR, and Firm Value

If institutions actively monitor pay without performance, we can expect a negative relation between monitoring institutions' ownership and ECR. To examine this, we sort our sample firms, in ascending order, into five equally weighted quintile portfolios, based on the percentage ownership of all (IO), long-term (LIO), and short-term (SIO) institutions. Then, we compute the corresponding mean values of ECR (*Rigidity*) in each quintile (see Table 5).

[Insert Table 5 about here.]

Overall, we find an inverse association between all measures of institutional ownership and ECR values. The *t*-test of the difference between the ECRs of the first quintile (lowest ownership) and fifth quintile (highest) firms, sorted by IO, is negative and significant ($t = -2.88$). The sign and magnitude are most pronounced ($t = -3.23$) for the difference between the ECRs of the two extreme quintiles sorted by LIO, whereas the difference between the quintiles of firms sorted by SIO is statistically insignificant. These univariate relations provide preliminary evidence in favor of Hypothesis H2a. Furthermore, they confirm the conventional wisdom in the literature that long-term institutions play an active monitoring role, whereas their short-term counterparts simply trade on their informational advantage (Chen, Harford, and Li 2007; Yan and Zhang 2009).

Based on equation (4), models 1 and 2 (shown in Table 6) show the results of multivariate regressions of the change in executive pay (ΔPay) on all institutions (IO; model 1) and on short-term (SIO) versus long-term (LIO) institutions (model 2). Here, we control for covariates such as year and Fama–French (1997) industry fixed effects and use Petersen's (2009) robust standard errors. Model 1 shows a positive and significant ($\hat{\beta}_1$) coefficient estimate for the change in corporate earnings (ΔROA), as well as a negative and significant ($\hat{\beta}_3$) coefficient estimate for the interaction of the change in earnings and the “poor performance” dummy ($\Delta ROA \times DD$).

Therefore, a positive and significant sign for the coefficient ($\hat{\beta}_5$) of the three-way interaction term ($\Delta ROA \times DD \times IO$) indicates that an increase in institutional holdings (IO) mitigates ECR significantly. As suggested in the univariate tests shown in Table 5, model 2 confirms the effective monitoring of long-term institutions (LIO), with a positive and significant coefficient estimate of the three-way interaction term reflecting the ownership of long-term institutional investors ($\Delta ROA \times DD \times LIO$). However, the coefficient estimate of the interaction term for SIO ($\Delta ROA \times DD \times SIO$) appears to be statistically insignificant. In other words, executive pay is less rigid in firms with a higher level of institutional ownership (particularly long-term ownership), confirming that long-term institutional shareholders play active monitoring and advisory roles in setting compensation arrangements. The Fama–MacBeth (1973) counterparts of models 1 and 2, reported in models 3 and 4, respectively, lead to largely unchanged inferences. Although many previous studies cite a positive association between PPS and monitoring as evidence of lower agency costs (Almazan, Hartzell, and Starks 2005; Hartzell and Starks 2003; Hwang and Kim 2009; Ozkan 2011), their findings are likely to be biased on the downside of a change in corporate earnings. The implication of our asymmetric measure of PPS suggests that institutional monitoring is effective in constraining the downward-rigid compensation of top managers in firms that show disappointing performance.¹⁰

[Insert Table 6 about here.]

Turning to Hypothesis H2b, we examine how firm value is affected by institutional monitoring and ECR. Using various measures of institutional ownership (IO , SIO , and LIO) as proxies for the degree of institutional monitoring, we extend the results in Table 4 on the negative

¹⁰We replicate Table 6 using ROE instead ROA as a robustness check and find qualitatively equivalent results, available upon request.

association between executive pay rigidity and firm value by interacting institutional ownership with our measure of ECR (*Rigidity*).¹¹ The estimates of multiple models based on equation (5) are presented in Table 7. Specifically, models 1–4 are panel regressions, with Petersen’s (2009) robust standard errors of stock returns (models 1 and 3) and industry-adjusted Tobin’s Q (models 2 and 4), on ECR and the interaction of ECR with institutional monitoring. Our estimates reveal the following findings. First, the detrimental impact of pay without performance on firm value is evident in terms of the magnitude and significance of the negative coefficient estimate of *Rigidity* ($\hat{\beta}_3 < 0$), regardless of whether we focus on total institutional ownership (IO; models 1 and 2) or distinguish between SIO and LIO (models 3 and 4). Second, and more important, for Hypothesis H2b, we find that larger institutional holdings, particularly those owned by long-term monitoring institutions (i.e., LIO), alleviate the value-destroying effect of downward ECR, as

¹¹We adopt this new approach because we cannot estimate firm-level rigidity each year based on the cross-sectional regression approach in equation (2), which is commonly used in the literature. Here, the time-series approach allows us to overcome the restriction on measuring firm-level rigidity. However, this approach could be subject to a look-ahead bias if the estimated firm-level rigidity is used in the cross-sectional/panel analysis, as in equation (5). Hence, as a robustness check, we estimate rigidity based on past observations so that institutional investors can obtain the information they require before monitoring the rigidity. Because the time-series regression approach requires sufficient observations for each firm to estimate the rigidity coefficient, we restrict the sample to firms with at least 15 observations. This leads to the estimation period 1995–2009 for the rigidity measure. We examine the effect of institutional investors on firm value subject to the degree of lagged compensation rigidity during 2010–2012. Because the investigation period is only three years (which limits the use of the Fama–MacBeth, 1973, regression approach), we consider only a panel regression estimation adjusted for robust clustering (Petersen 2009). We find that the negative relations between the rigidity dummy and firm value are still significant, corroborating the negative effect of ECR on firm value. More important, the coefficients for the interaction term between the institutional monitoring measure and the rigidity dummy are positive and significant in all models. These findings are largely consistent with Hypothesis H2a. Hence, we believe our results are not materially affected by a look-ahead bias. The results are available upon request.

suggested by the positive and significant coefficients of the interaction terms $Rigidity \times IO$ and $Rigidity \times LIO$ observed in all models.

[Insert Table 7 about here.]

Models 5–8 of Table 7 are similar, estimated using the Fama–MacBeth (1973) method, and largely corroborate the evidence shown in models 1–4.¹² Our results on the beneficial effect of long-term institutional investors substantiate the positive association between committed institutional monitoring and firm value. We extend our claims further by highlighting the role of active monitoring by long-term institutional shareholders in mitigating the wealth-undermining ECR. In Appendix B, we provide robustness tests based on alternative measures of institutional monitoring and find that the results are consistent with the findings shown in Tables 6 and 7. Overall, the outcomes presented in Table 7 support Hypothesis H2b.

V. Conclusion

The literature suggests that institutional monitoring is positively associated with the sensitivity of executive pay to firm performance (Almazan, Hartzell, and Starks 2005; Hartzell and Starks 2003; Shin and Seo 2011). Here, we extend this finding to address the persistent phenomenon of rigid executive pay when a firm underperforms, which biases the conventional PPS measure. As such, we posit that active monitoring by institutional shareholders in the presence of suboptimal compensation contracts mitigates the damaging effect of rigid pay arrangements on shareholder wealth. Our empirical findings are as follows. First, ECR is negatively and significantly associated

¹²Our findings might be altered by not controlling for CEO turnover, because CEO compensation is materially affected in a year when a CEO turnover occurs, which dilutes the measure of compensation rigidity. As a robustness check, we reestimate our main hypothesis based on a sample that excludes firm-year observations with CEO turnovers. The results remain consistent. Though unreported for brevity, the results are available upon request.

with firm value, measured by stock returns and Tobin's Q. In other words, downward-rigid pay arrangements are detrimental to shareholder wealth. Second, we find that a higher level of institutional ownership induces lower ECR, indicating that institutional shareholders, particularly those with a long-term investment horizon, play an active monitoring role that constrains the value-destroying effects of rigid pay schemes. These important conclusions are robust to alternative measures of institutional ownership. Collectively, our results lend empirical support to the active monitoring hypothesis.

Although our findings are consistent with the role of institutional monitoring in curbing executives' rent extraction, we acknowledge the following caveats. First, executive compensation is part of the overall incentive-alignment mechanism between firms and managers and, thus, may not fully reflect the extent of performance-driven rewards and punishment. For example, the board of directors can replace executives rather than reduce their pecuniary compensation when firms report substantially poor performance. In addition, curtailing executive compensation may decrease managerial morale, causing talented managers to depart. Hence, future research should investigate the optimal level of PPS and ECR. Second, we use the coefficient of change in pay, scaled by ROA, as a measure of pay rigidity. Because a large component of pay is stock and stock options, the pay level and change in pay vary as a function of stock returns and accounting performance (e.g., Leone, Wu, and Zimmerman 2006). By omitting stock returns, our results may underestimate PPS. Third, because we study the effect of pay rigidity on firm performance (stock returns and Tobin's Q), the causal interpretation that pay rigidity destroys value may require further endogeneity tests. For example, we have not controlled for marketwide covariates, such as market size (SMB) and value (HML) premium factors (Fama and French 1993). Similarly, variables related to board structure and/or CEO skills are not included. Finally, the components of

pay may vary in terms of their sensitivity to performance (Garvey and Milbourn 2006; Leone, Wu, and Zimmerman 2006). We leave these questions to future studies.

References

- Abowd, J. M., 1990, Does performance-based managerial compensation affect corporate performance? *Industrial and Labor Relations Review* 43, 52–73.
- Aggarwal, R., and A. A. Samwick, 1999, Executive compensation, strategic competition and relative performance evaluation: Theory and evidence, *Journal of Finance* 54, 1999–2043.
- Albuquerque, A. M., M. E. Carter, and L. J. Lynch, 2015, Court intervention as a governance mechanism over CEO pay: Evidence from the Citigroup derivative lawsuit, *European Accounting Review* 24, 637–58.
- Alissa, W., 2015, Boards' response to shareholders' dissatisfaction: The case of shareholders' say on pay in the UK, *European Accounting Review* 24, 727–52.
- Almazan, A., J. C. Hartzell, and L. T. Starks, 2005, Active institutional shareholders and cost of monitoring: Evidence from executive compensation, *Financial Management* 34, 5–34.
- Appel, I., T. Gormley, and D. Keim, 2016, Passive investors, not passive owners, *Journal of Financial Economics* 121, 111–41.
- Bebchuk, L. A., 2003, The case for shareholder access to the ballot, *The Business Lawyer* 59, 43–66.
- Bebchuk, L. A., and J. M. Fried, 2003, Executive compensation as an agency problem, *Journal of Economic Perspectives* 17, 71–92.

- Bebchuk, L. A., and J. M. Fried, 2004, Pay without performance: The unfulfilled promise of executive compensation, Boalt Working Papers in Public Law, University of California, Berkeley.
- Bebchuk, L. A., J. M. Fried, and D. J. Walker, 2002, Managerial power and rent extraction in the design of executive compensation, *University of Chicago Law Review* 69, 751–846.
- Bebchuk, L. A., and Y. Grinstein, 2005, The growth of executive pay, *Oxford Review of Economic Policy* 21, 283–303.
- Bebchuk, L. A., Y. Grinstein, and U. Peyer, 2010, Lucky CEOs and lucky directors, *Journal of Finance* 65, 2363–401.
- Becht, M., J. Franks, C. Mayer, and S. Rossi, 2009, Returns to shareholder activism. Evidence from a clinical study of the Hermes UK Focus Fund, *Review of Financial Studies* 22, 3093–129.
- Bertrand, M., and S. Mullainathan, 2001, Are CEOs rewarded for luck? The ones without principals are, *Quarterly Journal of Economics* 116, 901–32.
- Bettis, J. C., J. M. Bizjak, J. L. Coles, and S. L. Kalpathy, 2018, Performance-vesting provisions in executive compensation, *Journal of Accounting and Economics* 66, 194–221.
- Blanchard, O. J., F. Lopez-de-Silanes, and A. Shleifer, 1994, What do firms do with cash windfalls? *Journal of Financial Economics* 36, 337–60.
- Burkart, M., D. Gromb, and F. Panunzi, 1997, Large shareholders, monitoring, and the value of the firm, *Quarterly Journal of Economics* 112, 693–728.
- Bushee, B. J., 2001, Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research* 18, 207–46.

- Cai, J., and R. A. Walking, 2011, Shareholders' say on pay: Does it create value? *Journal of Financial and Quantitative Analysis* 46, 299–339.
- Carleton, W. T., J. M. Nelson, and M. S. Weisbach, 1998, The influence of institutions on corporate governance through private negotiations: Evidence from TIAA-CREF, *Journal of Finance* 53, 1335–62.
- Carpenter, M., 2000, The price of change: The role of CEO compensation in strategic variation and deviation from industry strategy norms, *Journal of Management* 26, 1179–98.
- Chen, X., J. Harford, and K. Li, 2007, Monitoring: Which institutions matter? *Journal of Financial Economics* 86, 279–305.
- Choi, N., and R. Sias, 2012, Why does financial strength forecast stock returns? Evidence from subsequent demand by institutional investors, *Review of Financial Studies* 25, 1550–87.
- Chowdhury, S., and E. Z. Wang, 2009, Institutional activism types and CEO compensation: A time-series analysis of large Canadian corporations, *Journal of Management* 35, 5–36.
- Chung, C. Y., and K. Wang, 2014, Do institutional investors monitor management? Evidence from the relationship between institutional ownership and capital structure, *North American Journal of Economics and Finance* 30, 203–33.
- Chung, C. Y., C. Liu, K. Wang, and B. Zykaj, 2015, Institutional monitoring: Evidence from F-score, *Journal of Business Finance and Accounting* 42, 885–914.
- Conyon, M., and G. Sadler, 2010, Shareholder voting and directors' remuneration report legislation: Say on pay in the UK, *Corporate Governance: An International Review* 18, 296–312.
- Core, J., and W. Guay, 1999, The use of equity grants to manage optimal equity incentive levels, *Journal of Accounting and Economics* 28, 151–84.

- Core, J. E., R. W. Holthausen, and D. F. Larcker, 1999, Corporate governance, chief executive officer compensation, and firm performance, *Journal of Financial Economics* 51, 371–406.
- Crystal, G. S., 1991, *In Search of Excess: The Overcompensation of American Executives* (W.W. Norton, New York).
- DeAngelo, H. and L. DeAngelo, 1989, Proxy contests and the governance of publicly held corporations, *Journal of Financial Economics* 23, 29–59.
- Dechow, P. M., 2006, Asymmetric sensitivity of CEO cash compensation to stock returns: A discussion, *Journal of Accounting and Economics* 42, 193–202.
- Deckop, J., K. Merriman, and S. Gupta, 2006, The effects of CEO pay structure on corporate social performance, *Journal of Management* 32, 329–42.
- Easton, P., and T. Harris, 1991, Earnings as an explanatory variable for returns, *Journal of Accounting Research* 29, 19–36.
- Easton, P., and J. Pae, 2004, Accounting conservatism and the relation between returns and accounting data, *Review of Accounting Studies* 9, 495–521.
- Ertimur, Y., F. Ferri, and V. Muslu, 2011, Shareholder activism and CEO pay, *Review of Financial Studies* 24, 535–92.
- Ertimur, Y., F. Ferri, and D. Oesch, 2013, Shareholder votes and proxy advisors: Evidence from say on pay, *Journal of Accounting Research* 51, 951–96.
- Fama, E. F., and K. R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3–56.
- Fama, E. F., and K. R. French, 1997, Industry costs of equity, *Journal of Financial Economics* 43, 153–93.

- Fama, E. F., and J. MacBeth, 1973, Risk, return, and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607–36.
- Ferri, F., and D. A. Maber, 2013, Say on pay votes and CEO compensation: Evidence from the UK, *Review of Finance* 17, 527–63.
- Garvey, G. M., and T. T. Milbourn, 2006, Asymmetric benchmarking in compensation: Executives are rewarded for good luck but not penalized for bad, *Journal of Financial Economics* 82, 197–225.
- Gaver, J. G., and K. M. Gaver, 1998, The relation between nonrecurring accounting transactions and CEO cash compensation, *Accounting Review* 73, 235–53.
- Gillan, S., J. C. Hartzell, A. Koch, and L. T. Starks, 2018, Getting the incentives right: Backfilling and biases in executive compensation data, *Review of Financial Studies* 31, 1460–98.
- Gillan, S. L., and L. T. Starks, 2000, Corporate governance proposals and shareholder activism: The role of institutional investors, *Journal of Financial Economics* 57, 275–305.
- Grossman, S. J., and O. D. Hart, 1983, An analysis of the principal-agent problem, *Econometrica* 51, 7–45.
- Hadlock, C. J., and M. Schwartz-Ziv, 2018, Blockholder heterogeneity, multiple blocks, and the dance between blockholders, Unpublished manuscript.
- Harford, J., A. Keschkes, and S. Mansi, 2018, Do long-term investors improve corporate decision making? *Journal of Corporate Finance* 50, 424–52.
- Hartzell, J. C., and L. T. Starks, 2003, Institutional investors and executive compensation, *Journal of Finance* 58, 2351–74.
- Hölmstrom, B., 1979, Moral hazard and observability, *Bell Journal of Economics* 10, 74–91.

- Hooghiemstra, R., Y. F. Kuang, and B. Qin, 2015, Say-on-pay votes: The role of the media, *European Accounting Review* 24, 753–78.
- Huddart, S., 1993, The effect of a large shareholder on corporate value, *Management Science* 39, 1407–21.
- Hwang, B.-H., and S. Kim, 2009, It pays to have friends, *Journal of Financial Economics* 93, 138–58.
- Jackson, S. B., T. J. Lopez, and A. L. Reitenga, 2008, Accounting fundamentals and CEO bonus compensation, *Journal of Accounting and Public Policy* 27, 374–93.
- Jensen, M. C., and W. H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305–60.
- Jensen, M. C., and K. J. Murphy, 1990, Performance pay and top-management incentives, *Journal of Political Economy* 98, 225–64.
- Karpoff, J. M., 2001, The impact of shareholder activism on target companies: A survey of empirical findings, Working Paper, University of Washington.
- Leone, A. J., J. S. Wu, and J. L. Zimmerman, 2006, Asymmetric sensitivity of CEO cash compensation to stock returns, *Journal of Accounting and Economics* 42, 167–92.
- Liu, C., C. Y. Chung, H. K. Sul, and K. Wang, 2018, Does hometown advantage matter? The case of institutional blockholder monitoring on earnings management in Korea, *Journal of International Business Studies* 49(2), 196–221.
- McCahery, J. A., Z. Sautner, and L. T. Starks, 2016, Behind the scenes: The corporate governance preferences of institutional investors, *Journal of Finance* 71, 2905–2932.
- McConaughy, D. L., and C. S. Mishra, 1996, Debt, performance-based incentives and firm performance, *Financial Management* 25, 37–51.

- McConnell, J., and H. Servaes, 1990, Additional evidence on equity ownership and corporate value, *Journal of Financial Economics* 27, 595–612.
- Monks, R. A. G., and N. Minow, 2008, *Corporate Governance* (Blackwell Publishing, Oxford).
- Mørck, R., A. Shleifer, and R. Vishny, 1988, Management ownership and market valuation: An empirical analysis, *Journal of Financial Economics* 20, 293–315.
- Murphy, K. J., 1985, Corporate performance and managerial remuneration: An empirical analysis, *Journal of Accounting and Economics* 7, 3–36.
- Murphy, K. J., 1999, Executive compensation, in O. Ashenfelter and D. Card, eds.: *Handbook of Labor Economics* (North Holland, Amsterdam), vol. 3, 2485–2563.
- Murphy, K. J., 2013, Executive compensation: Where we are, and how we got there, in G. M. Constantinides, M. Harris, and R. M. Stulz, eds.: *Handbook of the Economics of Finance* (North Holland, Amsterdam), vol. 2, 211–356.
- Newey, W. K., and K. D. West, 1987, A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica* 55, 703–08.
- Newey, W. K., and K. D. West, 1994, Automatic lag selection in covariance matrix estimation, *Review of Economic Studies* 61, 631–54.
- Ozkan, N., 2011, CEO compensation and firm performance: An empirical investigation of UK panel data, *European Financial Management* 17, 260–85.
- Petersen, M. A., 2009, Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies* 22, 435–80.
- Schaefer, S., 1998, The dependence of pay-performance sensitivity on the size of the firm, *Review of Economics and Statistics* 80, 436–43.

- Shaw, K. W., and M. H. Zhang, 2010, Is CEO cash compensation punished for poor firm performance? *Accounting Review* 85, 1065–93.
- Shin, J. Y., and J. Seo, 2011, Less pay and more sensitivity? Institutional investor heterogeneity and CEO, *Journal of Management* 37, 1719–46.
- Shin, T., 2013, Fair pay or power play? Pay equity, managerial power, and compensation adjustments for CEOs, *Journal of Management* 42, 419–48.
- Shleifer, A., and R. W. Vishny, 1986, Large shareholders and corporate control, *Journal of Political Economy* 94, 461–78.
- Shue, K., and R. R. Townsend, 2017, Growth through rigidity: An explanation for the rise in CEO pay, *Journal of Financial Economics* 123, 1–21.
- Sloan, R., 1993, Accounting earnings and top executive compensation, *Journal of Accounting and Economics* 16, 55–100.
- Smith, M. P., 1996, Shareholder activism by institutional investors: Evidence from CalPERS, *Journal of Finance* 51, 227–52.
- Tobin, J., 1969, A general equilibrium approach to monetary theory, *Journal of Money, Credit, and Banking* 1, 15–29.
- Woidtke, T., 2002, Agents watching agents? Evidence from pension fund ownership and firm value, *Journal of Financial Economics* 63, 99–131.
- Yan, X., and Z. Zhang, 2009, Institutional investors and equity returns: Are short-term institutions better informed? *Review of Financial Studies* 22, 893–924.
- Yermack, D., 1997, Good timing: CEO stock option awards and company news announcements, *Journal of Finance* 52, 449–76.

TABLE 1. Descriptive Statistics.

Variable	Mean	Std. Dev.	First Quartile	Median	Third Quartile
Dependent variables					
ΔPay	0.063	0.837	-0.243	0.053	0.386
<i>Return</i>	0.184	0.709	-0.154	0.098	0.370
<i>Q</i>	2.078	1.755	1.239	1.621	2.325
Independent variables					
ΔROA	-0.015	0.904	-0.285	0.009	0.248
$\Delta Assets$	0.106	0.234	-0.003	0.072	0.174
$\Delta Sales$	0.093	0.249	0.003	0.083	0.177
ΔI_ROA	0.042	0.369	-0.074	0.059	0.169
<i>CI</i>	6.119	50.425	0.638	2.107	6.012
ΔCI	-0.001	0.173	-0.006	0.004	0.014
<i>IO</i>	0.675	0.192	0.555	0.703	0.822
<i>SIO</i>	0.152	0.098	0.079	0.133	0.207
<i>LIO</i>	0.205	0.095	0.136	0.194	0.261
<i>DD</i>	0.493	0.500	0.000	0.000	1.000
<i>Rigidity</i>	0.526	0.499	0.000	1.000	1.000

Note: This table summarizes the descriptive statistics of the dependent and independent variables of this study for the sample of 11,294 firm-year observations, excluding financial and utility firms, sourced from the Center for Research in Securities Prices, Compustat, ExecuComp, and Thomson Financial for 1995–2012. For each firm i in year t , the dependent variables are ΔPay , which is the rate of change in total executive compensation in terms of 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; *Return*, which is the log of the fraction of the stock price over the previous year-end's price; and *Q*, which is industry-adjusted Tobin's Q , computed as the market value of assets divided by the book value of assets. Refer to Appendix A for the definitions of the independent variables.

TABLE 2. Pay for Performance Sensitivity.

Panel A. Pearson Correlation between ΔPay and $\Delta Market Capitalization$				
	$\Delta Market Capitalization$			
	Positive	Negative	Full	
$\Delta Market Capitalization$	0.108*** (.0000)	0.038*** (.0003)	0.084*** (.0000)	
Panel B. Panel Regression Results				
Variable	Model 1	Model 2	Model 3	Model 4
$\Delta Market Capitalization$	0.108*** (12.61)	0.137*** (12.44)	0.053*** (3.64)	0.137*** (11.56)
MC_Dummy				-565.980*** (-4.07)
$\Delta Market Capitalization \times MC_Dummy$				-0.084*** (-4.73)
Sign of $\Delta Market Capitalization$	Full	Positive	Negative	Full
No. of obs.	22,132	13,153	8,979	22,132
Adj. R^2	0.007	0.012	0.001	0.009

Note: This table is based on 22,132 raw firm-year observations for 1995–2012. Panel A presents the Pearson correlations between the changes in market capitalization (increases ($\Delta > 0$), decreases ($\Delta < 0$), and full sample) and the change in total executive pay (ΔPay); the p -values are reported in parentheses. Panel B presents the panel regression results of the change in total executive compensation (ΔPay) on the change in market capitalization ($\Delta Market Capitalization$); the t -statistics (reported in parentheses) are adjusted for robust clustering (Petersen 2009). The coefficient of $\Delta Market Capitalization$ is the conventional measure of pay-for-performance sensitivity. MC_Dummy is a dummy variable equal to 1 if $\Delta Market Capitalization$ is lower than one, and 0 otherwise.

***Significant at the 1% level.

TABLE 3. Executive Compensation Rigidity.

Variable	Model 1	Model 2	Model 3	Model 4
ΔROA	0.039*** (2.98)	0.027** (2.08)	0.047** (2.12)	0.040** (1.62)
DD	-0.142*** (-8.81)	-0.138*** (-8.51)	-0.124*** (-9.58)	-0.111*** (-8.00)
$\Delta ROA \times DD$	-0.047** (-2.37)	-0.023* (-1.84)	-0.038** (-2.54)	-0.022* (-1.73)
$\Delta Assets$		0.420*** (9.99)		0.354*** (8.39)
$\Delta Sales$		0.119*** (2.89)		0.103** (2.90)
ΔI_ROA		0.179*** (9.24)		0.598*** (8.88)
Panel regression	Yes	Yes	No	No
Fama–MacBeth regression	No	No	Yes	Yes
Year fixed effects	Yes	Yes	No	No
Fama–French 48-industry fixed effects	Yes	Yes	Yes	Yes
No. of obs.	11,294	11,294	11,294	11,294
Adj. R^2	0.009	0.035	0.010	0.043

Note: This table is based on 11,294 firm-year observations for 1995–2012. Models 1 and 2 present the panel regressions of the change in total executive compensation (ΔPay), where the reported t -statistics (in parentheses) are adjusted for robust clustering, as per Petersen (2009). Models 3 and 4 provide Fama–MacBeth (1973) regressions, where the reported t -statistics (in parentheses) are adjusted for autocorrelations with three lags, as per Newey and West (1987, 1994). The dependent variable is ΔPay , which is the rate of change in total executive compensation in terms of 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. Refer to Appendix A for the definitions of the independent variables. Please note that the intercepts are excluded from the presentation of the fixed effects regressions.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

TABLE 4. Executive Compensation Rigidity and Firm Value.

Variable	Model 1	Model 2	Model 3	Model 4
<i>CI</i>	0.010 (1.45)	0.002*** (4.62)	0.001 (0.69)	0.009** (2.42)
ΔCI	0.221** (2.37)	0.200** (2.06)	0.739** (2.08)	0.610** (2.74)
<i>Rigidity</i>	-0.012*** (-3.07)	-0.031*** (-2.89)	-0.008* (-1.89)	-0.021** (-2.19)
Dependent variable	<i>Return</i>	<i>Q</i>	<i>Return</i>	<i>Q</i>
Panel regression	Yes	Yes	No	No
Fama–MacBeth regression	No	No	Yes	Yes
Full institutional ownership	Yes	No	Yes	No
Year fixed effects	Yes	Yes	No	No
Fama–French 48-industry fixed effects	Yes	Yes	Yes	Yes
No. of obs.	11,294	11,294	11,294	11,294
Adj. R^2	0.004	0.002	0.038	0.003

Note: This table is based on firm-year observations for 1995–2012. Models 1 and 2 present the panel regression results, with t -statistics (in parentheses) adjusted for robust clustering, as per Petersen (2009). Models 3 and 4 provide the Fama and MacBeth (1973) regression results, with t -statistics (in parentheses) adjusted for autocorrelations with three lags, as per Newey and West (1987, 1994). For each firm i in year t , the dependent variables are *Return* (models 1 and 3), which is the log of the fraction of the stock price over the previous year-end's price, and *Q* (models 2 and 4), which is the industry-adjusted Tobin's Q , computed as the market value of assets divided by the book value of assets. Refer to Appendix A for the definitions of the independent variables. Please note that the intercepts are excluded from the presentation of the fixed effects regressions.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

TABLE 5. Executive Compensation Rigidity by Institutional Investor Group.

Institutions	Q1	Q2	Q3	Q4	Q5	Q5 – Q1
All (IO)	0.391	0.324	0.306	0.288	0.259	-0.131 (-2.88)***
Long-term (LIO)	0.521	0.498	0.470	0.382	0.216	-0.305 (-3.23)***
Short-term (SIO)	0.435	0.389	0.392	0.402	0.411	-0.024 -1.34

Note: In this table, we sort the sample firms in ascending order of executive compensation rigidity (ECR) into five quintile groups for ownership by all (IO), long-term (LIO), and short-term (SIO) institutions, where SIO (LIO) denotes institutional ownership by short-term (long-term) institutions, as per Yan and Zhang's (2009) churn rate. *Rigidity* (ECR) is a dummy variable equal to 1 if the time-series regression estimate for the interaction term of the change in return on assets (ROA) and the ROA dummy variable ($\Delta ROA_{it} \times DD_{it}$) in equation (2) is less than or equal to zero, and 0 otherwise, where the dependent variable is the change in total executive compensation (ΔPay). The differences between the mean values of ECR of the largest quintile firm and the lowest quintile firms are provided in the last column, where the *t*-statistics are provided in parentheses.

***Significant at the 1% level.

TABLE 6. Impacts of Institutional Monitoring on Executive Compensation.

Variable	Model 1	Model 2	Model 3	Model 4
ΔROA	0.017*** (3.07)	0.025* (1.89)	0.085** (2.07)	0.130* (1.79)
DD	-0.213*** (-3.74)	-0.217*** (-4.35)	-0.172** (-2.39)	-0.164*** (-2.86)
$\Delta ROA \times DD$	-0.081*** (-3.89)	-0.089*** (-2.84)	-0.171* (-1.89)	-0.192* (-1.69)
IO	0.025 (0.44)		0.070 (1.23)	
$\Delta ROA \times DD \times IO$	0.125* (1.83)		0.501* (1.71)	
SIO		0.029 (0.24)		-0.183 (-0.84)
$\Delta ROA \times DD \times SIO$		0.132 (0.68)		-0.369 (-1.15)
LIO		0.123 (1.04)		0.343 (1.01)
$\Delta ROA \times DD \times LIO$		0.370** (1.98)		0.597** (2.64)
$\Delta Assets$	0.417*** (9.92)	0.412*** (9.63)	0.336*** (6.68)	0.292*** (3.40)
$\Delta Sales$	0.119*** (-2.87)	0.118*** (2.84)	0.054 (1.14)	0.099*** (3.04)
ΔI_ROA	0.179*** (9.23)	0.180*** (9.29)	0.601*** (8.84)	0.600*** (8.76)
Panel regression	Yes	Yes	No	No
Fama–MacBeth regression	No	No	Yes	Yes
Year fixed effects	Yes	Yes	No	No
Fama–French 48-industry fixed effects	Yes	Yes	Yes	Yes
No. of obs.	11,294	11,294	11,294	11,294
Adj. R^2	0.036	0.036	0.053	0.051

Note: This table is based on firm-year observations for 1995–2012. Models 1 and 2 present the panel regressions of the change in total executive compensation (ΔPay), where the reported t -statistics (in parentheses) are adjusted for robust clustering, as per Petersen (2009). Models 3 and 4 provide the Fama–MacBeth (1973) regressions, where the reported t -statistics (in parentheses) are adjusted for autocorrelations with three lags, as per Newey and West (1987, 1994). For each firm i in year t , the dependent variable is ΔPay , which is the rate of change in total executive compensation in terms of 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. Refer to Appendix A for the definitions of the independent variables. Please note that the intercepts are excluded from the presentation of the fixed effects regressions.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

TABLE 7. Institutional Monitoring, Executive Compensation Rigidity, and Firm Value.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
<i>CI</i>	0.021** (2.07)	0.002*** (4.58)	0.015* (1.79)	0.002*** (6.24)	0.002 (1.07)	0.009** (2.46)	0.001 (0.78)	0.011** (2.45)
ΔCI	0.146** (2.23)	0.203** (2.09)	0.240** (2.34)	0.166* (1.72)	0.720** (2.21)	0.660** (2.84)	0.563** (2.34)	0.388** (2.50)
<i>Rigidity</i>	-0.033** (-3.43)	-0.057** (-2.17)	-0.018*** (-2.84)	-0.018* (-1.89)	-0.019** (-2.43)	-0.080* (-1.83)	-0.010* (-1.74)	-0.123* (-1.73)
<i>IO</i>	0.083* (1.73)	-0.264** (-2.23)			0.122 (1.51)	0.292** (2.24)		
<i>Rigidity</i> $\times$ <i>IO</i>	0.032* (1.73)	0.036** (2.13)			0.023 (0.73)	0.032* (1.93)		
<i>SIO</i>			1.331*** (14.29)	1.979*** (8.53)			1.133*** (5.10)	2.015*** (3.14)
<i>Rigidity</i> $\times$ <i>SIO</i>			-0.014* (-1.88)	-0.1179 (-0.98)			0.055 (0.78)	-0.2823 (-0.60)
<i>LIO</i>			-0.345*** (-3.55)	-1.589*** (-6.57)			-0.269** (-2.54)	-0.754*** (-2.96)
<i>Rigidity</i> $\times$ <i>LIO</i>			0.076* (1.87)	0.117** (2.15)			0.02 (1.13)	0.132* (1.83)
Dependent variable	<i>Return</i>	<i>Q</i>	<i>Return</i>	<i>Q</i>	<i>Return</i>	<i>Q</i>	<i>Return</i>	<i>Q</i>
Panel regression	Yes	Yes	Yes	Yes	No	No	No	No
Fama–MacBeth regression	No	No	No	No	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	No	No	No	No
Fama–French industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	11,294	11,294	11,294	11,294	11,294	11,294	11,294	11,294
Adj. R^2	0.005	0.003	0.04	0.023	0.044	0.001	0.085	0.020

Note: This table is based on firm-year observations for 1995–2012. Models 1–4 present the panel regression results, with t -statistics (reported in parentheses) adjusted for robust clustering, as per Petersen (2009). Models 5–8 provide the Fama–MacBeth (1973) regression results, with t -statistics (reported in parentheses) adjusted for autocorrelations with three lags, as per Newey and West (1987, 1994). For each firm i in year t , the dependent variables are *Return* (models 1, 3, 5, and 7), which is the log of the fraction of the stock price over the previous year-end's price, and *Q* (models 2, 4, 6, and 8), which is industry-adjusted Tobin's Q , computed as the market value of assets divided by the book value of assets. Refer to Appendix A for the definitions of the independent variables. Please note that the intercepts are excluded from the presentation of the fixed effects regressions.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

Appendix A: Variable Definitions

Variable	Definition
Dependent variables	
ΔPay	Rate of change in total executive compensation in terms of 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.
$Return$	Log of the fraction of the stock price over the previous year-end's price.
Q	Industry-adjusted Tobin's Q, computed as the market value of assets divided by the book value of assets.
Independent variables	
ΔROA	Natural logarithm of the ratio of return on assets (ROA) to lagged ROA.
$\Delta Asset$	Natural logarithm of the ratio of the book value of assets to the lagged book value of assets.
$\Delta Sale$	Natural logarithm of the ratio of sales to lagged sales.
ΔI_ROA	Industry average of the natural logarithm of the ratio of ROA to lagged ROA.
CI	Comprehensive income (CI), normalized by the stock price at the end of the previous year (Easton and Pae 2004).
ΔCI	Ratio of CI to lagged CI for firm i in year t , normalized by the stock price at the end of the previous year.
IO	Total institutional ownership, computed as the number of shares held by all institutions divided by the shares outstanding in the previous year.
SIO	Institutional ownership by short-term institutions, as per Yan and Zhang's (2009) churn rate.
LIO	Institutional ownership by long-term institutions, as per Yan and Zhang's (2009) churn rate.
$MON5$	Proportion of ownership by monitoring institutional investors as the fraction of shares outstanding owned by the five largest institutions. According to Bushee (2001), an institutional investor is classified as one of the five largest institutions if the institution is (1) one of the five institutions with the largest portfolio valuations (in U.S. dollars) at the end of the quarter, (2) one of the five largest institutions for the past year, and (3) a dedicated or quasi-indexer institution.
$Non-MON5$	Proportion of ownership of shares outstanding by (non)monitoring institutional investors other than the five largest institutions, as per Bushee (2001).
DD	Dummy variable equal to 1 if ROA is lower than the previous year's ROA, and 0 otherwise.
$Rigidity$	Dummy variable as a proxy for executive compensation rigidity equal to 1 if the time-series regression estimate of the interaction term for the change in ROA and the ROA dummy variable ($\Delta ROA_{it} \times DD_{it}$) in equation (2) is less than or equal to zero, and 0 otherwise. Here, we control for $\Delta Assets$, $\Delta Sales$, ΔI_ROA , and year, as well as Fama and French's (1997) 48-industry fixed effects:

$$\Delta Pay_{it} = \beta_0 + \beta_1 \Delta ROA_{it} + \beta_2 DD_{it} + \beta_3 \Delta ROA_{it} \times DD_{it} + \sum \beta_c Controls_{it} + \epsilon_{it}. \quad (2)$$

Note: This appendix provides definitions of the variables for each firm i in year t . Firm characteristics are obtained from the Center for Research in Security Prices and Compustat databases, executive compensation is taken from ExecuComp, and institutional ownership is taken from Thomson Financial for 1995–2012. The industry of a firm is classified as per Fama and French’s (1997) 48-industry classification. The final sample consists of 11,294 firm-year observations, excluding financial and utility firms.

Appendix B: Robustness Tests

Chen, Harford, and Li (2007) and Chung et al. (2015) document that not all long-term institutions have the incentives or means to monitor firm management. Instead, they find that only independent, long-term institutions with large shareholdings focus on monitoring and influencing the firms in which they invest. We follow these studies by adopting an alternative measure of monitoring institutions' holdings, defined as the proportion of ownership by the five largest institutions (*MON5*). Consequently, the ownership by all other institutions (*Non_MON5*) is considered to be held by nonmonitoring institutions.¹³ According to Bushee (2001), an institutional investor is classified as one of the five largest institutions if the institution (1) has one of the five largest holdings (in U.S. dollars) of stock at the end of a quarter and for the past year, and (2) is a dedicated or quasi-indexer institution. These institutions are more likely to perform a monitoring role by gathering information and attempting to influence managers.

We replicate the tests in Table 6, based on equation (4), by replacing the ownership measures of all (*IO*), long-term (*LIO*), and short-term (*SIO*) institutional investors with the alternative measures (*MON5* and *Non_MON5*), and present the results in Table B1. We find that

¹³The alternative measures provide the benefit of further considering the influence of institutional investors with large blockholdings. However, when it comes to capturing the factor differentiating between investors' investments and monitoring incentives based on investment horizon (Chen, Harford, and Li 2007; Chung et al. 2015; Yan and Zhang 2009), the alternatives are not as sophisticated as the main measures, *SIO* and *LIO*. Hence, the robustness tests with the alternative measures complement our main tests based on *SIO* and *LIO*. In addition to *Non_MON5* and *MON5*, motivated by Hadlock and Schwartz-Ziv (2018), we consider the classification of institutional blockholding based on Chen, Harford, and Li (2007), which includes all institutional investors that (1) hold at least 5% of the shares outstanding (blockholders) at the end of the current quarter, (2) hold at least 5% of the shares outstanding for the past year, and (3) are classified as a dedicated or quasi-indexing institution using Bushee's (2001) definitions. We find that the institutional blockholders mitigate the downward pay rigidity of top managers and facilitate value creation in a firm. The results are available upon request.

the coefficient of the three-way interaction term $\Delta ROA \times DD \times MON5$ using either a panel (model 1) or a Fama–MacBeth (1973) (model 2) regression of the change in executive pay (ΔPay) is positive and significant in economic and statistical terms ($\hat{\beta}_5 > 0$). This implies that long-term institutional investors with large shareholdings actively reduce the extent of the pay rigidity. The literature suggests that the stronger elasticity of pay–performance induced by monitoring blockholders reveals the alignment of the interests of managers and shareholders (Ozkan 2011). Our robustness check supports Hypothesis H2a, as well as the claim by Bebchuk and Fried (2003, 2004) that monitoring blockholders control pay without performance, thus lowering agency costs.

[Insert Table B1 about here.]

To further stress test Hypothesis H2b, we reexamine whether institutional monitoring on pay without performance offers benefits to shareholders by reconstructing Table 7 using the alternative measures of institutional ownership ($MON5$ and Non_MON5). The results are shown in Table B2. In terms of stock returns (models 1 and 3) or Tobin’s Q (models 2 and 4), both the panel (models 1 and 2) and Fama–MacBeth (1973) (models 3 and 4) regressions show that the downward rigidity of executive pay ($Rigidity$) is value destroying ($\hat{\beta}_3 < 0$), but also that nonmonitoring institutional investors do not contribute to curbing the pay distortion ($\hat{\beta}_4 < 0$, $Rigidity \times Non_MON5$). In contrast, the five largest institutional investors in terms of holdings appear to resist the value-eroding executive compensation rigidity ($\hat{\beta}_4 > 0$, $Rigidity \times MON5$). The strongest evidence is found when Tobin’s Q is used to measure firm performance and the Fama–MacBeth method is used for the estimation (model 4). Overall, these results support the inference drawn previously from Table 7 related to Hypothesis H2b. That is, the monitoring activities of committed institutional investors mitigate the downward pay rigidity of top managers and facilitate value creation in a firm.

[Insert Table B2 about here.]

TABLE B1. Impacts of Institutional Monitoring on Executive Compensation with an Alternative Institutional Monitoring Measure.

Variable	Model 1	Model 2
ΔROA	0.018*** (2.89)	0.079** (2.39)
DD	-0.113** (-2.35)	-0.112* (-1.86)
$\Delta ROA \times DD$	-0.129** (-2.18)	-0.235** (-2.68)
Non_MON5	-0.008 (-0.13)	0.022 (0.63)
$\Delta ROA \times DD \times Non_MON5$	-0.165* (-2.58)	-0.235*** (-2.95)
$MON5$	0.200* (1.70)	0.042 (0.25)
$\Delta ROA \times DD \times MON5$	0.290*** (3.14)	0.624*** (3.13)
$\Delta Asset$	0.343*** (4.54)	0.126*** (3.87)
$\Delta Sale$	0.235*** (3.32)	0.199*** (5.34)
ΔI_ROA	0.176*** (5.17)	0.464*** (7.11)
Panel regression	Yes	No
Fama–MacBeth regression	No	Yes
Year fixed effects	Yes	No
Fama–French 48-industry fixed effects	Yes	Yes
No. of obs.	11,294	11,294
Adj. R^2	0.057	0.087

Note: This table is based on 11,294 firm-year observations for 1995–2012. Models 1 and 2 present the panel and Fama–MacBeth (1973) regressions of the change in total executive compensation (ΔPay), where the reported t -statistics (in parentheses) are adjusted for robust clustering, as per Petersen (2009), and for autocorrelations with three lags, as per Newey and West (1987, 1994), respectively. The dependent variable is ΔPay , which is the rate of change in total executive compensation in terms of 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. Refer to Appendix A for the definitions of the independent variables. Please note that the intercepts are excluded from the presentation of the fixed effects regressions.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

TABLE B2. Impacts of Executive Compensation Rigidity on Firm Value with an Alternative Institutional Monitoring Measure.

Variable	Model 1	Model 2	Model 3	Model 4
<i>CI</i>	0.024** (2.39)	0.012 (1.24)	0.032** (2.39)	0.019** (2.24)
ΔCI	0.124* (1.89)	0.233** (2.13)	0.124*** (3.34)	0.098** (2.52)
<i>Rigidity</i>	-0.215*** (-3.86)	-0.071** (-2.59)	-0.025*** (-3.84)	-0.010 (-0.78)
<i>Non_MON5</i>	1.331*** (14.29)	1.979*** (8.53)	1.354*** (5.39)	1.890*** (3.19)
<i>Rigidity</i> $\times$ <i>Non_MON5</i>	-0.129*** (2.98)	-0.077* (-1.88)	-0.014** (-2.28)	-0.099** (-2.48)
<i>MON5</i>	-0.345*** (-3.55)	-1.589*** (-6.57)	-0.310** (-2.18)	-0.978** (-2.66)
<i>Rigidity</i> $\times$ <i>MON5</i>	0.055 (1.67)	0.088 (1.15)	0.021 (0.36)	0.077** (2.25)
Dependent variable	<i>Return</i>	<i>Q</i>	<i>Return</i>	<i>Q</i>
Panel regression	Yes	Yes	No	No
Fama–MacBeth regression	No	No	Yes	Yes
Year fixed effects	Yes	Yes	No	No
Fama–French 48-industry fixed effects	Yes	Yes	Yes	Yes
No. of obs.	11,294	11,294	11,294	11,294
Adj. R^2	0.054	0.035	0.076	0.045

Note: This table is based on 11,294 firm-year observations for 1995–2012. Models 1 and 2 present the panel regression results, with *t*-statistics (reported in parentheses) adjusted for robust clustering, as per Petersen (2009). Models 3 and 4 provide the Fama and MacBeth (1973) regression results, with *t*-statistics (reported in parentheses) adjusted for autocorrelations with three lags, as per Newey and West (1987, 1994). For each firm *i* in year *t*, the dependent variables are *Return* (models 1 and 3), which is the log of the fraction of the stock price over the previous year-end's price, and *Q* (models 2 and 4), which is industry-adjusted Tobin's *Q*, computed as the market value of assets divided by the book value of assets. Refer to Appendix A for the definitions of the independent variables. Please note that the intercepts are excluded from the presentation of the fixed effects regressions.

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

Appendix C: Institutional Investors' Presence on the Board of Directors

A common question that applies to most studies using institutional ownership as a proxy for institutional monitoring is what specific channels institutional investors use to achieve desired governance outcomes. In this section, we examine one such channel. Specifically, we identify directors directly employed by institutional investors and see whether these directors reduce downward ECR. Boards are the apex of corporate governance and have the fiduciary duty to deter managerial rent-seeking and maximize shareholder wealth. By sitting on a board, institutional investors gain access to the internal governance that gives them a substantial voice in corporate decisions. It is well known that activist shareholders often attempt to gain board representation to influence the management (DeAngelo and DeAngelo, 1989) and activist institutional investors prefer private communications with the management over open confrontations when they identify potential problems to address (Carleton, Nelson, and Weisbach, 1998; Becht, Franks, Mayer, and Rossi, 2009; McCahery, Sautner, and Starks, 2016). Our approach focuses on one of the most effective ways for institutional investors to influence corporate decisions and allows us to capture their private monitoring efforts.

[Insert Table C1 about here.]

We focus on two measures of institutional directors. The first is the number of institutional directors on the board and the second is a dummy variable indicating the presence of institutional directors. In Table C1, we show the correlations between these measures and our institutional ownership variables and find that the aggregate level of institutional ownership is positively related to both the number of institutional directors and the institutional director dummy. When we separate the aggregate institutional shareholdings into portions held by long-term and short-term institutions, we find that the positive relations are driven by the holdings of long-term institutions, suggesting that they are more likely to sit on the board to influence firm decisions. On the other

hand, the correlations between short-term institutional ownership and the institutional director measures, although positive, are not statistically significant.

[Insert Table C2 about here.]

In Table C2, we examine the impact of institutional directors on the downward pay rigidity of CEOs using panel regressions with Petersen's (2009) clustering-robust standard errors. The model specifications are similar to those in Table 6. Using either the number of institutional directors or the institutional director dummy, we find that the three-way interaction term ($\Delta ROA \times DD \times \text{Number of Institutional Directors}$ or $\Delta ROA \times DD \times \text{Institutional Director Dummy}$, respectively) is statistically positive. Given the presence of pay rigidity as indicated by the significantly positive coefficient for the two-way interaction term ($\Delta ROA \times DD$), these results provide strong evidence that institutional investors successfully reduce downward pay rigidity through their board presence.

We understand there are other possible channels through which institutional investors may affect executive compensation, such as sponsoring "say-on-pay" campaigns. However, we defer investigating these channels to future studies due to the scope of this research.

Table C1. Correlations

	IO	SIO	LIO	# of Institutional Directors	Institutional Director Dummy
IO	1				
SIO	0.4752 [<.0001]	1			
LIO	0.4576 [<.0001]	-0.2188 [0.0117]	1		
# of Institutional Directors	0.0281 [0.0891]	0.0649 [0.4592]	0.1398 [0.0398]	1	
Institutional Director Dummy	0.0582 [0.0472]	0.0485 [0.5807]	0.1145 [0.0191]	0.9216 [<.0001]	1

Notes: This table presents the Pearson correlation coefficients between institutional ownerships and institutional director variables based on 7,145 firm-year observations of S&P 1500 firms for the period 1998–2012.; *p*-values are reported in brackets.

Table C2. Impacts of institutional monitoring on executive compensation with # of institutional directors and institutional director dummy

This table is based on 7,145 firm-year observations of S&P 1500 firms for the period 1998–2012. Models 1 and 2 present the panel and Fama and MacBeth (1973) regressions of the change in total executive compensation (ΔPay), where the reported t -statistics (in parentheses) are adjusted for robust clustering per Petersen (2009). As the dependent variable, ΔPay is the rate of change in total executive compensation in terms of 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. Refer to Table A1 for the definitions of the independent variables. The intercepts are subdued with fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	Model 1	Model 2
ΔROA	0.072* (1.91)	0.063** (2.15)
DD	-0.213** (-2.33)	-0.093* (-1.98)
$\Delta\text{ROA} \times \text{DD}$	-0.271** (-2.27)	-0.153** (-2.52)
<i>Number of Institutional Directors</i>	0.008 (0.13)	
$\Delta\text{ROA} \times \text{DD} \times \text{Number of Institutional Directors}$	0.239** (2.48)	
<i>Institutional Director Dummy</i>		0.042 (0.25)
$\Delta\text{ROA} \times \text{DD} \times \text{Institutional Director Dummy}$		0.314** (2.20)
ΔAsset	0.929*** (3.07)	0.135*** (2.79)
ΔSale	0.009** (2.46)	0.012** (2.42)
$\Delta\text{I_ROA}$	0.659** (2.84)	0.309** (2.74)
Panel regression	Yes	No
Fama–MacBeth regression	No	Yes
Year fixed effects	Yes	No
Fama–French 48 industry fixed effects	Yes	Yes
No. of obs.	7,145	7,145
Adjusted- R^2	0.124	0.176