

CEO Pay Cuts and Forced Turnover: Their Causes and Consequences*

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We study large discrete decreases in CEO pay and compare them to CEO forced turnover. The determinants are similar, as are the performance improvements after the action. After the pay cut, the CEO pay-for-performance sensitivity is abnormally high, such that the CEO can restore his pay level by reversing the poor performance. After either a pay cut or forced turnover, CEOs reduce investment and leverage, and improve performance, on average. Together, our results show that the possibility of these large compensation cuts provides *ex ante* incentives for CEOs to exert effort to avoid poor performance and that CEOs take actions to improve poor performance once pay is cut. The similarity of the causes and outcomes of large pay cuts compared to forced turnover suggests that large pay cuts are used as a substitute for forced turnover, helping to explain why forced turnover is rare.

Keywords: Corporate governance; executive compensation; pay cuts; forced turnover; pay-for-performance sensitivity

JEL Classification: G34

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Abstract

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1. Introduction

Executive compensation has received enormous attention from both academics and the popular press. However, most of that attention has focused on the overall rise in pay, the increasing use of equity-based compensation, and the debate over whether pay is appropriately sensitive to performance (see for example, Jensen and Murphy (1990), and Bebchuk and Fried (2003)). At the same time, studies have consistently found CEO turnover following poor performance to be rare (see for example, Coughlan and Schmidt (1985), Warner, Watts, and Wruck (1988), and Denis and Denis (1995)). In this paper, we study large decreases in CEO compensation as a response to poor performance. Not only does this help expand our understanding of how boards dynamically adjust compensation to provide incentives, but it also has the potential to explain why CEO forced turnover is rare.

For ExecuComp firms over our sample period of 1994-2005, we identify approximately 1,000 instances of extreme pay cuts where a CEO's pay is reduced by at least 25% from the prior year, representing roughly 10% of the firm-year observations. The average (median) pay cut in our sample is 46% (42%) of the CEO's pay in the prior year. The median CEO suffers a pay cut of \$1.2 million, his portfolio wealth suffers a comparable loss of \$968,000, and a conservative estimate of the present value of his income loss up to expected retirement is \$2.5 million. We ensure that these cuts are not mechanical reversals of a prior pay spike. Further, using a model of normal compensation, we show that only about 60% of our pay-cut CEOs has abnormally high compensation in the year prior to the pay cut. The reduction in total pay is mainly due to a decrease in the units of stock and options grants leading to a major reduction in the value of equity-based compensation. In our pay cut sample, the median CEO experiences a 60% reduction in his equity-based pay but only a 12% reduction in his salary and bonus.

We compare the causes of CEO pay cuts to those of forced turnover and find,

unsurprisingly, that poor firm performance predicts a pay cut. However, we also find that the likelihood of receiving a sharp pay cut following poor performance is higher in firms with stronger governance mechanisms. Notably, the factors leading to a pay cut are quite similar to those leading to a dismissal.

CEOs respond to a pay cut in ways that are similar to changes that new CEOs make following a forced turnover. They decrease investment and leverage and improve performance, although the effect on performance improvement is significantly larger following forced turnover. Further, we find that those pay-cut CEOs who do engineer a turnaround see their pay restored to normal levels through abnormally high pay-for-performance sensitivity following the pay cut.

We perform a number of robustness checks. First, we confirm that the period surrounding the 2001-2002 recession is not driving our results. Second, we show that our inferences are robust to varying the threshold we use to identify pay cuts to 15% and 50%. However, the corporate policy and performance changes following a 15% cut are weaker than those following forced turnover, while those following a 50% cut are statistically indistinguishable from those following forced turnover. Overall, our results on the determinants and consequences of pay cuts are robust to different sample periods and various ways of defining pay cuts.

In summary, we conclude that boards use extreme pay cuts to motivate poorly-performing managers to improve performance. The approach is generally effective, with firm performance strengthening, and the successful CEO remaining in his post with restored pay following the pay cut. Our paper adds to the literature on executive compensation as well as providing an explanation for why forced turnover following poor performance is rare—boards use pay cuts as a largely effective substitute.

The plan of the paper is as follows. We review the literature and develop our hypotheses in

the next section. We describe our sample and variable construction in Section 3. We explore the causes and consequences of large pay cuts and compare them to CEO forced turnover in Section 4. We conclude in Section 5.

2. Prior literature and hypothesis development

2.1. Literature review

The principal-agent conflict is one of the most examined conflicts in corporate finance. Starting with Jensen and Meckling's (1976) discussion of the agency costs associated with the separation of ownership and control in modern corporations, many papers have explored the incentive mechanisms that overcome this conflict. In this paper, rather than studying the general pay-for-performance link (see for example, Jensen and Murphy (1990) and Hall and Liebman (1998)), we focus on discrete drops in pay as a response to poor performance, in parallel to forced turnover.

Because we study pay changes in response to poor performance, our paper is related to the vast literature on pay for performance, of which Core, Guay, and Larcker (2003) provide an excellent review. However, our contribution derives more from the literature on CEO turnover. Starting with Coughlan and Schmidt (1985) and Warner, Watts and Wruck (1988), we have been left with a puzzle as to why CEO forced turnover following poor performance is so rare. Weisbach (1988) shows that independent boards are more responsive to poor performance in dismissing CEOs, but that the sensitivity still is relatively low. Recent work by Jenter and Kanaan (2010) shows that poor industry performance can lead to CEO turnover, but the frequency still is low. The fact that forced turnover is rare does not mean that boards are completely passive. If boards are using sharp pay cuts as an effective alternative to CEO turnover, this would help explain the low

frequency of turnover.

2.2. *Our hypotheses*

Our general hypothesis is that, like the threat of CEO firing, the threat of sharp pay cuts is one way a board provides managers with *ex ante* incentives to maintain strong performance. Here we assume that in response to poor performance, the board evaluates whether the performance problem is due to CEO skill or effort.¹ If the board concludes that CEO skill is low relative to the average skill in the CEO labor pool, then it will rationally fire the CEO and draw a new CEO from the labor pool. If the board puts enough weight on an effort problem, or if its new, lower estimate of CEO ability is still greater than that of the average CEO, it will rationally retain the CEO with potentially different inducements to effort. The CEO accepts the pay cut if he believes that the value of his compensation with the firm is greater than it would be re-entering the labor market and attempting to find a new (job) match. In this way, the cuts are a form of the *ex post* settling-up incentives discussed in Fama (1980).²

The settling-up has the potential to take place within the firm if the board, whose information is superior to the outside labor market, believes it is more efficient to retain the CEO and partially settle-up. A CEO who believes (correctly or not) that his true ability is closer to the old estimate will exert effort to produce a performance reversal. A second reason why a CEO would respond to a pay cut with effort to improve performance is that the CEO updates his belief about the strength of the governance. The board has signaled that it is willing and able to take

¹ While most CEOs observably work hard, the kind of effort problems we envision suggests a redirection of existing effort toward tasks that CEOs may have preferred to avoid, but which might be necessary to improve performance. For example, a CEO may not want to fire a top lieutenant, divest a division, or cancel a pet project, but the board uses the pay cut and promised restoration of pay to increase his incentives to perform these tasks that otherwise provide him with disutility.

² As suggested by Fama (1980), the absence of complete *ex post* settling-up could be the reason why the CEO gets into trouble in the first place: When the manager's effort cannot be tracked accurately and costlessly, the *ex post* settling-up will be incomplete, which may cause the deviation of managerial action from what the contract desires.

actions to punish the CEO in response to poor performance. Thus, after receiving a pay cut, the CEO updates his belief that the board is stronger than he thought, and exerts more effort in the subsequent periods.

It is worth noting that we do not assume that the CEO's original contract was suboptimal. Rather, we view the flexibility of the board to sharply alter pay as part of the optimal contract with the CEO. This flexibility comes from discretion over the size of bonus, and stock and options grants. Gillan, Hartzell, and Parrino (2009) find that fewer than half of the S&P 500 CEOs have an explicit employment contract that would limit the board's flexibility.

Our primary conjecture is that boards use large pay cuts as an effective substitute for forced turnover. We expect that poor performance predicts both CEO pay cuts and CEO turnover (**H1**). Further, we predict that the relation between poor performance and CEO pay cuts and turnover is stronger in firms with better governance (**H2**). Finally, we expect that post-action, CEOs take similar actions to improve performance (**H3**).

3. Sample formation and variable construction

We start with the ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005.³ To construct our CEO pay cut sample, we first identify CEOs who experience an extreme form of pay cut of at least 25% in total compensation (2,633 firm-year observations). CEO pay will fluctuate over time if stock and options grants, the largest component in CEO compensation, are not granted every year. Suppose a CEO is granted stock and options awards once every two years, we will mechanically observe "pay cuts" every second year. To address this issue, we further require that the increase in CEO pay in the year prior to the pay

³ The ExecuComp database starts in 1992, but our sample formation scheme requires information on CEO pay for at least two years before a pay cut. As a result, our final sample period starts in 1994. Our final sample period ends in 2005 because the data on CEO forced turnover from Dirk Jenter ends that year.

cut is no more than 25% (1,572 firm-year observations). This additional filter helps ensure that pay cuts identified in our sample are not due to normal fluctuations in pay. As we discuss later, Figure 1 shows that our sample of CEOs do not experience a spike in pay in the year prior to the cut. In summary, a CEO experiences a major pay cut and thus is included in our sample if (1) the same CEO keeps his position from year -2 to the pay cut year 0; (2) his total pay in year 0 is no more than 75% of his pay in year -1; and (3) his total pay in year -1 is no more than 125% of his pay in year -2. Our final sample consists of 927 instances of pay cuts. Some CEO pay cut examples are provided in the Appendix.

Our data on CEO forced turnover is obtained from Jenter and Kanaan (2010) and Peters and Wagner (2010), which include all forced turnover cases for the ExecuComp firms during 1994-2005. Jenter and Kanaan (2010) and Peters and Wagner (2010) follow Parrino (1997) and classify a CEO turnover as being forced if the press reports that CEO is fired, forced out, or retires or resigns due to pressure. All other departures for CEOs aged 60 or above are classified as voluntary. Departures for CEOs below age 60 are also classified as forced if either the press does not report the reason as death, poor health, or the acceptance of another position (including the chairmanship of the board), or the press reports that the CEO is retiring, but does not announce the retirement at least six months before the succession.

Finally, we label the firms that experience neither pay cuts nor turnover as “no actions.” Our final sample consists of 12,449 firm-year observations of no actions, 927 instances of pay cuts, and 388 cases of forced turnover over the period of 1994-2005. Notably, the frequency of pay cuts are more than two times that of forced turnover, suggesting that pay cuts could be a more frequently-used corrective method by boards than is forced turnover.⁴

⁴ There are 11 cases of a pay-cut CEO being fired in year +1 (in our turnover sample), five cases of a pay-cut CEO being fired in year +2, and another five cases of a pay-cut CEO being fired in year +3. As a robustness check, we remove these 42 (= (11 + 5 + 5) × 2) overlapped pay cut and turnover cases and re-do all the analyses; our main

Table 1 presents an overview of our pay cut and turnover samples. Panel A reveals that the frequency of pay cuts has increased over time. It also reveals that the majority of the pay cuts took place during the early 2000s as the economy entered into a recession and the stock market fell considerably from its peak: 42% of pay cut cases clustered in the 2001-2003 period (as compared to 27% of turnover cases). As shown later, we conduct a robustness check and find that our results are not driven by the 2001-2003 period. In contrast, forced turnover is relatively equally distributed across the sample period.

In Panel B of Table 1, we find that three Fama-French industries (Fama and French (1997)): Business services, electronic equipment, and retail, have a noticeably higher representation in our pay cut sample (26%), while business services, computers, and retail are the top three industries with most turnover cases (32%). Panel C shows that the vast majority (85%) of our sample firms reduce their CEOs' pay by between 25% and 65% of their pay in the prior year. Unreported in the table, the average (median) size of pay cut is 46% (42%) of the CEO's pay in year -1 . Given that our pay cut and turnover samples are formed from the ExecuComp database and that the ExecuComp firms are not random draws of the US listed companies (as they tend to be larger than the overall Compustat population), we will employ only the ExecuComp firms to establish performance benchmarks in our later analyses.

Table 2 reports firm characteristics in the year before the pay cut/turnover (year -1). All dollar values are in 2005 dollars. To mitigate the effect of outliers, we winsorize all continuous variables at the one percent level in both tails of the distribution.

Both pay-cutting firms and CEO-dismissing firms are clearly underperforming in the stock market: The median industry-adjusted stock return for pay-cutting (CEO-dismissing) firms is

results remain.

around -10% (-20%), relative to 0% for the no-action firms.

We define an executive's total compensation (*Totalpay*) in a given year as the sum of the executive's salary, bonuses, long-term incentive plans, the grant-date value of restricted stock awards, and the Black-Scholes value of granted options (ExecuComp Item *TDC1*). Due to the requirement of CEO total pay in year *-1* being no more than 125% of his pay in year *-2* in defining pay cuts, pay-cut CEOs have lower level of compensation in year *-1* and smaller increase in pay over the period year *-2* to year *-1*, as compared to the other two groups of firms. The median pay-cut CEO receives about \$1.5 million in year *-1*, compared to \$2.9 million for the CEO in the no-action firms and \$2.4 million for the CEO in the turnover sample. The median pay ratio from year *-2* to year *-1* for pay-cut CEOs is 0.92, smaller than those figures in the no-action (1.11) and turnover firms (1.01).

Following Jensen and Murphy (1990), *PPS* is the dollar-value change in CEO wealth for \$1,000 change in shareholder value. CEOs in the turnover sample have a much lower *PPS* (2.28 at the median) than the CEOs in the no-action firms (6.11 at the median) and in the pay cut sample (7.68 at the median). We use institutional ownership to measure shareholder control (Huson, Parrino, and Starks (2001)). The median institutional ownership is 63.9%, 63.4%, and 58.5% for the non-action, pay cut, and turnover samples, respectively.

We measure the quality of board governance at the firm level using the board index developed by Harford, Li, and Zhao (2008). Harford, Li, and Zhao (2008) construct the index from ten board characteristics that will influence board effectiveness, including board size, director busyness, board independence, board interlocking, board equity ownership, board meeting fee, CEO-Chairman duality, whether a blockholder is on board, whether accumulative voting is allowed for director election, and whether there is a classified board. They add one point for every board measure that increases the likelihood that the board will be an effective monitor of

managers in shareholders' interests. Thus, the board index is just the sum of the points awarded for the existence of each board measure, and ranges from zero (least effective) to ten (most effective). The median value for the board index is 6 for all three samples, while the average is 5.72, 5.79, and 6.10 for the non-action, pay cut, and turnover samples, respectively.

Figure 1 presents the trend in CEO pay from three years before (year -3) to three years after the pay cut (year +3). In Panel A, we present the raw levels of our three pay measures: *Totalpay*, *Equitypay*, and *Cashpay*. *Equitypay* is the value of restricted stock granted and the Black-Scholes value of stock options granted, and *Cashpay* is the sum of salary and bonus. We show that CEO *Totalpay* increases from year -3 to -2 followed by a drop in year -1 and a further bigger drop in the pay cut year, and then the compensation level goes back up in year +1 and stays stable subsequently.⁵ It is clear that *Totalpay* and *Equitypay* move in tandem, while *Cashpay* is stable over the entire seven-year period we examine.⁶

It is well known that firm, industry, and CEO characteristics are strongly associated with the level of pay. A high raw level of pay may be justified by the characteristics of the firm and the CEO. As a result, we also compute a measure of abnormal pay, which is the difference between the actual level of pay and the "normal" level of pay implied by firm, industry, and executive characteristics. Using the CEO population in ExecuComp, we estimate our benchmark model for expected compensation following prior research in this area (for example, Core, Holthausen, and Larcker (1999) and Murphy (1999)):

$$\begin{aligned} \ln(\text{Totalpay})_{it} = & a_0 + a_1 \text{Stockreturn}_{it-1,t} + a_2 \text{ROA}_{it-1,t} + a_3 \ln(\text{sales})_{it} + a_4 \text{Volatility}_{it} \\ & + a_5 \text{CEOTenure}_{it} + \text{Year Fixed Effects} + \text{Industry Fixed Effects} + \varepsilon_{it}, \end{aligned} \quad (1)$$

⁵ While one could say that the pay cut event started in year -1, this is an artifact of our requirement that pay not increase substantially in year -1 to avoid mechanical reversals. If we drop that requirement, the graph does not show a decrease in year -1.

⁶ We also find that the decrease in *Equitypay* is largely due to the decrease in the number of stock and option granted, rather than the decrease in stock price.

where i indexes firm and t indexes year. Given that CEO compensation could be affected by firm performance in both the current year and the prior year, we use two-year cumulative stock returns and ROAs. All the other independent variables are measured contemporaneously. The estimated residual, actual $\ln(\text{Totalpay}) - \text{predicted } \ln(\text{Totalpay})$, is our measure of abnormal pay. We have also estimated Equation (1) with the two-year cumulative stock return and ROA broken out into yearly returns and ROAs. The correlation between our measure of abnormal pay and abnormal pay measured using the expanded specification is 0.99. The industry classification follows Fama and French (1997). Figure 1 Panel B presents the trend of abnormal CEO pay.

Panel B shows a very similar pattern to that of Panel A: Abnormal CEO pay increases from year -3 to year -2 followed by a continued decline between year -2 and the pay cut year (year 0), a reversal in year +1, and then stays stable afterwards. During the three years prior to the pay cut, the average CEO is receiving sizeable abnormal pay. However, in the period after the pay cut, his pay is pulled back to normal (the level of abnormal pay is down to zero). As before, the change in abnormal *Equitypay* contributes the most to the fluctuation of abnormal *Totalpay*.

4. Causes and consequences of CEO pay cuts and forced turnover

4.1. What cause pay cuts or forced turnover?

In this section, we examine why the board decides to cut its CEO's pay. Are the causes of pay cuts similar to those of CEO forced turnover? Our predictions are that pay cuts and turnover follow abnormally poor performance (**H1**) and that for a given level of performance, pay cuts and turnover are more likely when governance mechanisms are stronger (**H2**). We estimate the following multinomial logit regression:

$$\frac{\Pr[y = \text{Pay Cut}]}{\Pr[y = \text{No Action}]} = e^{x\beta^{(1)}}, \quad \frac{\Pr[y = \text{Turnover}]}{\Pr[y = \text{No Action}]} = e^{x\beta^{(2)}}, \quad (2)$$

where X is a vector of pre-determined variables including measures of industry-adjusted stock and operating performance, industry-wide stock performance, abnormal CEO pay, abnormal pay-for-performance sensitivity (*PPS*), firm size, market-to-book ratio, and stock return volatility. We also include industry and year fixed effects. Table 3 presents the results.

Table 3 shows that, similar to turnover, pay cuts are more likely to occur following poor performance, especially stock performance. In Columns (1) and (2), the coefficients on *Abnormal stock return*, *Lagged abnormal stock return*, *Abnormal ROA*, and *Lagged abnormal ROA* are negative and significant at the 1% level (except for *Lagged abnormal ROA* in Column (2), significant at the 10% level). Prior literature (see for example, Warner, Watts, and Wruck (1988) and Denis and Denis (1995)) shows that, while CEO turnover is negatively associated with firm performance, the aggressive dismissal of a poorly-performing CEO is still rare in practice. Jensen and Murphy (1990) hence conclude that dismissals are not an important source of CEO incentives. Our results suggest a justification to the rare use of dismissal: Boards do cut CEO pay (as an alternative to forced turnover) in response to poor performance.

In Columns (1) and (2), the coefficient on *Industry stock return* and *Lagged industry stock return* are negative and significant at the 1% level (except for *Industry stock return* in Column (2)), suggesting that firms in poorly performing industries are more likely to cut their CEOs' pay or fire the CEO directly, consistent with the findings in Jenter and Kanaan (2010) on CEO turnover. There is overwhelming evidence that CEO compensation increases when the sector performs well (usually referred to as pay-for-luck, see for example, Garvey and Milbourn (2006)). This fact is often interpreted as evidence in support of the managerial power hypothesis, which argues that powerful CEOs have exerted undue influence on the pay process in their favor (Bebchuk and Fried (2003)). Our evidence suggests that the above view is at least incomplete, as CEOs also suffer major pay cuts when their sector performs poorly. That is, we have provided evidence on

“pay cut for bad luck,” complementing the literature on pay-for-luck.

CEOs with high compensation in the prior year are also more likely to be subject to pay cuts: The coefficient on *Abnormal CEO pay* is positive and significant at the 1% level in Column (1). This result, while unsurprising, indicates that boards are more likely to employ a pay cut when pay is high to begin with. In the face of poor performance, activist shareholders are more likely to target highly paid CEOs for pay cuts, as evidenced by the public call for massive pay cuts to CEOs of financial companies during the most recent crisis. We note that our sample selection procedure ensures that these pay cuts are not simply reversals of pay spikes. Further, these CEOs do not all have positive abnormal pay relative to their peers prior to the pay cut. More than one third (38%) of our pay-cut CEOs have pay at or below the level predicted by a model of normal pay in the year prior to the pay cut.

In Column (2), the coefficient on CEOs’ pay-for-performance sensitivity, *Abnormal CEO PPS*, is negative and significant at the 1% level. *PPS* is driven by higher stock and option ownership, so this finding indicates that CEOs with higher current or future equity ownership are less likely to be fired. Our results are also consistent with Denis, Denis, and Sarin (1997), who find that executives with higher stock ownership are less likely to be fired. Further, larger firms are more likely to experience CEO turnover. Finally, CEOs of firms with high stock volatility are more likely to experience a pay cut or turnover.

Overall, our results suggest that the board takes pay cuts as a disciplining event toward the CEOs, analogous to dismissal, in response to poor firm performance, consistent with our hypothesis (**H1**). The choice between a pay cut and forced turnover depends on the extent of poor performance, firm size, the CEO’s existing compensation scheme and equity ownership. Boards of large worse performing firms are more likely to fire their CEOs. Applying pay cuts to discipline poorly-performing CEOs is also more likely when CEOs have higher pay to begin with. Finally,

the board tends to fire a poorly-performing CEO when he holds less equity. Our results are broadly consistent with Kalpathy's (2009) finding that the choice between repricing, granting new stock, or granting new options also depends on the existing compensation structure.

In Table 3 Panel B, we use institutional ownership as a measure of governance, and examine the role of governance in the pay cut versus forced turnover decisions. Hartzell and Starks (2003) show that the presence of monitoring institutional investors is positively associated with higher CEO pay-for-performance sensitivity and negatively associated with the level of CEO pay. Our results show that better-governed firms are more likely to use pay cuts and forced turnover in response to poor performance. Specifically, the coefficients on the interaction terms, *Abnormal stock return* \times *Institutional ownership*, *Lagged abnormal stock return* \times *Institutional ownership*, *Abnormal ROA* \times *Institutional ownership*, and *Lagged abnormal ROA* \times *Institutional ownership*, are all negative and significant (except for *Lagged abnormal ROA* \times *Institutional ownership* in Column (2)). These results indicate that higher institutional ownership strengthens the sensitivities of pay cuts and CEO turnover to poor firm performance. Notably, the coefficient on *Institutional ownership* itself is also negative and significant, suggesting that, controlling for performance, better-governed firms are less likely to have a disciplinary event. This could reflect more careful selection of the CEO, on average, but we cannot definitively identify the cause of the relation.

In Panel C, we replace *Institutional Ownership* with *Board index* as an alternative measure for corporate governance. Weisbach (1988) shows that board governance matters in the relation between prior performance and the likelihood of CEO turnover. We obtain similar results. The coefficients on the interaction terms, *Abnormal stock return* \times *Board index* and *Lagged Abnormal stock return* \times *Board index*, are all negative and significant, suggesting that an effective board is more likely to cut a CEO's pay or fire a CEO following poor stock performance.

In summary, Table 3 Panels B and C show that the use of a pay cut or forced turnover to discipline poorly-performing CEO is more likely to happen in firms with strong governance structures, consistent with our second hypothesis (**H2**).

4.2. Firm performance after pay cuts and forced turnover

In this section, we examine firm performance after pay cuts and CEO forced turnover. Figure 2 reveals that, on average, accounting performance improves in the year following pay cuts or CEO turnover.⁷ There is a “V” shape in ROA around year 0: The median ROA for pay-cutting (CEO-dismissing) firms drops from 14% (13%) to 10% (9%) over the period year -3 to year 0, and improves afterward. Denis and Denis (1995) present similar V-shaped plots for a sample of turnover firms. We show that like CEO-dismissing firms, pay-cutting firms exhibit similar performance reversal. Consequently, stock performance reverses as well, from the pay cut (turnover) year (year 0) to year +1, the median stock return increases from -8% (-10%) to 10% (7%).

This significant performance improvement after a pay cut (turnover) could be due to mean reversion of industry and firm-specific factors. To explore this possibility, we match each pay-cutting or CEO-dismissing sample firm to a control firm using the following procedure. We first identify a group of firms in the same Fama and French (1997) 48 industry whose ROA in year -1 is at least $0.9 \times$ and no more than $1.1 \times$ the sample firm’s ROA in year -1, and whose ROA in year 0 is also within the same band around the sample firm’s ROA in year 0 (i.e., the pay cut/turnover year). Among them, we then pick the firm with the closest two-year cumulative ROA in year -1 and year 0. The control-adjusted performance measure of each sample firm is computed

⁷ It is worth noting that if we extend our observation window up to five years before the disciplinary event, there is some evidence suggesting that the CEO-dismissing sample firms experience a longer and deeper decline in performance than do the pay-cutting sample firms. This would help explain why some CEOs are dismissed and others have their pay cut.

by subtracting the performance measure of its control firm. Similar to the matching approach advocated by Barber and Lyon (1996), our method can isolate the component of performance change attributable to pay cuts or turnover from that due to mean reversion in performance time series.

Figure 2 Panel C shows that both the pay-cutting and the CEO-dismissing sample firms were outperforming their matched control firms prior to the matching period. Following the matching period, their performance shows a small, but significant change in control-adjusted ROA (small changes in control-adjusted ROA can be economically meaningful). The changes in control-adjusted ROA from the pay cut/turnover year (year 0) to year +1 are both approximately 1% at the median and 1.5% on average (not shown); both are significantly different from zero at the 1% level. The results on the improvement in operating performance are consistent with Denis and Denis (1995) and Huson, Malatesta, and Parrino (2004), who provide evidence of improved operational performance after CEO forced turnover.

Overall, Figure 2 indicates that, similar to the effect of forced turnover, pay cuts are indeed associated with performance turnaround, consistent with being an effective substitute to turnover. This turnaround is not simply driven by mean reversion in performance.

While the average pay-cutting (CEO-dismissing) firm improves to normal performance, there is still considerable cross-sectional variation. To further investigate the effect of a pay cut (turnover) on subsequent firm performance, we estimate the following regression to explain the change in performance in the year following the disciplinary event:

$$\Delta Performance_{it+1} = \gamma_0 + \gamma_1 Payout_{it} + \gamma_2 Turnover_{it} + \gamma_3 Ln(sales)_{it} + \gamma_4 M / B_{it} + \gamma_5 Volatility_{it} + Year\ Fixed\ Effects + Industry\ Fixed\ Effects + \varepsilon_{it}, \quad (3)$$

where the dependent variable is $\Delta Abnormal\ ROA$, the change in the industry-adjusted ROA from

the pay cut/turnover year (i.e., year t) to year $t+1$.⁸ Our variables of interest are the indicator variables *Paycut* and *Turnover*. Table 4 presents the results.

We show that the coefficients on *Paycut* and *Turnover* are approximately 0.021 and 0.055, respectively, and both are significant at the 1% level. These effects are also economically significant: For a pay-cutting (CEO-dismissing) sample firm, $\Delta Abnormal ROA$ increases by 2 percentage points (5.5 percentage points) compared to the population median of zero. The F test of the equality of these two coefficients reported at the bottom of the table shows that they are significantly different from each other at the 1% level, indicating that CEO forced turnover has a greater impact on performance turnaround than pay cuts. In summary, the evidence is consistent with the view that, similar to CEO dismissal, the pay cut motivates the CEO to improve subsequent performance, consistent with our final hypothesis (**H3**).

4.3. Pay changes following pay cuts

Given that CEOs appear to be motivated to improve performance, a natural question is whether their compensation recovers some of the pay cut if they are indeed able to reverse the poor performance. In Table 5 we estimate the CEO pay-for-performance sensitivity after the pay cut, based on the following model specification:

$$\begin{aligned} \ln(\text{Totalpay})_{it} = & \gamma_0 + \gamma_1 \text{Paycut}_{it-1} + \gamma_2 \text{Abnormal stock return}_{it-1,t} + \gamma_3 \text{Paycut}_{it-1} \times \text{Abnormal stock return}_{it-1,t} \\ & + \gamma_4 \ln(\text{sales})_{it-1} + \gamma_5 M / B_{it-1} + \gamma_6 \text{Volatility}_{it-1} + \text{Other Controls} + \varepsilon_{it}. \end{aligned} \quad (4)$$

The dependent variable is the natural logarithm of CEO *Totalpay*. We use the two-year cumulative industry-adjusted stock return to measure firm performance. The indicator variable, *Paycut*, takes the value of one if the board cuts the CEO's pay in the previous year, and zero otherwise. The coefficient on the interaction term *Paycut* \times *Abnormal stock return* captures the

⁸ It is worth noting that our performance measures in the year after the disciplinary event are not driven by bankruptcy filings or acquisitions as only one percent of our sample are lost from Compustat (and less than ten percent of our sample is lost from ExecuComp).

pay-for-performance sensitivity of the pay-cut CEO in the year following the cut compared to non-pay-cut CEOs.

Table 5 shows that the coefficient on *Abnormal stock return* is positive and significant at the 1% level: Better-performing firms pay their CEOs more. The coefficient on the interaction between *Paycut* and *Abnormal stock return* is also positive and significant at the 1% level, showing that in the year right after the pay cut, pay-cut CEOs' pay response to performance is greater than for other CEOs, leading to sharp reverses to their pay cuts when they can turn performance around. Overall, this provides evidence that CEO pay is abnormally sensitive to performance following the pay cut, providing incentives to reverse the performance decline.

4.4. Corporate policies after pay cuts and forced turnover

To further eliminate the possibility that performance improvement after a pay cut/CEO turnover is due to mean reversion of industry and firm-specific factors, we explore the actions taken by the CEO to effect the performance change. Specifically, we study capital expenditures, R&D expenses, and capital structure decisions after a CEO pay cut or turnover.

We formally examine the changes in corporate policy associated with pay cuts (turnover) by estimating the following regression:

$$\Delta \text{Corporate policy}_{it+1} = \gamma_0 + \gamma_1 \text{Paycut}_{it} + \gamma_2 \text{Turnover}_{it} + \gamma_3 \text{Ln}(\text{sales})_{it} + \gamma_4 M / B_{it} + \gamma_5 \text{Volatility}_{it} + \text{Year Fixed Effects} + \text{Industry Fixed Effects} + \varepsilon_{it}. \quad (5)$$

The results on corporate policy changes surrounding a pay cut or a turnover are reported in Table 6.

We examine the change in capital expenditures subsequent to a pay cut/turnover in Column (1). The coefficient on *Paycut (Turnover)* is -0.005 (-0.004), and significant at the 1% (5%) level. This result indicates that pay-cutting (CEO-dismissing) firms further reduce capital

expenditures by 0.5 (0.4) percentage points, relative to the sample median growth rate in capital expenditures of -0.04 percentage points. In Column (2), the dependent variable is the change in R&D expenses from the pay cut/turnover year to year $+1$. The coefficient on *Paycut (Turnover)* is -0.002 (-0.003) and is significant at the 5% (5%) level. Given that the sample average growth rate in R&D expenses is zero, pay-cutting (CEO-dismissing) firms reduce R&D expenses by 0.2 (0.3) percentage points. The dependent variable in Column (3) is the change in *Book Leverage* from the pay cut/turnover year to year $+1$. The coefficient on *Paycut (Turnover)* is -0.005 (-0.009), and is significant at the 10% (10%) level. Thus, relative to the non-action peers, firms cutting their CEOs' pay (removing their CEOs), take on 0.5 (0.9) percentage points lower debt on average. Using the change in *Market Leverage* yields similar results (not reported). The F test of the equality of the coefficients on *Paycut* and *Turnover* reported at the bottom of the table when the dependent variables are different corporate policies shows that these two coefficients are not significantly different from each other, indicating that both disciplinary events have a similar impact on corporate policies.

In summary, CEOs respond to their pay cuts by curtailing capital expenditures, reducing R&D expenses, and allocating funds to reduce leverage. The observable actions suggest that it is less likely that the performance improvement following a pay cut is due to mean-reversion.

4.5. Robustness checks

Our pay cut sample has some clustering during the 2001-2003 period (see Table 1 Panel A), so we conduct additional analysis to check whether our results are driven by this period. In particular, we exclude the firm-year observations in the 2001-2003 period (representing 42% and 27% of the total numbers of pay cut and turnover cases, respectively), and repeat all the analysis.

Table 7 show that our results are the same: Analogous to forced turnover, pay cuts are triggered by poor firm performance, are associated with improved firm performance and changes in corporate policies. Our results are not driven by the 2001-2003 period.

So far, we have used 25% as the cutoff to define a major pay cut, which is an arbitrary cutoff, so we examine the robustness of the results to other cutoffs, specifically 15% and 50%. There are 1,288 instances of 15% pay cut, and 421 instances of 50% pay cut over our sample period. We tabulate the results in Table 8, showing that the results for both thresholds are similar to those reported for the 25% threshold. The main difference comes when comparing them to forced turnover. In Panels B and D, which examine the operating performance and corporate policies, the F-statistics reported at the bottom of the tables show that the effects of a 50% pay cut are not different from the effects of a turnover, while the effects of a 15% pay cut mostly are. This is what one would expect—smaller pay cuts, likely in response to smaller performance declines also have smaller effects. Those effects, while still statistically similar to those reported for a 25% pay cut are small enough to be different from the effects of a turnover.

5. Conclusions

Creating incentives for managers to exert effort to perform well and to improve poor performance is a complex process. In this paper we study changes to CEOs' compensation packages that have the potential to create *ex ante* incentives to exert effort to avoid poor performance, and appear to create incentives to improve poor performance once enacted. Specifically, we examine the causes and consequences of a sharp pay cut, and compare them to those of CEO forced turnover.

We find that, like turnover, the likelihood of a pay cut is increasing in poor performance and that strong firm governance is important in establishing this link. Pay cuts are twice as likely as dismissals, making them the more common response to poor performance.

Following the pay cut, performance improves and the CEO's pay subsequently rises. The performance improvement is significantly smaller than that following a turnover but reflects similar actions taken by the CEO. We conclude that boards substitute pay cuts for forced turnover as response to poor performance. Not only are sharp pay cuts an important part of dynamic adjustments made to compensation, they are also part of the explanation why CEO forced turnover appears to be so rare.

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Appendix: Examples of CEO pay cut in our sample

1. Edward W. Barnholt, CEO of Agilent Technologies Inc

In 2002, Agilent's sales were down 28%, the stock was off 35%, and the firm posted a \$1 billion loss. So when it came time for the board to decide Barnholt's pay, the board decided to cut his base salary by 10%, to \$925,000, and give no bonus or restricted-stock grant for the second consecutive year. Says Barnholt: "I don't expect anything different. If the company doesn't perform, I shouldn't be getting any rewards."

Source: Business Week.

www.businessweek.com/magazine/content/03_16/b3829002.htm

2. Richard M. Rodstein, CEO of K2 INC

In determining the CEO's incentive compensation award for 2001, the Committee considered K2's performance for the year in meeting earnings targets, stock price performance, improvement in margins, returns on investment and meeting cash flow objectives, implementation of cost reduction programs, and augmenting K2's long-term strategic plan for sustainable growth. The Committee noted that while K2's stock price decreased 10% for the year, K2's peer group index decreased 16% in the same period. The Committee also noted that despite a significant decline in the sales of inline skates and a collapse of the scooter market, K2's remaining businesses reported significant improvements in operating earnings in 2001 due in part to sales of new products, to the transfer of certain production to China and an aggressive cost reduction program. The Committee noted the successful transfer of production of alpine skis to China and the implementation of significant cost reduction measures that should benefit future years. Finally, the committee considered the significant cash flow and debt reduction of K2 during the period despite the substantial decline in sales. After consideration of the above factors, the committee elected not to grant any award to the Chief Executive Officer for the year 2001 compared to an award of \$285,000 in the prior year. The 2001 total compensation for the CEO represents a 47% shortfall from the 50th percentile for total compensation of the marketplace for similar positions, according to survey data.

Source: Def 14A 2002 for K2 INC

www.sec.gov/Archives/edgar/data/6720/000091205702012792/a2072243zdef14a.htm

3. Philip J. Purcell, CEO of Morgan Stanley

Morgan Stanley cut the compensation of its chairman and chief executive, Philip J. Purcell, by 26 percent in 2002. The cut in pay follows a 17 percent decline in stock price and a 15 percent decline in net income at Morgan Stanley. The company paid Mr. Purcell \$11 million in 2002, down from \$15 million in 2001. Moreover, the aggregate compensation paid to the five most highly compensated officers for 2002 also decreased approximately 26% from 2001.

Source: Def 14A 2002 for Morgan Stanley

www.sec.gov/Archives/edgar/data/895421/000095013003001281/ddef14a.htm#tx814_16

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Table 1

Sample distribution. The sample consists of ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005. No action refers to firms whose CEOs experience neither pay cuts nor forced turnover. Payout is defined as occurring when (1) the same CEO keeps his position from year -2 to the pay cut year 0; (2) his total pay in year 0 is no more than 75% of his pay in year -1; and (3) his total pay in year -1 is no more than 125% of his pay in year -2. Turnover is forced turnover, where the press reports that CEO is fired, forced out, retires or resigns due to pressure, or the CEO retires young without warning, following Parrino (1997), Jenter and Kanaan (2010), and Peters and Wagner (2010). There are 927 instances of CEO pay cuts and 388 instances of CEO forced turnover from 1994 to 2005. Panel A presents the sample distribution over time. Panel B presents the sample distribution across Fama and French 48 industries. Panel C presents the sample distribution of CEO pay cuts by size where the size of the pay cut is computed as one minus $\text{Pay}(t)/\text{Pay}(t-1)$ with $\text{Pay}(t)$ and $\text{Pay}(t-1)$ being the CEO's total pay in the pay cut year t and year $t-1$, respectively.

Panel A: Distribution of CEO pay cuts and forced turnover by year

Year	(1) No Action	(2) Payout	(3) Turnover	(4) Total
1994	312	12	5	329
1995	870	48	21	939
1996	1180	51	32	1263
1997	1149	55	37	1241
1998	1005	57	29	1091
1999	980	42	38	1060
2000	985	72	51	1108
2001	1067	91	25	1183
2002	1155	140	35	1330
2003	1226	162	43	1431
2004	1279	88	37	1404
2005	1241	109	35	1385
Total	12449	927	388	13764

Panel B: Distribution of CEO pay cuts and forced turnover by industry

Fama and French 48 Industry	Payout		Turnover	
	Frequency	Percent	Frequency	Percent
1 Agriculture	5	0.54%	2	0.52%
2 Food Products	16	1.73%	6	1.55%
3 Candy & Soda	0	0.00%	1	0.26%
4 Beer & Liquor	2	0.22%	0	0.00%
5 Tobacco Products	0	0.00%	1	0.26%
6 Recreation	7	0.76%	6	1.55%
7 Entertainment	2	0.22%	5	1.29%
8 Printing and Publishing	17	1.83%	5	1.29%
9 Consumer Goods	23	2.48%	5	1.29%
10 Apparel	20	2.16%	2	0.52%
11 Healthcare	22	2.37%	6	1.55%
12 Medical Equipment	16	1.73%	8	2.06%
13 Pharmaceutical Products	43	4.64%	18	4.64%
14 Chemicals	21	2.27%	8	2.06%
15 Rubber and Plastic Products	5	0.54%	1	0.26%
16 Textiles	10	1.08%	3	0.77%
17 Construction Materials	13	1.40%	6	1.55%
18 Construction	5	0.54%	3	0.77%
19 Steel Works etc.	25	2.70%	11	2.84%
20 Fabricated Products	4	0.43%	2	0.52%
21 Machinery	24	2.59%	7	1.80%
22 Electrical Equipment	6	0.65%	5	1.29%
23 Automobiles and Trucks	18	1.94%	7	1.80%
24 Aircraft	4	0.43%	3	0.77%
25 Shipbuilding, Railroad Equipment	0	0.00%	0	0.00%
26 Defense	1	0.11%	0	0.00%
27 Precious Metals	3	0.32%	3	0.77%
28 Non-Metallic and Industrial Metal Mining	4	0.43%	3	0.77%
29 Coal	1	0.11%	0	0.00%
30 Petroleum and Natural Gas	29	3.13%	10	2.58%
31 Utilities	32	3.45%	12	3.09%
32 Communication	18	1.94%	13	3.35%
33 Personal Services	6	0.65%	4	1.03%
34 Business Services	91	9.82%	48	12.37%
35 Computers	59	6.36%	43	11.08%
36 Electronic Equipment	78	8.41%	21	5.41%
37 Measuring and Control Equipment	33	3.56%	5	1.29%
38 Business Supplies	22	2.37%	4	1.03%
39 Shipping Containers	2	0.22%	1	0.26%

40 Transportation	27	2.91%	12	3.09%
41 Wholesale	25	2.70%	14	3.61%
42 Retail	68	7.34%	33	8.51%
43 Restaurants, Hotels, Motels	20	2.16%	8	2.06%
44 Banking	52	5.61%	10	2.58%
45 Insurance	20	2.16%	8	2.06%
46 Real Estate	0	0.00%	0	0.00%
47 Trading	20	2.16%	6	1.55%
48 Other	8	0.86%	9	2.32%
Total	927	100%	388	100%

Panel C: Distribution of CEO pay cuts by size

Size of Payout	Frequency	Percent	Cumulative Percent
[25%, 35%)	321	34.63%	34.63%
[35%, 45%)	213	22.98%	57.61%
[45%, 55%)	147	15.86%	73.46%
[55%, 65%)	108	11.65%	85.12%
[65%, 75%)	65	7.01%	92.13%
[75%, 85%)	42	4.53%	96.66%
[85%, 95%)	24	2.59%	99.25%
[95%, 100%]	7	0.76%	100%
Total	927	100%	

Table 2

Sample descriptive statistics. This table reports firm characteristics in the year before the pay cut or CEO forced turnover. The sample consists of ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005. No action refers to firms whose CEOs experience neither pay cuts nor forced turnover. Payout is defined as occurring when (1) the same CEO keeps his position from year -2 to the pay cut year 0; (2) his total pay in year 0 is no more than 75% of his pay in year -1; and (3) his total pay in year -1 is no more than 125% of his pay in year -2. Turnover is forced turnover, where the press reports that CEO is fired, forced out, retires or resigns due to pressure, or the CEO retires young without warning, following Parrino (1997), Jenter and Kanaan (2010), and Peters and Wagner (2010). There are 927 instances of CEO pay cuts and 388 instances of CEO forced turnover from 1994 to 2005. Abnormal stock return is the difference between firm stock return and industry median stock return. ROA is operating income before depreciation over total assets. Abnormal ROA is the difference between firm ROA and industry median ROA. Industry return is industry median return. The industry classification follows Fama and French (1997) 48 industries. Totalpay is the sum of the CEO's salary, bonuses, long-term incentive plans, the grant-date value of restricted stock awards, and the Black-Scholes value of granted options. PPS is the dollar-value change in CEO wealth for \$1,000 shareholder return following Jensen and Murphy (1990). M/B is the ratio of market value of equity over book value of equity. Volatility is the standard deviation of stock returns based on monthly returns over the past 60 months. Institutional ownership is the number of shares owned by institutional investors as a percentage of the total number of shares outstanding. Board index measures board effectiveness and is constructed following Harford, Li, and Zhao (2008); higher index values indicate more effective boards. All dollar values are in 2005 dollars. All continuous variables are winsorized at the 1st and 99th percentiles. Panels A, B, and C present the summary statistics of no-action firms, pay-cutting firms, and CEO-dismissing firms, respectively.

Panel A: No action

	Mean	Std	5 th Pct	Median	95 th Pct
Abnormal stock return	4.55%	42.00%	-54.45%	0.00%	79.05%
Lagged abnormal stock return	5.78%	44.70%	-54.47%	0.00%	85.71%
Abnormal ROA	0.51%	8.85%	-11.89%	0.14%	14.73%
Lagged abnormal ROA	-0.68%	9.35%	-14.08%	0.09%	10.43%
Industry return	12.72%	21.62%	-23.89%	12.98%	48.49%
Lagged industry return	13.22%	22.03%	-23.89%	13.73%	50.36%
Total pay (\$K)	5347	7043	558	2898	19388
PPS	26.23	55.36	0.63	6.11	146.10
Total pay _{t-1} /Total pay _{t-2}	1.52	1.55	0.31	1.11	4.13
Sales (\$M)	4748	8836	140	1459	21727
M/B	2.92	3.00	0.68	2.10	8.24
Volatility	41.16%	20.82%	18.10%	35.50%	84.40%
Institutional ownership	61.91%	19.46%	26.75%	63.85%	91.23%
Board index	5.72	1.45	4	6	8

Panel B: Pay cuts

	Mean	Std	5 th Pct	Median	95 th Pct
Abnormal stock return	-11.48%	41.54%	-71.53%	-13.11%	54.01%
Lagged abnormal stock return	-8.39%	39.23%	-65.97%	-11.04%	54.88%
Abnormal ROA	-2.36%	10.57%	-23.29%	-1.12%	12.65%
Lagged abnormal ROA	-1.94%	11.92%	-29.82%	0.00%	10.89%
Industry return	10.40%	24.48%	-30.32%	10.35%	50.36%
Lagged industry return	6.22%	23.01%	-30.32%	6.82%	45.98%
Total pay (\$K)	2896	4151	385	1466	10438
PPS	31.03	58.48	0.93	7.68	150.35
Total pay _{t-1} /Total pay _{t-2}	0.85	0.29	0.27	0.92	1.24
Sales (\$M)	4006	8418	96	1119	18608
M/B	2.68	2.64	0.50	2.01	7.20
Volatility	50.47%	24.70%	21.30%	44.20%	99.60%
Institutional ownership	61.57%	19.95%	23.35%	63.36%	91.04%
Board index	5.79	1.43	4	6	8

Panel C: Forced turnover

	Mean	Std	5 th Pct	Median	95 th Pct
Abnormal stock return	-15.72%	52.58%	-88.23%	-22.73%	84.65%
Lagged abnormal stock return	-19.57%	43.46%	-80.59%	-20.24%	46.00%
Abnormal ROA	-5.32%	12.26%	-32.73%	-3.43%	11.90%
Lagged abnormal ROA	-6.26%	14.54%	-42.74%	-2.37%	9.09%
Industry return	10.90%	23.87%	-27.87%	11.86%	50.46%
Lagged industry return	9.79%	22.81%	-27.38%	9.98%	50.36%
Total pay (\$K)	5384	8053	419	2395	24690
PPS	11.35	35.19	0.18	2.28	64.50
Total pay _{t-1} /Total pay _{t-2}	1.57	1.84	0.19	1.01	5.04
Sales (\$M)	4891	9754	99	1247	23430
M/B	2.61	3.03	0.32	1.77	8.79
Volatility	55%	25%	26%	49%	114%
Institutional ownership	55.93%	22.11%	14.38%	58.45%	91.19%
Board index	6.10	1.41	4	6	8

Table 3

What cause a CEO pay cut or forced turnover? This table reports the multinomial logit regression results using a sample of ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005. The dependent variable takes the value of zero if the board takes no action (the baseline case), the value of one if the board cuts the CEO's pay (paycut), and the value of two if the board fires the CEO (turnover). Abnormal stock return is the difference between firm stock return and industry median stock return. Abnormal ROA is the difference between firm ROA and industry median ROA. Industry return is industry median return. The industry classification follows Fama and French (1997) 48 industries. Totalpay is the sum of the CEO's salary, bonuses, long-term incentive plans, the grant-date value of restricted stock awards, and the Black-Scholes value of granted options. Abnormal CEO pay is the difference between CEO $\ln(\text{Totalpay})$ and predicted $\ln(\text{Totalpay})$, where predicted $\ln(\text{Total pay})$ is estimated based on Equation (1). Abnormal CEO PPS is the difference between CEO PPS (pay-for-performance sensitivity) and predicted PPS, where PPS is the dollar-value change in CEO wealth for \$1,000 shareholder return following Jensen and Murphy (1990), and the predicted PPS is estimated based on the coefficient in Equation (1). M/B is the ratio of market value of equity over book value of equity. Volatility is the standard deviation of stock returns based on monthly returns over the past 60 months. Institutional ownership is the number of shares owned by institutional investors as a percentage of the total number of shares outstanding. Board index measures board effectiveness and is constructed following Harford, Li, and Zhao (2008); higher index values indicate more effective boards. Column (1) reports the determinants of CEO pay cuts. Column (2) reports the determinants of forced turnover. Column (3) reports the F-statistics to test the equality of coefficients between CEO pay cuts and forced turnover. Corresponding robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Panel A presents the baseline regression model. Panel B presents the regression results controlling for institutional ownership. Panel C presents the regression results controlling for board index.

Panel A: Baseline model

	(1)	(2)	F-statistic of the Test
	Payout	Turnover	(1) = (2)
Abnormal stock return	-1.005*** (0.110)	-0.916*** (0.171)	0.21
Lagged abnormal stock return	-0.919*** (0.112)	-1.450*** (0.210)	5.24**
Abnormal ROA	-2.561*** (0.591)	-3.071*** (0.946)	0.23
Lagged abnormal ROA	-2.939*** (0.632)	-1.623* (0.962)	1.43
Industry stock return	-0.764*** (0.233)	-0.317 (0.338)	1.23
Lagged industry stock return	-1.254*** (0.234)	-0.950*** (0.335)	0.62
Abnormal CEO pay	0.395*** (0.042)	-0.097 (0.071)	39.24***
Abnormal CEO PPS/100	0.171** (0.078)	-0.670*** (0.153)	24.43***
Ln(sales)	-0.027 (0.027)	0.149*** (0.041)	13.41***
M/B	-0.023 (0.015)	0.018 (0.018)	3.65*
Volatility	0.686*** (0.221)	1.863*** (0.328)	10.26***
Constant	-24.901*** (0.885)	-7.668*** (1.236)	
Industry and Year FE	Yes	Yes	
Observations	13764	13764	
Pseudo R2	11%	11%	

Panel B: Using institutional ownership to measure corporate governance

	(1)	(2)	F-statistic of the Test
	Payout	Turnover	(1) = (2)
Abnormal stock return × Institutional ownership	-1.154** (0.465)	-1.460*** (0.502)	0.21
Lagged abnormal stock return × Institutional ownership	-1.327*** (0.329)	-2.405*** (0.553)	3.08*
Abnormal ROA × Institutional ownership	-3.818** (1.787)	-6.458*** (2.046)	1.06
Lagged abnormal ROA × Institutional ownership	-4.034* (2.205)	-3.059 (2.072)	0.10
Institutional ownership	-0.387* (0.212)	-1.436*** (0.359)	6.39**
Abnormal stock return	-0.277 (0.285)	-0.036 (0.232)	0.46
Lagged abnormal stock return	-0.103 (0.195)	-0.054 (0.263)	0.03
Abnormal ROA	-0.192 (0.891)	0.263 (0.587)	0.19
Lagged abnormal ROA	0.282 (1.173)	-0.207 (0.593)	0.13
Industry stock return	-0.757*** (0.237)	-0.279 (0.346)	1.34
Lagged industry stock return	-1.266*** (0.237)	-1.111*** (0.331)	0.16
Abnormal CEO pay	0.397*** (0.043)	-0.075 (0.073)	33.89***
Abnormal CEO PPS/100	0.002** (0.001)	-0.007*** (0.002)	23.68***
Ln(sales)	-0.022 (0.028)	0.136*** (0.041)	10.66***
M/B	-0.020 (0.015)	0.018 (0.019)	2.82*
Volatility	0.801*** (0.220)	1.742*** (0.340)	5.64**
Constant	-1.635** (0.681)	-5.960*** (1.019)	
Industry and Year FE	Yes	Yes	
Observations	13405	13405	
Pseudo R2	11%	11%	

Panel C: Using board index to measure corporate governance

	(1)	(2)	F-statistic of the Test
	Pay Cut	Turnover	(1) = (2)
Abnormal stock return × Board index	-0.084** (0.041)	-0.183** (0.093)	1.39
Lagged abnormal stock return × Board index	-0.226*** (0.052)	-0.205** (0.105)	1.10
Abnormal ROA × Board index	0.142 (0.299)	-0.124 (0.368)	0.39
Lagged abnormal ROA × Board index	-0.061 (0.313)	-0.489 (0.444)	0.70
Board index	-0.090*** (0.033)	-0.205*** (0.055)	22.01***
Abnormal stock return	-0.899* (0.480)	-0.063 (0.522)	1.48
Lagged abnormal stock return	-0.156 (0.201)	-1.471*** (0.492)	6.29***
Abnormal ROA	-3.025* (1.552)	-3.338* (1.859)	0.14
Lagged abnormal ROA	-2.713 (1.686)	-4.939** (2.490)	0.11
Industry stock return	-0.998*** (0.280)	-0.151 (0.394)	3.07*
Lagged industry stock return	-1.680*** (0.277)	-0.976** (0.435)	1.39*
Abnormal CEO pay	0.367*** (0.054)	-0.208** (0.087)	28.36***
Abnormal CEO PPS/100	0.250*** (0.086)	-1.025*** (0.261)	24.11***
Ln(sales)	-0.034 (0.032)	0.242*** (0.054)	17.88***
M/B	-0.012 (0.017)	0.032 (0.027)	2.13
Volatility	0.753** (0.312)	2.460*** (0.490)	8.79***
Constant	-0.880 (0.841)	-11.276*** (1.440)	
Industry and Year FE	Yes	Yes	
Observations	10146	10146	
Pseudo R2	13%	13%	

Table 4

Firm performance after a CEO pay cut or forced turnover. This table reports the OLS regression results using a sample of ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005. Abnormal ROA is the difference between firm ROA and industry median ROA. The industry classification follows Fama and French (1997) 48 industries. Δ Abnormal ROA is defined as Abnormal ROA ($t+1$) – Abnormal ROA (t). Payout takes the value of one if the board cuts the CEO's pay in year t , and zero otherwise. Turnover takes the value of one if the board fires the CEO in year t , and zero otherwise. M/B is the ratio of market value of equity over book value of equity. Volatility is the standard deviation of stock returns based on monthly returns over the past 60 months. The F-statistics to test the equality of coefficients on payout and turnover are provided at the bottom of the table. Corresponding robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	Δ Abnormal ROA	Δ Abnormal ROA
Payout	0.021*** (0.008)	0.020*** (0.008)
Turnover	0.055*** (0.015)	0.054*** (0.015)
Ln(sales)	0.000 (0.001)	0.002 (0.001)
M/B		0.001** (0.001)
Volatility		0.032** (0.013)
Constant	-0.007 (0.030)	-0.052 (0.035)
Industry and Year FE	Yes	Yes
Observations	12420	12420
Adjusted R2	1%	1%
F-statistic of the test: Payout = Turnover	11.65***	11.12***

Table 5

Pay-for-performance sensitivity after a CEO pay cut. This table reports the OLS regression results using a sample of ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005. The dependent variable, $\ln(\text{Totalpay})$, is the natural logarithm of CEO's total annual compensation. Payout takes the value of one if the board cuts the CEO's pay in the previous year (year $t-1$), and zero otherwise. Abnormal stock return is the cumulative difference between firm stock return and industry median stock return in year $t-1$ and year t . The industry classification follows Fama and French (1997) 48 industries. M/B is the ratio of market value of equity over book value of equity. Volatility is the standard deviation of stock returns based on monthly returns over the past 60 months. Columns (1) and (2) are based on the full sample of pay-cutting firms and all non-pay-cutting firms. Columns (3) and (4) are based on a subsample excluding firms that experience CEO forced turnover during the sample period. Corresponding robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Full sample		Subsample excluding firms with CEO forced turnover	
	(1)	(2)	(3)	(4)
Payout	-0.033 (0.028)	-0.019 (0.029)	-0.050* (0.030)	-0.039 (0.031)
Abnormal stock return	0.100*** (0.007)	0.097*** (0.007)	0.099*** (0.008)	0.097*** (0.008)
Payout \times Abnormal stock return		0.191** (0.083)		0.179** (0.089)
$\ln(\text{sales})$	0.451*** (0.005)	0.451*** (0.005)	0.454*** (0.006)	0.454*** (0.006)
M/B	0.048*** (0.002)	0.048*** (0.002)	0.046*** (0.003)	0.046*** (0.003)
Volatility	0.359*** (0.042)	0.363*** (0.042)	0.421*** (0.049)	0.424*** (0.049)
Constant	5.427*** (0.121)	5.426*** (0.121)	5.323*** (0.134)	5.322*** (0.134)
Industry and Year FE	Yes	Yes	Yes	Yes
Observations	15046	15046	12208	12208
Adjusted R2	46%	46%	46%	46%

Table 6

Corporate policies after a CEO pay cut or forced turnover. This table reports the OLS regression results using a sample of ExecuComp firms whose CEOs stay in office for at least three years during the period from 1994 to 2005. Capex is capital expenditures over total assets. ΔCapex is defined as $\text{Capex}(t+1) - \text{Capex}(t)$. R&D is research and development expenses over total assets. $\Delta\text{R\&D}$ is defined as $\text{R\&D}(t+1) - \text{R\&D}(t)$. Book Leverage is the ratio of long-term debt and current debt over total assets. $\Delta\text{Book Leverage}$ is defined as $\text{Book Leverage}(t+1) - \text{Book Leverage}(t)$. Payout takes the value of one if the board cuts the CEO's pay in year t , and zero otherwise. Turnover takes the value of one if the board fires the CEO in year t , and zero otherwise. M/B is the ratio of market value of equity over book value of equity. Volatility is the standard deviation of stock returns based on monthly returns over the past 60 months. The industry classification follows Fama and French (1997) 48 industries. The F-statistics to test the equality of coefficients on payout and turnover are provided at the bottom of the table. Corresponding robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	ΔCapex	$\Delta\text{R\&D}$	$\Delta\text{Bookleverage}$
Payout	-0.005*** (0.001)	-0.002** (0.001)	-0.005* (0.003)
Turnover	-0.004** (0.002)	-0.003** (0.001)	-0.009* (0.005)
Ln(sales)	0.000** (0.000)	0.001*** (0.000)	-0.003*** (0.001)
M/B	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
Volatility	-0.003 (0.002)	-0.006*** (0.001)	0.007 (0.004)
Constant	-0.009** (0.003)	-0.010*** (0.003)	0.058*** (0.012)
Industry and Year FE	Yes	Yes	Yes
Observations	12995	12995	12322
Adjusted R2	2%	2%	2%
F-statistic of the test: Payout = Turnover	0.01	1.57	0.43

Table 7

Robustness check: Excluding the 2001-2003 period. This table presents the results of robustness check based on a subsample excluding the 2001-2003 period. Panel A presents the multinomial logit regression results, using the same specification as in Panel A of Table 3. Panel B presents the performance improvement results after a pay cut/turnover, using the same specification as in Table 4. Panel C presents the pay-for-performance sensitivity after pay cut results, using the same specification as in Table 5. Panel D presents the corporate policy changes after a pay cut/turnover, using the same specification as in Table 6. Corresponding robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: What cause a CEO pay cut or forced turnover?

	(1) Payout	(2) Turnover	F-statistic of the Test (1) = (2)
Abnormal stock return	-1.517*** (0.184)	-0.967*** (0.203)	4.27**
Lagged abnormal stock return	-1.181*** (0.158)	-1.390*** (0.221)	0.64
Abnormal ROA	-2.938*** (0.778)	-2.972*** (1.071)	0.01
Lagged abnormal ROA	-2.978*** (0.840)	-1.007 (1.142)	2.16
Industry stock return	-0.989*** (0.309)	-0.178 (0.404)	2.74*
Lagged industry stock return	-1.213*** (0.338)	-1.384*** (0.426)	0.11
Abnormal CEO pay	0.381*** (0.062)	-0.151* (0.090)	26.61***
Abnormal CEO PPS/100	0.109 (0.107)	-0.694*** (0.183)	15.11***
Ln(sales)	-0.058 (0.036)	0.117** (0.050)	8.64***
M/B	0.001 (0.019)	0.049** (0.021)	3.55*
Volatility	0.107 (0.351)	1.896*** (0.404)	13.77***
Constant	-25.665*** (1.204)	-8.206*** (1.454)	
Industry and Year FE	Yes	Yes	
Observations	9820	9820	
Pseudo R2	11%	11%	

Panel B: Firm performance after a CEO pay cut or forced turnover

	(1)	(2)
	Δ Abnormal ROA	Δ Abnormal ROA
Payout	0.020*** (0.004)	0.020*** (0.004)
Turnover	0.021*** (0.007)	0.022*** (0.007)
Ln(sales)	0.001 (0.001)	0.000 (0.001)
M/B		0.001** (0.000)
Volatility		-0.010 (0.006)
Constant	-0.017 (0.014)	0.005 (0.017)
Industry and Year FE	Yes	Yes
Observations	8755	8755
Adjusted R2	2%	2%

Panel C: Pay-for-performance sensitivity after a CEO pay cut

	Full sample		Subsample of excluding firms with CEO forced turnover	
	(1)	(2)	(3)	(4)
Payout	-0.043 (0.035)	-0.019 (0.037)	-0.041 (0.037)	-0.023 (0.039)
Abnormal stock return	0.136*** (0.009)	0.134*** (0.009)	0.132*** (0.010)	0.129*** (0.010)
Payout \times Abnormal stock return		0.232** (0.106)		0.188* (0.114)
Ln(sales)	0.449*** (0.006)	0.449*** (0.006)	0.451*** (0.006)	0.451*** (0.006)
M/B	0.044*** (0.003)	0.044*** (0.003)	0.042*** (0.003)	0.042*** (0.003)
Volatility	0.357*** (0.054)	0.359*** (0.054)	0.433*** (0.062)	0.435*** (0.062)
Constant	5.485*** (0.142)	5.484*** (0.142)	5.383*** (0.157)	5.383*** (0.157)
Industry and Year FE	Yes	Yes	Yes	Yes
Observations	10681	10681	8676	8676
Adjusted R2	47%	47%	48%	48%

Panel D: Corporate policies after a CEO pay cut or forced turnover

	(1)	(2)	(3)
	ΔCapex	$\Delta\text{R\&D}$	$\Delta\text{Bookleverage}$
Payout	-0.007*** (0.002)	-0.002* (0.001)	-0.009** (0.005)
Turnover	-0.016*** (0.003)	-0.004* (0.002)	-0.020** (0.010)
Ln(sales)	0.001** (0.000)	0.001*** (0.000)	-0.004*** (0.001)
M/B	0.000* (0.000)	-0.000*** (0.000)	0.000 (0.000)
Volatility	-0.004 (0.003)	-0.006*** (0.002)	-0.003 (0.008)
Constant	-0.012* (0.007)	-0.015*** (0.004)	0.081*** (0.020)
Industry and Year FE	Yes	Yes	Yes
Observations	9243	9243	8680
Adjusted R2	2%	2%	2%

Table 8

Robustness check: Using different cutoffs to define a CEO pay cut. This table presents the results of robustness checks using 15% and 50% as the cutoffs to define a CEO pay cut. The indicator variable, Payout15 (Payout50), captures a CEO experiencing a cut of at least 15% (50%) relative to his previous year's pay, defined in the same way as using the 25% pay cut. There are 1,288 instances of 15% pay cut, and 421 instances of 50% pay cut over our sample period of 1994-2005. Panel A presents the multinomial logit regression results, using the same specification as in Panel A of Table 3. Panel B presents the performance improvement results after a pay cut/turnover, using the same specification as in Table 4. Panel C presents the pay-for-performance sensitivity after pay cut results, using the same specification as in Table 5. Panel D presents the corporate policy changes after a pay cut/turnover, using the same specification as in Table 6. Corresponding robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: What cause a CEO pay cut or forced turnover?

	Payout15 versus Forced Turnover			Payout50 versus Forced Turnover		
	(1) Payout15	(2) Turnover	F-statistic of the Test (1) = (2)	(3) Payout50	(4) Turnover	F-statistic of the Test (3) = (4)
Abnormal stock return	-0.949*** (0.097)	-0.945*** (0.175)	0.01	-0.785*** (0.153)	-0.885*** (0.170)	0.20
Lagged abnormal stock return	-1.017*** (0.105)	-1.455*** (0.210)	3.78*	-0.790*** (0.165)	-1.361*** (0.202)	4.98**
Abnormal ROA	-2.241*** (0.552)	-3.280*** (0.959)	1.02	-3.531*** (0.789)	-3.069*** (0.937)	0.16
Lagged abnormal ROA	-2.574*** (0.589)	-1.928** (0.970)	0.37	-3.346*** (0.871)	-1.534 (0.951)	2.08
Industry stock return	-0.638*** (0.214)	-0.371 (0.341)	0.47	-0.384 (0.353)	-0.334 (0.340)	0.01
Lagged industry stock return	-1.242*** (0.219)	-0.986*** (0.338)	0.45	-0.751** (0.333)	-0.835** (0.328)	0.03
Abnormal CEO pay	0.282*** (0.039)	-0.095 (0.071)	24.47***	0.817*** (0.058)	-0.112 (0.072)	108.89***
Abnormal CEO PPS/100	0.158** (0.071)	-0.655*** (0.154)	23.43***	0.327*** (0.115)	-0.698*** (0.155)	28.82***
Ln(sales)	-0.043* (0.024)	0.141*** (0.041)	15.45**	0.013 (0.040)	0.150*** (0.039)	6.41**
M/B	-0.029** (0.013)	0.019 (0.018)	4.93**	-0.041* (0.022)	0.014 (0.019)	4.02**
Volatility	0.440** (0.204)	1.919*** (0.329)	16.95***	1.438*** (0.288)	1.794*** (0.322)	0.73
Constant	-24.286*** (1.058)	-7.494*** (1.240)		-26.956*** (1.219)	-7.652*** (1.207)	
Industry and Year FE	Yes	Yes		Yes	Yes	
Observations	13764	13764		13764	13764	
Pseudo R2	10%	10%		14%	14%	

Panel B: Firm performance after a CEO pay cut or forced turnover

	(1)	(2)	(3)	(4)
	Δ Abnormal ROA	Δ Abnormal ROA	Δ Abnormal ROA	Δ Abnormal ROA
Payout15	0.009*** (0.003)	0.009*** (0.003)		
Payout50			0.020*** (0.005)	0.019*** (0.005)
Turnover	0.029*** (0.006)	0.028*** (0.006)	0.030*** (0.006)	0.029*** (0.006)
Ln(sales)	-0.000 (0.001)	0.001 (0.001)	-0.000 (0.001)	0.001 (0.001)
M/B		0.001** (0.000)		0.001** (0.000)
Volatility		0.025*** (0.005)		0.021*** (0.005)
Constant	0.009 (0.012)	-0.027* (0.015)	0.005 (0.012)	-0.026* (0.015)
Industry and Year FE	Yes	Yes	Yes	Yes
Observations	12420	12420	12420	12420
Adjusted R2	2%	2%	2%	2%
F-statistic of the test:				
Payout15 = Turnover	9.16***	8.22***		
Payout50 = Turnover			0.2	1.7

Panel C: Pay-for-performance sensitivity after a CEO pay cut

	Full sample		Subsample excluding firms with CEO forced turnover	
	(1)	(2)	(3)	(4)
Payout15	-0.064** (0.026)		-0.071*** (0.027)	
Payout15 × Abnormal stock return	0.158** (0.064)		0.164** (0.070)	
Payout50		0.052 (0.044)		0.049 (0.048)
Payout50 × Abnormal stock return		0.177** (0.074)		0.243* (0.145)
Abnormal stock return	0.096*** (0.007)	0.099*** (0.007)	0.090*** (0.007)	0.099*** (0.008)
Ln(sales)	0.451*** (0.005)	0.451*** (0.005)	0.455*** (0.006)	0.455*** (0.006)
M/B	0.048*** (0.002)	0.048*** (0.002)	0.047*** (0.003)	0.046*** (0.003)
Volatility	0.366*** (0.042)	0.357*** (0.042)	0.426*** (0.049)	0.426*** (0.050)
Constant	5.429*** (0.121)	5.426*** (0.121)	5.300*** (0.134)	5.287*** (0.135)
Industry and Year FE	Yes	Yes	Yes	Yes
Observations	15046	15046	12208	12208
Adjusted R2	46%	45%	46%	46%

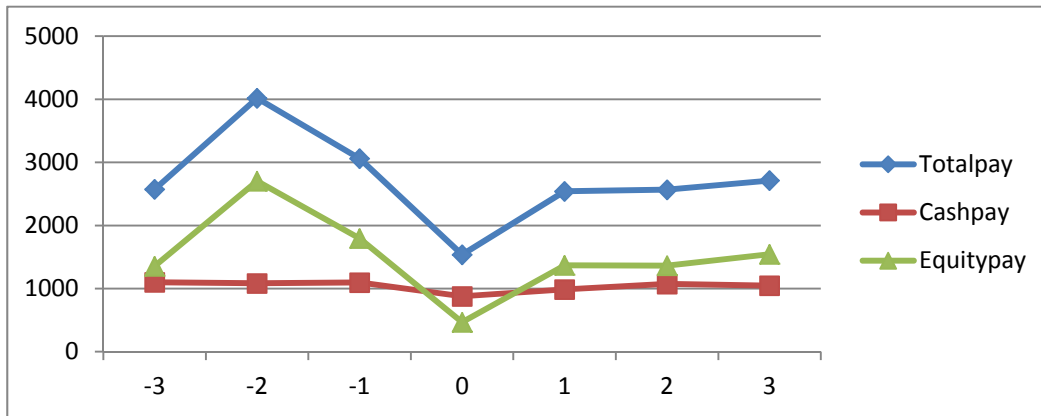
Panel D: Corporate policies after a CEO pay cut or forced turnover

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔCapex	$\Delta\text{R\&D}$	$\Delta\text{Bookleverage}$	ΔCapex	$\Delta\text{R\&D}$	$\Delta\text{Bookleverage}$
Paycut15	-0.005*** (0.001)	-0.002*** (0.001)	-0.010*** (0.002)			
Paycut50				-0.005*** (0.001)	-0.003*** (0.001)	-0.011** (0.004)
Turnover	-0.006*** (0.002)	-0.004*** (0.001)	-0.009* (0.005)	-0.006*** (0.002)	-0.004*** (0.001)	-0.009* (0.005)
Ln(sales)	0.000*** (0.000)	0.001*** (0.000)	-0.002*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	-0.003*** (0.001)
M/B	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)
Volatility	-0.002* (0.001)	-0.007*** (0.001)	0.004 (0.004)	-0.002 (0.001)	-0.006*** (0.001)	0.006 (0.004)
Constant	-0.005*** (0.001)	-0.002*** (0.001)	-0.010*** (0.002)	-0.011*** (0.004)	-0.012*** (0.003)	0.055*** (0.012)
Industry and Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12995	12995	12322	12995	12995	12322
Adjusted R2	3%	2%	3%	3%	2%	3%
F-statistic of the test:						
Paycut15 = Turnover	2.64*	6.41**	0.89			
Paycut50 = Turnover				1.43	3.03*	0.03

Figure 1

CEO Pay around a Pay Cut. This figure presents the trend in CEO pay over the seven-year period surrounding a pay cut. Totalpay is the sum of the CEO's salary, bonuses, long-term incentive plans, the grant-date value of restricted stock awards, and the Black-Scholes value of granted options. Cashpay is the sum of the CEO's salary, bonus, payouts from long-term incentive plans, and all other cash-based compensation. Equitypay is the value of restricted stock and the Black-Scholes value of stock options. Year 0 is the year when the pay cut occurs. Abnormal CEO pay is the difference between CEO pay and the predicted CEO pay based on Equation (1). Panel A presents the median value of CEO pay measured in thousands of 2005-constant dollars over the seven-year period surrounding a pay cut. Panel B presents the abnormal CEO pay.

Panel A: CEO pay



Panel B: Abnormal CEO pay

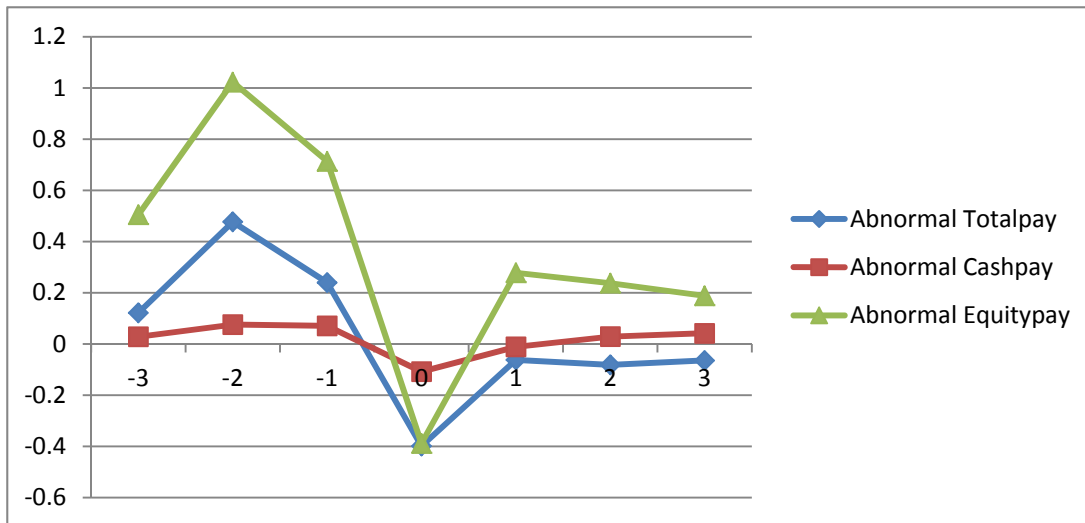
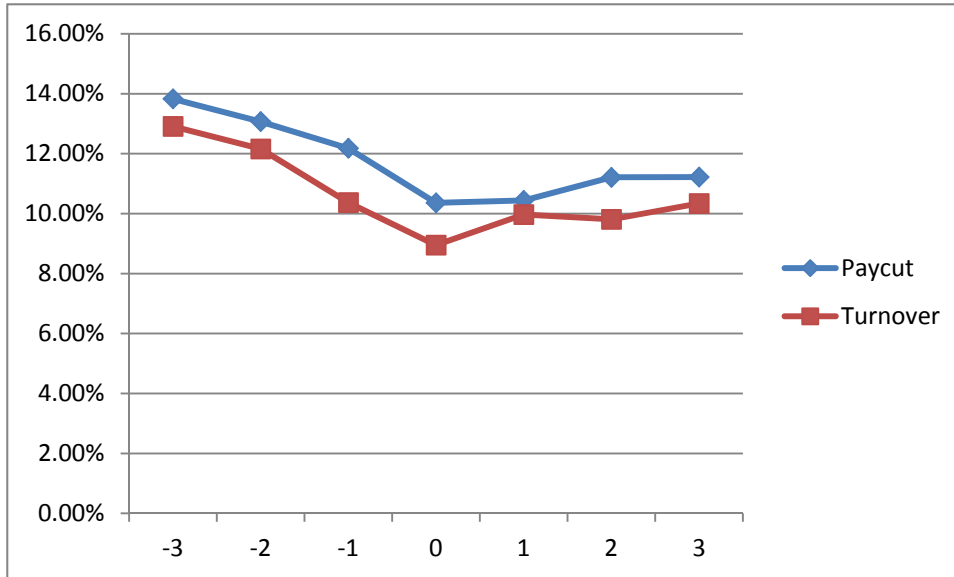


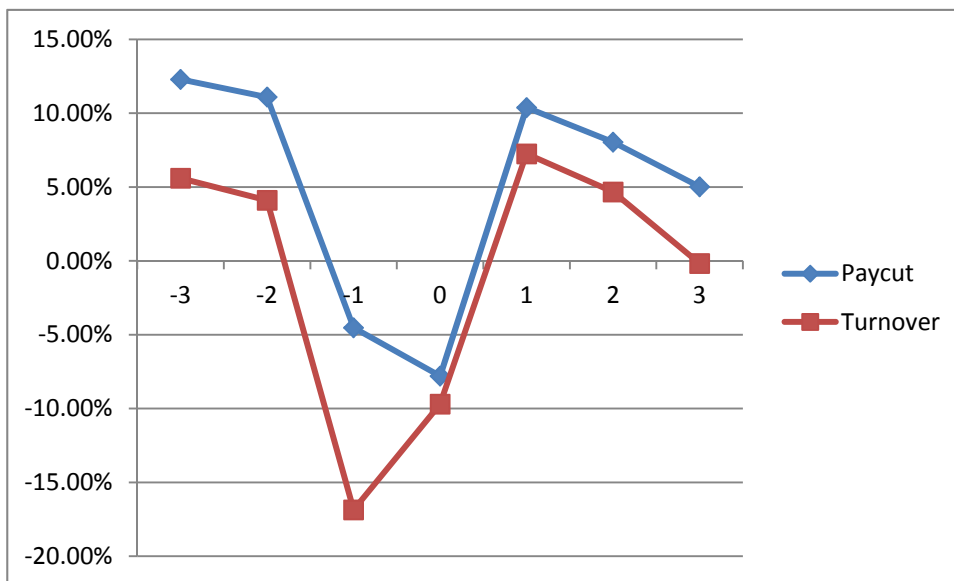
Figure 2

Firm performance around a CEO pay cut or forced turnover. This figure presents the trend in firm performance over the seven-year period surrounding a pay cut or turnover. The figure is based on firms with available performance information over the entire seven-year period. Each pay-cutting/CEO-dismissing firm is matched to a control firm in the following way. We first identify a group of firms in the same Fama and French (1997) 48 industry whose ROA in year -1 is at least $0.9 \times$ and no more than $1.1 \times$ the sample firm's ROA in year -1 , and whose ROA in year 0 is also within the same band around the sample firm's ROA in year 0 (i.e., the pay cut/turnover year). Among them, we then pick the firm with the closest two-year cumulative ROA in year -1 and year 0 . The control-adjusted performance measure of each sample firm is computed by subtracting the performance measure of its control firm. The median value is presented. Year 0 is the year when the pay cut/turnover occurs. Panel A presents the time series of ROA. Panel B presents the time series of stock returns. Panel C presents the time series of control-adjusted ROA.

Panel A: ROA



Panel B: Stock Return



Panel C: Control-adjusted ROA

