Do CEO pay cuts really work?*

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Abstract

CEO pay is often cut in poorly performing firms to prod the CEO to work harder and restore profitability. This paper examines whether such CEO pay cuts really work. Although we do see an improvement in firms' reported accounting performance following a CEO pay cut, we find that much of this reported improvement is achieved via accruals and real activities manipulation. We also find that earnings management after a pay cut is more pronounced when managers are more entrenched and less likely when institutional ownership is higher. Finally, we find that boards of directors do not punish such opportunistic behavior sufficiently. Collectively, we interpret these findings as evidence of managerial influence in the pay-setting process.

1. INTRODUCTION

CEOs of poorly performing firms often receive a pay cut.[1] The rationale for a pay cut is that it will prod the CEO to work harder in the future and restore profitability. Agency theory (Jensen and Meckling 1976, Fama 1980) supports this notion of linking CEO pay with firm performance. In this study, we examine whether these pay cuts really work.

It is not clear ex ante whether pay cuts would yield the desired result of improving firm performance. If pay cuts are viewed as a disciplining mechanism, it is possible that CEOs improve their behavior, leading to decreased managerial agency costs and better performance in subsequent periods. This perspective is likely to arise when the CEO understands that the firm attributes the past poor operating performance results to sub-optimal managerial behavior and decisions. Alternatively, if the firm's decision to cut the pay of its CEO is driven by tight financial prospects of the firm that are outside the control of the manager, then pay cuts may be viewed as "a gesture of sacrifice by CEOs of firms in crisis" (Hamm et al. 2013) and might signal the CEO's confidence in turning around the company in the near future.

It is also possible that cutting the pay of an incumbent CEO could induce an adversarial response because the lowered compensation could dampen managerial incentives. Further, the current CEO is also likely to feel slighted and insulted due to the pay cut. In such circumstances, we hypothesize that the CEO is likely to engage in earnings management in the year following a

[1] In a recent WSJ article (March 20, 2013), Thurm documents several instances of a firm cutting its CEO's pay following poor performance. For instance, when Air Products & Chemicals Inc.'s earnings per share (EPS) fell far short of the company's target in the fiscal year 2012, CEO John McGlade paid the price with a 65% cut in his annual bonus. His grants of stock and stock options shrank as well, reducing his total direct compensation 19%, to $9.1 million. When the net income of Smithfield Foods Inc. fell 31% for the fiscal year 2012, the directors of the company responded by making CEO C. Larry Pope's bonus formula less lucrative. As a result, the cash bonus fell 64%, contributing to a 31% drop in total direct compensation. Johnson & Johnson said it sliced 2012 bonuses for top executives by 10% and Nabors Industries Ltd. rewrote its CEO's contract to eliminate lucrative bonus and severance clauses to reflect "mixed" results.

Gao et al. (2012) also present empirical evidence indicating that poor performance leads to CEO pay cuts.

pay cut because it will lead to faster improvement in reported performance, and hence, to speedier restoration of the CEO's pay to earlier levels.

Our hypothesis is based on multi-task agency theory (e.g., Holmstrom and Milgrom, 1991; Baker, 1992; Feltham and Xie, 1994), which indicates that the use of imperfect performance measures can lead to distorted incentives in the sense that the CEO allocates effort inefficiently between productive and manipulative activities (e.g., accruals manipulation, or engaging in real activities management such as cutting research and development (R&D) expenditures which will boost reported earnings in the short-run, but at the expense of long-term shareholder value).

We use a sample of non-financial firms from Execucomp over the period 1994-2011 and identify 1,330 instances of significant pay cuts. We classify a decrease in CEO compensation as a "pay cut" if a CEO's total compensation is reduced by at least 25% from the previous year. The median pay cut for our sample is 42.20% from the CEO's prior year compensation, or approximately $1.49 million. These pay cuts are not just mechanical reversals of prior pay hikes. Further, these reductions in total pay result mainly from a decline in the number of stock and options grants (and not just the decline in stock price).

We find that the reported earnings performance of a firm does improve in the year following a CEO pay cut. However, we also find that much of this improvement is achieved via accruals and real activities management. Performance-adjusted discretionary accruals in the year after the pay cut are on average income-increasing, and are almost 2.33 times greater than discretionary accruals for a control sample. Regarding real earnings management, we find that pay-cut firms on average overproduce, cut their discretionary expenditures (such as R&D and SG&A expenditure), and undertake activities that improve reported cash flows from operations

in the year following the pay cut. Overall, our results indicate that pay-cut firms would have reported *insignificant* improvement in profits in the year following the pay cut had they not engaged in these earnings management activities.

Given that a CEO is expected to make operational changes after the pay cut, the implications of our findings will depend on the extent to which our real earnings management proxies capture an operational change rather than an opportunistic action. To distinguish between these alternative interpretations, we examine the association between these earnings management proxies and stock returns as well as long term operating profits. We find that for pay-cut firms, none of the earnings management actions in the year following the pay cut is associated with a greater contemporaneous stock market return. In fact, discretionary accruals management by pay-cut firms is associated with negative stock market returns in the year following the pay cut. Further, the earnings management in the year following the pay cut is negatively associated with longer term operating performance in underlying fundamental terms (measured as industry-adjusted return on assets in the second year following the pay cut), suggesting that these earnings management activities in the year following a CEO pay cut are really an attempt to mask poor reported accounting performance in the short-run.

We next examine cross-sectional variation in the CEO's proclivity to manage earnings following a pay cut. We hypothesize that the relative power of the CEO vis-à-vis the board and the effectiveness of monitoring by external shareholders have an impact on managerial opportunism. We empirically examine these two dimensions of governance using the following: (1) Entrenchment Index *(E-Index*) as proposed by Bebchuk et al (2009), which measures how difficult it is to remove the incumbent CEO and serves as a proxy for CEO power; and (2) Institutional Ownership, which measures the extent of external monitoring of a firm's activities.

Consistent with our expectations, we find that the proclivity to manage earnings in the year following a pay cut is higher for firms with higher *E-Index*, and that firms with greater institutional ownership of shares are less likely to experience value-destroying earnings management following a pay cut.

Finally, we also examine whether the board rewards the managed and pre-managed components of earnings differentially after a pay cut is initiated in order to provide appropriate compensation incentives to a CEO. Our results indicate that the board neither creates additional incentives to engage in productive activities by giving higher weight to the pre-managed component of earnings nor imposes penalties on manipulative activities by giving lower weight to the managed component of earnings in the year following the pay cut. On the contrary, we find that CEO compensation in the year following the pay cut actually increases by as much as 40% on average.

These findings collectively give rise to the following puzzle: why would a firm reward its CEO in the year following a pay cut in the form of higher wages, despite the CEO's earnings management behavior imposing significant agency costs on the firm in terms of both lower contemporaneous market returns and diminished long-term operating performance? While there me be other possible explanations for this puzzle, we interpret these findings as evidence of CEOs' influence over the pay-setting process (Bertrand and Mullainathan 2001; Bebchuk and Fried 2004). This influence can lead to a CEO accepting a pay cut in the wake of poor performance to placate stakeholders and, subsequently, having the pay restored to earlier levels when the firm's reported accounting performance improves (although via real earnings management activities and discretionary accruals). In this manner, the CEO is able to avoid negative publicity and scrutiny.

Our study contributes to the literature on executive compensation by examining the effectiveness of pay cuts as a mechanism for encouraging CEO effort and for strengthening the pay-for-performance relation. While Gao et al. (2012) conclude that the board uses large pay cuts to motivate poorly-performing managers to improve firm performance, we show that the apparent improved reported financial performance after a CEO pay cut is only superficial. The pressure to achieve a quick turnaround and to restore compensation and reputation in the labor market to pre-cut levels may lead CEOs to engage in both real earnings management and accruals management. Our results therefore suggest caution before considering CEO pay cut as a strategy to induce greater CEO effort, as it can have unintended consequences. We also add to the literature in corporate governance by showing that strong governance mechanisms improve the credibility of financial reporting by acting as a check on managerial opportunism and tendency to manipulate reported earnings after a CEO pay cut. Finally we also contribute to the earnings management literature by identifying a setting where incentives to manage earnings are high.

The rest of this study is organized as follows. We develop the hypotheses in the next section. We describe the measurement of variables and sample selection in Section 3, report the results of the empirical analysis in Section 4, and present our conclusions in Section 5.

2. HYPOTHESIS DEVELOPMENT

A large body of research examines how firms design their CEO compensation contracts to align the interests of managers with those of various stakeholders.[2] One disciplining mechanism used by boards to motivate CEOs is pay revision. Fama (1980) outlines a theoretical

[2]Murphy (1999), Core et al. (2003), Frydman and Jenter (2010) are some papers that review the vast literature on CEO compensation, including pay-for-performance sensitivity.

model of the wage revision process that reflects the labor market learning about managers' talents over a period of time based on managers' performance.

The role of pay cuts in this context can be explained as follows. The board evaluates whether the poor performance of the firm (assuming that such poor performance is due to factors within the control of the firm) is due to lack of CEO skill (relative to the average skill in the CEO labor market) or lack of effort. If it is the former, the board will rationally fire the CEO and hire a new CEO. However, if the board views the poor performance as resulting from low effort, it is likely to retain the CEO and revise the pay to induce greater effort. The CEO will accept the pay cut if the utility he derives from staying with the firm (at the lower pay) is still greater than the utility from re-entering the labor market and finding a new job. In such a case, the CEO will exert additional effort to produce a better performance and restore his earlier level of pay. Another reason why a CEO will respond to a pay cut with higher effort is that the CEO updates his belief about the strength of corporate governance. By cutting CEO pay in response to poor performance, the board signals that it is willing and able to take actions to punish the CEO. Thus CEO pay cuts can potentially lead to better future performance.

While a pay cut may induce effort from CEOs to achieve measured performance improvement, it remains an empirical question whether such performance reversal is due to productive or earnings management activities. It is possible that cutting the pay of an incumbent CEO might induce an adversarial response. Since managerial effort is unobservable, CEO compensation contracts are generally based on stock price performance and accounting earnings numbers (Lambert and Larker 1987; Sloan1993). The multi-task agency literature (e.g. Holmstrom and Milgrom, 1991; Baker, 1992; Feltham and Xie, 1994) shows that the use of these imperfect performance measures can lead to distorted incentives, in the sense that the CEO

allocates his effort inefficiently between productive and manipulative activities (e.g., accruals manipulation, or cutting R&D expenditure to boost earnings in the short-run at the expense of long-term shareholder value). Thus, following a pay cut, CEOs can have greater incentives to engage in earnings management because such activities can lead to faster improvement in reported (measured) performance, and hence to speedier restoration of their pay to earlier levels. This argument is consistent with the extensive prior accounting research that finds earnings-based bonus plans (e.g., Healy 1985; Holthausen et al. 1995), and equity incentives (e.g., Cheng and Warfield 2005; Bergstresser and Philippon 2006) lead to earnings management. In addition to compensation-related incentives, CEOs also have incentives to restore their reputation in the labor market. CEOs may view pay cuts as an adverse signal about their quality and will want to counteract this negative signal by reporting a rapid performance turnaround. Based on the discussion above, we hypothesize the following (stated in alternate form):

H1: Earnings management increases in the year following a CEO pay cut.

While CEOs have incentives to manage earnings upwards in the year following the pay cut, as one would expect, their proclivity to manage earnings can be checked by effective corporate governance. Prior research suggests that one role of corporate governance in financial reporting is to ensure compliance with financial accounting requirements and maintain the credibility of financial statements (Shleifer and Vishny 1997; Core et al.1999). Thus, properly structured corporate governance mechanisms are expected to reduce earnings management because they provide effective monitoring of management in the financial reporting process. While several facets of corporate governance can affect earnings management, e.g., audit committees or board characteristics (Klein 2002; Larcker et al. 2007), we focus on the role of two particular features of corporate governance that we feel are most relevant (based on prior

research such as Bertrand and Mullainathan 2001; Bebchuk and Fried 2004) in the process of managing the pay cut process and its aftermath: CEO's power vis-à-vis the board and institutional ownership in the firm.

Following Bebchuk et al (2009), we use the entrenchment index (*E-index*) as the proxy of managerial power. The *E-index* is based on six provisions in the governance mechanisms of a firm: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. Bebchuk et al (2009) find that increase in the index level is monotonically associated with economically significant reduction in firm value. The presence of these provisions collectively represents how difficult it is to remove the incumbent CEO. We, therefore, expect that the proclivity to manage earnings after a pay cut will be higher in firms where managers are more entrenched (as proxied by a higher *E-index*) because the CEO is more likely to get away with it when her/his power is relatively greater vis-à-vis the board.

While *E-index* captures a significant part of internal governance, it does not effectively capture external governance. Therefore, we also examine the impact of institutional ownership, which represents the effectiveness of monitoring by external parties. Institutional investors can provide active monitoring that is difficult for smaller, more passive, or less-informed investors (Hartzell and Starks 2005). Additionally, institutional investors have the opportunity, resources, and ability to monitor managers in a more cost-effective manner than individual investors. In this regard, Bushee (1998) documents that institutional ownership inhibits managers from engaging in opportunistic earnings management. Therefore, we expect that institutional ownership is associated with better monitoring of management activities, which will reduce the ability of

managers to opportunistically manipulate earnings in the year after the pay cut. Accordingly, we posit the following:

> **H2: Earnings management (in the year following the CEO pay cut) increases in the relative power of the manager vis-à-vis the board of directors and decreases in the level of institutional ownership.**

In addition to ensuring high financial reporting quality, corporate governance can also check managerial opportunism by structuring effective compensation schemes. When merited by the circumstances, the board can exercise judgment in structuring CEO compensation contracts by rewarding managed and pre-managed components of earnings differentially. The year following a pay cut presents one such situation for the board to exercise judgment because incentives of CEOs to manage earnings are higher during this time.

Prior literature provides evidence on the effectiveness of the board in providing proper incentives to CEOs by treating various earnings components differentially. For example, Dechow et al. (1994) document that the board shields CEO compensation from the impact of restructuring charges and, thereby, encourages the CEO to undertake such value enhancing activities even though they might adversely affect profitability in the short-run. More recently, Huson et al. (2012) find that in a CEO's terminal years, positive changes in discretionary accruals receive significantly less weight than other income components in determining cash compensation, suggesting that not all gains flow through to compensation.

However, other studies show that boards just take the reported earnings as given while compensating CEOs. Gaver and Gaver (1998) decompose earnings into ''above the line'' and ''below the line'' groupings and find that both above- and below-the-line gains pass through to compensation, while compensation is shielded from losses in either category. Balsam (1998)

decomposes income into cash flow and the discretionary and nondiscretionary components of accruals and finds that compensation is shielded from negative discretionary accruals, and that positive discretionary accruals pass through to compensation. These studies argue that while not punishing sufficiently opportunistic behavior can be efficient (particularly, if the CEO labor market is thin and there are not adequate replacements), such lack of punishment for earnings management actions could also reflect CEOs' influence in the pay-setting process (Bertrand and Mullainathan 2001; Bebchuk and Fried 2004). Based on the discussion above, we hypothesize the following:

H3: The managed component of earnings is weighted lower than the pre-managed component in determining CEO compensation in the year following the pay cut.

3. VARIABLE MEASUREMENT, SAMPLE SELECTION, AND DATA

3.1. Variable Measurement

3.1.1. CEO pay cut

We define CEO total compensation (*TOTALPAY*) in a given year as the sum of salary, bonus, long-term incentive plans, grant-date value of restricted stock awards, and Black–Scholes value of granted options (Execucomp item TDC1). Following Gao et al. (2012), we identify firm-years with significant CEO pay cuts based on the following criteria: (1) the same individual is the CEO from year *−2* to *+1*; (2) the CEO's total pay in year *0* declines by more than 25% of his pay in year *−1*;[3] and (3) the CEO's total pay in year *−1* is no more than 125% of his pay in year *−2*. The third criterion helps ensure that pay cuts identified in our sample are not due to normal fluctuations in pay. CEO pay will fluctuate over time if stock and options grants, the

[3] We find that the decrease in stock-based compensation is largely due to the decrease in the number of stock and options granted, rather than the decrease in stock price. Thus, our measure of pay cut captures the reduction in benefits provided to the CEO.

largest component in CEO compensation, are not granted every year. For example, if a CEO is granted stock and options awards once every two years, we will mechanically observe "pay cuts" every second year.[4] To address this issue, we require that the increase in CEO pay in the year prior to the pay cut is no more than 25%. We create an indicator variable *PAYCUT* that equals one if all the three conditions are met, and zero otherwise.

3.1.2. Measures of earnings management

Following prior literature, we use discretionary accruals to proxy for accrual-based earnings management. We measure discretionary accruals using a modified Jones (1991) model augmented by current ROA as described in Kothari et al. (2005).

$$TACC_{i,t} = \alpha_0 + \alpha_1 \left[\frac{1}{A_{i,t-1}}\right] + \alpha_2\left[\Delta SALES_{i,t} - \Delta AR_{i,t}\right] + \alpha_3\left[\Delta PPE_{i,t}\right] + \alpha_4\left[ROA_{i,t}\right] + \varepsilon_{i,t} \quad (1)$$

where Total accruals (*TACC*), is defined as the difference between net income before extraordinary items (Compustat variable IB) and cash flows from operations (Compustat variable OANCF). Δ*SALES* and Δ*AR* represent the annual change in revenue (Compustat variable SALE) and in accounts receivable from operating activities (Compustat variable RECCH), respectively. *PPE* is current-year gross property, plant, and equipment (Compustat variable PPEGT). All terms are scaled by lagged total assets ($A_{i,t-1}$). *ROA* is return on assets for the year *t*. $\varepsilon_{i,t}$ is a zero-mean random error, and forms our estimate of the discretionary component of accruals (*DA*).

[4] For example Apple Inc. CEO Tim Cook's 2012 total compensation package was $4.17 million, a drastic reduction compared to the 2011 package of $376 million. Virtually all of 2011 stock option awards vest in two chunks - one in 2016 and the other in 2021. This structure was intended to keep the CEO at the helm for many years, as the value of the stock will depend on how well the company is doing in the long term. Further this structure gives a big one-time long-term incentive rather than several smaller grants every year. Thus, while there is a decline in 2012 compensation relative to 2011 compensation, it does not constitute a "pay cut" in real economic terms.

Equation (1) is estimated cross-sectionally for each industry-year with at least eight observations, where industry is defined following Fama and French (1997).[5]

Next, following Roychowdhury (2006) we use the abnormal levels of cash flow from operations, production costs, and discretionary expenditures as the measures for real activities management. Subsequent studies using these metrics (e.g., Cohen et al. 2008; Cohen and Zarowin 2010) provide further evidence that these measures capture real activities manipulation. The three manipulation methods and their impact on earnings are as follows: (1) Acceleration of the timing of sales through increased price discounts or more lenient credit terms. Such discounts and lenient credit terms are likely to increase sales volume temporarily and boost current period earnings, assuming the margins are positive; (2) reporting lower cost of goods sold through increased production. As is well known, when managers produce more units, they can spread fixed manufacturing overhead costs over a larger number of units, thus lowering fixed manufacturing costs per unit. This decreases reported cost of goods sold (COGS), which allows the firm to report higher operating margins; (3) Decreases in discretionary expenditures that include advertising, R&D, and SG&A. Reducing such expenses will boost current period reported earnings. Reducing discretionary expenses could also lead to higher current period cash flows (at the risk of lower future cash flows) if the firm generally pays for such expenses in cash.

We estimate the normal level of cash flow from operations as follows:

$$CFO_{i,t} = \alpha_0 + \alpha_1\left[\frac{1}{A_{i,t-1}}\right] + \alpha_2\left[SALE_{i,t}\right] + \alpha_3\left[\Delta SALE_{i,t}\right] + \varepsilon_{i,t} \qquad (2)$$

where *CFO* is cash flow from operations (Compustat variable OANCF). All terms are scaled by lagged total assets ($A_{i,t-1}$). The abnormal cash flow from operations (*RCFO*), is actual CFO minus

[5] The results are similar if we use (1) the two-digit SIC industry grouping for all the estimation regressions, and (2) lagged ROA in place of current ROA in Equation (1).

the normal level of CFO calculated using the estimated coefficients from equation (2), which is estimated cross-sectionally for each industry-year with at least eight observations.

The normal level of production costs is estimated as:

$$PROD_{i,t} = \alpha_0 + \alpha_1 \left[\frac{1}{A_{i,t-1}}\right] + \alpha_2[SALE_{i,t}] + \alpha_2[\Delta SALE_{i,t}] + \alpha_3[\Delta SALE_{i,t-1}] + \varepsilon_{i,t} \quad (3)$$

where *PROD* represents production costs in period *t*, defined as the sum of COGS (Compustat variable COGS) and change in inventory (Compustat variable INVCH). All terms are scaled by lagged total assets ($A_{i,t-1}$). We estimate Equation (3) cross-sectionally for each industry-year with at least eight observations. The abnormal production costs (*RPROD*) are actual production costs minus the normal level of production costs calculated using the estimated coefficients from equation (3). The higher the residual, the larger is the amount of inventory overproduction, and the greater is the increase in reported earnings through reducing the cost of goods sold.

We model the normal level of discretionary expenses as:

$$DISX_{i,t} = \alpha_0 + \alpha_1 \left[\frac{1}{A_{i,t-1}}\right] + \alpha_2[SALE_{i,t-1}] + \varepsilon_{i,t} \quad (4)$$

where *DISX* represents the discretionary expenses in period *t*, defined as the sum of advertising expense (Compustat variable XAD), R&D expense (Compustat variable XRD), and SG&A expense (Compustat variable XSGA).[6] All terms are scaled by lagged total assets ($A_{i,t-1}$).We estimate the above regression cross-sectionally for industry-years with at least eight observations. Abnormal discretionary expenses is the actual discretionary expenses minus the normal level of discretionary expenses calculated using the estimated coefficients from equation (4). We multiply the residuals by -1 (denoted as *RDIDX*) so that higher values indicate greater amounts of discretionary expenses.

[6] Following Cohen et al. (2008), as long as SG&A is available, advertising expense and R&D are set to zero if they are missing.

Firms that manage earnings are likely to engage in accruals manipulation and/or one or more of the three real activities management techniques. Hence, following Cohen and Zarowin (2010) and Zang (2012) we also construct a proxy of total earnings management, *TOTALEM*, which is the sum of *DA*, *RPROD* and *RDISX*.[7]

3.2. Sample

We obtain CEO compensation, firm financial information, analysts' earnings forecasts, and stock returns data from Execucomp, COMPUSTAT, I/B/E/S, and CRSP, respectively. Table 1, Panel A, outlines our sampling procedure. Our initial sample comprises 31,732 firm-year observations from 1994-2011 with non- missing CEO total compensation.[8] From this initial sample we remove observations of firms in the financial services sector (SIC codes 6000 – 6999) and of firms whose CEOs have short tenure (i.e., tenure of less than three years), and observations without sufficient Compustat, return, or analyst data.[9] This yields our final sample of 21,387 firm-year observations, of which 1,330 observations relate to the PAYCUT sample and 20,057 observations to the CONROL sample.

Table 1, Panel B describes the temporal distribution of CEO pay cuts and reveals that the frequency of pay cuts has increased over time. It also shows a higher frequency of pay cuts when the economy was in recession and when the stock market was performing poorly (2002-03 and 2008-09). In Panel C of Table 1, we find that the three Fama-French industries, electronic equipment, business services, and retail, have the most CEO pay cut cases (29% combined).

[7] Cohen and Zarowin (2008) also use a composite measure that combines abnormal cash flow from operations and abnormal discretionary expenses. We do not use this metric because, for our sample setting, the mean (and median) abnormal cash flow from operations is positive, indicating that it arises from reduction in discretionary expenses rather than from acceleration of the timing of sales through increased price discounts or lenient credit terms. Hence, combining RCFO and RDISX would lead to double counting in our setting.

[8] The Execucomp database starts in 1992, but our sample formation requires information on CEO pay for at least two years before a pay cut. Hence, our test sample period starts in 1994.

[9] We drop observations relating to short CEO tenure (i.e., less than three years tenure) because we need data on total compensation for two years before the year of pay cut.

Panel D of Table 1 shows that the vast majority (83%) of our sample firms reduce their CEO's pay by between 25% and 65% of prior year's pay.

[Insert Table 1 about here]

3.3. Descriptive statistics

Table 2, Panel A reports the trend in median total pay, annual stock returns, ROA, earnings management proxies, and pre-managed earnings for the PAYCUT and CONTROL samples. We also highlight whenever the median value of a variable is statistically different for the two sub-samples. We winsorize all continuous variables at their first and ninety-ninth percentiles to mitigate the effect of extreme values on our estimation results. We report medians because they are less likely to be influenced by extreme observations than means.

For the PAYCUT sample, the *TOTALPAY* for the year *t-1* is $2.86 million, where year *t* reflects the year of pay cut. This is higher than the *TOTALAY* for the CONROL group for the corresponding period. However, after the pay cut in year *t*, the *TOTALPAY* for the year *t* and the year *t+1* for the PAYCUT sample is lower than the *TOTALPAY* for the CONTROL sample. The median change in *TOTALPAY* for the PAYCUT sample is -9%, -42%, and 40% for the year *t-1*, *t*, and *t+1*, respectively. In contrast, the median change in *TOTALPAY* for the CONTROL sample is around 10% during this time period.

Stock returns and accounting performance (as measured by *RET* and *ROA*) for the PAYCUT sample are lower than those of the CONTROL sample for the years *t-1* and *t*. After the pay cut, both *RET* and *ROA* for the year *t+1* show improvement. These results are consistent with the findings of Gao et al. (2012) that CEOs' pay is cut in response to poor firm performance, and that the pay cut spurs CEOs to take actions to improve performance.

We study this apparent improvement in reported firm performance after the pay cut more closely by examining whether it is driven by earnings management. Indeed, we find high levels of discretionary accruals and real earnings management in the year following the pay cut. Specifically, median *DA, RCFO, RPROD*, and *RDISX* in year *t+1*, are 0.0163, 0.0187, 0.0130, and 0.0180, respectively for the PAYCUT sample. These median values are higher than the corresponding numbers for the CONTROL sample. The median values for *DA, RCFO, RPROD,* and *RDISX* for the PAYCUT sample are also generally lower in other years. These results provide preliminary evidence that the observed increase in *ROA* in the year after the CEO pay cut may be driven by accruals and real activities management. For the PAYCUT sample, the median *PREEM_ROA* in the year *t+1* is 0.003, which is not statistically different from zero, suggesting that earnings management masks poor performance in the short-run.

Table 2, Panel B, presents descriptive statistics for other firm characteristics used as control variables in our regressions. We also highlight the statistical significance of the differences in mean and median values of these variables for the PAYCUT sample and the CONTROL sample. The construction of these variables is explained in Appendix A. Firms in the PAYCUT sample are generally smaller, have lower growth opportunities (as proxied by market-to-book ratio) and lower analyst following, and have higher leverage, implicit claims and litigation risk, compared to firms in the CONTROL group.

Table 2, Panel C, presents Pearson (below the diagonal) and Spearman (above the diagonal) correlations among the main variables of interest. Since we are interested in the consequences of a pay cut, we study the correlations between the pay cut variable and compensation change, firm performance, and earnings management for the year following the pay cut. $PAYCUT_t$ is positively correlated with $\Delta TOTALPAY_{t+1}$ and RET_{t+1} (at the 1%

significance level). We also find that $PAYCUT_t$ is significantly positively related to various proxies of earnings management. These reported correlations between $PAYCUT_t$ and earnings management proxies support the prediction that CEOs resort to earnings management following a pay cut, presumably to boost their firms' reported accounting performance and their compensation.

[Insert Table 2 about here]

4. EMPIRICAL ANALYSIS

4.1. Earnings management following a CEO pay cut

In this section, we report the results of multivariate tests that examine the relation between CEO pay cut and earnings management. We use the following model:

$$\begin{aligned} EM_{t+1} = {} & \delta_0 + \delta_1 PAYCUT_t + \delta_2 LEV_{t+1} + \delta_3 Ln(ASSETS_{t+1}) + \delta_4 MB_{t+1} + \delta_5 BONUS_{t+1} \\ & + \delta_6 EX\_OPTION_{t+1} + \delta_7 UN\_OPTION_{t+1} + \delta_8 GRNT\_OPTION_{t+1} + \delta_9 OWNER_{t+1} \\ & + \delta_{10} HAB\_BEAT_{t+1} + \delta_{11} Ln(ANALYSTS_{t+1}) + \delta_{12} Ln(SHARES_{t+1}) + \delta_{13} ICLAIMS_{t+1} \\ & + \delta_{14} LITIGATION_{t+1} + \delta_{15} NOA_t + \delta_{16} INSTIT_{t+1} + \varepsilon_{t+1} \end{aligned} \quad (5)$$

We estimate several versions of this model where the dependent variable in each version is a different proxy for earnings management, as defined in the variable measurement section. We use *EM* for the period *t+1* because our prediction is that CEOs will resort to earnings management after they experience a pay cut. Our main variable of interest, $PAYCUT_t$, identifies firm-year observations where the CEO experienced a pay cut and we expect a positive coefficient on $PAYCUT_t$.

In estimating the regression specified in Model (5), we include several variables that capture the incentives and costs associated with earnings management. The choice of these variables is guided by prior literature on earnings management (Watts and Zimmerman 1986; Healy and Wahlen 1999; Fields et al. 2001; Dechow et al. 2010). We explain the construction of these variables in Appendix A. Our first set of controls relate to firm characteristics. We include

proxies for leverage (*LEV*), firm size (*ASSETS*), and growth opportunities (*MB*, market-to-book ratio). If high leverage is indicative of a firm that is closer to a debt covenant restriction, then managers in more levered firms are more likely to take actions to boost income as a means to avoid violating a covenant. Hence, we expect a positive coefficient for *LEV*. Prior studies on the relation between firm size and earnings management provide mixed evidence. On one hand, it can be argued that larger firms are less likely to manage earnings upwards in response to greater regulatory/political scrutiny. However, recent studies suggest that firm size is positively associated with earnings quality because of fixed costs associated with maintaining adequate internal controls over financial reporting. Hence, we make no prediction on the sign of the coefficient for *SIZE*. High growth firms are more likely to manage earnings to meet or beat analysts' forecasts to avoid the negative consequences associated with missing analysts' forecasts. Therefore, we expect a positive coefficient on *MB*.

The next set of controls relate to compensation-related incentives to manage earnings. We include *BONUS*, *EX_OPTION*, *UN_OPTION*, *GRNT_OPTION*, and *OWNER* in the model to control for incentives provided by bonus, exercisable options, unexercisable options, new option grants, and stock holdings of CEOs, respectively. *BONUS* is included because several studies link earnings-based bonus plans to earnings management, especially if realized earnings are close to floors and caps in the bonus plan. While several studies document a positive relation between CEO equity incentives and earnings manipulation, Armstrong et al. (2010) note that studies documenting a positive association between equity incentives and earnings management differ on which component of CEO equity incentives drives the relation. In fact, Armstrong et al. (2010) find a negative association between accounting irregularities and equity incentives after matching CEOs on the observable characteristics of their contracting environment. Since the

evidence on the relation between equity incentives and accounting irregularities is mixed, we make no predictions on the expected signs of the coefficients for these variables.

Our third set of controls variables, *HAB_BEAT*, *ANALYSTS*, and *SHARES*, are included to capture capital market incentives. Research suggests that firms that meet or beat analysts' earnings forecasts enjoy higher returns. Further, this 'meet/beat' premium is higher for firms that consistently meet/beat analysts' earnings forecasts, i.e., 'habitual beaters'. Such firms have stronger incentives to manage earnings to keep beating those earnings targets in order to avoid the significant adverse stock price consequences of failing to do so. Therefore, we include *HAB_BEAT* to capture this specific capital market incentive, and expect its coefficient to be positive. The variable *ANALYST* controls for the effect of financial analysts. On the one hand, financial analysts provide scrutiny and monitoring over firms' activities and thus constrain earnings management. On the other hand, analyst coverage also creates pressure to meet or beat their forecasts, which may induce earnings management. Given these conflicting arguments, we do not make a directional prediction on its coefficient. We include *SHARES* because a greater number of shares outstanding requires more earnings management activity to achieve a given per share earnings target. Since this higher threshold may induce greater earnings management to achieve the target or discourage earnings management because the target is more difficult to achieve, we make no directional prediction on the coefficient of *SHARES*.

Our fourth set of controls relates to constraints on earnings management behavior. Firms with greater litigation risk, implicit claims, and institutional ownership face greater scrutiny, and hence, are less likely to manage earnings. However, it can also be argued that incentives to avoid negative earnings surprises increase with greater scrutiny. We, therefore, include an industry-based *LITIGATION* dummy, *IMPLICIT_CLAIM*, and *INSTIT* variables but make no predictions

on the expected signs of their coefficients. We capture a firm's ability to manage earnings using accruals by *NOA*, the firm's beginning of period net operating assets position. Firms with high net operating assets in the previous year are less likely to meet or just beat analysts' forecasts, arguably due to a lack of flexibility in managing accruals upward. Such firms with higher *NOA* are also likely to substitute accrual-based earnings management with real earnings management.

We also include industry and year fixed effects to control for industry characteristics and overall macroeconomic factors over time. We use OLS to estimate these models and, because these models are estimated using pooled cross-sectional data, we base statistical inferences on heteroskedasticity-consistent standard errors that are clustered at the firm and year level.

The estimation results for equation (5) are presented in Table 3. Different notions of earnings management are dependent variables, *TOTALEM*, *DA*, *RPROD*, *RDISX*, and *RCFO*, in columns (1) – (5), respectively. Consistent with our expectations, the coefficient on *PAYCUT* is positive and significant (at the 1% level) in most of the specifications. The economic significance of these coefficients can be interpreted as follows. The coefficient on *PAYCUT* in column 1 reflects the overall earnings management (including accruals and real activities) in the year following the pay cut. The magnitude of this estimate (0.0544), together with the median ROA in the year following the pay cut (0.0566, reported in panel A of Table 2) indicates that absent earnings management, firms would be reporting only marginally positive ROA. In column 2, the coefficient on *PAYCUT* is 0.0178 indicating that on average discretionary accruals are income-increasing for these firm-years. Further, compared to the control sample, *DA* is almost 2.33 times (0.0178 / 0.0076, where 0.0076 is the median DA for the control group reported in panel A of Table 2) higher in the year after the pay cut. Similarly, the positive

coefficients on *PAYCUT* in columns 3 – 5 indicate that on average firms overproduce, and cut their discretionary expenditures after a CEO pay cut.

The coefficients on the control variables are generally consistent with our expectations. Bonus considerations lead to accruals manipulation as reflected by the positive coefficient on *BONUS* in column 2. We do not find a significant association between stock-based compensation incentives and earnings management, except for newly granted options. The coefficient on *GRNT_OPTION* is negative in columns 1 and 4. Capital market pressure as reflected by the tendency to habitually meet or beat analysts' forecasts is positively associated with earnings management (*HAB_BEAT* has a positive coefficient in columns 1 - 5). On the other hand, greater scrutiny in terms of large analyst following, institutional ownership, implicit claims, litigation risk, as well as large number of shares outstanding, reduce earnings management as evidenced by the negative coefficients on these variables.

4.2. Stock market response to earnings management after a CEO pay cut

A CEO is expected to make operational changes after the pay cut. To the extent that the real earnings management proxies capture an operational change rather than an opportunistic action, the implications of our findings would vary. To provide corroboratory evidence that our earning management proxies do indeed capture managerial opportunism, we perform two tests.

First we examine how the stock market treats managed versus pre-managed components of earnings in the year following a CEO pay cut. The efficient markets hypothesis suggests that investors can see through the earnings management, especially in the year after the CEO pay cut, because the incentives to manage earnings are higher in the year following the CEO pay cut. Thus, if our earnings management proxies are indeed capturing managerial opportunism in the

year following the pay cut, we expect that the market will price the managed and pre-managed components of earnings differentially. Specifically, we estimate the following model:

$$RET_{t+1} = \beta_0 + \beta_1 \Delta PREEM\_ROA_{t+1} + \beta_2 \Delta EM_{t+1} + \beta_3 PAYCUT_t + \beta_4 PAYCUT_t * \Delta EM_{t+1} + \beta_5 SIZE_t + \beta_6 Ln(BM_t) + \varepsilon \quad (6)$$

where RET_{t+1} is the 12-month cumulative market-adjusted return ending three months after the fiscal year end. We decompose ROA_{t+1} in its pre-managed ($PREEM\_ROA_{t+1}$) and managed (EM_{t+1}) components to examine whether the market prices these components differentially. To the extent that the market sees though earnings management we would expect $\beta_2 < \beta_1$, indicating that the market reaction to the managed portion of earnings is weaker than the market reaction to the unmanaged portion of earnings. We are also interested in the sign of the coefficient on $PAYCUT_t * \Delta EM_{t+1}$. A negative coefficient would indicate that the market reaction to the managed portion of earnings will be even weaker in the year following a CEO pay cut.

We present the results of estimating equation (6) in Table 4. EM_{t+1} is measured as $TOTALEM_{t+1}$, DA_{t+1}, $RPROD_{t+1}$, $RDISX_{t+1}$, and $RCFO_{t+1}$ in columns 1 – 5, respectively. Consistent with a vast body of accounting research, the coefficient on $\Delta PREEM\_ROA_{t+1}$ is positive and significant (at the 1% level) in all the columns. The coefficient on ΔEM_{t+1} is also positive and significant (at the 1% level) but lower than the coefficient on $\Delta PREEM\_ROA_{t+1}$. A *t-test* (un-tabulated) rejects the hypothesis that $\beta_2 = \beta_1$ (at the 5% level) suggesting that the market reward for the managed portion of earnings is lower than the reward for the unmanaged portion of earnings. The coefficient on the interaction term $PAYCUT_t * \Delta EM_{t+1}$ in column 2 is negative and significant (at the 5% level) indicating that the market imposes an even greater penalty for accruals manipulation in the year following the pay cut. However, the interaction term $PAYCUT_t * \Delta EM_{t+1}$ is insignificant in other columns, suggesting that the market does not impose

additional penalty for real activities management in the year following the pay cut. Overall, our results indicate that following a CEO pay cut, the market sees through accruals manipulation and penalizes it, but does not do so for real earnings management.

We next examine the association between earnings management after a CEO pay cut and future operating performance. Following Cohen and Zarowin (2008) and Gunny (2010), we estimate the following model:

$$\Delta ADJROA_{t+2} = \mu_0 + \mu_1 \Delta EM_{t+1} + \mu_2 PAYCUT_t * \Delta EM_{t+1} + \mu_3 PAYCUT_t + \mu_4 Ln(ASSETS_{t+1}) + \mu_5 MB_{t+1} + \mu_6 LEV_{t+1} + \varepsilon \quad (7)$$

where $ADJROA_{t+2}$ is industry adjusted return on assets .[10] The coefficient on ΔEM_{t+1} captures the impact of earnings management on future performance. The coefficient on the interaction term $\Delta PAYCUT_t * EM_{t+1}$ captures the impact of earnings management in the year after CEO pay cut on future performance. A negative coefficient on $\Delta PAYCUT_t * EM_{t+1}$ will be consistent with our earlier claims that in the year after a pay cut CEOs use accounting and/or operational discretion in an opportunistic manner. On the other hand, a positive coefficient on this interaction would suggest that our earnings management proxies might be capturing genuine operational changes that result in future profitability.

Table 5 presents the results of estimating equation (7). EM_{t+1} is measured as $TOTALEM_{t+1}$, DA_{t+1}, $RPROD_{t+1}$, $RDISX_{t+1}$, and $RCFO_{t+1}$ in columns 1 – 5, respectively. The coefficient on ΔEM_{t+1} is negative and significant across the various specifications, suggesting that earnings management leads to a decline in future operating performance. Further, the coefficient on the interaction term $PAYCUT_t * \Delta EM_{t+1}$ is also negative and significant (at 5% level) across all columns. We also estimate this model with industry adjusted cash flow from

[10]Subtracting median industry ΔROA from a firm's ΔROA helps in controlling for the normal level of mean reversion in ROA. It also controls for differences in industry concentration that may affect performance. We also estimate this model with industry adjusted cash flow from operations and get qualitatively similar results.

operations and get qualitatively similar results (untabulated). Taken together, these results suggest that earnings management in the year after a pay cut has a negative impact on the firm's long-term profitability. These results further rule out the possibility that our earnings management proxies capture genuine operational changes that a CEO might undertake after a pay cut to improve future operational profitability.

4.3. Impact of governance on earnings management after a CEO pay cut

To examine the cross-sectional variation in the CEO's proclivity to manage earnings following a pay cut, we expand equation (5) to include the interaction term, *PAYCUT*GOV*, and estimate the following model:

$$EM_{t+1} = \delta_0 + \delta_1 PAYCUT_t + \delta_2 LEV_{t+1} + \delta_3 Ln(ASSETS_{t+1}) + \delta_4 MB_{t+1} + \delta_5 BONUS_{t+1} + \delta_6 EX\_OPTION_{t+1} + \delta_7 UN\_OPTION_{t+1} + \delta_8 GRNT\_OPTION_{t+1} + \delta_9 OWNER_{t+1} + \delta_{10} HAB\_BEAT_{t+1} + \delta_{11} Ln(ANALYSTS_{t+1}) + \delta_{12} Ln(SHARES_{t+1}) + \delta_{13} ICLAIMS_{t+1} + \delta_{14} LITIGATION_{t+1} + \delta_{15} NOA_t + \delta_{16} GOV_{t+1} + \delta_{17} PAYCUT_{t*} GOV_{t+1} + \varepsilon_{t+1} \quad (8)$$

The dependent variable, control variables, and estimation techniques are the same as explained in the previous sub-section. We estimate two specifications of this model, where the variable GOV_{t+1} is either $E\text{-}Index_{t+1}$ or $HIINSTIT_{t+1.}$ $E\text{-}Index_{t+1}$ is the entrenchment index as defined in Bebchuk et al (2009). $HIINSTIT_{t+1}$ is a dummy variable that equals one if the institutional ownership in the firm is above the 75th percentile of the yearly sample distribution, and zero otherwise.[11] We expect positive and negative signs on the interaction terms $PAYCUT_t$*$E\text{-}Index_{t+1}$ and $PAYCUT_t$*$HIINSTIT_{t+1}$, respectively. We present the results of estimating equation (8) in Table 6. In panel A, the coefficient on the interaction term $PAYCUT_t$*$E\text{-}Index_{t+1}$ is positive under a variety of specifications. For example, when we use discretionary accruals as the dependent variable, the coefficient on *PAYCUT*E-Index* is 0.0038,

[11] We use a dummy variable for institutional ownership in the interaction term to facilitate interpretation of the coefficient. The results remain unchanged (i.e., the interaction term has a negative and significant coefficient) even if we include a continuous measure for institutional ownership.

which is significant at the 5% level. In terms of economic significance of this coefficient, discretionary accruals increase by 21.47% in the year following the pay cut (i.e., 0.0038 / 0.0177, where 0.0038 and 0.0177 are the coefficients on $PAYCUT_t$*$E\text{-}Index_{t+1}$ and $PAYCUT_t$, respectively reported in Table 6, panel A, column 2) for each unit increase in $E\text{-}Index_{t+1}$. Similarly, from column 1, we can impute that overall earnings management following a pay cut increases by 30.88% for each unit increase in $E\text{-}Index_{t+1}$.

In panel B, again consistent with our expectations, the coefficient on the interaction term $PAYCUT_t$*$HIINSTIT_{t+1}$ is negative under a variety of specifications. Total earnings management (discretionary accruals) is lower by 59.78% (41.93%) in the year following the pay cut for firms with high institutional ownership. The coefficient estimates for the control variables are similar in sign and significance to those reported in Table 4. Hence, for the sake of brevity, we do not discuss them here.

4.4. Board's treatment of reported earnings after a CEO pay cut

We estimate the following model to examine whether the board treats the managed portion of reported earnings differently from the unmanaged portion while determining the CEO compensation in the year following the pay cut:

$$\begin{aligned}\Delta Ln(COMP_{t+1}) = {} & \alpha_0 + \alpha_1 \Delta PREEM\_ROA_{t+1} + \alpha_2 \Delta EM_{t+1} + \alpha_3 PAYCUT_t \\ & + \alpha_4 PAYCUT_t * \Delta PREEM\_ROA_{t+1} + \alpha_5 PAYCUT_t * \Delta EM_{t+1} + \alpha_6 RET_{t+1} \\ & + \alpha_7 Ln(ASSETS_{t+1}) + \varepsilon \end{aligned} \quad (9)$$

where $\Delta Ln(COMP_{t+1})$ is the change in log of total compensation for the year after the CEO pay cut. We examine changes in compensation rather than levels to allow each firm to serve as its own control, which reduces the need for control variables. While estimating this equation, we drop observations relating to the first year of CEO tenure because change in compensation

cannot be calculated for such cases. Following prior research that examines the determinants of CEO compensation, we include both accounting-based and stock-based performance measures ($\Delta PREEM\_ROA_{t+1}$ and RET_{t+1}, respectively) in the model and expect a positive coefficient on α_1 and α_6. The coefficient α_2 reflects the weight placed on the managed components of reported earnings in determining CEO compensation. To the extent that the board assigns a lower weight to the managed portion of reported earnings relative to the unmanaged portion of reported earnings, we expect $\alpha_2 < \alpha_1$. Our model also includes the interaction of these earnings component variables with *PAYCUT* to capture the differential sensitivity of CEO compensation to accounting performance measures in the year following the pay cut. Incentives to manage earnings upwards are greater in the year following the pay cut. Therefore, the question of differential weighting of the pre-managed and managed components of earnings in determining CEO compensation becomes even more important. A finding of $\alpha_4 > 0$ and $\alpha_5 < 0$ would indicate that the board creates additional incentives to engage in productive activities and disincentives to engage in manipulative activities following a pay cut. We also include industry and year fixed effects to control for industry characteristics and overall macroeconomic factors over time. We use OLS to estimate these models and since these models are estimated using pooled cross-sectional data, we base statistical inferences on heteroskedasticity-consistent standard errors that are clustered at the firm and year level.

Table 7 presents the results of estimating equation (9). As before, EM_{t+1} is measured as $TOTALEM_{t+1}$, DA_{t+1}, $RPROD_{t+1}$, $RDISX_{t+1}$, and $RCFO_{t+1}$, in columns 1 – 5, respectively. Surprisingly, we find that the coefficient on ΔEM in columns 1-5 is positive and significant (at the 1% level), suggesting that the board does not appear to penalize the CEO for such value destroying earnings management behavior following a pay cut. However, the coefficient on

ΔEM_{t+1} in columns 1-5 is uniformly lower in magnitude than the respective coefficients on $\Delta PREEM\_ROA_{t+1}$ (un-tabulate *t-tests* reject the hypothesis that $\alpha_2 = \alpha_1$), suggesting a partial discounting of changes in the managed portion of earnings in determining CEO compensation. Further, the coefficients on both $PAYCUT_t$*$\Delta PREEM\_ROA_{t+1}$ and $PAYCUT_t$*ΔEM_{t+1} are statistically insignificant, indicating that the board neither creates additional incentives to engage in productive activities by giving higher weight to the pre-managed component of earnings nor imposes penalties on manipulative activities by giving lower weight to the managed component of earnings in the year following the pay cut. The positive and significant (at the 1% level) coefficient on $PAYCUT_t$ in columns 1-5 indicates that, on average, total compensation goes up by 40% in the year following the pay cut. Lastly, both changes in accounting earnings and stock returns are significantly (at the 1% level) positively related to changes in compensation, consistent with previous research.

In untabulated tests we estimate equation (9) with ΔLn($CASHPAY_{t+1}$) as the dependent variable and find that the results are very similar to the results documented in table 6. Overall, our findings indicate that in the year following the pay cut, the board does not punish manipulative activities sufficiently. These results are consistent with the findings of Gaver and Gaver (1998) and Balsam (1998).

These findings are puzzling in the sense that it is unclear why firms would reward their managers in the year following a pay cut in the form of higher wages, despite managers' earnings management behavior imposing significant agency costs on the firm in terms of both lower market returns and diminished operating performance in fundamental terms in the longer run. We argue that the CEO's influence in the pay-setting process (Bertrand and Mullainathan 2001; Bebchuk and Fried 2004) can lead to this situation where the CEO accepts a pay cut in the

wake of poor performance to placate stakeholders and, subsequently, when the firm's performance improves (though via earnings management), the CEO's pay is restored to earlier levels, thereby avoiding negative publicity and scrutiny.

While our results support the managerial power hypothesis (Bertrand and Mullainathan 2001; Bebchuk and Fried 2004), there can be several possible explanations for this puzzle which we cannot rule out. These explanations include: (1) regardless of the effectiveness of corporate governance mechanisms, the board is unable to see through managers engaging in such value-destructive earnings management practices; (2) the corporate governance mechanisms in pay-cut firms are not strong enough either to detect such value-destroying behavior of managers or there are additional agency problems with respect to boards of such firms in not performing their duties to shareholders conscientiously by monitoring their managers more rigorously after pay cuts; (3) the board rationally tolerates earning management, particularly if the CEO labor market is thin and there are no adequate replacements; (4) the board is aware of such earnings management behavior of managers following a pay cut, but chooses to tolerate or ignore such behavior because such seemingly value-destructive earnings management behavior potentially saves costs of contracting with other stakeholders, especially debt holders.[12]

4.5. Robustness checks

We perform four sensitivity tests to check the robustness of our result. First we address the issue of endogeneity. It is possible that pay cut and earnings management are jointly determined by some unmeasured firm / CEO attributes, such as uncertainty in operating environment, difficulty in assessing CEO talent or effort, etc. To address this concern, we adopt

[12] In untabulated analyses, we find that earnings management after a CEO pay cut is higher in firms with high financial leverage. We also find that the probability of debt covenant violation (rating downgrades) reduces by 4.53% (5.32%) in the year after a CEO pay cut if the firm engages in a high level of earnings management.

a two stage regression framework. In the first stage, we use a logit model to predict the probability of a pay cut. The dependent variable equals one if the board cuts the CEO's pay, and zero otherwise. The firm's stock return and accounting performance (*RET* and *ROA*) for the current and prior year are the main independent variables. The control variables include all the exogenous variables from equation (5). Panel A of Table 8 presents the results from this estimation. Column 1 presents the first-stage logit model. Both contemporaneous and lagged *RET* and *ROA* have negative and significant (at 1% level) coefficients suggesting that poor stock return and accounting performance increase the probability of a pay cut. The model also includes all the independent variables from Equation (5). The predicted probability of pay cut is then used in the second-stage equation to examine the association between a pay cut and earnings management. EM_{t+1} is measured as $TOTALEM_{t+1}$, DA_{t+1}, $RPROD_{t+1}$, $RDISX_{t+1}$, and $RCFO_{t+1}$, in columns 2– 6, respectively. In each of these columns, the coefficient on *Predicted* $PAYCUT_t$ is positive and significant (at 1% level). Thus, consistent with the results based on OLS (Table 3), we continue to find the hypothesized relationships when we use the instrumented (predicted values) versions of $PAYCUT_t$.

Second, we use alternate earnings management proxies. Compared to proxies of accruals and real activities management, a firm's tendency to beat earnings benchmarks is an outcome-based proxy for earnings management and is likely to be free from measurement error. Prior research (e.g., Graham et. al. 2005) identifies three earnings benchmarks – avoiding loss, showing improvement over previous year's earnings, and meeting or beating analysts' forecasts. We create indicator variables $SUSPECT1_{t+1}$, $SUSPECT2_{t+1}$, and $SUSPECT3_{t+1}$, which equal one if income before extraordinary items scaled by total assets lies in the interval [0, 0.005], change in net income before extraordinary items scaled by total assets lies in the interval [0, 0.005], and

forecast error is one cent per share or less ($0.00 <= Actual EPS - Consensus forecast <= $0.01), respectively, and zero otherwise. We re-estimate equation (5) with $SUSPECT1_{t+1}$, $SUSPECT2_{t+1}$, and $SUSPECT3_{t+1}$ as dependent variables using a logit model and present the results in Table 8, panel B. Consistent with our earlier results, the coefficient on $PAYCUT_t$ is positive and significant, indicating that our results are not sensitive to the choice of earnings management proxy.

Third, Cohen at al. (2008) report that earnings management via accruals management has declined and real activities management has increased after the Sarbanes-Oxley Act (SOX). Further, the relations between discretionary accruals and various measures of CEO cash and CEO equity incentives have also declined in the post-SOX period. We examine the impact of SOX on our results by estimating equation (5) for the post-SOX period. The results presented in Table 8, panel C indicate that SOX has little impact on our analysis. Both accruals-based and real activities manipulation are high in the year after the CEO pay cut.

Finally, our pay cut sample has some clustering during the 2002-03 and 2008-09 periods, which are periods of recession and financial crisis. Therefore, we conduct additional analysis to check whether our results are driven by observations from these periods. In particular, we re-estimate equation (5) after excluding firm-year observations from these periods. The results presented in Table 8, panel D show that our primary findings are not driven by the economic conditions in 2002-03 and 2008-09.

5. CONCLUSION

In this study, we examine whether a pay cut in response to poor performance is an effective strategy to stimulate CEO effort and achieve a turnaround. We find that while performance as measured by reported *ROA* certainly improves after a pay cut, such measured

improvement is primarily driven by accruals and real activities management. We show that in the year following a pay cut, CEOs are more likely to engage in earnings management because it will lead to a faster improvement in the reported performance and a speedier restoration of CEO pay to earlier levels. Our analysis also suggests that the board does not penalize earnings management following the CEO pay cut. We also find that this agency problem is consistent with the CEO's power hypothesis. When CEOs enjoy greater power (through greater entrenchment) vis-à-vis their boards, their proclivity towards engaging in value-destroying real and accrual earnings management following pay cuts is greater. In the same vein, in the presence of more effective monitoring in the form of greater institutional holding, CEOs tend to engage less in such earnings management activities following pay cuts.

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Appendix A: Variable definitions

Compensation variables

TOTALPAY	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 (Execucomp variable TDC1)
Δ*TOTALPAY*	$(TOTALPAY_t - TOTALPAY_{t-1}) / TOTALPAY_{t-1}$
CASHPAY	Sum of CEO salary and cash incentive payment (Execucomp variable SALARY + BONUS)
Δ*CASHPAY*	$(CASHPAY_t - CASHPAY_{t-1}) / CASHPAY_{t-1}$
EQUITYPAY	Sum of restricted stock granted and the Black–Scholes value of stock options granted (Execucomp variable STOCK_AWARDS_FV + OPTION_AWARDS_FV)
Δ*EQUITYPAY*	$(EQUITYPAY_t - EQUITYPAY_{t-1}) / EQUITYPAY_{t-1}$
PAYCUT	An indicator variable that equals one if there is a CEO pay cut during the year, and zero otherwise. Following Gao et al. (2012), we classify a decline in CEO's total pay as PAYCUT if the following conditions are met (1) the same CEO keeps his position from year −2 to the pay cut year +1; (2) his total pay in year 0 declines by more than 25% 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
BONUS	Bonus compensation as a proportion of total compensation received by the CEO
EX_OPTION	Number of unexercised options that the CEO held at the end of year that were vested (Execucomp variable OPT_UNEX_EXER_NUM) scaled by total shares outstanding of the firm (Compustat variable CSHO)
UN_OPTION	Number of unexercised options (excluding option grants in the current period) that the CEO held at the end of year end that had not vested (Execucomp variable OPT_UNEX_UNEXER_NUM) scaled by total shares outstanding of the firm (Compustat variable CSHO)
GRNT_OPTION	New option grants made to the CEO during the current period (Execucomp variable OPTION_AWARDS_NUM) scaled by total shares outstanding of the firm (Compustat variable CSHO)
OWNER	The sum of restricted stock grants in the current period and the aggregate number of shares held by the CEO at the year-end (excluding stock options) (Execucomp variable SHROWN_EXCL_OPTS) scaled by total shares outstanding of the firm (Compustat variable CSHO)

Variable relating to firm performance

ROA	Income before extraordinary items (Compustat variable IB), scaled by total assets at the beginning of the fiscal year (Compustat variable AT)
RET	The 12-monthcumulative market-adjusted return ending three months after the fiscal year end
CAR(-1,+1)	Three day cumulative market adjusted return centered around earnings announcement date at the end of fiscal year; where return on CRPS value weighted index is the taken as the market return
ESURPRISE	Actual EPS minus the most recent analyst consensus forecast EPS for the year *t*, scaled by the stock price at the beginning of year
MBE	An indicator variable that equals one if the actual EPS is greater than or equal to the analyst consensus forecast EPS in the year t, and zero otherwise

Earnings management proxies

DA Discretionary accruals calculated following a modified Jones (1991) model augmented by current ROA (as described in Kothari et al., 2005), as the residuals from the following industry –year regression:

$$TACC_{i,t} = \alpha_0 + \alpha_1\left[\frac{1}{A_{i,t-1}}\right] + \alpha_2\left[\Delta SALES_{i,t} - \Delta AR_{i,t}\right] + \alpha_3\left[\Delta PPE_{i,t}\right] + \alpha_4\left[ROA_{i,t}\right] + \varepsilon_{i,t} \quad (1)$$

Total accruals (TACC) are defined as the difference between net income before extraordinary items (Compustat variable IB) and cash flows from operations (Compustat variable OANCF); ΔSALES and ΔAR represent the annual change in revenue(Compustat variable SALE) and in accounts receivables (Compustat variable RECT), respectively; PPE is current-year gross property, plant, and equipment (Compustat variable PPEGT).All terms are scaled by lagged total assets $A_{i,t-1}$(Compustat variable AT).

RCFO The level of abnormal cash flows from operations calculated following Roychowdhury (2006),as the residuals from the following industry –year regression:

$$\frac{\boldsymbol{CFO}_{i,t}}{\boldsymbol{A}_{i,t-1}} = \boldsymbol{\alpha_0} + \boldsymbol{\alpha_1}\left[\frac{\mathbf{1}}{\boldsymbol{A}_{i,t-1}} + \right]\boldsymbol{\alpha_2}\left[\frac{\boldsymbol{SALE}_{i,t}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\alpha_3}\left[\frac{\Delta\boldsymbol{SALE}_{i,t}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\varepsilon}_{i,t}(\mathbf{2})$$

where CFO is cash flow from operations (Compustat variable OANCF)

RPROD The level of abnormal production costs calculated following Roychowdhury (2006), as the residuals from the following industry –year regression:

$$\frac{\boldsymbol{PROD}_{i,t}}{\boldsymbol{A}_{i,t-1}} = \boldsymbol{\alpha_0} + \boldsymbol{\alpha_1}\left[\frac{\mathbf{1}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\alpha_2}\left[\frac{\boldsymbol{SALE}_{i,t}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\alpha_2}\left[\frac{\Delta\boldsymbol{SALE}_{i,t}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\alpha_3}\left[\frac{\Delta\boldsymbol{SALE}_{i,t-1}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\varepsilon}_{i,t}(\mathbf{3})$$

where production costs are defined as the sum of cost of goods sold and the change in inventory (Compustat variable COSG + INVCH)

RDISX The level of abnormal discretionary expenditure calculated following Roychowdhury (2006), as the residuals from the following industry –year regression:

$$\frac{\boldsymbol{DISX}_{i,t}}{\boldsymbol{A}_{i,t-1}} = \boldsymbol{\alpha_0} + \boldsymbol{\alpha_1}\left[\frac{\mathbf{1}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\alpha_2}\left[\frac{\boldsymbol{SALE}_{i,t-1}}{\boldsymbol{A}_{i,t-1}}\right] + \boldsymbol{\varepsilon}_{i,t}(\mathbf{4})$$

where the discretionary expenditure is the sum of R&D, Advertising , and Selling, General and Administrative expenses (Compustat variable: XRD + XAD + XSGA)

TOTALEM *DACC + RPROD + RDISX*

PREEM_ROA *ROA – TOTALEM*

SUSPECT1 An indicator variable that equals one if the income before extraordinary items (Compustat variable IB)scaled by total assets(Compustat variable AT) that lies in the interval [0, 0.005], and zero otherwise

SUSPECT2 An indicator variable that equals one if the change in the income before extraordinary items (Compustat variable IB)scaled by total assets (Compustat variable AT)lies in the interval [0, 0.005], and zero otherwise

SUSPECT3 An indicator variable that equals one if $0.00 <= Actual EPS - Consensus forecast <= $0.01, and zero otherwise

Control variables

ASSETS	Total assets at the end of fiscal year (Compustat variable AT)
SIZE	Log of market value of equity (Compustat variable PRCC_F*CSHO)
MB	The ratio of the market value of equity to the book value of equity (Compustat variable CEQ) of the firm at the end of fiscal year
LEV	The ratio of total debt (Compustat variable DLC + DLTT) to the market value of equity (Compustat variable PRCC_F*CSHO) of the firm at the end of fiscal year
HAB_BEAT	The frequency of meeting/beating analysts' earnings forecasts in the past four quarters (ranges from 0-4)
ANALYSTS	The number of analysts whose forecasts are included in the I/B/E/S consensus annual earnings forecast
SHARES	The natural logarithm of the number of shares outstanding (Compustat variable CSHO)
NOA_{t-1}	Net operating assets (Compustat variable CEQ – CHE + DLC + DLTT) at the end of fiscal year t-1, scaled by total assets (Compustat variable AT)
ICLAIMS	Implicit claims, proxied by labor intensity, calculated as 1 minus the ratio of gross property, plant, and equipment (Compustat variable PPEGT) scaled by total assets (Compustat variable AT)
LITIGATION	An indicator variable that equals one if the firm is in the following industries: pharmaceutical/biotechnology (SIC codes 2833-2836, 8731-8734), computer (3570-3577, 7370-7374), electronics (3600-3674), or retail (5200-5961), and zero otherwise
INSTIT	The total number of shares held by institutional investors, scaled by total shares outstanding of the firm (Compustat variable CSHO)
HIINSTIT	A dummy variable that equals one if INSTIT is above 75^{th} percentile of the yearly sample distribution
E-Index	Entrenchment index based on Bebchuk, Cohen, and Ferrell (2009)

Table 1: Sample selection and distribution

Panel A summarizes the sample selection procedure. Panel B presents the sample distribution over time. Panel C presents the sample distribution over Fama and French 48 industries. Panel D presents sample distribution of CEO pay cuts by size of the pay cut. Refer to Appendix A for the definition of *PAYCUT*.

Panel A: Sample selection

	N
Initial sample (1994 – 2011) with non missing CEO total compensation data	31,732
Less: Firm-years observations	
- in the financial services sector	(4,710)
- where CEO does not hold his/her position for at least 3 years	(2,165)
- not having stock return data on CRSP	(1,701)
- not having sufficient data on COMPUSTAT to calculate earnings management proxies	(1,028)
- not having analyst data on IBES	(741)
Final sample	21,387
Firm-years with CEO pay cut	1,330

Panel B: Sample distribution by year

Year	*PAYCUT (#)*	*CONTROL (#)*	*TOTAL*
1994	8	986	994
1995	41	1,096	1,137
1996	46	1,124	1,170
1997	41	1,135	1,176
1998	63	1,145	1,208
1999	52	1,193	1,245
2000	70	1,160	1,230
2001	85	1,114	1,199
2002	117	1,073	1,190
2003	128	1,093	1,221
2004	71	1,161	1,232
2005	86	1,124	1,210
2006	93	1,127	1,220
2007	93	1,205	1,298
2008	99	1,168	1,267
2009	143	1,144	1,287
2010	53	1,145	1,198
2011	41	864	905
Total	1,330	20,057	21,387
Percent	6.22%	93.78%	100.00%

Panel C: Distribution of CEO pay cut by industry

Fama and French 48 Industry	*Frequency*	*Percent*
2: Food products	28	2.11%
9: Consumer goods	38	2.86%
10: Apparel	29	2.18%
11: Healthcare	27	2.03%
12: Medical equipment	34	2.56%
13: Pharmaceutical products	53	3.98%
14: Chemicals	29	2.18%
17: Construction materials	31	2.33%
18: Construction	30	2.26%
19: Steel works etc.	34	2.56%
21: Machinery	48	3.61%
30: Petroleum & natural gas	46	3.46%
31: Utilities	54	4.06%
32: Communications	33	2.48%
34: Business services	139	10.45%
35: Computers	85	6.39%
36: Electronic equipment	137	10.30%
37: Measuring and control equipment	43	3.23%
40: Transportation	48	3.61%
41: Wholesale	43	3.23%
42: Retail	98	7.37%
43: Restaurants, hotels, motels	29	2.18%
Other industries with < 2% frequency	194	14.59%
Total	1330	100.00%

Panel D: Distribution of CEO pay cut by size

Size of pay cut	*Frequency*	*Percent*
25% - 35%	416	31.28%
35% - 45%	348	26.17%
45% - 55%	209	15.71%
55% - 65%	138	10.38%
65% - 75%	108	8.12%
75% - 85%	65	4.89%
85% - 95%	29	2.18%
95% - 100%	17	1.28%
Total	1330	100.00%

Table 2: Descriptive statistics

Panel A reports time series of median values for CEO compensation, firm performance, and earnings management proxies from year -1 to year +1 relative to the year of CEO pay cut. Wilcoxon signed-rank test is used to test the significance of difference in median values for these variables for the *PAYCUT* sample and the *CONTROL* sample. Panel B presents descriptive statistics on various firm characteristics for these two sub-samples. The significance of the differences in the means (medians) between the two sub-samples is based on t-statistics (z-statistics) from t-tests (Wilcoxon tests).Panel C of this table presents Pearson (below the diagonal) and Spearman (above the diagonal) correlations. The definitions of variables are in Appendix A. All continuous variables are winsorized at top and bottom 1% to mitigate the effect of outliers. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Panel A: Trends in median values of compensation, firm performance and earnings management proxies

	PAYCUT (n = 1,330)			CONTROL (n = 20,057)		
Year	t-1	t	t+1	t-1	t	t+1
TOTALPAY($ millions)	2.8600***	1.3700***	2.3280***	2.3080	2.5900	2.6470
Δ*TOTALPAY (%)*	-0.0910***	-0.4220***	0.4010***	0.1101	0.1009	0.0971
RET	-0.1215***	-0.0631***	0.0110*	0.0084	0.0099	0.0073
ROA	0.0441***	0.0312***	0.0566	0.0606	0.0586	0.0576
DA	0.0089	0.0051*	0.0163***	0.0070	0.0078	0.0070
RCFO	0.0085	0.0076*	0.0187***	0.0081	0.0089	0.0069
RPROD	-0.0070	0.0031**	0.0130***	-0.0050	-0.0049	-0.0050
RDISX	0.0016*	0.0022	0.0180***	0.0030	0.0029	0.0030
PREEM_ROA	0.0412**	0.0102***	0.0030***	0.0556	0.0528	0.0526

Panel B: Descriptive statistics

	PAYCUT (n = 1,330)					CONTROL (n = 20,057)				
	Q1	Mean	Median	Q3	SD	Q1	Mean	Median	Q3	SD
$ASSETS_{t+1}$ *($ billions)*	0.5013	4.5362***	1.2286	3.8204	10.0677	0.4928	5.2566	1.3071	4.1922	11.1721
MB_{t+1}	1.2071	2.7799***	1.8651***	3.1516	2.9608	1.5360	3.1699	2.2753	3.6182	2.9820
LEV_{t+1}	0.0295	0.5023***	0.2204**	0.5790	0.7853	0.0341	0.3918	0.1857	0.4885	0.5993
$INSTIT_{t+1}$	0.4495	0.5970	0.6871	0.8382	0.3186	0.4281	0.5873	0.6713	0.8270	0.3138
$BONUS_{t+1}$	0.0000	0.1047***	0.0000***	0.1674	0.1710	0.0000	0.1403	0.0917	0.2349	0.1620
EX_OPTION_{t+1}	0.0026	0.0112***	0.0074***	0.0156	0.0123	0.0012	0.0078	0.0044	0.0103	0.0102
UN_OPTION_{t+1}	0.0000	0.0030**	0.0016***	0.0042	0.0040	0.0000	0.0024	0.0011	0.0032	0.0036
$GRNT\_OPTION_{t+1}$	0.0000	0.0011***	0.0000***	0.0014	0.0023	0.0000	0.0021	0.0010	0.0025	0.0033
$OWNER_{t+1}$	0.0012	0.0267*	0.0049***	0.0187	0.0562	0.0009	0.0239	0.0033	0.0136	0.0558
HAB_BEAT_{t+1}	2.0000	2.4556***	3.0000***	4.0000	1.2588	2.0000	2.8238	3.0000	4.0000	1.1758
$ANALYSTS_{t+1}$	4.0000	10.1564	9.0000***	14.0000	7.2568	5.0000	10.2561	9.0000	14.0000	7.2751
$SHARES_{t+1}$	3.4085	4.2816**	4.1033***	4.9722	1.2007	3.3249	4.1990	3.9755	4.8758	1.2069
$LITIGATION_{t+1}$	0.0000	0.3707***	0.0000***	1.0000	0.4832	0.0000	0.3157	0.0000	1.0000	0.4648
$ICLAIMS_{t+1}$	0.2553	0.4755***	0.5718***	0.7585	0.3606	0.1740	0.4329	0.5162	0.7391	0.3733
NOA_t	0.4459	0.5590	0.5937	0.7076	0.1969	0.4609	0.5645	0.6018	0.6996	0.1866

Panel C: Correlations

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
(1)$PAYCUT_t$	1.0000	0.1601***	0.0117*	-0.0525***	0.0448***	0.0387***	0.0427***	0.0193***
(2) $\Delta Ln(TOTALPAY_{t+1})$	0.1285***	1.0000	0.1339***	0.0342***	0.0109	0.0616***	-0.0184***	-0.0041
(3) RET_{t+1}	0.0209***	0.0830***	1.0000	0.0927***	-0.0143**	0.1311***	-0.0815***	-0.0397***
(4) $PREEM\_ROA_{t+1}$	-0.0553***	0.0327***	0.0768***	1.0000	-0.2070***	0.4188***	-0.6095***	-0.7030***
(5) DA_{t+1}	0.0418***	0.0162**	-0.011	-0.1871	1.0000	-0.3496***	0.0710***	0.0682***
(6) $RCFO_{t+1}$	0.0449***	0.0601***	0.0987***	0.4191***	-0.3083***	1.0000	-0.4278***	-0.0534***
(7) $RPROD_{t+1}$	0.0464***	-0.0196***	-0.0599***	-0.6227***	0.0495***	-0.4169***	1.0000	0.6747***
(8) $RDISX_{t+1}$	0.0219***	-0.0096	-0.0504***	-0.7622***	0.0723***	-0.0460***	0.7065***	1.0000

Table 3: CEO pay cut and earnings management

This table presents the results from estimating equation (5).

$$EM_{t+1} = \delta_0 + \delta_1 PAYCUT_t + \delta_2 LEV_{t+1} + \delta_3 Ln(ASSETS_{t+1}) + \delta_4 MB_{t+1} + \delta_5 BONUS_{t+1} + \delta_6 EX\_OPTION_{t+1} + \delta_7 UN\_OPTION_{t+1} + \delta_8 GRNT\_OPTION_{t+1} + \delta_9 OWNER_{t+1} + \delta_{10} HAB\_BEAT_{t+1} + \delta_{11} Ln(ANALYSTS_{t+1}) + \delta_{12} Ln(SHARES_{t+1}) + \delta_{13} ICLAIMS_{t+1} + \delta_{14} LITIGATION_{t+1} + \delta_{15} NOA_t + \delta_{16} INSTIT_{t+1} + \varepsilon \quad (5)$$

The dependent variable in columns 1-5 is the earnings management proxy *TOTALEM, DA, RPROD, RDISX,* and *RCFO,* respectively for the year *t+1* where year *t* refers to the year of *PAYCUT* event. All other variables are as defined in Appendix A. Heteroskedasticity consistent standard errors clustered at firm and year level are reported in parentheses. For brevity, we do not report the coefficient estimates for the intercept, industry dummies, and year dummies. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Dependent variable = EM_{t+1}	(1) $EM_{t+1} = TOTALEM_{t+1}$	(2) $EM_{t+1} = DA_{t+1}$	(3) $EM_{t+1} = RPROD_{t+1}$	(4) $EM_{t+1} = RDISX_{t+1}$	(5) $EM_{t+1} = RCFO_{t+1}$
$PAYCUT_t$	0.0544***	0.0178***	0.0270***	0.0140**	0.0199***
	(0.0114)	(0.0035)	(0.0069)	(0.0056)	(0.0047)
LEV_{t+1}	0.0196***	0.0073***	0.0192***	0.0077**	0.0165***
	(0.0069)	(0.0015)	(0.0038)	(0.0035)	(0.0022)
$Ln(ASSETS_{t+1})$	0.1046***	0.0069***	0.0472***	0.0505***	0.0122***
	(0.0104)	(0.0012)	(0.0050)	(0.0056)	(0.0017)
MB_{t+1}	0.0175***	0.0006	0.0115***	0.0067***	0.0053***
	(0.0021)	(0.0005)	(0.0011)	(0.0011)	(0.0004)
$BONUS_{t+1}$	0.0171	0.0186***	-0.0094	0.0079	0.0118**
	(0.0241)	(0.0051)	(0.0137)	(0.0123)	(0.0049)
EX_OPTION_{t+1}	-0.4919	-0.0964	0.0129	-0.4085*	-0.1730*
	(0.4886)	(0.0782)	(0.2494)	(0.2463)	(0.0990)
$UN\_OPTIONS_{t+1}$	-0.9448	-0.2455	-0.2484	-0.4508	-0.0121
	(1.0179)	(0.2128)	(0.5466)	(0.5896)	(0.2921)
$GRNT\_OPTION_{t+1}$	-2.4013**	0.1239	-0.4487	-2.0764***	-1.1758***
	(1.0787)	(0.2696)	(0.5657)	(0.6090)	(0.2849)
$OWNER_{t+1}$	0.0664	0.0086	0.0540	0.0209	0.0485**
	(0.1096)	(0.0147)	(0.0543)	(0.0638)	(0.0191)
HAB_BEAT_{t+1}	0.0061**	0.0026***	0.0059***	0.0049***	0.0055***
	(0.0031)	(0.0006)	(0.0016)	(0.0016)	(0.0007)
$Ln(ANALYSTS_{t+1})$	-0.0382***	-0.0084***	-0.0144***	-0.0154***	-0.0112***
	(0.0085)	(0.0014)	(0.0043)	(0.0045)	(0.0018)
$Ln(SHARES_{t+1})$	-0.0758***	-0.0034**	-0.0357***	-0.0367***	-0.0097***
	(0.0110)	(0.0015)	(0.0055)	(0.0059)	(0.0020)
$ICLAIMS_{t+1}$	-0.1075***	-0.0131***	-0.0294*	-0.0650***	-0.0113**
	(0.0348)	(0.0036)	(0.0169)	(0.0186)	(0.0048)
$LITIGATION_{t+1}$	-0.0854***	-0.0081***	-0.0239	-0.0534***	-0.0089*
	(0.0315)	(0.0031)	(0.0153)	(0.0167)	(0.0048)
NOA_t	0.1889***	0.0027	0.0214	0.1647***	0.0323***
	(0.0326)	(0.0049)	(0.0168)	(0.0188)	(0.0073)
$INSTIT_{t+1}$	-0.0229**	-0.0095**	-0.0201*	-0.0213*	-0.0086**
	(0.0127)	(0.0043)	(0.0118)	(0.0120)	(0.0040)
Industry and year dummies	Included	Included	Included	Included	Included
N	21,387	21,387	21,387	21,387	21,387
Adj. R^2	0.143	0.035	0.129	0.140	0.130

Table 4: Stock market response to earnings management after a CEO pay cut

This table presents the results from estimating equation (6).

$$RET_{t+1} = \beta_0 + \beta_1 \Delta PREEM\_ROA_{t+1} + \beta_2 \Delta EM_{t+1} + \beta_3 PAYCUT_t + \beta_4 PAYCUT_t * \Delta EM_{t+1} + \beta_5 SIZE_t + \beta_6 Ln(BM_t) + \varepsilon \quad (6)$$

The dependent variable is $RET_{t+1,}$ the 12-month cumulative, market-adjusted return ending three months after the fiscal year where the year *t* refers to the year of *PAYCUT* event. The earnings management proxy *EM* refers to *TOTALEM, DA, RPROD, RDISX,* and *RCFO,* respectively in columns 1-5. All other variables are as defined in Appendix A. Heteroskedasticity consistent standard errors clustered at firm and year level are reported in parentheses. For brevity, we do not report the coefficient estimates for intercept, industry dummies and year dummies. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Dependent variable = RET_{t+1}	(1) $EM_{t+1} = TOTALEM_{t+1}$	(2) $EM_{t+1} = DA_{t+1}$	(3) $EM_{t+1} = RPROD_{t+1}$	(4) $EM_{t+1} = RDISX_{t+1}$	(5) $EM_{t+1} = RCFO_{t+1}$
$\Delta PREEM\_ROA_{t+1}$	1.2848***	1.4098***	1.1662***	1.2177***	1.1366***
	(0.1246)	(0.2548)	(0.1969)	(0.2011)	(0.1947)
ΔEM_{t+1}	1.1342***	1.1006***	0.9558***	1.0233***	1.1530***
	(0.1078)	(0.1941)	(0.1873)	(0.1847)	(0.2161)
$PAYCUT_t$	-0.0151	-0.0024	-0.0031	-0.0101	-0.0310
	(0.0261)	(0.0245)	(0.0261)	(0.0236)	(0.0193)
$PAYCUT_t * \Delta EM_{t+1}$	-0.0709	-0.3928**	-0.0383	-0.1802	-0.5438
	(0.0573)	(0.1745)	(0.1960)	(0.1234)	(0.4071)
$Ln(ASSETS_t)$	-0.0188***	-0.0160**	-0.0170**	-0.0171**	-0.0165**
	(0.0072)	(0.0069)	(0.0071)	(0.0071)	(0.0070)
$Ln(BM_t)$	0.0129**	0.0167**	0.0126**	0.0128**	0.0136**
	(0.0065)	(0.0074)	(0.0062)	(0.0063)	(0.0063)
Industry and year dummies	Included	Included	Included	Included	Included
N	21,387	21,387	21,387	21,387	21,387
Adj. R^2	0.116	0.115	0.113	0.112	0.117

Table 5: Earnings management after CEO pay cut and future operating performance

This table presents the results from estimating equation (7).

$$\Delta ADJROA_{t+2} = \mu_0 + \mu_1 \Delta EM_{t+1} + \mu_2 PAYCUT_t * \Delta EM_{t+1} + \mu_3 PAYCUT_t + \mu_4 Ln(ASSETS_{t+1}) + \mu_5 MB_{t+1} + \mu_6 LEV_{t+1} + \varepsilon \quad (7)$$

The dependent variable $\Delta ADJROA_{t+2}$ is change in industry adjusted ROA for the year t+2, where year *t* refers to the year of *PAYCUT* event. *EM* is measured as *TOTALEM, DA, RPROD, RDISX,* and *RCFO* in columns 1 – 5, respectively. All other variables are as defined in Appendix A. Heteroskedasticity consistent standard errors clustered at firm and year level are reported in parentheses. For brevity, we do not report the coefficient estimates for industry and year dummies. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Dependent variable = $\Delta ADJROA_{t+2}$	(1) $EM_{t+1} = TOTALEM_{t+1}$	(2) $EM_{t+1} = DA_{t+1}$	(3) $EM_{t+1} = RPROD_{t+1}$	(4) $EM_{t+1} = RDISX_{t+1}$	(5) $EM_{t+1} = RCFO_{t+1}$
ΔEM_{t+1}	-0.3257***	-0.1154***	-0.1861***	-0.2187***	-0.1709***
	(0.0394)	(0.0410)	(0.0583)	(0.0597)	(0.0471)
$PAYCUT_t * \Delta EM_{t+1}$	-0.0419**	-0.0157**	-0.0379**	-0.0517**	-0.0565**
	(0.0202)	(0.0074)	(0.0174)	(0.0198)	(0.0290)
$PAYCUT_t$	0.0037	-0.0015	-0.0012	-0.0005	-0.0002
	(0.0023)	(0.0027)	(0.0029)	(0.0029)	(0.0036)
$Ln(Assets_{t+1})$	0.0003	-0.0004	-0.0001	-0.0002	0.0003
	(0.0005)	(0.0005)	(0.0004)	(0.0005)	(0.0004)
MB_{t+1}	-0.0022***	-0.0016***	-0.0019***	-0.0018***	-0.0015***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
LEV_{t+1}	0.0079***	0.0062***	0.0069***	0.0068***	0.0052**
	(0.0024)	(0.0017)	(0.0018)	(0.0018)	(0.0021)
Industry and year dummies	Included	Included	Included	Included	Included
N	21,387	21,387	21,387	21,387	21,387
Adj. R^2	0.026	0.009	0.008	0.008	0.028

Table 6: Impact of corporate governance on earnings management following CEO pay cut
This table presents the results from estimating equation (8).

$$EM_{t+1} = \delta_0 + \delta_1 PAYCUT_t + \delta_2 LEV_{t+1} + \delta_3 Ln(ASSETS_{t+1}) + \delta_4 MB_{t+1} + \delta_5 BONUS_{t+1} + \delta_6 EX\_OPTION_{t+1} + \delta_7 UN\_OPTION_{t+1} + \delta_8 GRNT\_OPTION_{t+1} + \delta_9 OWNER_{t+1} + \delta_{10} HAB\_BEAT_{t+1} + \delta_{11} Ln(ANALYSTS_{t+1}) + \delta_{12} Ln(SHARES_{t+1}) + \delta_{13} ICLAIMS_{t+1} + \delta_{14} LITIGATION_{t+1} + \delta_{15} NOA_t + \delta_{16} GOV_{t+1} + \delta_{17} PAYCUT_{t*} GOV_{t+1} + \varepsilon \quad (8)$$

The dependent variable in columns 1-5 is the earnings management proxy *TOTALEM, DA, RPROD, RDISX,* and *RCFO,* respectively, for the year *t+1*, where year *t* refers to the year of *PAYCUT* event. In panel A, *GOV* is captured by *E-Index*, where *E-Index* is the entrenchment index as defined in Bebchuk et al (2009). In panel B, *GOV* is captured by *HIINSTIT*, a dummy variable that equals one if the institutional ownership in the firm is above the 75th percentile of the yearly sample distribution, and zero otherwise. All other variables are as defined in Appendix A. For brevity, we do not report the coefficient estimates for the intercept, control variables, industry dummies, and year dummies. Control variables include all the other independent variables used in Table 3. Heteroskedasticity consistent standard errors clustered at firm and year level are reported in parentheses. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Panel A: *GOV = E-Index*

Dependent variable = EM_{t+1}	(1) $EM_{t+1} = TOTALEM_{t+1}$	(2) $EM_{t+1} = DA_{t+1}$	(3) $EM_{t+1} = RPROD_{t+1}$	(4) $EM_{t+1} = RDISX_{t+1}$	(5) $EM_{t+1} = RCFO_{t+1}$
$PAYCUT_t$	0.0434**	0.0177***	0.0267**	0.0159***	0.0222***
	(0.0209)	(0.0059)	(0.0128)	(0.0052)	(0.0069)
$EINDEX_{t+1}$	0.0064**	0.0054**	0.0061*	0.0091**	0.0078**
	(0.0028)	(0.0026)	(0.0037)	(0.0042)	(0.0034)
$PAYCUT_t * EINDEX_{t+1}$	0.0134**	0.0038**	0.0036*	0.0051**	0.0055**
	(0.0053)	(0.0017)	(0.0021)	(0.0023)	(0.0024)
Controls	Included	Included	Included	Included	Included
Industry and year dummies	Included	Included	Included	Included	Included
N	21,387	21,387	21,387	21,387	21,387
Adj. R^2	0.149	0.043	0.130	0.144	0.138

Panel B: *GOV = HIINSTIT*

Dependent variable = EM_{t+1}	(1) $EM_{t+1} = TOTALEM_{t+1}$	(2) $EM_{t+1} = DA_{t+1}$	(3) $EM_{t+1} = RPROD_{t+1}$	(4) $EM_{t+1} = RDISX_{t+1}$	(5) $EM_{t+1} = RCFO_{t+1}$
$PAYCUT_t$	0.0644***	0.0217***	0.0279**	0.0194**	0.0249***
	(0.0184)	(0.0052)	(0.0103)	(0.0062)	(0.0067)
$HIINSTIT_{t+1}$	-0.0169**	-0.0075**	-0.0171*	-0.0073*	-0.0076**
	(0.0074)	(0.0036)	(0.0085)	(0.0038)	(0.0031)
$PAYCUT_t * HIINSTIT_{t+1}$	-0.0385**	-0.0091**	-0.0171**	-0.0079**	-0.0115**
	(0.0143)	(0.0052)	(0.0063)	(0.0034)	(0.0061)
Controls	Included	Included	Included	Included	Included
Industry and year dummies	Included	Included	Included	Included	Included
N	21,387	21,387	21,387	21,387	21,387
Adj. R^2	0.152	0.041	0.137	0.149	0.141

Table 7: Board's treatment of reported earnings after a CEO pay cut

This table presents the results from estimating equation (9).

$$\Delta Ln(COMP_{t+1}) = \alpha_0 + \alpha_1 \Delta PREEM\_ROA_{t+1} + \alpha_2 \Delta EM_{t+1} + \alpha_3 PAYCUT_t + \alpha_4 PAYCUT_t * \Delta PREEM\_ROA_{t+1} + \alpha_5 PAYCUT_t * \Delta EM_{t+1} + \alpha_6 RET_{t+1} + \alpha_7 Ln(ASSETS_{t+1}) + \varepsilon \quad (9)$$

The dependent variable is change in log of CEO total compensation measured as $\Delta Ln(TOTALPAY_{t+1})$ where the year *t* refers to the year of *PAYCUT* event. The earnings management proxy *EM* refers to *TOTALEM, DA, RPROD, RDISX,* and *RCFO,* respectively in columns 1-5.All other variables are as defined in Appendix A. This table excludes firm-year observations that experience a CEO turnover (either forced or voluntary). Heteroskedasticity consistent standard errors clustered at firm and year level are reported in parentheses. For brevity, we do not report the coefficient estimates for intercept, industry dummies and year dummies. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Dependent variable = $\Delta Ln(COMP_{t+1})$	(1) $EM_{t+1} = TOTALEM_{t+1}$	(2) $EM_{t+1} = DA_{t+1}$	(3) $EM_{t+1} = RPROD_{t+1}$	(4) $EM_{t+1} = RDISX_{t+1}$	(5) $EM_{t+1} = RCFO_{t+1}$
$\Delta PREEM\_ROA_{t+1}$	0.6848***	0.6383***	0.5840***	0.5715***	0.6275***
	(0.0994)	(0.1526)	(0.1177)	(0.1229)	(0.1180)
ΔEM_{t+1}	0.5870***	0.5170***	0.3713***	0.4275***	0.4125***
	(0.0935)	(0.1185)	(0.1155)	(0.1420)	(0.1344)
$PAYCUT_t$	0.3937***	0.3862***	0.3861***	0.3908***	0.3819***
	(0.0132)	(0.0162)	(0.0137)	(0.0158)	(0.0182)
$PAYCUT_t * \Delta PREEM\_ROA_{t+1}$	0.1966	0.1233	0.1281	0.1627	0.1462
	(0.2339)	(0.2468)	(0.2566)	(0.2368)	(0.2250)
$PAYCUT_t * \Delta EM_{t+1}$	-0.1997	-0.1653	0.0053	-0.2417	-0.2463
	(0.2785)	(0.2629)	(0.4012)	(0.3935)	(0.3506)
RET_{t+1}	0.0985**	0.1020**	0.1018**	0.1023**	0.1001**
	(0.0400)	(0.0408)	(0.0407)	(0.0407)	(0.0407)
$Ln(ASSETS_{t+1})$	0.0038	0.0046	0.0042	0.0045	0.0045
	(0.0031)	(0.0030)	(0.0031)	(0.0032)	(0.0031)
Industry and year dummies	Included	Included	Included	Included	Included
N	18,804	18,804	18,804	18,804	18,804
Adj. R^2	0.054	0.054	0.054	0.055	0.053

Table 8: Robustness tests

This table presents results from our robustness tests where we estimate Equation (5) various alternate specifications. In Panel A we use a 2SLS estimation technique. In the first stage a logit model is used to predict the probability of pay cut. The dependent variable takes the value of one if the board cuts the CEO's pay, and zero otherwise. The predicted probability of pay cut is then used in the second stage equation. *EM* is measured as *TOTALEM, DA, RPROD, RDISX,* and *RCFO* in columns 1– 5, respectively. In panel B, we measure earnings management as the propensity of a firm to just meet or beat the three earnings benchmarks and use a logit model. Indicator variables SUSPECT1, SUSPECT2, and SUSPECT3 equal to one if a firm marginally avoids loss (0 <= ROA<= 0.005), shows marginal improvement over previous year's ROA (0 <= ΔROA<= 0.005), and just meets or beats analysts' earnings forecast by one cent, respectively. In panel C, we restrict the sample to post-SOX period. In panel D, we drop observations from the recession years. For brevity, we do not report the coefficient estimates for intercept, control variables, industry and year dummies. Control variables include all the other independent variables used in Table 3.Allother variables are as defined in Appendix A. Heteroskedasticity consistent standard errors clustered at firm and year level are reported in parentheses.. ***, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Panel A: 2SLS estimation

First stage logit regression

Dependent variable = $PAYCUT_t$	RET_t	RET_{t-1}	ROA_t	ROA_{t-1}	Controls	Industry and year dummies	N	Pseudo R^2
Coefficient	-0.1641***	-0.7420***	-2.1378***	-1.1962***				
SE	(0.0611)	(0.0795)	(0.3887)	(0.3773)	Included	Included	21,387	0.097

Second stage OLS regression

Dependent variable = EM_{t+1}	(1) *EM = DA*	(2) *EM = RPROD*	(3) *EM = RDISX*	(4) *EM = TOTALEM*	(5) *EM = RCFO*
Predicted $PAYCUT_t$	0.1580***	0.2315***	0.3507***	0.3228**	0.2897***
	(0.0302)	(0.0762)	(0.0709)	(0.1405)	(0.0413)
Controls	Included	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included	Included
Year dummies	Included	Included	Included	Included	Included
N	21,387	21,387	21,387	21,387	21,387
Adj. R^2	0.023	0.122	0.131	0.134	0.126

Panel B: Alternate measures of earnings management

Dependent variable = $SUSPECT_{t+1}$	(1) *SUSPECT = 1 if0 <= ROA_{t+1}< 0.005*	(2) *SUSPECT = 1 if0 <= ΔROA_{t+1}< 0.005*	(3) *SUSPECT = 1 if0 <= (Actual EPS_{t+1} - Forecast EPS_{t+1}) <= 1 cent*
$PAYCUT_t$	0.3756**	0.5343***	0.8802***
	(0.1530)	(0.1767)	(0.1127)
Controls	Included	Included	Included
Industry dummies	Included	Included	Included
Year dummies	Included	Included	Included
N	21,387	21,387	21,387
Pseudo R^2	0.093	0.085	0.067

Panel C: Post SOX sub-sample

Dependent variable = EM_{t+1}	(1) *EM = TOTALEM*	(2) *EM = DA*	(3) *EM = RPROD*	(4) *EM = RDISX*	(5) *EM = RCFO*
$PAYCUT_t$	0.0615***	0.0161***	0.0266***	0.0228**	0.0102**
	(0.0167)	(0.0031)	(0.0087)	(0.0097)	(0.0045)
Controls	Included	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included	Included
Year dummies	Included	Included	Included	Included	Included
N	10,838	10,838	10,838	10,838	10,838
Adj. R^2	0.122	0.024	0.112	0.114	0.110

Panel D: Sub-sample excluding recession years

Dependent variable = EM_{t+1}	(1) *EM = TOTALEM*	(2) *EM = DA*	(3) *EM = RPROD*	(4) *EM = RDISX*	(5) *EM = RCFO*
$PAYCUT_t$	0.0706***	0.0177***	0.0293***	0.0276***	0.0227***
	(0.0167)	(0.0040)	(0.0089)	(0.0103)	(0.0054)
Controls	Included	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included	Included
Year dummies	Included	Included	Included	Included	Included
N	16,422	16,422	16,422	16,422	16,422
Adj. R^2	0.127	0.027	0.119	0.125	0.114