

**Earnings Management and Executive Compensation:
a Case of Overdose of Option and Underdose of Salary?**

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First Draft: September 6th, 2001
Second Draft: February 28th, 2002
This Draft: July 29, 2002

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Abstract:

We present and test hypotheses about how the components of compensation influence earnings management behavior. Hypotheses are based, in part, on the observation that discretion over accounting accruals gives managers a potentially valuable timing option that will lead to strategies for maximizing their compensation. Our empirical analysis shows that earnings management intensity, as measured by the absolute value of discretionary current accruals scaled by asset size, is related to managerial compensation contract design. We find the amounts of stock options and bonuses, and the incentive intensity of stock options, are positively related to earnings management intensity, whereas salaries are negatively related. Results do not reliably support either positive or negative effects of long-term incentive plans or restricted stock compensation on earnings management intensity, aside from the incentive intensity effect of restricted stock. We show that magnitudes of the effects of some compensation variables on earnings management intensity are conditional on proximity of premanaged earnings to specified targets. The importance of our findings is the strong evidence they provide that compensation contract design does influence earnings management, and that the influences of the various compensation components appear to be largely predictable on a presumption that (at least some) managers behave opportunistically.

JEL codes: G32, G34

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"Earnings management is like dirt - it's everywhere."
Unattributed quote from the U.S. Senate hearings on Enron.

Earnings management has become a mainstay of corporate financial news, and the concerns about earnings management/manipulation have come to the fore of securities regulation issues.¹ Papers by Chan et al (2001), and Guay, Kothari and Watts (1997) point out the possibility that discretionary accruals may satisfy either the performance measure hypothesis or the opportunistic accrual management hypothesis. The performance measure hypothesis argues that accruals lead future cash flows, and managers use the discretionary accruals to enable outsiders to make more reliable forecasts of future performance. In contrast, the opportunistic earnings management hypothesis claims that managers use accruals to exploit information asymmetry, manipulating current year income in order to achieve various benefits to themselves or their firms.

There is ample evidence that when earnings management is based on opportunistic managerial motives, the corporate costs due to distorted information flow can be substantial. An indication of these costs in extreme cases of earnings management is the finding by Dechow, Sloan and Sweeney (1996), who document that firms alleged to have committed accounting fraud experienced announcement-related losses in shareholder wealth averaging about 9%.

Even where there are no accusations of fraudulent behavior, there is growing evidence that shareholders of firms practicing "aggressive" earnings management will ultimately pay a price. Chan et al (2001) show that accruals are reliably negatively related to future stock returns. Teoh, Welch and Wong (1998a, 1998b) and Teoh, Welch, Wong and Rao (1998), find that aggressive accruals management initial public offerings experience significant long-run underperformance compared to less aggressive accruals management initial public offerings in a five year period

¹ In one of the remarks by the United States Security and Exchange Committee Commissioner Norman S. Johnson entitled U.S. Securities and Exchange Commission Current SEC Developments — 'Managed Earnings' and 'The Year of the Accountant', he made the following comments: No one who follows the financial pages could escape awareness of the recent allegations of apparent large-scale financial fraud, often involving hundreds of millions of dollars of manufactured or "managed earnings," at many prominent public companies. While the problem is not new, it is happening with alarming frequency. Barely a week goes by without an announcement that another large company is restating its past results. There are a number of dubious practices that companies employ to manage their earnings, including such gems as: "big bath" restructuring charges, creative acquisition accounting, "cookie jar

after IPOs. In summary, there is considerable evidence that earnings management distorts information flow and that its impact on stock returns is economically significant.

The objective of our study is to identify firm specific factors that influence the extent of earnings management, with a focus on managerial compensation contracts. There is substantial literature devoted to CEO compensation, but only a few authors look at the consequences of contracting structure upon earnings management. Healy (1985), Sloan (1993), Gaver, Gaver and Austin (1995) and Holthausen, Larcker and Sloan (1995), Balsam (1998) and Guidry, Leone and Rock (1999) focus on the effects of bonus plans.² Yermack (1997) hypothesizes that managers influence their compensation contracts to include more option awards preceding the release of good news. Aboody and Kaznik (2000) present evidence that CEOs opportunistically manage investor expectations during the interval around scheduled option award dates.

Our work differs in several ways. First, we investigate earnings management from a comprehensive view of the compensation contract, rather than focusing on just one or two items. As Anderson, Banker and Ravidran (2000) point out, "If components of total compensation have different risk and incentive profiles, empirical analysis of compensation-performance relations must consider the interplay between the components." Furthermore, there is growing recognition of more complex representations (i.e., metrics) of the nature of compensation contracts, suggesting that simply using the percentage of total compensation in various broad categories will fail to capture important aspects of compensation as they impact managerial incentives (recent examples of extensions are the excellent papers by Guay, 1999, and Bryan et al, 2000). No studies we are aware of assess earnings management in the context of whole CEO compensation package, particularly options, restricted stocks and long-term incentive plans. Further knowledge of the comparative influence of option compensation on earnings management is especially desirable, given recent growth in the importance of the option component of compensation, and general sentiment about its effects on earnings management⁴.

reserves," "immaterial" misapplications of accounting principles, and the premature recognition of revenue. The names for some of these techniques may be amusing, but in reality they are not amusing at all.

² Murphy (1999) documents that During the early 1990s, stock options replaced base salaries as the single largest component of compensation (in all sectors except utilities). Option grants in manufacturing firms swelled from 27% to 36% of total compensation, more than doubling in dollar terms.

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⁴ One Wall Street Journal report entitled Option overdose: Use of stock options spins out of control: Now a backlash brews (June 4th, 2001) shows that for CEOs from the top industrial and service companies ranked by

We address several aspects of executive compensation, including the contemporary linearity and convexity and incentive-intensity of the compensation package. Hypotheses about how the components of compensation influence earnings management behavior are based on the observation that discretion over accounting accruals gives managers a potentially valuable timing option that will lead to strategies for maximizing their compensation.

Our empirical results reliably indicate that executive compensation components, taken individually and collectively, are systematically related to earnings management behavior. We do not limit ourselves to any of the implicit assumptions about earnings management motivations, such as the income smoothing hypothesis (Liberty and Zimmerman, 1986; Ronen and Sadan, 1981; Bartov, 1992, among others), the bonus plan hypothesis (Healy, 1985; Gaver et al, 1995; Holthausen, 1995, among others), or ratchet effects (Sheikh, 2001). Our sampling methodology ensures that we examine the performance of firms and CEO compensation in a representative set of firms and over a cycle including both bull and bear markets. We utilize current and comprehensive data, covering some 1,200 firms over the period 1992 to 2000.

The remainder of the paper is organized as follows. Section I reviews the literature on earnings management and CEO compensation, and section II discusses recent evolution of compensation contracts and develops the major hypotheses; section III describes variable construction and data sources. Section IV introduces the model, section V describes estimation results; and Section VI concludes.

I. Literature Review on Earnings Management and CEO Compensation

By the usual definition, accruals are the difference between reported income and cash from operations. Put another way, net income can be thought of as cash from operations, plus accruals. If managers are focused on reported earnings, then the role of accruals as an earnings management tool becomes clear: for a given amount of cash from operations, reported income is increased by positive accruals, and decreased by negative accruals. Accruals, in turn, are divided into two components: nondiscretionary (the accruals that would be observed absent any incentives to manage earnings), and discretionary (accruals used to manage earnings).

revenues, stock option counts for 58% of total CEOs' remuneration during 1999 and 2000, up from 25% during 1989 and 1990; long-term incentive plans decrease from 24% during 1989 and 1990 to 14% during 1999 and 2000; annual incentives (bonus) decreases from 21% to 19; and salary decrease from 30% to 9%. In a recent appearance

An important observation about discretionary accruals is that they "reverse," i.e., if a manager selects a negative accrual in the current period, for example, by increasing a provision for doubtful accounts, then necessarily, the need to provide for the same doubtful accounts in a future period is removed. The result is to bring about a decrease in current period reported earnings, and an increase in future periods' reported earnings, relative to the alternative of postponing the provision. This feature of discretionary accruals implies that the time series of a particular firm's discretionary accruals is mean reverting (Dechow et al, 1995). As we shall see, this fact takes on special significance in the context of evaluating the impact of compensation policy on earnings management, since it implies that there is a dynamic aspect to earnings management. The allegedly common practice of using accruals to establish "cookie jar" reserves is but one manifestation of this dynamic aspect.

One major thread of earnings management studies attempts to identify discretionary accruals based on the relationship between total accruals and non-discretionary accruals. The most important contribution in this vein is the Jones (1991) model and its derivatives, such as the "modified" Jones model (DeChow et al, 1995, and Beneish, 1997; see Thomas and Zhang, 2000 for comprehensive references). In the Jones model, realized accruals are compared with forecasts from an accrual prediction model based upon changes in sales and property, plant and equipment. The forecast errors are assumed to represent the discretionary accruals, or earnings management.

Watts and Zimmerman (1986) are among the first to examine the motivations for earnings management. They argue managers in firms with earnings-based compensation agreements have the incentive to manipulate the earnings to maximize their award by (always) selecting income increasing accounting policies. There are two major hypotheses regarding the earnings management behavior *vis-a-vis* Watts and Zimmerman's positive accounting choice models. The first one is the income-smoothing hypothesis. It suggests that managers take actions to reduce earnings fluctuations around some level considered normal for the firm, in order to (1) better deliver management's expectations concerning the persistence of future earnings to investors (Barnea, Ronen and Sadan 1975; Hand, 1989), (2) increase their job security with the firm (DeFond and Park, 1997), or (3) reduce the firm's borrowing costs (Trueman and Titman, 1988).

before the U.S. Senate (July 17, 2002), Fed Chairman Greenspan used the phrase "infectious greed" in the context of managerial motivations leading to the recent spate of accounting problems in U. S. firms.

The competing hypothesis is the so-called bonus plan hypothesis. Healy (1985) is the first one to incorporate the definition and parameters actually used in bonus agreements in the empirical tests of the income-increasing accounting policy choices. In contrast to Watts and Zimmerman, he argues that managers can also have the incentive to adopt the *income-decreasing* accounting choices. He observes that bonus plans allow funds to be set aside for awards only when earnings exceed a specified threshold. Managers observe the sum of cash flows from operations and nondiscretionary accruals at year-end, and then select the level of discretionary accruals that maximizes the expected value of their bonus award. In years when earnings before discretionary accruals either fall sufficiently far below the lower bound or above the upper bound specified by the bonus plan, managers are expected to select negative discretionary accruals. Positive discretionary accruals are expected in all other years. Important follow-up research relating to Healy's bonus plan hypothesis has been done by Kaplan (1985), Gaver et al (1995), Holthausen et al (1995), and Degeorge et al (1999).

II. Innovations in CEO Compensation and Earnings Management Hypotheses

Murphy (1999) summarizes the empirical and theoretical research on executive compensation and provides a comprehensive and up-to-date description of pay practices (and trends in pay practices) for CEOs. For example, he documents that levels of pay and pay-performance sensitivities in the US have increased substantially over the past decade, driven primarily by an explosion in stock-option compensation. Many current executive compensation packages contain five components: the cash salary, an annual performance-based bonus, stock options, restricted stock grants, and long-term incentive plans (LTIPs). In developing hypotheses regarding the individual and joint impacts of these five components on earnings management behavior, we review some stylized economic facts regarding the compensation environment and the potential costs of earnings management. These stylized facts include exogenous shocks to corporate earnings and share prices, informational asymmetry between managers and investors, and nonlinearities in the relationship between share prices and compensation.

Recent discussions of the potential influence of compensation contracts on managerial

behavior generally have gone beyond the earlier discussions of salary versus bonus plans, and focused more generally on nonlinearities in the relationship between compensation and shareholder wealth (Guay, 1999; Bryan et al, 2000). Linear and non-linear payoff structures derived from different components of the compensation package will induce different behaviors, especially in light of the mean-reverting property of accruals. From the CEO's personal wealth realization perspective, it is clear that the horizon of compensation matters. As mentioned in the introduction, from an investor perspective, there is evidence that aggressive accruals management *per se* carries a risk of adverse current or future stock market performance (Dechow, Sloan and Sweeney, 1996; Chan et al, 2001). From a manager's perspective, making an earnings management choice that will "reverse" in a later period involves consideration of the tradeoffs between current and future periods' wealth realizations. Additional delayed cost factors that may result from heavy indulgence in earnings management are reputation loss and discontinuity of future incomes (the CEO may lose her job if continuous aggressive earnings management leads to allegations of accounting fraud⁵). Hence, especially in a realistic multiperiod setting, earnings management practices may be perceived by managers as having real costs. The crux of the issue is whether favorable tradeoffs between current and future compensation contract-related wealth realizations convey a net benefit to the earnings management behavior.

The five separate components typically found in compensation for top managers of large corporations may embody different incentives for earnings management. To the extent that reported earnings influence managers' compensation directly through bonuses, or indirectly through stock prices (e.g., restricted stock grants or options), managerial discretion over reported earnings gives managers a potentially valuable timing option that will lead to earnings management strategies for maximizing their compensation.⁷ Using estimated discretionary accruals as a metric for earnings management, we test for a systematic relationship between the magnitude of discretionary accruals and metrics for the relative importance of each of the five

⁵ Dechow et al. (1996) show that accounting fraud firms experience large buildup of positive discretionary accruals prior to the year when they are identified as accounting fraud firms. Beneish (1997) provides similar evidence and concludes that accounting fraud happens when the firms exhaust all possible means of accrual management within the boundary of Generally Accepted Accounting Principles (GAAP). He finds that aggressive discretionary accrual firms and accounting fraud firms are likely to come from the same sample.

⁷ See Constantinides (1983, 1984) for a discussion of timing options in the context of capital gains taxes and stock trading strategies.

components of compensation. The following paragraphs briefly describe the essential features of each of the components, and our expectations regarding their relationship to discretionary accruals.

Salary. CEO salaries are usually set on an annual basis. Moreover, it is a stylized fact that firm's size is associated with base salary (Murphy, 1999). In a static setting, during any particular year, salary's sensitivity to price movement is zero. Barring an implicit bonus scheme in which subsequent salary is adjusted according to reported earnings, it appears unlikely that there is a salary-related explanation for earnings management. As argued above, both logic and empirical evidence suggest that earnings management is a costly behavior, with the costs increasing in the degree of earnings management, e.g., due to increasing litigation risk. It follows that a manager on straight salary, who receives at best a fixed benefit from earnings management, would have an incentive to reduce the extent of earnings management, and so reduce the costs. We expect a nonpositive relationship between the role of salary in compensation and the use of discretionary accruals as a tool of earnings management.

Stock options. Nonlinear payoffs are expected to induce greater earnings management. The rationale is similar to that used by Healy (1985) in developing the hypothesis that managers have incentives to use discretionary accruals to maximize bonus plan awards (see the discussion in the previous section). Suppose stock prices contain a large exogenous stochastic component, with time-varying volatility, and that managers have the discretion to boost earnings, or not, by a given positive increment. Assume further that there is informational asymmetry between managers and investors, such that the discretionary increment to reported earnings will impact share prices. At a point in time, the manager has a choice between a higher and lower earnings number, but understands that there will necessary be a reversal of the discretionary increment in a later period. In essence, the manager is faced with a timing choice, namely when to report the higher earnings number, and when to report the lower number. Given the convexity of the relationship of option value to stock price, the manager will try to time the higher earnings number to the period when the option component of compensations is relatively large, and when sensitivity of option value with respect to stock price is relatively high, for example, when discretionary positive accruals can convert otherwise negative earnings results into a positive earnings report. Option sensitivity depends upon stock price, volatility, and time to expiration,

all of which are time-varying.⁸

A feature of stock option compensation intended to mitigate opportunistic behavior is a vesting period that restricts the fraction of options granted in a given year that can be exercised in subsequent years. This offset may not be very large, however, since, in a given year, a manager who has been employed for several years can exercise options granted over prior years, so the cumulative amount of exercisable options in a given year is not necessarily reduced by vesting restrictions. In summary, we anticipate that effect of the stock options component of the compensation package has the potential to induce managers to manipulate earnings.

Restricted stock. Like executive stock options, restricted stock typically involves a vesting period. However, the most distinct difference between stock options and restricted stocks is that restricted stocks have linear payoffs with respect to the stock price movements. Therefore, in the context of mean reversion in accruals, even though the timing option associated with discretionary accruals is still valuable because the sensitivity of stock price to a given increment in reported earnings is time-varying, it is less valuable than in the case of the stock option component of compensation. Restricted stock compensation provides less incentive for earnings management behavior than stock option compensation, and, the costs associated with earnings management are more likely to outweigh benefits to the manager.

Bonus. As previous literature (such as Healy 1995; and Gaver 1995, among others) documented, nonlinearities embodied in bonus compensation might create incentives to exploit accounting choices. However, bonus plans are highly firm-specific because of the heterogeneous performance measures, performance standards, and the structure of the pay-performance relation, making it difficult to predict the magnitude of such positive relationship.⁹

Long-term incentive plans (LTIP). Long-term incentive plans are usually based on a three- to five-year moving average of firm's performance, and hence will likely mitigate incentives to manage earnings due to the mean-reverting aspect of accruals. As with salary, to the extent that earnings management is a costly behavior for managers, and if the costs are increasing in the

⁸ Yermack (1997) suggests that CEOs directly influence the structure of their compensation contracts, and that causality runs from "good news" to option grants, i.e., that CEOs receive stock options just prior to favorable earnings news.

⁹ The data available to us is the cash amount of bonus in any particular year, but we do not know from our data the structure of the plan. Furthermore, bonus compensation plays a less important role in CEO compensations in the 90's. For example, our sample (of the firms in S&P 1000) shows that it accounts for only about 16 percent of total compensation during 1992 to 2000 period—slightly more than the restricted stocks and only half as much as salary.

extent of earnings management, then the behavior should be negatively related to the importance of LTIP in managerial compensation.

Summary. The timing option embedded in discretionary accruals may be used strategically by managers to improve their overall compensation. The accruals timing option has greatest value in the context of the convex payoffs from the stock options component of compensation. Bonuses tied to earnings will also be enhanced by the capacity to manage earnings through discretionary accruals. While the value of the restricted stock component of compensation is enhanced by the timing option embedded in discretionary accruals, the incentive to manage earnings will be less than for the stock options component, due to the linearity of the relationship between restricted stock value and stock price. On the other hand, the mean-reverting property of accruals implies that earnings management behavior results in little, if any, benefit from either the long-term incentive plan or salary components of compensation. If earnings management involves increasing costs, then these two components should be inversely related to the use of discretionary accruals.

III. Data Sources, Variable Construction, and Descriptive Statistics

A. Source of Data

The executive compensation information is obtained from the Standard and Poor's ExecuComp database, which reports components of compensation for CEOs of 1,500 U.S. firms, including the S&P 500, S&P 400 MidCap, and S&P 600 SmallCap, 1992-1999. We filter out firms with SIC codes between 6000 and 6999, including utilities, insurance, financial, and depository institutions. Consistent with previous researchers, we also exclude cases when the executive of the firm has more than 10% holding of the company's common stocks (for example, Guay (1999) uses a cut-off value of 30%; Bryan et al (2000) use a cut-off value of 10%). In those high executive ownership cases the incentive effects of compensation components may be different from the vast majority of cases. Whenever necessary, we also use SEC filings and Global Disclosure to supplement the ExecuComp database. We obtain accounting data from the Standard and Poor's Compustat annual industrial files, and market value information from the CRSP database.

B. Variable Definitions (Definitions are summarized in the Appendix)

Metric for earnings management. We use an estimate of discretionary current accruals (scaled by total assets) as a proxy for earnings management. Though firms in our sample are publicly traded firms, there is still substantial cross-sectional variation in firm size. Cross-sectional comparisons are more meaningful using a the assets-relative magnitude of managed earnings.

To distinguish between the discretionary and nondiscretionary components of total accruals, we use a modified version of Jones model, introduced by Dechow, Sloan and Sweeney (1996), and also used by Teoh et al (1998a). For each year, the following ordinary least squares regression model is estimated for each two-digit SIC industry represented by at least eight firms.^{10, 11}

$$\frac{CA_{i,t}}{TA_{i,t-1}} = \alpha_0 \frac{1}{TA_{i,t-1}} + \alpha_1 \frac{\Delta Sales_{i,t}}{TA_{i,t-1}} \quad (1)$$

where (with COMPUSTAT data item numbers in parentheses) CA is total current accruals (defined below), $\Delta Sales$ is the change in sales (12) and TA is total assets (6). Nondiscretionary current accruals (NDCA) are calculated as:

$$NDCA_{i,t-1} = \hat{\alpha}_0 \frac{1}{TA_{i,t-1}} + \hat{\alpha}_1 \frac{\Delta Sales_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} \quad (2)$$

Where α_0 is the estimated intercept and α_1 is the slope coefficient for firm i at year t, and $\Delta TR_{i,t}$ is the change in trade receivables (151) in year t for firm i. The increase in trade receivables is subtracted from the change in sales to allow for the possibility of credit sales manipulation.

Discretionary current accruals, $DCA_{i,t}$, for firm i for year t are represented by the residual:

$$DCA_{i,t} = CA_{i,t}/TA_{i,t-1} - NDCA_{i,t} \quad (3)$$

¹⁰ We also consider the fact that CRSP and COMPUSTAT have different industry classifications for the same firm. Guenther and Rosman (1994) examine the difference between SIC codes assigned by CRSP and COMPUSTAT, and they find large differences at two-, three-, and four-digit levels. They suggest that COMPUSTAT industry classification gives a more homogeneous description of the industry based on several financial ratio tests.

Following Teoh et al (1998), the definition of current accruals is (COMPUSTAT annual data item numbers in parentheses) the change in noncash current assets minus the change in operating current liabilities:

$$CA = \Delta[\text{current assets (4)} - \text{cash (1)}] \\ - \Delta[\text{current liabilities (5)} - \text{current maturity of long-term debt (44)}],$$

or further refined as:

$$CA = \Delta[\text{account receivables (2)} + \text{inventory (3)} + \text{other current assets (68)}] \\ - \Delta[\text{account payable (70)} + \text{tax payable (71)} + \text{other current liabilities (72)}]$$

Similar to Thomas and Zhang (2000) we adopt the winsorization procedure for the top and bottom one percent of discretionary accrual estimates to mitigate the effects of potentially influential extreme values. Our results before and after winsorization are quantitatively similar. Table 1 presents the distributions and summary statistics of estimated discretionary accruals, before winsorizing, by major SIC grouping and year.

The dependent variable in the regressions reported below is the absolute value of the scaled discretionary accruals (hereafter, we use the term discretionary accruals interchangeably with discretionary *current* accruals). We use the absolute value because either positive or negative discretionary accruals are consistent with earnings management behavior. Negative discretionary accruals of a given magnitude are expected to have the same significance as positive values. As a check on our presumption that negative accruals are as integral to earnings management strategies as positive accruals, we replicate our tests on the absolute value of accruals in a format that explicitly tests for differences in the effects of explanatory variables on positive and negative discretionary accruals.

INSERT TABLE 1 HERE

Executive compensation and incentive effects. In keeping with our objective of assessing the influence of managerial compensation on earnings management, we consider the role of each of the major compensation components: salary, bonus, restricted stock, options and long-term

¹¹ Following conventional practice, we exclude the financial service industry from our sample (SIC code 6000 to 6999), since the Jones model or modified Jones model do not readily apply to this industry.

incentive plans. The first measure of compensation is the dollar value of compensation accounted for by each of the five components, denoted as: Salary, Bonus, RestrictedStock, and LTIP.¹²

A number of papers (Jensen and Murphy, 1990; Yermack, 1995; Guay, 199; and Bryan, *et al*,2000) propose using the concept of incentive intensity to capture the relative incentive effects of option and restricted stocks compared to cash-based compensation components. Incentive-intensity measures the fraction of total wealth gain from an increase in stock price that is captured by the manager, thereby purportedly reflecting the strength of the manager-stockholder alignment incentives of different compensation components. In the context of earnings management, of course, the same compensation components may be related to managerial incentives for opportunistic use of discretionary accruals. For stock options and restricted stock, incentive intensity captures a dimension of incentive compensation not reflected in the dollar value variables described in the previous paragraph, since the wealth-increasing potential of a given amount of option compensation depends upon the sensitivity of option value to the price of the underlying stock. Incentive intensity measures are not meaningful for salary, bonus, and long-term incentive plans, since these three components of compensation are not formally tied to share price.

IISO stands for Incentive-Intensity of Stock Option Awards, and, consistent with the papers cited above, it can be estimated as follows:

$$IISO \approx \frac{\partial Option_{share}}{\partial P} \times \frac{Number\ of\ Options\ Granted}{Number\ of\ Shares\ Outstanding} \times \$1,0000$$

where δ stands for the partial derivative operator; $Option_{share}$ denotes the per share value of a CEO stock option award, estimated using the Black-Scholes-Merton option pricing model (Black and Scholes, 1973; Merton, 1973); and P denote the stock price on the date of the stock option grant. The option's value can be estimated by the following formula¹³:

$$Option\ Value = [Se^{-dT} N(Z) - Xe^{-rT} N(Z - \sigma T^{(1/2)})]$$

where $Z = [\ln(S/X) + T(r - d + \sigma^2 / 2)] / \sigma \sqrt{T}$, and N is the cumulative normal distribution.

¹² We also replicate all regressions using compensation amounts scaled by market capitalization, with little difference in the results.

¹³ We understand that strictly speaking, Black-Scholes-Merton formula does not apply to executive option valuation for various reasons, such as poor diversification of executive personal wealth, vesting features, etc. However, for simplicity and applicability, we use the conventional model.

The partial derivative of option value with respect to stock-price is defined as Delta, Δ , and it is easy to show that (for example, see Hull, 2000):

$$\Delta = \frac{\partial \text{Option}_{\text{share}}}{\partial P} = N'(Z)$$

where N' is the normal density function, and Z is defined as before. In construction of individual CEO's option compensation package's IISO, we consider several complications. First, in any given year, some of the CEOs receive multiple grants with different exercise prices and times to maturity. Following Hull's (2000) approach for defining the Delta of an options portfolio, we construct our IISO index using a value-weighted measure of Delta. For example, if a firm's CEO receives n grants of stock options with different exercises and maturities, we calculate individual Delta's, or $\Delta_1, \Delta_2, \dots, \Delta_n$ and also calculate individual option's values, or p_1, p_2, \dots, p_n , as well as the total value of that year's grant. Then we calculate the weight of any particular grant, w_i , where $w_i = p_i / \sum p_i$. Then that year's CEO option grants portfolio Delta is $\Delta = \sum_{i=1}^n w_i \Delta_i$. Second, many of these multiple grants (as many as 31 multiple grants in our sample) are reload options. We exclude those reloaded option grants from our sample, since they are different from conventional option grants' incentive effects and valuation.¹⁴ Finally, consistent with Bryan et al (2000), we exclude the cases when CEO of any particular firm owns more than 10% of the outstanding shares because these firms may have different incentive effects.¹⁵

Since the partial derivative of the value of restricted stock with respect to stock price is unity, the Incentive-Intensity of CEO Restricted Stock Grants is simply:

$$IIRS = \frac{\text{Number of Restricted Shares Granted}}{\text{Number of Shares Outstanding}} \times \$1,000$$

Panel A of Table 2 summarizes the descriptive statistics for the CEO compensation package in our sample. Figure 1 shows the percentage decomposition of the dollar value of the executive compensation year by year from 1992 to 2000. The stock option has become the

¹⁴ We estimate our regressions with reloaded option in an unreported regression, and we do not find they make the results different. Therefore, we do not believe they drive our results in any manner, and we report the results without reloaded options. For a more detailed analysis of reloaded options, along with many other non-traditional options in the executive compensation, readers are referred to Johnson and Tian (2000), Carter and Lynch (2000), and Brenner, Sundaram and Yermack (2000).

single most important component in executive compensation; the role of cash compensations has clearly diminished. Our estimated values of the incentive intensity for restricted stocks and options are qualitatively similar to Bryan et al (2000). In general we observe the incentive intensity for the options increases over time and dominates incentive intensity for the restricted stocks. Panel B of Table 2 presented descriptive statistics for the positive and negative DCA subsets. It is noteworthy that the number of observations with negative accruals is roughly at parity with positive accruals, and that the magnitudes of the mean values of negative accruals and positive accruals are similar. These observations underscore the relative importance of the role of negative accruals as an earnings management device, and our choice of the absolute value of DCA as the relevant metric for accruals.

INSERT TABLE 2 and FIG 1 HERE.

Controlling for in-the-money options granted in prior periods. The compensation variable representing stock options (Option) represents the impact of the current year's option grant. But the vesting features of prior years' grants also have implications for the incentives to engage in earnings management during a given year. Conceivably, this overhang might be large enough to overwhelm the incentive effects of the other compensation components. To investigate whether the cumulative impact of executive stock option grants influences discretionary accruals, we include the value of all exercisable in-the-money options as of the beginning of the current year, denoted INMONEX (provided by the ExecuComp data).

Controlling for errors in measurement of discretionary accruals. In accounting literature, there have been heated debates about earnings management identification and estimation models (see McNichols, 2000). Admittedly, the Jones (1991) model and modified Jones models suffer from misspecification problems, but they are still the most widely used models applicable to a large sample empirical study like ours. One issue raised has been the possibility that the estimation errors in discretionary accruals variable are correlated with missing variables that are themselves related to explanatory variables used to explain the cross-sectional variation in discretionary accruals, resulting in spurious regression coefficients. For example, McNichols (2000) shows that growth firms have higher positive discretionary accruals, and she advocates

¹⁵ The results are not very sensitive to changes in the cutoff value used for this exclusion.

using return on assets (ROA) and earnings growth rate (GROWTH) to control for long-term growth of earnings in the empirical research.¹⁶

Controlling for book-to-market effects. Subraranyam (1996) shows that discretionary current accruals are value relevant, e.g., they are priced on the capital market. In similar spirit, Chan et al (2001) strengthen Subraranyam's argument by controlling various competing risk factors, such as book-to-market (BVMV). In our context, the book-to-market ratio may be interpreted as a measure of observability, in that firms with high book-to-market are composed a relatively large proportion of assets-in-place relative to growth opportunities. If stock prices in such firms are more sensitive to deviations from earnings expectations, then managers may have greater incentives to use discretionary accruals to reach earnings targets. For a given compensation arrangement, we control for possible effects by including BVMV as an explanatory variable.¹⁷

Controlling for debt contract covenants. Various papers dating back to Watts and Zimmerman (1986) have found that avoiding violations of debt contract covenants is an important motivation for the management to inflate earnings. More generally, firms that will need to access external capital markets to finance profitable investments may be particularly sensitive to the implications of reported earnings for the cost of equity or the cost of new debt. Empirical evidence (Teoh, Welch and Wong, 1998a, b and Teoh et al, 1998) shows that firms do manage earnings in anticipation of equity financing, whether the equity financing is through the initial public offerings or seasoned equity offerings. Dechow et al. (1996) show that accounting fraud firms manage their earnings to obtain favorable financing. Baker, Stein and Wurgler (2002) argue that investment by financing-constrained firms is sensitive to the market price of equity. Therefore, we hypothesize that favorable earnings numbers will lower the cost of external capital, and we need to control for this phenomenon if we are to properly assess the role of compensation as a determinant of earnings management behavior. The measure we use to gauge the financing constraint of the firms is developed by Kaplan and Zingales (1997 and 2000), and it has been used in a large sample study by Lemont et al. (2001), and Baker et al. (2002). It is called the Kaplan-Zingales index, or KZ index. We use the modified version of the

¹⁶ However, we emphasize that adding those control variables (not limited to ROA or GROWTH) does not change our major empirical results. Regressions without those control variables are quantitatively and qualitatively similar.

KZ index developed by Lemont et al. (2001) and Baker et al. (2002), which we call KZ4Factor.¹⁸ The higher the KZ4Factor, the more constrained for the firm in financing.

$$KZ4Factor = -1.002 \frac{CF_{i,t}}{A_{i,t-1}} - 39.368 \frac{DIV_{i,t}}{A_{i,t-1}} - 1.315 \frac{C_{i,t}}{A_{i,t-1}} + 3.139 Lev_{i,t}$$

where $CF_{i,t}/A_{i,t-1}$ is cash flow (COMPUSTAT items 14+18) over previous year's assets (COMPUSTAT item 6); $DIV_{i,t}/A_{i,t-1}$ is cash dividends (COMPUSTAT items 21+19) over assets; $C_{i,t}/A_{i,t-1}$ is cash balance (COMPUSTAT item 1) over assets; $Lev_{i,t}$ is the leverage measure (COMPUSTAT items 9+34) divided by (COMPUSTAT items 9+34+216). Consistent with Baker et al. (2002), we find that KZ index exhibits substantial amount of cross-sectional variation so we winsorize for the top and bottom one percent of estimates to mitigate the effects of potentially influential extreme values.

Controlling for mean reversion. We use the lag of discretionary current accruals (lag(DCA)) to control for the mean-reversion effect of discretionary current accruals. Because we use the absolute value of the discretionary current accruals in our regression, we adjust the lagged discretionary current accruals accordingly, i.e., whenever we convert a negative discretionary current accrual to a positive by taking the absolute value, we also reverse the sign of the lagged current accrual. This preserves the sign of the correlation between previous discretionary accruals and current discretionary accruals.

IV. Empirical Models and Results

A. Unconditional effects of compensation

To investigate the role of different executive compensation components and option and restricted stock incentive effects on the intensity of earnings management, we estimate the following ordinary least square regressions on the pooled data, with fixed-effects on year.¹⁹

¹⁷ Size (Fama and French, 1996) is often suggested as a control variable. We used the log of market capitalization in year t as a measure of firm size, but as its coefficient is never significant in our regressions, the specifications presented below do not include it.

¹⁸ The reason we use four-factor KZ index is because we also use book-to-market ration in our regression to capture the growth opportunity and associated risk (Fama and French, 1992, 1993, and 1996), and we try to avoid the collinearity that might result if we used the original five-factor KZ index.

¹⁹ Instead of using year dummy variables, we also use some macroeconomic factors to control for year effects. The variables we consider include Standard and Poor's 500-index change, annual inventory change, average of federal fund rates (in specific years), average unemployment rate (in specific year), business productivity index, among

$$|DCA_{i,t}| = \beta_0 + \beta_1 Salary_{i,t} + \beta_2 Bonus_{i,t} + \beta_3 Option_{i,t} + \beta_4 RestrictedStock_{i,t} + \beta_5 LTIP_{i,t} + \beta_6 IISO_{i,t} + \beta_7 IIRS_{i,t} + \beta_8 INMONEX_{i,t} + \sum_{t=1992}^{1999} \alpha_t Year_t \quad (4)$$

where $|DCA_{i,t}|$ is the absolute value of estimated discretionary accruals for firm i at year t ; Salary, Bonus, Option, Restricted Stock and LTIP are the dollar values of salary, bonus, option, restricted stock and long-term incentive plans paid to executives for firm i at year t ; IISO _{i,t} is the incentive intensity of stock option awards; IIRS _{i,t} is the incentive intensity of the restricted stock award; and Year _{t} for $t=1992$ to 1999 are year binary variables (year 2000 is the reference year).²⁰

The second regression is similar to the first regression, but includes the control variables described in section III.B. ROA _{i,t} is the return on assets; Growth _{i,t} is the growth rate of the company obtained by regressing the past five year's log of earnings on time; KZ4Factor _{i,t} is the company's four-factor Kaplan-Zingales Index value, BVMV _{i,t} is the book-to-market ratio, and DCA _{$i,t-1$} is the lagged value of discretionary accruals:

$$|DCA_{i,t}| = \beta_0 + \beta_1 Salary_{i,t} + \beta_2 Bonus_{i,t} + \beta_3 Option_{i,t} + \beta_4 RestrictedStock_{i,t} + \beta_5 LTIP_{i,t} + \beta_6 IISO_{i,t} + \beta_7 IIRS_{i,t} + \beta_8 INMONEX_{i,t} + \beta_9 ROA_{i,t} + \beta_{10} Growth_{i,t} + \beta_{11} KZ4Factor_{i,t} + \beta_{12} BVMV_{i,t} + \beta_{13} DCA_{i,t-1} + \sum_{t=1992}^{1999} \alpha_t Year_t \quad (5)$$

B. Conditioning compensation effects on specified thresholds

A potentially important issue suggested by the extant literature is not addressed in the specification of (4) and (5), namely, that the role of compensation-related managerial opportunism as a driver of earnings management behavior may be conditional on whether the firm has positive or negative discretionary accruals, or on the proximity of the firm to an earnings target. Conditioning on proximity to an earnings target is of interest because it isolates firms that were able to use discretionary accruals to reach the specified target. We expect that the relationship between discretionary accruals and compensation would have a discontinuity at such a threshold.

many others. However, we do not find these macroeconomic variables have any explanatory power, so we drop them in favor of the year dummy variables.

²⁰ To assess possible collinearity problems, we looked at the variance inflation factor (VIF) measure. It turns out that multicollinearity is not a concern for us, as none of the VIFs is larger than the suggested cutoff value of 10 (Montgomery, Peck and Vining, pp. 118).

One natural choice for a threshold effect (our data source does not include details on bonus plan parameters) is conditioning the relationship between earnings management and compensation on the algebraic sign of the estimate of discretionary accruals. The "normal" incentives given by compensation components, especially a bonus plan component, may be in abeyance in settings where the manager has chosen a negative discretionary accrual. Previous literature (Healy, 1985; Gaver, Gaver and Austin, 1995; Holthausen, Larcker, and Sloan, 1995) finds evidence that managers are motivated differently conditional on whether the discretionary current accruals are positive or negative. For example, Healy (1985) argues that managers use the positive discretionary current accruals to reach the lower bound of a bonus plan, and use negative discretionary current accruals to smooth the earnings when the pre-managed earnings are above the upper bound of the bonus plan, or so far below the lower bound that it cannot be achieved using discretionary accruals.

Other choices for threshold effects would be earnings targets, such as zero earnings, meeting or exceeding the prior year's earnings level, or maintenance of a growth trend in earnings (Burgstahler and Dichev, 1997; Degeorge, Patel and Zeckhauser, 1999). Each of these constitutes a natural benchmark for determining whether a given reported earnings level represents "good news" or "bad news" to investors, and hence a point of extraordinary sensitivity of compensation to discretionary accruals choices.

With respect to the issue of symmetry of compensation effects on positive and negative discretionary accruals, we create a binary variable, $D_{i,t}$, equal to unity if the estimated DCA is positive, and zero otherwise, and modify equation (5) by including an intercept effect and interaction effects for each of the compensation variables. We estimate:

$$\begin{aligned}
|DCA_{i,t}| = & \beta_0 + \beta'_0 D_{i,t} + \beta_1 Salary_{i,t} + \beta'_1 D_{i,t} \times Salary_{i,t} + \beta_2 Bonus_{i,t} + \beta'_2 D_{i,t} \times Bonus_{i,t} \\
& + \beta_3 Option_{i,t} + \beta'_3 D_{i,t} \times Option_{i,t} + \beta_4 RestrictedStock_{i,t} + \beta'_4 D_{i,t} \times RestrictedStock_{i,t} \\
& + \beta_5 LTIP_{i,t} + \beta'_5 D_{i,t} \times LTIP_{i,t} + \beta_6 IISO_{i,t} + \beta'_6 D_{i,t} \times IISO_{i,t} + \beta_7 IIRS_{i,t} + \beta'_7 D_{i,t} \times IIRS_{i,t} \\
& + \beta_8 INMONEX_{i,t} + \beta'_8 D_{i,t} \times INMONEX_{i,t} \\
& + \beta_9 ROA_{i,t} + \beta_{10} Growth_{i,t} + \beta_{11} KZ4Factor_{i,t} + \beta_{12} BVMV_{i,t} + \beta_{13} DCA_{i,t-1} \\
& + \sum_{t=1992}^{1999} \alpha_t Year_t
\end{aligned} \tag{6}$$

These additional coefficients indicate whether the intercept or slope coefficients are different for

positive accrual and negative accrual observations.

Our empirical strategy with respect to earnings thresholds is to identify the subset of firms that would fail to reach a specified earnings target without recourse to positive discretionary accruals, but do, in fact, reach the target with accruals. These are cases where compensation policy may be expected to have an especially strong impact on discretionary accruals choices. We examine whether the impact of compensation on the level of discretionary accruals is different within that subset than in the broader sample. We define a binary variable, $Dtarget$, as follows:

$$Dtarget_{i,t} = 1 \text{ if } Earn_{i,t}(1 - \tau_{i,t}) > TARGET_{i,t} \text{ and } Earn_{i,t}(1 - \tau_{i,t}) - DCA_{i,t} < TARGET_{i,t},$$

$$Dtarget_{i,t} = 0, \text{ otherwise,}$$

(7)

where $Earn_{i,t}$ and $\tau_{i,t}$ are firm i 's pretax operating income (COMPUSTAT item 170), and estimated marginal tax rate in period t , respectively.²¹ $TARGET_{i,t}$ is the specified earnings target for firm I in year t . Figure 2 depicts the dichotomization of observations that results in terms of combinations of reported earnings, discretionary accruals, and a given earnings target. Firms in the shaded region in the figure are those for which $Dtarget=1$. Table 3 shows how the sample breaks down into the number of observations falling into the categories defined by each conditioning criterion.

INSERT FIG 2 HERE

INSERT TABLE 3 HERE

We estimate equation (6) using $Dtarget$ instead of D . These additional intercept and slope coefficients indicate whether the compensation influences firms differently, conditional on

²¹ We are grateful to John Graham (1996) for providing estimates of simulated marginal tax rates. We recognize that errors in measurement of DCA will be correlated with the partitioning of the sample using the target earnings regimes. Firms with positive errors in estimated DCA are more likely to be erroneously classified as using DCA to meet an earnings target, and firms with negative errors, more likely to be erroneously classified in the complementary set. There is no reason to believe, however, that this fact would bias the estimated coefficients in the regression model unless there were a correlation between these classification errors and corporate compensation policies.

whether accruals allowed the firm to reach the specified earnings target. Four different targets are analyzed: zero earnings, meeting the prior year's earnings level, maintenance of a three-year growth trend in earnings, maintenance of a five-year growth trend in earnings.

V. Estimation Results

A. Unconditional Regressions

We report our results for equations (4) and (5) in Table 4. In the first column we present results of regression without considering the control variables, finding that salary is significantly (at 1% p-level) negatively associated with the our measure of earnings management intensity, the absolute value of the discretionary current accruals (scaled by asset size). In sharp contrast, dollar values of bonus, the current option grant component of compensation, and the overhang of in-the-money options resulting from prior years' option grants, are positively and significantly associated with earnings management intensity. Likewise, the association between incentive intensity of stock option awards and earnings management intensity is positive and significant (at a 1% p-level). Neither restricted stock, long-term incentive plan, nor incentive intensity of restricted stock are significant. The negative coefficient for salary is consistent with the view that, in the face of costly earnings management, the salary component of compensation creates a disincentive for managers to practice aggressive earnings management. The positive roles for bonus, stock options, and stock option incentive intensity are consistent with opportunistic use of the timing option in discretionary accruals to exploit the nonlinearity in the payoffs on those components.

INSERT TABLE 4 HERE

For estimation of equation (5), which adds the control variables, the earnings growth rate has a statistically significant positive relationship with earnings management intensity, and the ROA measure is significantly negatively related.²² None of the remaining control variables, including the year binary variables, are statistically significant. The compensation variables in this regression exhibit similar patterns as the regression without controls. The dollar value of

²² These results are not directly comparable to coefficient estimates found in earlier papers by Dechow, Sloan and Sweeny (1996) or McNichols (2000), since we use the absolute value of discretionary accruals, rather than the signed value used in those studies.

bonus, current option grants, exercisable in-the-money stock options from prior grants, and incentive intensity of stock option awards have significant positive influence on earnings management intensity, while salary has a negative influence-. As before, LTIP, restricted stock and incentive intensity of restricted stock do not appear to have significant influence on the magnitude of discretionary accruals.

We now turn to the question of the economic significance of the compensation variables. Indeed, the coefficient estimates are economically significant. Panel B of Table 4 presents an evaluation of the dollar magnitudes and "multiplier" effects from changes in compensation components. Recall that the dependent variable is the absolute value of current discretionary accruals, scaled by assets. Therefore, to approximate the average impact of the compensation variables on the dollar value of discretionary current accruals, we scale up the regression coefficients by \$5 billion, the asset value of "typical" firm in our sample. We report the resulting dollar effects of changes in the compensation components for two hypothetical changes: a flat \$1,000 change in the component, and a one standard deviation change, using the sample standard deviation for the respective components. Note that there are dramatic differences in sample variation on the six dollar-denominated compensation metrics. For example, a \$1,000 increase in salary would, according to our rough estimate, reduce the magnitude of discretionary accruals by \$127,700. We might say there is a "DCA multiplier effect" of -127.7 for the salary component of compensation. What may be of even more interest in explaining cross-sectional variation in discretionary accruals is the impact of a one standard deviation change, which is over \$35 million (multiply the scaled-up regression coefficient by the sample standard deviation of salary, which is \$274,700). It is noteworthy that, even though the coefficient of exercisable in-the-money options (INMONEX) is small, the potential cross-sectional variation in DCA attributable to INMONEX is large due to the huge variation in this component of compensation.

For assessing the economic impact of the Incentive Intensity of Stock Options (IISO) and Incentive Intensity of Restricted Stocks (IIRS) on the absolute value of discretionary current accruals we only present the change in estimated discretionary accruals for a one standard deviation increase in the incentive intensity.

B. Regressions Which Condition the Effects of Compensation

The first conditioning regression is for positive versus negative accruals. $D_{it}=1$ if the estimated discretionary current accrual for firm i in period t is positive, otherwise $D_{it}=0$. We use the binary variables to capture individual compensation item and incentive intensity measures' influences on the intensity of earnings management *conditional* on the sign of the discretionary current accruals. Therefore, this revised specification admits the possibility that the magnitude and incentive intensity of compensation components exhibit asymmetric influence on positive and negative discretionary accruals.

The regression outcomes are reported in the first column of results in Table 5. Compared to the regression in Table 4, the sign and magnitude of the coefficients are qualitatively similar, and significance of the model and goodness of fit measures improve slightly. The intercept is significantly larger in the positive accruals observations. The regression coefficients for the compensation component or incentive intensity variables represent the impact of the components on the *magnitude* of negative accruals; the coefficients of the interactions of the binary variable and each salary component or incentive intensity measure represent estimates of the *difference* between the magnitude of the coefficient for positive and negative discretionary accruals. To determine the overall effect of each compensation variable for positive accruals, we test whether the sum of the coefficients for the component and component interaction is different from zero. The resulting sum and test F-statistics are given in panel B of Table 5. Since results for the control variables are quantitatively and qualitatively similar to the regression results in Table 4, we move directly to discussion of the compensation variables.

INSERT TABLE 5 HERE

The results show that two compensation variables exhibit only marginally different impacts on earnings management intensity, depending on the whether discretionary current accruals are positive or negative. The salary coefficients are significantly negative for both categories of discretionary accruals, and difference between the salary coefficients for negative and positive accruals is significant a 10% p-level.²³ Even though the INMONEX coefficient is not significant

²³ The results of salary impact on earnings management intensity for both positive and negative discretionary accruals are at odds with Balsam's (1998) observation that discretionary current accruals choice is related to cash-based compensation adopted in the executive compensation scheme, and in general, positive discretionary accruals receives more encouragement. Our overall effect on both positive and negative discretionary accruals, after

for negative accruals observations, and the difference between the coefficients for positive and negative cases is not significant at a 10% p-level, the total impact of the overhang of exercisable in-the-money options is positive and significant for positive discretionary accruals (Panel B). The IIRS coefficient remains insignificant for the negative accruals observations, but is significantly positive (10% p-level) for positive accruals observations.

In conclusion, several compensation items do exhibit asymmetric incentive effects for positive and negative discretionary accruals. It seems fair to conclude, however, that the asymmetries in the relation between compensation and discretionary accruals based on the algebraic sign of the latter are relatively minor.

We now turn to the conditioning based on earnings targets. Recall that we defined a binary variable equal to unity in the subset of firms that would fail to reach a specified earnings target without recourse to positive discretionary accruals, but do, in fact, reach the target with accruals (see equation (7)). We focus our discussion on the zero earnings and prior year's earnings targets. Results of estimation of the models are shown in the second and third columns of results in Table 5. The goodness of fit, as indicated by the regression R-square, improves dramatically for the zero earnings target, relative to the unconditional model, and is also substantially higher, relative to the unconditional regressions, for the prior year's earnings target definition. We also used three-year and five-year earnings growth targets, but do not present the results here. Explanatory power is lower for the three- and five-year growth targets than for either zero growth or prior year's earnings targets. These observations are consistent with the conclusions of Degorge, Patel, and Zeckhauser (1999, p. 25), who analyze the frequency distributions of earnings levels around zero, previous period's earnings, and analyst's forecasts: "Overall, a threshold hierarchy emerges. The positive EPS threshold is most important. It prevails whether or not the other two thresholds are met. The threshold of previous period's EPS is second in importance . . ."

The coefficients for the control variables are broadly consistent with the unconditional regression results. Growth has a significantly positive impact on DCA, ROA a negative impact, becoming significant when the compensation effects are conditioned on the prior year's earnings target. The KZ4Factor is not significant. The coefficient for book-to-market ratio remains

incorporating equity-based compensation items and other control variables, is still negative. Our findings for salary are consistent with the discussion by Gaver (1998) about Balsam's work.

positive, and becomes statistically significant under either conditioning regime. The lagged DCA variable continues with a negative coefficient that is significant when conditioning on either earnings target definition.

With respect to the estimated impact of compensation on discretionary accruals, the results for both the zero and prior year's earnings targets support the following findings. Salary is inversely related to the magnitude of DCA, and the strength of the association is stronger among firms that would not meet the earnings target without DCA. Both bonus and options are positively related to the magnitude of DCA. When using the zero earnings target definition, both coefficients are greater among firms that would not meet the earnings target without DCA.

For the zero earnings target, the coefficient of exercisable in-the-money options was positive for firms not using DCA in meeting the target, and positive, but not significant, for firms that met the target. Exercisable in-the-money options has a positive influence on both categories when using the prior year's earnings as the target (Table 5, panel B).

Among the firms that fail to meet earnings targets through their accruals, the impact of restricted stock grants on the magnitude of DCA is positive, but not significant. Among firms that did meet targets using discretionary accruals, the impact is negative, but not significantly so.

Long-term incentive plans are insignificantly negatively related to DCA magnitude for firms that do not use DCA to meet targets, but positively related for firms that do meet targets with DCA, significantly so when using the zero earnings target definition (Table 5, panel B).

The evidence with respect to IISO is that it is always significantly positively associated with the magnitude of discretionary accruals, and the association does not appear to be conditioned on proximity to either the zero earnings or prior year's earnings targets. Whereas the role of IIRS was not found to be significant in the unconditional regressions, we find that, for firms that used DCA to meet the prior year's earnings target, IIRS has a positive association with the magnitude of the DCA.

C. Summary of Results for Compensation Variables

The unconditional regression results support several hypotheses relating to the influence of compensation contracts on levels of discretionary accruals. As hypothesized from the convexity in payoffs on bonus plans and stock options, including both current year awards and overhanging

exercisable in-the-money options from prior year's awards, the levels of discretionary accruals vary directly with levels of bonus plan and option values in the compensation contract. Higher incentive intensity of options also leads to greater use of discretionary accruals. Also as hypothesized, results support a conclusion that costly earnings management behavior leads to lower discretionary accruals, the higher a manager's salary.

When we stratify our sample conditional on different information content of positive and negative discretionary accruals, the results indicate that salaries are negatively related to earnings management intensity, but moreso for negative discretionary accruals. Bonuses, current year stock option grants, and the incentive intensity of those grants are significant for both positive and negative accruals, but the overhang of exercisable in-the-money options is significant only for positive discretionary accruals. While the dollar amount of restricted stock is not influential for either positive or negative discretionary accruals, the incentive intensity of restricted stock does positively influence positive accruals. While the results indicate that the effects of compensation are asymmetric with respect to positive and negative discretionary choices, they also indicate that at least some subset of compensation components affects both types of accruals.

By-and-large, the findings support conditioning the impact of compensation on earnings thresholds, especially with respect to the zero earnings target definition. Conditioning on proximity to an earnings target is of interest because it isolates firms that were able to use discretionary accruals to reach the specified target. Observing the association between compensation and discretionary accruals in this subset of firms is important because of the well established focus of the financial press on deviations from earnings benchmarks, as well as extant studies suggesting that firms try to avoid narrowly missing such benchmarks. As expected, several of the compensation variables have a different impact on discretionary accruals in those cases where firms that would otherwise not reach the earnings target, but do so by employing positive discretionary accruals. Notwithstanding the additional statistical power of the conditioning regressions, the fundamental insights regarding influence of compensation policies on earnings management are largely the same as with the unconditional regression model.²⁵

²⁵ We use asset size of the firm to scale the discretionary accruals because we believe it is a better measure of the "intensity of earnings management". Regarding this measure, we received some comments from earlier version of this paper that size effect may drive our results. The critic's general argument is that it is a stylized fact that executive compensation is positively correlated the size of the firm under management. This could result in a spurious

D. Other Specifications and Robustness Checks

We considered other versions of our regression models. Instead of using the dollar value of earnings compensation components, we use the ratios of stock options, restricted stocks, LTIPs to the sum of salary and bonus, and re-estimated our models, obtaining qualitatively similar results. We also scaled the dollar earnings components by equity capitalization. Again, the results are qualitatively similar to those reported.

We carefully explored the data for potential outlier observations that might influence the regression results. The dependent variable and compensation metrics, as mentioned earlier, were winsorized. After winsorization, we found no indications that the results were due to overly influential observations.

VI. Conclusions

Our empirical analysis shows that earnings management intensity, as measured by absolute value of discretionary current accruals scaled down by asset size, is related to compensation design. Specifically, we find the amounts of current year stock option grants, the overhang of exercisable in-the-money options from prior year's grants, bonuses, and the incentive intensity of current year stock option awards, are reliably positively related to earnings management intensity. There is weaker support for a positive association between the incentive intensity of restricted stock and earnings management intensity. Salaries are negatively related to earnings management intensity. Results do not reliably support either positive or negative effects of long-term incentive plans or restricted stock compensation on earnings management intensity, aside from the incentive intensity effect of restricted stock already noted. We show that magnitudes of the effects of some compensation variables on earnings management intensity are conditioned on whether discretionary current accruals are positive or negative.

negative correlation between our measure of earnings management intensity and salary. We do not believe that such a size effect drives our empirical results, for several reasons. First, regressing the monetary value of executive option award on size, we find that the option award is significantly positively correlated with the size of the company, as is salary. Had size driven the results in our regressions, we would observe both Option and Salary exhibiting a negative sign. In contrast, we observe a positive sign for Option and negative sign for Salary. Second, if our statistically significant regression coefficient for Salary is driven by the size effect, then when we condition our regression on positive or negative DCA, we would observe opposite signs on the salary variable for positive and negative discretionary accruals. We don't. Finally, when we use the logarithm of market value to scale the compensation items, we find qualitatively similar results.

The findings indicate a variety of compensation-related incentive effects, with some features seeming to encourage greater earnings management intensity, and others, discouraging it. The importance of our collective findings is the strong evidence they provide that compensation contract design does influence earnings management, and that the influences of the various compensation components appear to be largely predictable on a presumption that (at least some) managers behave opportunistically by exploiting timing options embedded in some components of the compensation contracts.

As discussed in Chan et al (2001), and Guay, Kothari and Watts (1997), earnings management identification and estimation techniques as used herein to decompose total accruals into discretionary and non-discretionary accrual components involve measurement error. We acknowledge this qualification of our findings, while noting that is more likely to work against findings of significance, making our inferences the more conservative.

In discussing hypotheses about how compensation components might influence discretionary accruals, we focus on the potential for managers to utilize the discretionary accruals timing option to maximize *their own expected compensation*. Such hypotheses are clearly a subset (and we hope, a refinement) of the broader opportunistic earnings management hypothesis. Our hypotheses are not mutually exclusive of the performance measure hypothesis that managers use the discretionary accruals to enable outsiders to make more reliable forecasts of future performance. Rather our hypotheses highlight potential compensation-related impediments to the fulfillment of that hypothesis. Is it possible that compensation committees design the contracts with an eye to encourage managers to make greater use of discretionary accruals, in the belief that the performance measure objective will be served? In light of our discussion of the potential abuse of those incentives, and our own and others' empirical findings, we believe that the answer to that question is unlikely to be in the affirmative. Indeed, it appears that the evolving compensation contract, with its salary component, stock and option vesting features, long-term incentive plan features, and other restrictions on managerial trading in the firm's securities, seeks to minimize the damage done by abuse of the discretion. Additionally, in light of evidence that accruals are reliably negatively related to future stock returns, then we ask what type of rational investors would value the "information delivery service" contained in discretionary accruals?

The results reported herein should not be taken to imply that firms should eliminate compensation components that encourage earnings management, or increase those that discourage it, because our analysis does not consider the other incentive effects of the various components, chief among which is their role in aligning the interests of managers and owners with respect to other considerations, such as investment decisions and risk-taking. The evaluation of the implied trade-offs remains a topic for future research.

Appendix: Variable Definitions

Variable	Definitions
DCA ^a	The absolute value of discretionary accruals scaled by assets.
Salary ^b	The amount of salary awarded to the executive during the fiscal year. (1000's of dollars)
Bonus ^b	The dollar value of a bonus (cash and non-cash) earned by the named executive officer during the fiscal year. (1000's of dollars)
Option ^b	The aggregate value of stock options granted to the executive during the year as valued using Black Scholes methodology. This calculation of this figure takes into account the volatility of the individual company. (1000's of dollars)
INMONEX	The value of all exercisable in-the-money options as of the beginning of the current year. (1000's of dollars.)
RestrictedStock ^b	The value of restricted stock holdings at the end of the year. (1000's of dollars.)
LTIP ^b	The amount paid out to the executive under the company's long-term incentive plan. These plans measure company performance over a period of more than one year (generally three years). (in 1000's dollars)
IISO ^c	Incentive intensity of stock option award(s)
IIRS ^c	Incentive intensity of restricted stock award
ROA ^d	Return on assets
Growth ^e	Geometric rate of growth based on past five year of earnings.
KZ4Factor ^f	Modified version of Kaplan-Zingales index (4-Factor version)
BVMV ^h	Book-to-market value of equity (calculated as Fama and French, 1993)
lag(DCA) ⁱ	Previous year discretionary current accruals.
D , Dtarget ^j	Binary variables defined according positive/negative accruals or meeting/missing earnings thresholds

Notes:

^a We estimate the discretionary current accruals from the Modified Jones model.

^b We use the data item coded as Salary , Bonus , Option , LTIP , RestrictedStock from the ExecuComp Database directly.

^c We calculate the incentive intensity of stock options and restricted stocks following Bryan et al. (2000).

^d Return on assets is calculated as the earning before extraordinary items over the average of the assets at the beginning and the end of the fiscal year.

^e Growth is the geometric average of the earning before extraordinary items during the past five years.

^f Kaplan and Zingales index is calculated following the modified version in Baker et al (2002).

^h Book value of equity to market value of equity is calculated according to Fama and French (1993), the BV/MV can be defined as the ratio of BV (Book Common Equity) to MV (Market Equity), where Book value of equity is calculated as follows (depending on data availability):

ⁱ Market value of equity is calculated as the number of shares outstanding times the fiscal year ending share price. Any negative book value companies are eliminated from our sample.

^j previous year's discretionary accruals after transformation to preserve the original serial correlations. If the current year's discretionary current accrual is positive, then lag(DCA) equals the last fiscal year ending discretionary accruals; if the current discretionary accruals is negative, we change the sign of previous year's discretionary accruals as lag(DCA). By such operation, we preserve the sign of current and previous year discretionary accruals.

^j In general, we denote D=1 if the discretionary accrual is positive and D=0 if the discretionary accrual is negative. Dtarget=1 if the manager succeeds in using discretionary current accruals to meet certain earnings targets and Dtarget=0 otherwise.

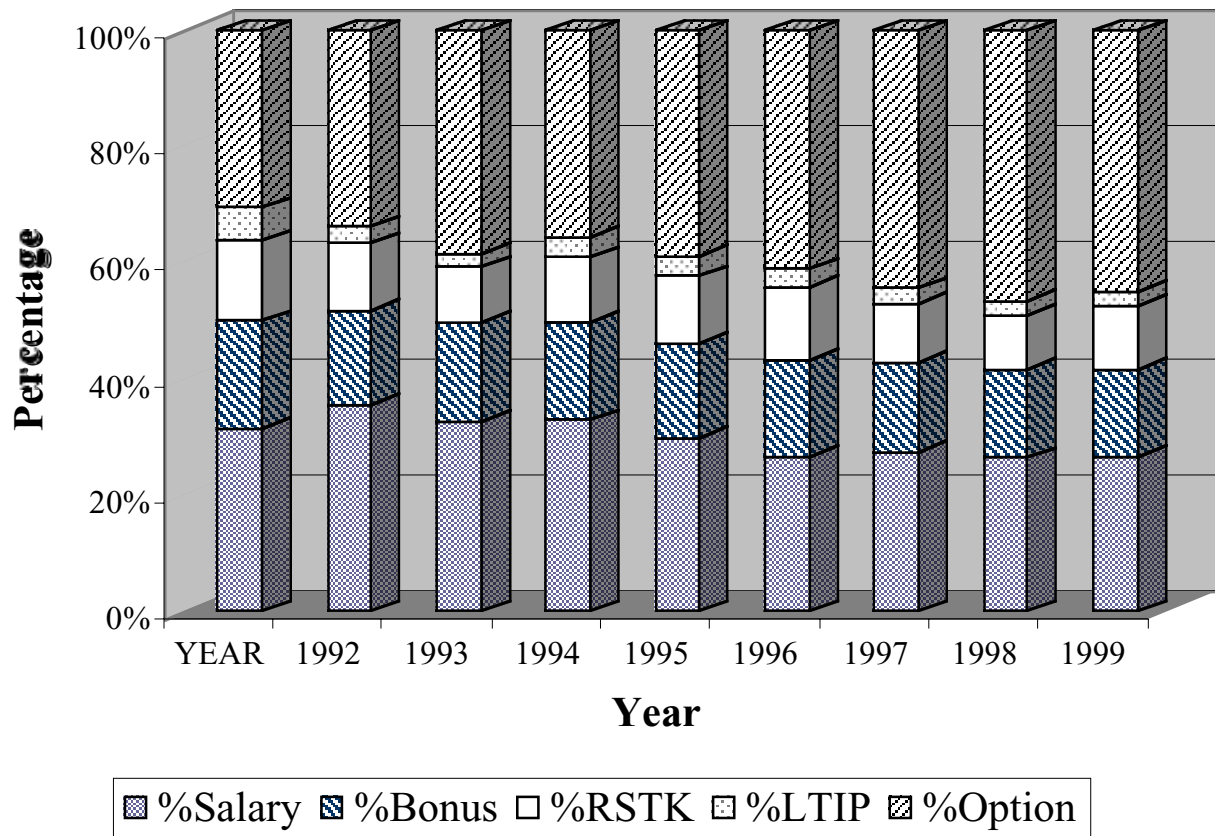
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Fig 1: Percentage Distribution of U.S. CEO Compensation Components (1992 - 2000)



Source: Standard & Poor's Execucomp

Figure 2: Earnings Target Regions

The shaded area includes observations for which $D_{target,i,t}=1$, where the specified reported earnings target would not be achieved without positive discretionary accruals.

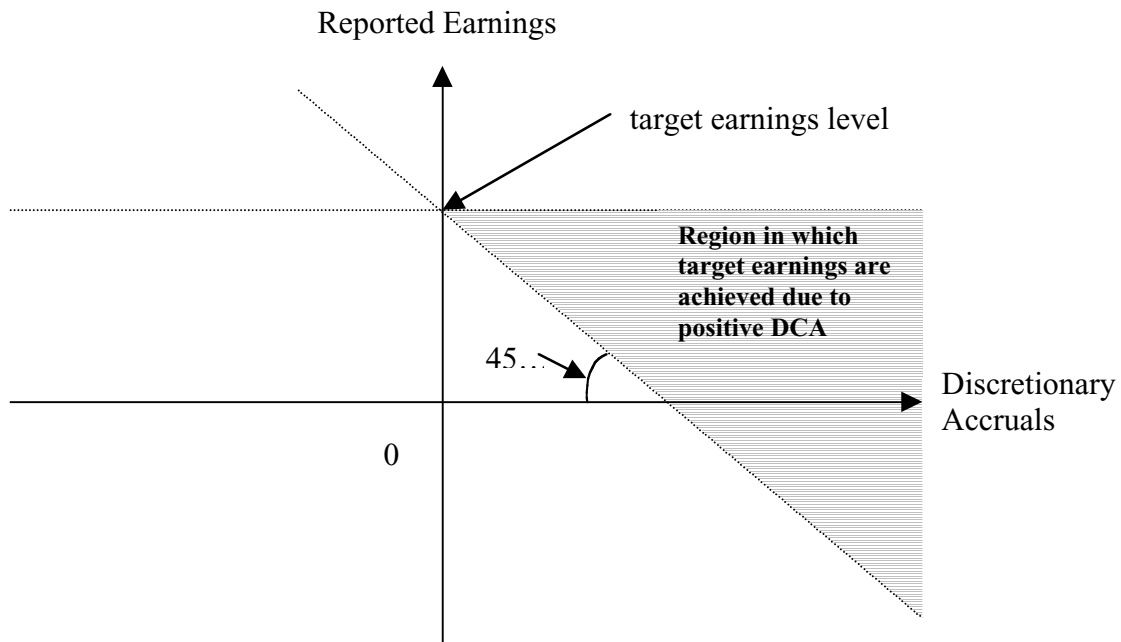


Table 1: Summary Statistics for the Estimated Discretionary Accruals and Non-Discretionary Accruals

Results of estimation of discretionary current accruals, before winsorizing, by SIC industry and year. The discretionary current accruals (DCA), panel A, and non-discretionary current accruals (NDCA), panel B, are estimated by the modified Jones model. Dollar value of the DCA and NDCA are scaled by asset size.

Panel A: Estimated Discretionary Accruals (DCA), Scaled by Assets

SIC	Statistics	1992	1993	1994	1995	1996	1997	1998	1999	2000
0-999	Max	0.447297	0.089584	0.347171	0.229684	0.387782	0.140474	0.148284	0.286105	0.200688
	Mean	0.046052	-0.00687	0.011931	0.010907	0.003213	-0.00114	0.008439	0.006022	-0.00721
	Min	-0.07574	-0.25475	-0.1726	-0.11193	-0.19202	-0.14683	-0.11414	-0.24583	-0.2119
	Std	0.123142	0.060803	0.097237	0.065813	0.105198	0.072723	0.057639	0.085103	0.081597
	N	29	31	31	31	29	32	31	32	28
1000-1999	Max	0.632602	0.908622	0.593092	1.196367	0.958279	0.787438	1.012673	2.288725	1.049517
	Mean	-0.02792	0.03943	0.011271	0.014244	-0.00085	-0.00306	0.008466	-0.01537	0.008138
	Min	-0.68021	-0.45232	-0.57299	-0.69076	-1.70569	-0.74735	-0.76639	-1.08559	-0.48647
	Std	0.177282	0.148952	0.114529	0.156282	0.157148	0.128069	0.14452	0.275246	0.163368
	N	453	495	503	493	525	513	471	440	374
2000-2999	Max	0.802599	0.880583	0.870649	1.257006	0.811974	1.014818	1.004399	3.583289	1.425561
	Mean	0.00189	-0.00252	-2.5E-05	0.025681	-0.00705	-0.00062	0.006757	0.010622	-0.00275
	Min	-0.70676	-0.69426	-0.68061	-0.57814	-1.46703	-0.80393	-0.70133	-1.11827	-1.05946
	Std	0.133934	0.137654	0.117867	0.142753	0.176343	0.140382	0.136685	0.219564	0.175822
	N	986	1056	1108	1131	1253	1268	1206	1222	1030
3000-3999	Max	0.974728	0.950554	0.951861	1.221206	1.165258	1.041066	1.012144	4.480012	1.486806
	Mean	0.00573	0.005643	0.005882	0.028729	-0.04795	0.001347	0.013775	0.018518	0.032948
	Min	-0.66661	-0.70514	-0.69344	-0.72433	-1.91881	-0.76424	-0.7897	-1.02596	-1.39324
	Std	0.154526	0.168405	0.171632	0.176706	0.305565	0.161033	0.148216	0.239714	0.218635
	N	1845	1960	2017	2141	2303	2331	2206	2220	1840
4000-4999	Max	0.834657	0.863939	0.861383	0.465725	0.683728	0.658268	0.902132	2.93143	1.356661
	Mean	-0.0036	-0.0023	-0.0004	-0.00388	-0.0159	-0.00286	-0.0142	0.013652	-0.04329
	Min	-0.67556	-0.6776	-0.6012	-0.65671	-1.46459	-0.70934	-0.84547	-1.24504	-1.42619
	Std	0.107805	0.101243	0.111042	0.09908	0.147719	0.113292	0.132013	0.264237	0.194735
	N	652	678	690	704	782	761	693	753	589
5000-5999	Max	0.901131	0.923704	0.840742	0.960266	1.01656	1.053396	0.947445	4.679904	1.159215
	Mean	0.021908	-0.00323	0.016215	0.01803	0.020781	0.038029	0.025916	0.005108	0.008836
	Min	-0.55045	-0.70265	-0.69013	-0.69018	-0.77809	-0.75818	-0.81166	-1.15417	-0.72392
	Std	0.149396	0.165966	0.150974	0.159863	0.175647	0.209344	0.187132	0.359238	0.135036
	N	751	809	840	840	932	883	859	845	699

Table 1: Panel A (Cont'd.)

SIC	Statistics	1992	1993	1994	1995	1996	1997	1998	1999	2000
7000-7999	Max	0.803959	0.93093	0.919038	1.221689	1.069832	0.96624	1.038898	4.768493	1.400397
	Mean	-0.00664	-0.00838	-0.00788	0.079878	0.007437	0.03373	0.02603	0.4127	-0.01051
	Min	-0.71053	-0.63578	-0.6878	-0.69526	-1.518	-0.8038	-0.83697	-1.21013	-1.34489
	Std	0.162984	0.170586	0.172697	0.223986	0.257097	0.197599	0.215395	0.76767	0.242137
	N	670	733	795	905	1188	1244	1267	1451	1249
8000-8999	Max	0.961138	0.931217	0.882954	1.090776	1.053099	1.051096	0.819658	0.894576	1.269021
	Mean	-0.01914	0.008279	0.022062	0.007475	0.024039	0.033302	0.027594	0.008773	0.046075
	Min	-0.70537	-0.49789	-0.65499	-0.67908	-1.89307	-0.77327	-0.7972	-1.27748	-0.68771
	Std	0.190647	0.163931	0.178622	0.164235	0.251097	0.184845	0.157938	0.210375	0.219973
	N	292	313	306	315	359	363	341	360	308
9000-9999	Max	0.77249	0.875038	0.39785	0.992696	0.891572	0.973868	0.931823	4.771034	1.252109
	Mean	-0.03116	-0.00441	-0.01224	-0.01407	-0.00307	-0.00322	-0.00411	0.526885	-0.29112
	Min	-0.67716	-0.70722	-0.54931	-0.58183	-1.07855	-0.58152	-0.69279	-1.18486	-1.24041
	Std	0.307742	0.247003	0.174027	0.249781	0.316468	0.222131	0.238377	1.15859	0.509664
	N	79	87	82	79	85	79	83	66	38

Panel B: Estimated Non Discretionary Current Accruals (NDCA), Scaled by Assets

SIC	Statistics	1992	1993	1994	1995	1996	1997	1998	1999	2000
0-999	Max	0.196086	0.456067	0.051596	0.085872	0.494421	0.245099	0.132533	0.228296	0.041918
	Mean	0.015892	0.018428	-0.00012	0.001308	0.033608	0.024078	0.024293	-0.0054	-0.00705
	Min	-0.16401	-0.02999	-0.15036	-0.18623	-0.18703	-0.07393	-0.01956	-0.24013	-0.1271
	Std	0.068162	0.084076	0.038982	0.05279	0.104002	0.061304	0.036792	0.079299	0.02968
	N	30	32	32	32	31	35	31	32	29
1000-1999	Max	0.694563	0.335375	0.532764	0.451005	0.922997	0.370503	0.47144	0.843762	0.959553
	Mean	0.033978	-0.0231	0.004886	-0.00645	0.018454	0.012126	0.006172	0.029587	0.022765
	Min	-0.35654	-0.3514	-0.32022	-0.65864	-0.22324	-0.1962	-0.46096	-2.30912	-0.48652
	Std	0.159131	0.075475	0.068681	0.101707	0.069078	0.058094	0.082317	0.244801	0.118209
	N	479	527	551	535	569	558	507	468	404
2000-2999	Max	0.715996	0.593178	0.65328	0.396682	1.585988	0.526504	0.484958	0.601675	0.607116
	Mean	0.026846	0.022668	0.025867	0.000269	0.024631	0.008849	0.022004	-0.00992	0.001229
	Min	-0.41727	-0.35772	-0.25672	-0.44755	-0.50457	-0.22842	-0.44922	-2.75194	-0.98326
	Std	0.086823	0.086552	0.064804	0.061409	0.114874	0.057669	0.059791	0.135474	0.069243
	N	1018	1078	1132	1154	1283	1299	1239	1254	1053
3000-3999	Max	0.730213	0.581478	0.699195	0.473528	1.821662	0.577519	0.515881	0.79204	0.953042
	Mean	0.018159	0.033572	0.049862	0.028434	0.10136	0.040034	0.007862	0.010683	0.010931
	Min	-0.41904	-0.33271	-0.34138	-0.71344	-0.42044	-0.23778	-0.53555	-4.30782	-1.1214
	Std	0.098076	0.097696	0.127254	0.106895	0.262071	0.085195	0.084458	0.144649	0.157802
	N	1876	1972	2039	2169	2337	2375	2256	2269	1877
4000-4999	Max	0.701581	0.319125	0.625275	0.446613	1.254579	0.563589	0.508485	0.842713	0.702135
	Mean	0.005298	0.005309	0.00787	-0.001	0.004529	0.009122	0.009638	-0.01661	0.027584
	Min	-0.25272	-0.32624	-0.23884	-0.38456	-0.49594	-0.11795	-0.507	-1.90017	-0.84938
	Std	0.049002	0.047618	0.04652	0.049335	0.085131	0.040967	0.070706	0.175339	0.106173
	N	695	724	739	759	844	842	768	845	652
5000-5999	Max	0.599959	0.596734	0.726962	0.479874	1.778371	0.58483	0.511468	0.846618	0.799635
	Mean	0.016584	0.052351	0.032842	0.023837	0.019317	0.016761	0.004294	0.001194	0.009784
	Min	-0.42789	-0.35596	-0.32519	-0.5692	-0.41512	-0.24016	-0.55355	-4.35136	-0.78365
	Std	0.082609	0.125998	0.112821	0.09452	0.130009	0.083375	0.099249	0.317557	0.081234
	N	768	824	852	856	953	882	878	851	712

Table 1: Panel B (Cont'd.)

SIC	Statistics	1992	1993	1994	1995	1996	1997	1998	1999	2000
7000-7999	Max	0.617633	0.591583	0.716942	0.377548	1.569997	0.557203	0.510768	0.843621	0.805927
	Mean	0.014972	0.027481	0.023299	-0.05033	0.032965	-0.00847	-0.03096	-0.45475	-0.00867
	Min	-0.43408	-0.33786	-0.32193	-0.71161	-0.45644	-0.23544	-0.55401	-4.42136	-1.02156
	Std	0.089371	0.079459	0.10157	0.113112	0.111812	0.053757	0.086533	0.731045	0.123487
	N	712	780	840	951	1256	1318	1330	1500	1299
8000-8999	Max	0.540987	0.597506	0.365177	0.456511	0.704753	0.576485	0.259872	0.181172	0.281447
	Mean	0.051094	0.039856	0.024732	0.010733	-0.00453	-0.00552	-0.01883	-0.02353	-0.03673
	Min	-0.3574	-0.33074	-0.23564	-0.36612	-0.46883	-0.2403	-0.48601	-2.39458	-0.95235
	Std	0.131427	0.087593	0.063104	0.063877	0.057319	0.04877	0.052315	0.174438	0.132178
	N	299	326	320	333	374	374	361	374	318
9000-9999	Max	0.583449	0.15469	0.65509	0.32507	1.076623	0.32367	0.199153	0.052425	0.728641
	Mean	0.060673	0.013574	0.02539	0.001306	-0.02101	0.023515	-0.01276	-0.47468	0.131962
	Min	-0.41657	-0.09214	-0.23202	-0.59009	-0.38311	-0.20276	-0.2082	-4.38482	-0.77718
	Std	0.218045	0.040367	0.098903	0.141571	0.155631	0.07863	0.054929	0.944768	0.310337
	N	76	93	88	89	90	82	86	67	37

Table 2: Descriptive Statistics for Discretionary Accruals, Executive Compensation, and Control Variables (after winsorizing)

The mean, standard deviation, minimum and maximum values, after winsorization for the regression variables are given below. |DCA| is the absolute value of discretionary accruals scaled by assets. Salary is the amount of salary awarded to the executive during the fiscal year (1000's of dollars). Bonus is the dollar value of a bonus (cash and non-cash) earned by the named executive officer during the fiscal year (1000's of dollars). Option is the aggregate value of stock options granted to the executive during the year as valued using Black-Scholes methodology (1000's of dollars). RestrictedStock is the value of restricted stock holdings at the end of the year (1000's of dollars). LTIP is the amount paid out to the executive under the company's long-term incentive plan (in 1000's dollars). These plans measure company performance over a period of more than one year (generally three years). IISO is Incentive intensity of stock option award(s). IIRS is Incentive intensity of restricted stock award. ROA is Return on assets; Growth is Geometric rate of growth based on past five year of earnings; KZ4Factor is Modified version of Kaplan-Zingales index (4-Factor version); BVMV is Book-to-market value of equity (calculated as Fama and French, 1993); lag(DCA) is previous year discretionary current accruals.

Panel A: Descriptive Statistics for entire sample

Variable	N	Mean	Std	Minimum	Maximum
DCA	7301	0.052	0.068	0.000	0.440
Salary	7301	574.57	274.66	60.00	1548.00
Bonus	7301	506.47	639.08	0.00	3600.00
Option	7301	1636.00	3514.00	0.00	23381.00
RestrictedStock	7301	1262.00	10213.00	0.00	591084.00
INMONEX	7301	7652.00	35637.00	0.00	1834645.00
LTIP	7301	114.68	381.90	-2361.00	2383.00
IISO	7301	1.85	3.75	0.00	30.00
IIRS	7301	1.89	6.90	0.00	50.00
ROA	7301	0.06	0.07	-1.13	1.33
Growth Rate	7301	0.23	0.72	-0.96	25.37
lag(DCA)	7301	0.00	0.11	-3.05	1.63
KZ4Factor	7301	0.50	14.17	-188.08	706.74
BVMV	7301	0.71	33.02	-515.56	2478.00

Panel B: Descriptive Statistics by positive and negative DCA Subsets

	Variables	MIN	Lower Quartile	Mean	Median	Upper Quartile	Max	Std
Positive DCA Situations	DCA	0.00	0.01	0.06	0.03	0.07	0.44	0.08
	SALARY	60.00	350.00	550.60	500.00	700.00	1548.17	269.30
	BONUS	0.00	75.00	481.96	294.25	630.00	3600.00	617.82
	BLK_VALUE	0.00	0.00	1618.34	437.89	1483.40	23380.82	3488.32
	RSTKHLDV	0.00	0.00	1277.65	0.00	241.56	416988.00	11062.78
	INMONEX	0.00	0.00	6484.90	664.02	3757.87	782568.95	25818.12
	LTIP	-2360.93	0.00	110.86	0.00	0.00	2382.87	378.87
	IISO	0.00	0.00	2.14	0.62	2.11	30.00	4.39
	IIRS	0.00	0.00	1.82	0.00	0.00	50.00	6.73
Negative DCA Situations	DCA	-0.30	-0.07	-0.05	-0.03	-0.01	0.00	-0.06
	SALARY	60.00	350.00	551.01	500.00	700.00	1548.17	274.71
	BONUS	0.00	78.75	468.57	285.00	594.40	3600.00	620.64
	BLK_VALUE	0.00	0.00	1669.57	470.47	1546.71	23380.82	3513.89
	RSTKHLDV	0.00	0.00	1092.09	0.00	217.86	591084.00	9597.59
	INMONEX	0.00	11.56	8074.45	870.00	4588.48	1834645.24	39343.39
	LTIP	0.00	0.00	104.11	0.00	0.00	2382.87	366.55
	IISO	0.00	0.00	2.06	0.69	2.22	30.00	3.98
	IIRS	0.00	0.00	1.73	0.00	0.00	50.00	6.66

Table 3: Conditioning for Threshold Effects

The number of firms falling into the groups defined according to specified conditioning criteria. The binary variable, $D_{i,t}$ equals unity if the estimated DCA is positive, and zero otherwise. The variable $Dtarget$ distinguishes firms that met specified earnings targets with positive discretionary accruals, that would not otherwise have met the target:

$$Dtarget_{i,t} = 1 \text{ if } Earn_{i,t}(1 - \tau_{i,t}) > TARGET_{i,t} \text{ and } Earn_{i,t}(1 - \tau_{i,t}) - DCA_{i,t} < TARGET_{i,t},$$

$$Dtarget_{i,t} = 0, \text{ otherwise,}$$

Where Earn is the pretax operating income as reported in Compustat.

Conditioning Criterion	D=1 or N		D=0 or Dtar		Percent with D=1 or Dtarget=1
	get= 1	get= 0	get= 1	get= 0	
Positive/Negative DCA Dummy	7301	3874	3427		53.1
Positive/Negative Earnings Threshold	7301	948	6353		13.0
Previous Year Earnings Threshold	5323	1289	4034		24.2
Previous 3-Year Growth Target Threshold	4383	624	3759		14.2
Previous 5-Year Growth Target Threshold*	4853	585	4268		12.1

* Note: A regression approach is used to obtain growth rates that are then used to project earnings based on previous year's earnings.

Table 4: Unconditional Regressions of Absolute Value of Discretionary Current Accruals on Executive Compensation Components, Incentive Intensity of Options and Restricted Stocks, with and without Control Variables [Equations (4) and (5)]

Coefficient estimates and standard errors for the following regression model:

$$|DCA_{i,t}| = \beta_0 + \beta_1 Salary_{i,t} + \beta_2 Bonus_{i,t} + \beta_3 Option_{i,t} + \beta_4 RestrictedStock_{i,t} + \beta_5 LTIP_{i,t} + \beta_6 IISO_{i,t} + \beta_7 IIRS_{i,t} + \beta_8 INMONEX_{i,t} + \beta_9 ROA_{i,t} + \beta_{10} Growth_{i,t} + \beta_{11} KZ4Factor_{i,t} + \beta_{12} BVMV_{i,t} + \beta_{13} DCA_{i,t-1} + \sum_{t=1992}^{1999} \alpha_t Year_t$$

where '1 |DCA| is the absolute value of discretionary accruals scaled by assets. Salary is the amount of salary awarded to the executive during the fiscal year (1000's of dollars). Bonus is the dollar value of a bonus (cash and non-cash) earned by the named executive officer during the fiscal year (1000's of dollars). Option is the aggregate value of stock options granted to the executive during the year as valued using Black-Scholes methodology (1000's of dollars). RestrictedStock is the value of restricted stock holdings at the end of the year (1000's of dollars). LTIP is the amount paid out to the executive under the company's long-term incentive plan (in 1000's dollars). These plans measure company performance over a period of more than one year (generally three years). IISO is Incentive intensity of stock option award(s). IIRS is Incentive intensity of restricted stock award. ROA is Return on assets; Growth is Geometric rate of growth based on past five year of earnings; KZ4Factor is Modified version of Kaplan-Zingales index (4-Factor version); BVMV is Book-to-market value of equity (calculated as Fama and French, 1993); lag(DCA) is previous year discretionary current accruals.

Panel A: regression results

variable	Regression Without Control Variables		Regression With Control Variables	
	Parameter	Standard Errors	Parameter	Standard Errors
Intercept	0.06945156	0.00307703 ***	0.05760670	0.00336353 ***
Salary	-0.00003918	0.00000336 ***	-0.00002554	0.00000357 ***
Bonus	0.00000489	0.00000149 ***	0.00000619	0.00000157 ***
Option	0.00000193	0.00000026 ***	0.00000134	0.00000028 ***
RestrictedStock	-0.00000003	0.00000007	0.00000000	0.00000008
INMONEX	0.00000013	0.00000002 ***	0.00000009	0.00000002 ***
LTIP	0.00000026	0.00000207	0.00000048	0.00000216
IISO	0.00160772	0.00019511 ***	0.00145040	0.00023740 ***
IIRS	0.00003698	0.00011016	0.00008390	0.00011449
ROA	NA	NA	-0.02850021	0.01074958 ***
Growth Rate	NA	NA	0.00739785	0.00110139 ***
Lag (DCA)	NA	NA	-0.00165011	0.00713568
KZ4Factor	NA	NA	0.00003464	0.00005505
BVMV	NA	NA	0.00003524	0.00002376
Year1992	0.00103361	0.00338327	0.00076555	0.00364702
Year1993	-0.00354147	0.00334107	-0.00126020	0.00360782
Year1994	-0.00211912	0.00327789	-0.00089620	0.00350031
Year1995	-0.00046067	0.00329797	-0.00190802	0.00346847
Year1996	0.00212336	0.00334469	0.00230864	0.00350496
Year1997	-0.00401687	0.00339334	-0.00325242	0.00354891
Year1998	-0.00123228	0.00344094	0.00026026	0.00359861
Year1999	0.00365483	0.00352662	0.00586109	0.00369146
N	9809		7301	
Adj-R ²	0.0427		0.0358	

Note: ***, **, and * denote parameters are significant at 1%, 5% and 10% significance levels, respectively.

Panel B: Economic Interpretations of Compensation Coefficients for a Firm with \$5 billion in Assets

To approximate the average impact of the compensation variables on the dollar value of discretionary current accruals, we scale up the regression coefficients by \$5 billion, the asset value of "typical" firm in our sample. We report the resulting dollar effects of changes in the compensation components for two hypothetical changes: a flat \$1,000 change in the component, and a one standard deviation change, using the sample standard deviation for the respective components.

Compensation Metric	Variable Means (000s)	Variable Stdd. Dev. (000s)	Estimated Coefficients	Change in DCA for a \$1,000 Dollar Value Change	Change in DCA for a One Standard Deviation Change
Salary	574.57	274.66	-0.000025540	-127,700	-35,074,082
Bonus	506.47	639.08	0.000006190	30,950	19,779,526
Option	1,636.00	3,514.00	0.000001340	6,700	23,543,800
INMONEX	7,652.00	35,637.00	0.000000087	437	15,576,172
RestrictedStock	1,145.00	1,146.00	-0.000000002	-8	-9,567
LTIP	114.68	381.90	0.000000484	2,421	924,486
IISO	1.85	3.75	0.001450000	NA	27,187,500
IIRS	1.89	6.90	0.000083900	NA	2,894,550

Table 5: Conditional Regressions of Absolute Value of Discretionary Current Accruals on Executive Compensation Components, Incentive Intensity of Options and Restricted Stocks, with and without Control Variables [Equation (6)]

Coefficient estimates and standard errors are presented in Panel A. Tests for significance of the conditioning category D=1 and Dtarget=1 are presented in Panel B. The binary variable, $D_{i,t}$ equals unity if the estimated DCA is positive, and zero otherwise. The variable Dtarget distinguishes firms that met specified earnings targets with positive discretionary accruals, that would not otherwise have met the target:

$$Dtarget_{i,t} = 1 \text{ if } Earn_{i,t}(1 - \tau_{i,t}) > TARGET_{i,t} \text{ and } Earn_{i,t}(1 - \tau_{i,t}) - DCA_{i,t} < TARGET_{i,t},$$

$$Dtarget_{i,t} = 0, \text{ otherwise,}$$

Where Earn is the pretax operating income as reported in Compustat, and the earnings targets evaluated are zero earnings and the firm's prior year's earnings.. In the regression results, interpret D as Dtarget for the two earnings target regressions. The regression models are of the form:

$$\begin{aligned} |DCA_{i,t}| = & \beta_0 + \beta'_0 D_{i,t} + \beta_1 Salary_{i,t} + \beta'_1 D_{i,t} \times Salary_{i,t} + \beta_2 Bonus_{i,t} + \beta'_2 D_{i,t} \times Bonus_{i,t} + \beta_3 Option_{i,t} + \beta'_3 D_{i,t} \times Option_{i,t} + \beta_4 RestrictedStock_{i,t} \\ & + \beta'_4 D_{i,t} \times RestrictedStock_{i,t} + \beta_5 LTIP_{i,t} + \beta'_5 D_{i,t} \times LTIP_{i,t} + \beta_6 IISO_{i,t} + \beta'_6 D_{i,t} \times IISO_{i,t} + \beta_7 IIRS_{i,t} + \beta'_7 D_{i,t} \times IIRS_{i,t} + \beta_8 INMONEX_{i,t} \\ & + \beta'_8 D_{i,t} \times INMONEX_{i,t} + \beta_9 ROA_{i,t} + \beta_{10} Growth_{i,t} + \beta_{11} KZ4Factor_{i,t} + \beta_{12} BVMV_{i,t} + \beta_{13} DCA_{i,t-1} + \sum_{t=1992}^{1999} \alpha_t Year_t \end{aligned}$$

where $|DCA|$ is the absolute value of discretionary accruals scaled by assets.; Salary is the amount of salary awarded to the executive during the fiscal year (1000's of dollars); Bonus is the dollar value of a bonus (cash and non-cash) earned by the named executive officer during the fiscal year (1000's of dollars); Option is the aggregate value of stock options granted to the executive during the year as valued using Black Scholes methodology (1000's of dollars); RestrictedStock is the value of restricted stock holdings at the end of the year (1000's of dollars.); LTIP is the amount paid out to the executive under the company's long-term incentive plan (in 1000's dollars). These plans measure company performance over a period of more than one year (generally three years). IISO is Incentive intensity of stock option award(s); IIRS is Incentive intensity of restricted stock award; ROA is Return on assets; Growth is Geometric rate of growth based on past five year of earnings; KZ4Factor is Modified version of Kaplan-Zingales index (4-Factor version); BVMV is Book-to-market value of equity (calculated as Fama and French, 1993); lag(DCA) is previous year discretionary current accruals.

Coefficients for the Year binary variables are not shown.

Continued . . .

Panel A: Parameters and standard errors (interpret D as Dtarget for the earnings target regressions)

Variable	Positive/Negative DCAs		Zero Earnings Target		Prior Year's Earnings Target	
	Parameter	Standard Error	Parameter	Standard Error	Parameter	Standard Error
Intercept	0.04964143	0.00396315 ***	0.04574068	0.00322937 ***	0.04976917	0.00391899 ***
D	0.01638721	0.00392383 ***	0.07362818	0.00534008 ***	0.04294300	0.00527724 ***
Salary	-0.00001956	0.00000533 ***	-0.00002061	0.00000358 ***	-0.00001750	0.00000473 ***
D*Salary	-0.00001226	0.00000711 *	-0.00002255	0.00000978 **	-0.00003087	0.00000984 ***
Bonus	0.00000766	0.00000231 ***	0.00000524	0.00000160 ***	0.00000357	0.00000211 *
D*Bonus	-0.00000228	0.00000310	0.00000981	0.00000416 **	0.00000426	0.00000428
Option	0.00000110	0.00000043 **	0.00000080	0.00000030 ***	0.00000152	0.00000037 ***
D*Option	0.00000049	0.00000057	0.00000207	0.00000071 ***	0.00000089	0.00000074
RestrictedStock	0.00000013	0.00000013	0.00000002	0.00000008	0.00000014	0.00000012
D*RestrictedStock	-0.00000019	0.00000016	-0.00000048	0.00000036	-0.00000017	0.00000016
INMONEX	0.00000001	0.00000005	0.00000008	0.00000003 **	-0.00000001	0.00000004
D*INMONEX	0.00000009	0.00000006	-0.00000004	0.00000005	0.00000008	0.00000006
LTIP	-0.00000193	0.00000304	-0.00000155	0.00000215	-0.00000081	0.00000285
D*LTIP	0.00000556	0.00000430	0.00001619	0.00000625 ***	0.00000500	0.00000587
IISO	0.00138106	0.00033614 ***	0.00158778	0.00023634 ***	0.00102234	0.00031727 ***
D*IISO	0.00012616	0.00047255	-0.00055439	0.00071028	0.00049944	0.00068468
IIRS	-0.00012836	0.00016430	-0.00003802	0.00011731	-0.00021353	0.00015528
D*IIRS	0.00041415	0.00022837 *	0.00037046	0.00029101	0.00075663	0.00029553 **
ROA	-0.03314346	0.01074562 ***	-0.01629956	0.01008049	-0.06472205	0.01304796 ***
Growth Rate	0.00707101	0.00109854 ***	0.00570020	0.00103146 ***	0.00741357	0.00127379 ***
Lag (DCA)	-0.00523512	0.00713770	-0.01240551	0.00668776 *	-0.01084815	0.00800072
KZ4Factor	0.00003250	0.00005485	0.00001319	0.00005154	0.00001060	0.00005897
BVMV	0.00004120	0.00002381 *	0.00004337	0.00002231 *	0.00005577	0.00002468 **
N	7301		7301		5323	
Adj-R2	0.043		0.158		0.0785	

Note: ***, **, and * denote parameters are significant at 1%, 5% and 10% significance levels, respectively.

**Panel B: Tests for significance of coefficients for the D=1 and Dtarget=1 conditioning categories
(interpret D as Dtarget for the two earnings target regressions)**

Test of:	Positive/Negative DCAs			Zero Earnings Target			Prior Year's Earnings Target		
	Sum	F-Value		Sum	F-Value		Sum	F-Value	
Salary+D*Salary	-0.00003182	44.87	***	-0.00004315	22.36	***	-0.00004836	31.21	***
Bonus+D*Bonus	0.00000538	6.53	***	0.00001505	15.34	***	0.00000783	4.43	**
Option+D*Option	0.0000016	17.71	***	0.00000286	19.73	***	0.00000241	14.31	***
Rstkhdv+D*Rstkhdv	-0.00000006	0.37		-0.00000046	1.25		-0.00000003	0.07	
Inmonex+D*inmonex	0.0000001	14.2	***	0.00000003	6.22	**	0.00000007	4.74	**
LTIP+D*LTIP	0.00000364	1.43		0.00001464	1.65		0.00000419	0.67	
IISO+D*IISO	0.00150722	20.48	***	0.00103339	2.38		0.00152179	6.29	**
IIRS+D*IIRS	0.00028579	3.25	*	0.00033244	1.56		0.0005431	4.66	**

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.