



Earnings Management from the Bottom Up: An Analysis of Managerial Incentives Below the CEO

**Felix Oberholzer-Gee
Julie Wulf**

Working Paper

12-056

August 17, 2012

Copyright © 2012 by Felix Oberholzer-Gee and Julie Wulf

Working papers are in draft form. This working paper is distributed for purposes of comment and discussion only. It may not be reproduced without permission of the copyright holder. Copies of working papers are available from the author.

Earnings Management from the Bottom Up: An Analysis of Managerial Incentives Below the CEO

August, 2012

Felix Oberholzer-Gee
Graduate School of Business Administration
Harvard University & NBER

Julie Wulf*
Graduate School of Business Administration
Harvard University & NBER

Abstract

Performance-based pay is an important instrument to align the interests of managers with the interests of shareholders. However, recent evidence suggests that high-powered incentives also provide managers with incentives to manipulate the firm's reported earnings. The previous literature has focused primarily on Chief Executive Officers, but managers further down in the firm hierarchy—division managers and Chief Financial Officers-- are likely to have similar incentives, and perhaps even greater opportunity to influence reported earnings in a manner that maximizes these managers' personal income. Moreover, previous research focuses on equity incentives and largely ignores other elements of incentive pay. We contribute to this literature by analyzing all forms of incentive pay for several types of managerial positions and include additional measures of earnings manipulation--end-of-year excess sales and class action litigation—in addition to the standard measure of discretionary accounting accruals. We find that the association between high-powered incentives and earnings manipulation varies by both type of incentive pay and position. Our findings have important policy implications and suggest that compensation committees should review pay policies of other managerial positions in addition to CEOs. Importantly, if the committees wanted to weaken incentive pay to get more truthful reporting, diluting the CFO's bonus and stock options would be one place to start.

JEL Classification: G30, J33, K22, M41, M52

Keywords: Compensation, Incentive Pay, Earnings Management, Gaming, Fraud, Shareholder Litigation, Division Managers, CFO

*Corresponding author: jwulf@hbs.edu; Harvard Business School, Morgan Hall 241, Boston, MA 02163; 617-495-8542.

1. Introduction

Pay-for-performance contracts are a critical instrument to align the interests of principals and agents (Jensen and Meckling, 1976). While it can be optimal to make the agent the residual claimant of the firm's profit, under numerous conditions principals are better off employing weaker incentives. These include situations with poor measures of performance and multitasking environments (Baker, 1992, Holmström and Milgrom, 1991), when agents reduce their motivation in response to financial incentives (Frey and Oberholzer-Gee, 1997; Benabou and Tirole, 2003), and when principal and agent have differing priors (Van den Steen, 2010). Another cost of high-powered incentives is that they provide managers with incentives to manipulate the firm's reported earnings (e.g., Burns and Kedia, 2005; Bergstresser and Philippon, 2006). For example, equity incentives can entice managers to boost reported earnings just before they exercise options or sell stock. There are now a number of academic studies – and many anecdotes – that document this link between the structure of chief executive officer (CEO) compensation and various measures of earnings manipulation (e.g., Bergstresser and Philippon, 2006; Peng and Roell, 2008). These papers generally focus on one component of compensation for the top position—equity incentives for the CEO. In this paper, we extend this literature by analyzing all components of compensation packages for CEOs and for managers at lower levels. To our knowledge, this study is the first that analyzes the relationship between CEO, division manager, and chief financial officer (CFO) compensation and earnings management in a large sample of firms.

We are interested in positions below the CEO because it is unclear if all or even most financial misreporting is decided at the top. There are many examples of managers at lower levels in the corporate hierarchy “cooking the books,” in some cases without the knowledge of senior management. For instance, at the H.J. Heinz Company, division managers received

bonuses only when earnings increased from the prior year. These incentive plans led managers, among a longer list of improper accounting practices, to manipulate the timing of shipments, falsify dates on sales invoices, and recognize advertising expenses in the wrong period. Senior managers were unaware of these practices for seven years. They were ultimately discovered during investigations associated with a lawsuit that Heinz filed against a competitor.¹ In addition to division managers, the importance of the CFO's role in financial reporting and the numerous recent corporate fraud cases suggest that CFOs can significantly affect accounting quality. Although these examples certainly suggest that managers below the CEO level could play a significant role in earnings management, to date much of the literature is focused on CEOs, mainly due to data limitations. This paper fills the gap.

Since the quality of financial reporting is difficult to assess, we use various measures of earnings manipulation in our study, including discretionary accounting accruals, end-of-year excess sales and class action litigation. While most of the existing literature employs cross-sectional methods, we analyze a panel over a long period (1986-1999) during which the structure of compensation contracts varied considerably. The panel structure of our data allows us to control for time-invariant unobserved heterogeneity, both at the level of the firm and the managerial position. While most of the existing literature uses discretionary accounting accruals, we also use a measure of excess fourth-quarter sales that is measured rather precisely because identification stems from variation in the beginning of firms' fiscal years (Oyer, 1998), which is plausibly exogenous to earnings manipulation. We also evaluate the incidence of future lawsuits that can reflect the quality of earnings (e.g., Choi, 2007; Johnson, Nelson and Pritchard, 2007).

¹ Post, R. and K. Goodpaster, "H.J. Heinz Company: The Administration of Policy," HBS Case #382-034. "In April 1979 James Cunningham, H. J. Heinz Company's president and chief operating officer, learned that since 1972 certain Heinz divisions had allegedly engaged in improper income transferal practices. Payments had been made to certain vendors in a particular fiscal year, then repaid or exchanged for services in the succeeding fiscal year." Source: Heinz form 8-K, April 27, 1979, p. 2.

We find that the effects of incentive pay on earnings management vary considerably by both type of incentive pay and position. For instance, companies report significantly higher discretionary accruals, excess sales and have a higher incidence of future lawsuits when CFOs are paid larger bonuses. Importantly, the magnitudes of these effects are much larger for CFOs in comparison to both CEOs and division managers. We find a small positive effect on accruals from current grants of stock options to division managers, but in contrast to prior research, we find no effect from equity incentives for CEOs or CFOs on accruals once we include bonus pay in our regressions. Turning to excess 4th quarter sales, we find little effect of division manager pay on excess sales in the fourth quarter which is at odds with the explanation that division managers reallocate effort to make annual budgets. Instead our findings suggest that CFOs aggregate financials to make bonus targets by shifting revenue to the 4th quarter of the fiscal year. We also find larger excess 4th quarter sales when CFOs have more stock options--a result that is at odds with the expectation that managers should lower reported earnings in advance of options grants to reduce exercise prices. Overall, our results suggest that the primary focus of compensation committees on equity incentives for CEOs overlooks a critical component in curbing earnings manipulation. If one wanted to weaken incentive pay to get more truthful reporting, diluting bonuses—particularly the CFO's--would be the place to start.

The remainder of the paper is organized as follows. In Section 2, we discuss the relevant literature. In Section 3, we develop our hypotheses and outline our empirical approach. Section 4 describes the sample and Section 5 presents our findings. Section 6 concludes.

2. Executive Compensation and Earnings Manipulation

Why might executives manage reported earnings? The most obvious reason is that these earnings affect a manager's compensation (Bebchuk, Fried and Walker, 2002). Bonus payments, for instance, often increase when accounting profits improve (Murphy, 2000). Reported earnings also influence stock prices and hence the value of executives' stock and stock options (Murphy, 1999). Career concerns are another reason for earnings manipulation (Gibbons and Murphy, 1992). Managers who regularly make their numbers can expect improved future compensation (Aggarwal and Samwick, 2003; Wulf, 2007) and better promotion opportunities (McNeil, Niehaus and Powers, 2004). As surveys show, dependable managers who meet their earnings targets are well-liked and rewarded in the firm for the "sleep-well factor" that they provide (Graham, et al., 2005: 50).

The previous literature documents numerous links between the structure of executive compensation and reported earnings. Early papers show a relationship between accruals and CEO bonus plans that is consistent with managers "gaming" earnings to maximize bonus payouts. Healy (1985) finds that CEOs manipulate earnings downwards when their bonuses are at the maximum. Murphy (2000) compares bonus payouts of firms that set performance standards internally to those that set standards based on an external comparison. He finds that internal standards lead to greater smoothing of earnings, presumably because managers fear that performance goals will be ratcheted up if they report exceptional performance in a particular year.

More recent research is focused on the effects of equity-based pay. For example, Bergstresser and Philippon (2006) find that firms manipulate earnings through discretionary accruals when the CEO's compensation is more closely tied to the value of stock and option

holdings. Also, in high-accrual years, CEOs are more likely to exercise stock options and sell large quantities of shares. Consistent with these results, Burns and Kedia (2005) document that the sensitivity of the CEO's stock option portfolio to stock price is positively related to earnings restatements. Finally, Jiang, Petroni and Wang (2010) study CFO equity incentives and find that the magnitude of accruals and the likelihood of beating analyst forecasts are more sensitive to CFO equity incentives than to those of the CEO.

Using securities class action litigation, Peng and Roell (2008) show that a larger number of vested options for top executives increases the probability of litigation, while base pay levels and executive share ownership are not related to the incidence of lawsuits. They conclude that incentive pay has a significant impact on earnings manipulation, which in turn significantly affects the probability of litigation. Finally, there is also some evidence that high-powered incentives distort real activities. In a survey of financial executives, Graham, Harvey, and Rajgopal (2005) find that many managers prefer reducing R&D and advertising expenses to manipulating accounting numbers. These survey results are consistent with some econometric work on real manipulations by executives (Roychowdhury, 2006), but also in other settings such as government employees (Courty and Marschke, 2004) and enterprise software sales (Larkin, 2008).

While there appear to be many links between the structure of executive compensation and reported earnings, to date, most empirical research has focused on CEOs. Data on CEO compensation are readily available because the SEC requires disclosure of compensation data for the top-five highest paid executives. In this paper, we rely on information from a confidential compensation survey among large U.S. companies to analyze incentives of managers below the CEO. We investigate the link between the structure of compensation and measures of earnings

manipulation for two key positions--division managers and CFOs—in addition to the CEO. It is not a priori obvious whether this link for either lower level position is weaker or stronger than that for CEOs. One might argue that division managers have greater opportunity to influence reported earnings or to game revenues because they are closer to the business processes in their division. Alternatively, since the CFO has the primary responsibility for financial reporting and aggregates financials across businesses, the CFO may have greater ability to manage earnings. It may be easier for the firm's top management to monitor both of these positions than it is for outside investors to supervise CEOs. Furthermore, if managers below the CEO are mostly concerned about their reputation in internal labor markets (Gibbs, 1995), and if these internal markets are better at detecting manipulations, high-powered incentives for division managers or CFOs might have less of an effect than similar incentives for CEOs. As these arguments make clear, a comparison between the various positions is ultimately an empirical question.

3. Hypotheses and Empirical Approach

We are interested in studying the relation between the structure of executive compensation and measures of earnings manipulation. The simplest approach to our problem is to estimate models of the form

$$(1) \quad EM_{ft} = X_{ift}\beta + t + v_{ift}.$$

EM_{ft} is a measure of earnings manipulation for firm f in year t , X_{ift} is a vector of pay components for position i , and t is a time trend, common to all observations, which we implement as year fixed effects. The unit of observation in this analysis is a firm-year. Since we have multiple position types for each firm, and since this is one of the first papers to study the impact of compensation of different positions on earnings management, we are particularly

interested in analyzing whether or not the impact of pay on the quality of financial reporting varies by position. So, we first estimate equation (1) separately for each position type: CEO, division manager, and CFO. While firms generally have only one CEO and CFO, many firms report more than one division manager. Since we only observe firm-level measures of earnings management, we calculate a weighted sum of the individual division manager compensation using division sales as weights. This weighting scheme implicitly assumes that managers of larger divisions have greater influence over earnings management at the firm-level.

Equation (1) represents the most common approach taken in the literature. However, there are a couple of concerns with this specification as estimated in prior research. First, most recent research focuses on equity-based pay and ignores the potential affect of other forms of incentive pay, such as, bonuses and other long-term incentive plans. So, instead of a vector of pay components, the focus is on equity-based incentives. And, because pay components are correlated, omitting one type of incentive pay from regressions might bias results. A second concern with this specification is that industry and firm characteristics might influence both pay and earnings management, biasing the coefficient of interest, β , in ways that are difficult to ascertain. That is, we are concerned that $v_{ift} = \mu_f + \varepsilon_{ift}$, where μ_f is a firm fixed effect and ε_{ift} is a well-behaved individual error. For instance, in our sample bonus payments are particularly generous in apparel and accessory stores (SIC 56) and these stores also have large discretionary accruals, suggesting β might at least in part reflect a spurious correlation. We can control for this type of heterogeneity by including firm fixed effects μ_f in this model,

$$(1a) \quad EM_{ft} = X_{ift}\beta + t + \mu_f + \varepsilon_{ift}.$$

Specification (1a) exploits one source of variation: changes in, say, bonus payments for a given position within firms over time.

Because pay practices between positions within a firm are highly correlated, omitting one type of position from our regressions might bias our results. In fact, one of main contributions of the study is to identify the positions and the forms of incentive pay that are most strongly associated with earnings management. So, we also estimate a set of regressions that include all pay components (bonus, stock options, restricted stock and other long-term incentives) for all three positions (CEO, division manager, CFO).

$$(1b) \quad EM_{ft} = P_i X_{ift} \beta + t + \mu_f + \varepsilon_{ift}.$$

In this specification, P_i represents the three different positions: CEO, division manager and CFO. This is a demanding specification given the correlation between different pay components and the correlation between different positions.

Specification (1b) differs from the previous literature in that it lacks measures of managers' wealth. In previous studies, the incentives X_{it} are stock variables, for instance the manager's entire equity holdings or all his options. A popular equity incentive measure is to calculate by how much a manager's wealth would change if the firm's share price appreciated by 1%. In contrast, (1b) looks at flows. That is, we are asking how a measure of earnings manipulation changes as the executive's stock holdings change. In this approach, the executive's stock holdings are subsumed in the firm fixed effect. We prefer (1b) to previous models because μ_f controls for time-invariant firm-specific heterogeneity.

3.1 Measures of Earnings Manipulation

Earnings manipulation is notoriously difficult to measure. Previous studies relied on a number of indicators, discretionary accruals being the most common. We use three different proxies for earnings management: discretionary accruals, 4th-quarter excess sales and litigation.

3.1.1. Discretionary Accruals

Our first measure is discretionary accruals, a proxy for earnings management that has been widely used in the finance and accounting literature (e.g. Dechow et al., 1995; Teoh, Welch and Wong, 1998; DuCharme, et. al., 2004). Managers enjoy a degree of discretion when they report earnings because they can choose to recognize some future cash flows. For example, firms commonly adjust reported net income to include credit sales for which the firm is believed to receive cash in the future. Similarly, generally accepted accounting principles (GAAP) allow managers to delay recognizing some expenses, for example after they advance cash to suppliers, and they can choose a level of provision for bad debts. These types of adjustments involving short-term assets and liabilities are called current accruals. Accruals drive a wedge between reported net income and actual cash flow from operations. The size of this wedge is related to business characteristics – how important are credit sales in the firm’s industry – and managerial decisions.

In contrast to short-term accruals, long-term accruals are adjustments to long-term assets. Managers can influence long-term accruals by changing the rate of depreciation of the firm’s capital stock, altering deferred taxes and realizing unusual gains. As with current accruals, long-term accruals are in part due to industry characteristics – for instance, firms in asset-intensive industries have high depreciation – and in part due to earnings management. Investors can observe current and long-term accruals, but it is difficult to know what fraction of reported accruals is discretionary. For example, it is hard to ascertain if the firm has been overly aggressive in recognizing future cash receipts.

In constructing these accrual measures for our sample firms, we follow the standard approach outlined in Teoh, Welch and Wong (1998) and estimate a modified Jones model. The idea is to identify the portion of accruals that is determined by business characteristics, firm sales and investments. The remainder, this approach assumes, reflects managed accruals. Discretionary current accruals (DCA) for firm f in year t , ε_{ft} , are given by

$$(2) \quad \frac{CA_{ft}}{TA_{f,t-1}} = \alpha_0 \frac{1}{TA_{f,t-1}} + \alpha_1 \frac{\Delta sales_{ft}}{TA_{f,t-1}} + \varepsilon_{ft},$$

where CA are current accruals as observed in financial statements and TA are the firm's total assets. We estimate (2) by two-digit industry and year, effectively allowing the parameters of interest to vary by type of business and period. Discretionary current accruals, ε_{ft} , thus measures the portion of current accruals that is not explained by the firm's industry, the year and the change in sales the firm experienced.²

Discretionary accruals are widely used in the literature because these indicators come conceptually close to a true measure of earnings manipulation. While this is theoretically appealing, the measures we actually employ are the residuals of models explaining current accruals, opening up the possibility that we measure managerial discretion with considerable error.

3.1.2. *Excess Fourth Quarter Sales*

To complement discretionary accruals, we use excess 4th-quarter sales as an arguably more precise measure of "gaming." Sales are particularly interesting because 40% of SEC enforcement actions entail questions of revenue recognition (Dechow, Sloan and Sweeney, 1995;

² We also estimate long-term accruals (DLA) which are analogous to current accruals, but include gross property, plant and equipment.

Graham, et al., 2005). Because many incentive schemes are linked to annual performance, managers have incentives to adjust reported revenues during the final months of the fiscal year when they know how close they are to their targets. One way to “make the numbers” is to engage in manipulation of real activities such as price discounts to increase sales. Annual performance targets can also influence the allocation of effort. For example, close to the end of the fiscal year, managers might delay deals once they hit their maximum bonus.

We isolate the effect of the final quarter on reported sales by exploiting variation in the beginning of firms’ fiscal years. In a Compustat sample of firms spanning the years 1983-2002, 58% of all companies end their fiscal year in December and 9% in June. Every month of the year serves as the fiscal year end for a significant number of companies. To determine the impact of the final quarter on reported sales, we follow Oyer (1998) and estimate the following sales regression in first differences:

$$(3) \quad \Delta s_{ft} = \sum_{q=1}^4 \Delta d_t^q \phi_q + \sum_{m=1}^{12} \Delta d_t^m \theta_m + \Delta \psi_{ft} .$$

s is the change in sales for firm f in period t , θ_m is a seasonality effect of being in month m , d terms are indicators for fiscal quarters and calendar months, and ϕ_q , the effect of interest, measures by how much sales change going from, say, the third to the fourth quarter. While Oyer was interested in industry-wide average effects, we would like to partial out firm-specific fiscal revenue effects from those of the industry. We do this by allowing ϕ_q to vary by firm. For each of the 235 three-digit industries in Compustat, we estimate

$$(3a) \quad \Delta s_{ft} = \alpha_i + \sum_{q=1}^4 \Delta d_t^q \phi_q + \alpha_i \Delta d_t^4 \kappa_{f4} + \sum_{m=1}^{12} \Delta d_t^m \theta_m + \Delta \psi_{ft} .$$

As in model (3), ϕ_4 measures by how much sales change from the third to the fourth quarter, and κ_{f4} captures differences in this fourth-quarter fiscal revenue effect between firm f and its industry peers. κ_{f4} is our second measure for earnings management. In contrast to discretionary accruals, we believe that excess fourth-quarter sales are measured rather precisely because identification stems from variation in the beginning of firms' fiscal years, which is plausibly exogenous to earnings manipulation.

3.1.3 *Shareholder Class Action Lawsuits*

Our third measure is based on allegations of executive misbehavior in shareholder class action lawsuit filings from the Stanford Securities Class Action Clearinghouse. Such lawsuits have become much more common in recent years. While there were 110 suits in 1996, this number has risen to 225 in 2002 and 175 in 2003.³ Under U.S. securities laws, it is illegal to make materially false and misleading statements. Many of the class action lawsuits involve alleged accounting irregularities, but private litigation is also triggered by a broader set of misleading disclosures. Examples include companies which do not report the loss of important clients or specific requirements for new financing. Most class action lawsuits are brought under the Securities Act of 1933 and the Securities Exchange Act of 1934. Our measure is the incidence of at least one lawsuit in a given year. An advantage of using lawsuits as a measure of earnings management is that these suits are an important response to suspected misinformation. However, the decision to sue a company is influenced by many considerations, including the financial strength of the company, the likelihood of a quick settlement and the technical difficulties of proving misinformation.

³ There is a substantial body of research examining the causes and consequences of shareholder litigation. See Choi (2007) and Johnson, Nelson and Pritchard (2007) for two empirical studies that examine the merit of securities fraud class actions over the time period of our study.

3.2 Measures of Compensation

A distinguishing feature of our analysis is that we observe the complete pay package that CEOs, division managers, and CFOs receive. We have detailed data for the executives' bonus payments, grants of stock options and restricted stock as well as long-term incentive plans (LTIP). The latter include performance units, performance shares and phantom stock. Numerous mechanisms can link components of incentive pay to earnings manipulation. In this section, we discuss the most important mechanisms and develop our hypotheses (summarized in Table 1).

Bonus payments provide incentives to exaggerate reported earnings. Consider a manager who convinces his customers to shift future orders to the current fiscal year. If successful, the current year will appear extraordinarily successful, while the next year is likely to be disappointing. Although the shift in sales does not increase total sales over a longer-term period, the manager receives a larger bonus payment earlier in time, thereby increasing his income.

Stock options provide a direct link between managerial rewards and share-price appreciation, since the payout from exercising options increases with increases in stock price. In our data, we observe an executive's current option grants. Executives learn at the beginning of the fiscal year how many options they will receive. Since most options are granted at the money, executives face short-term incentives to manage earnings downward just prior to receiving option grants in order to reduce the exercise price. For current grants, we expect $\beta < 0$. In contrast to current grants, vested options provide incentives to boost earnings in the short run, provided that investors believe the gains to be longer-term. There is some empirical evidence that earnings increases due to "gaming" have fooled investors into bidding up the company's share price.

Thus, earnings manipulation is particularly attractive just prior to option exercise, so we expect $\beta > 0$ for vested options. If investors believe that managers resort to legally questionable practices to manage the company's earnings, we also expect stock options to be positively associated with the likelihood of lawsuits.

Similar to options, the value of restricted stock increases with the appreciation of the firm's stock, but restricted stock typically has 3 to 5 year vesting requirements and executives often face further restrictions, making it difficult to sell this type of stock. Because restricted stock ties the executive's expected income to longer-run firm performance, restricted stock discourages manipulations that come at the expense of long-run performance, $\beta < 0$. Consider an executive who thinks of asking a customer to move a large order from the next to the current quarter. If the customer requires a discount to place the order early, restricted stock discourages the executive to accept the bargain. In contrast, for accounting manipulations that bear little relationship to real firm performance (e.g., the manipulation of depreciation schedules), we expect no link between restricted stock and earnings management, $\beta = 0$. A complication arises because executives often earn dividends from restricted stock and performance shares. For example, in 2005, these payouts reached more than \$1 million for Jeffrey Immelt, CEO of General Electric Co., and \$2.89 million for Kenneth Lewis, CEO of Bank of America Corp. (Thurm, 2006). Dividend payouts typically increase in reported earnings, providing a greater incentive for the short-term manipulation of reported earnings, $\beta > 0$.

LTIPs, which are typically based on a rolling-average of 3 to 5-year cumulative performance (Murphy, 1999), provide incentives similar to restricted stock. These plans discourage forms of earnings management which reduce firm performance, $\beta < 0$. But as with restricted stock, executives often earn dividends from LTIPs, even from stock that they have not earned yet.

3.3 Timing

Before we turn to a description of our data, it is important to discuss the timing in model (1). Grants of stock and options and the terms of bonus payments are announced upon completion of the budgeting process, typically at the beginning of the firm's fiscal year. With these incentives in place, executives then make the decisions that affect reported earnings. There is no surprise in the number of stocks and options granted, and we sum up these grants for the entire fiscal year and relate them to contemporaneous earnings.⁴

Timing is also important for the construction of our dependent variables. Many forms of earnings management are purely transitory. An overly aggressive recognition of credit sales, for instance, will eventually be followed by lower-than-expected income.⁵ Other forms of earnings manipulation result in permanent reductions in income. For example, executives who reduce their effort to minimize the exercise price associated with a large grant of stock options permanently reduce the company's income. Shareholder lawsuits typically occur some time after the alleged manipulation has taken place. In our lawsuit models, we lag executives' pay by two years. Table 1 summarizes our hypotheses.

4. Data Description

⁴ Recent literature has explored the extent to which firms backdate stock option grants (e.g., Heron and Lie, 2007). Our hypotheses assume that firms are not backdating options. To the extent that backdating is a widespread phenomenon, it would be more difficult to test the set of hypotheses around the various stages of option grants.

⁵ One might argue that such transitory forms of earnings management are best captured by the absolute value of accruals. We investigate this in a series of robustness checks (unreported). In our Tables 3-5, while we do not report results with the absolute value as our dependent variable, all of our results are robust to using this measure (with one exception: we lose the division manager bonus effect in Table 4, column 4). Also, it makes little sense to estimate models with the absolute value of 4th-quarter sales as the dependent variable. While shifts in sales often have transitory effects, these effects are likely to be short run, i.e. high sales in December are followed by weak sales in January, not by weak sales next December. Finally, when we use discretionary long-term accruals in Tables 3-5 (unreported), while we find qualitatively similar results for the CFO position, we lose significance on the CEO bonus effect and the division manager stock option effect.

The primary data set used in this study includes an unbalanced panel of more than 300 publicly traded U.S. firms over the years 1986-1999, spanning a number of industries. The data are collected from a confidential compensation survey conducted by a leading human resources consulting firm specializing in executive compensation and benefits. The survey sample is most representative of Fortune 500 firms (see Appendix A for details).

The survey is exceptionally broad in that it collects data on many senior and middle management positions. In this paper, we focus on CEOs, CFOs, and the most senior position in a division, which we term the division manager. In the survey, a division is defined as “the lowest level of profit center responsibility for a business unit that engineers, manufactures and sells its own products.”⁶

We believe the survey data are accurate for several reasons. First, the consulting firm personnel are knowledgeable about survey participants because they are typically assigned to specific participants for several years. Furthermore, while the participating firms initially match their positions to benchmark positions in the survey, the consulting firm personnel follow up to verify accuracy and spend an additional 8-10 hours on each questionnaire evaluating the consistency of responses with public data (e.g. proxy statements) and across years. Participants use the survey results to set pay levels and design management compensation programs, an indication that they believe others treat the survey seriously.

Our compensation variables are denominated in 10 millions of 1996 dollars. As is common practice, the consulting firm values stock options grants and long-term incentives using a modified version of Black-Scholes that takes into account vesting and termination provisions as well as the likelihood of achieving particular performance goals.

⁶ For a more complete description of the survey coverage of division managers and how it changes over time, refer to Rajan and Wulf (2006).

The above data are supplemented with financial information from Compustat, which we use to calculate discretionary current and long-term accruals as well as excess fourth-quarter sales. For class action lawsuit filings, we use the Stanford Securities Class Action Clearinghouse. Table 2 presents summary statistics of the variables used in the study.

5. Results

5.1 CEO Compensation Effects

We begin by analyzing the relation between our measures of earnings manipulation and CEO compensation. The models in Table 3 relate discretionary current accruals (DCA), excess fourth-quarter sales, and the incidence of lawsuits to four measures of CEO compensation: actual bonus, the value of current stock option grants, restricted stock grants, and other long-term incentives (LTIP). We cluster standard errors at the firm-level. For our lawsuit models, we present logit estimates. All specifications include year fixed effects.

In Table 3 column 1, we begin with equity-based compensation and other long-term incentive pay and we find that current stock option grants are positively related to discretionary current accruals (DCA) in OLS regressions. However, when we include CEO bonus payments (model 2), the association between stock options and discretionary current accruals disappears. These results provide a useful reminder of the importance of including all components of executive pay in models of earnings management. These components are likely to be correlated, and models that fail to control for any one of them will suffer from omitted-variable bias. Once we control for bonus payments, these payments increase discretionary current accruals while current stock option grants bear no relationship to DCA. To address unobserved firm-heterogeneity, we repeat these specifications and include firm fixed effects in the next two

columns (model 3 and 4) with roughly similar results. Notice that the link between stock options and DCA disappears in the firm fixed effects regression (model 3) suggesting that a time-invariant firm characteristic is correlated with both accruals and stock options. The findings on the CEO bonus effects correspond to our hypothesis (see Table 1) suggesting that CEOs manage earnings to advance the receipt of bonus payments. The magnitude of the bonus effect is economically significant: a one-standard-deviation increase in CEO bonus payments increases short-term accruals by 17.4 % of their mean value (column 4).

Because discretionary accruals are a fairly noisy measure of earnings manipulation, the positive coefficient on bonus payments needs to be interpreted with care. To complement the accruals analysis, we estimate similar models using 4th-quarter excess sales as our second measure of earnings management. In models 5 and 6, we show a large and positive association between CEO bonus and 4th-quarter excess sales. The effect is economically significant: a one-standard-deviation increase in CEO bonus increases excess sales by 45.9 % evaluated at the mean (or an increase of 1.1% in excess sales; column 6). Similar to our findings with the accrual measure, this is consistent with CEOs increasing sales prior to the end of the fiscal year to meet bonus targets. We also find a positive coefficient on stock options which is the opposite of what we might expect. Because we observe grants of stock options, we expect managers to manage revenues downward to reduce the exercise price that is set when stock options are granted. In contrast to options, restricted stock decreases excess sales. This suggests that restricted stock offsets the incentive to game sales since some of the extra revenue might come at the expense of the firm's longer-run profitability. Finally, the last two columns in Table 3 provide logit estimates of the likelihood of a shareholder lawsuit occurring. We find that more generous bonus payments to the CEO are associated with an increased incidence of future lawsuits.

To sum up these results, we find that (i) CEOs appear to manage earnings and to shift sales to the fourth quarter to meet bonus targets. (ii) Current grants of stock options appear to have a negligible effect on discretionary accruals once we control for all forms of pay. However, we do find a positive effect of current option grants on excess sales. (iii) Restricted stock appears to offset the incentive to game sales. (iv) Higher bonuses lead to a higher incidence of future lawsuits.

5.2 *Division Manager Compensation Effects*

Next, we turn to analyzing division manager's pay. In Table 4, we replicate all analyses in Table 3. Since there are multiple division manager positions per firm and we only observe earnings management at the firm-level, we calculate a weighted sum of compensation for individual division managers using division sales as weights. Weighting by sales recognizes that division managers responsible for larger divisions may have greater influence over the management of firm-level earnings. We find small positive and statistically significant effects of division manager bonuses and stock options on accruals (model 4). In contrast to the CEO analyses, the stock option result is robust to the inclusion of bonus payments in both OLS and firm fixed effects regressions. The positive bonus effect is consistent with division managers managing earnings to advance bonus payments. Again, as with CEO stock options, we see a somewhat puzzling effect of division manager stock option grants: increasing options lead to more earnings management. While the above evidence suggests that division manager bonuses increase accruals, the effects are smaller in magnitude in comparison to the CEO effect: a one-standard-deviation increase in bonus increases accruals by 5.4 % evaluated at the mean (column 4). The comparable CEO statistic is a 17.4% increase in accruals. Increasing division manager stock options increases accruals by 4.3% evaluated at the mean.

In models 5 and 6 in Table 4, we investigate the relation between excess 4th-quarter sales and division manager compensation. While we find a positive and significant coefficient on stock options and other long-term incentives in column 5, once we control for bonus this effect disappears. Surprisingly, we find little effect of division manager pay components on excess 4th quarter sales. As argued earlier, one might expect division managers to have a greater ability to shift revenues at the end of the fiscal year. However, we find no support for this. Stock options are positively correlated with the incidence of lawsuits (column 7) suggesting that investors may believe that division managers are more likely to “cook the books” when granted a larger number of options. However, this effect is no longer statistically significant once we include bonus payments in the regression (column 8).

To sum up our findings related to division manager pay: (i) Higher bonuses lead division managers to increase accruals upwards, however the magnitude of the effect is smaller relative to CEO bonuses. (ii) Stock options are positively correlated with discretionary current accruals (and to a weaker extent excess sales and future lawsuits), however the magnitude of the effect is small.

5.3 Chief Financial Officer Compensation Effects

Next, we turn to analyzing CFO’s pay. In Table 5, we replicate the analyses as in Tables 3 and 4. In general, we find patterns that are similar to those in the CEO regression analyses presented in Table 3, however, the magnitude of the CFO pay effects are generally larger. All three measures of earnings management—discretionary current accruals, excess 4th quarter sales, and the incidence of lawsuits—are positively related to the CFO’s bonus payment. The magnitudes of the effects are economically meaningful and vary somewhat in comparison to

CEO and division manager effects. The positive effect of CFO bonuses on accruals is of a similar magnitude to the CEO bonus effect: a one-standard deviation increase in CFO bonuses increases accruals by 15.0% (column 4) in comparison to 17.4% and 5.4% for the CEO and division manager, respectively. Most notably, the effects of CFO bonuses and stock options on excess 4th quarter sales are substantially larger than analogous CEO (and division manager) effects. Specifically, a one-standard deviation increase in CFO bonuses increases excess sales by 71.5 % of their mean value (or an increase of 1.7% in excess sales; column 4), while the comparable CEO and division manager bonus effects are 45.9% and 37.0% (insignificant), respectively. Also, a similar calculation of the CFO stock option effect is associated with 66.6% increase in excess sales of their mean value, while the comparable CEO effect is 45.8%. While we find that increases in CFO stock options are associated with higher excess sales and lawsuit incidence, there is no robust effect on accruals.

To sum up our findings related to CFO pay: (i) Higher bonuses lead CFOs to increase accruals upward and to shift revenues toward the 4th-quarter; and are associated with a higher lawsuit incidence. (ii) Stock options for CFOs are positively correlated with excess sales and lawsuit incidence. (iii) The magnitude of the CFO effects on excess sales are considerably larger in comparison to both CEO and division manager effects.

5.4 Comparing CEO, Division Manager and CFO Compensation Effects

Now that we have documented several interesting relations between our measures of earnings management and CEO, division manager and CFO pay, we want to evaluate their robustness. Because pay practices between positions within a firm are highly correlated, omitting one type of position from our regressions might bias our results. In Table 6, we include

all pay components for all three positions to evaluate which pay components for which positions have the greatest effect on our measures of earnings management.⁷ We find that while higher CEO and CFO bonuses and more stock options for division managers are associated with higher discretionary accruals, the magnitudes of the effects are relatively small. Most notably, we find that CFO bonuses and stock options are positively correlated with excess sales and that the economic magnitudes of the effects are large in comparison to both CEO and division manager pay effects. We describe details of our results in the two paragraphs that follow. We first compare the coefficients between the regressions that include all positions (Table 6) to the single position regressions (Table 3 through 5). We then compare the coefficients across positions in the regressions that include all three positions (Table 6). In general, when we include all three positions, we lose statistical significance on various coefficients and the magnitudes of the effects are smaller.

When we include all pay components for all three positions (Table 6), CEO effects are no longer robust with the exception of the bonus effect on discretionary accruals. Including all three positions reduces the magnitude of this effect: a one-standard deviation increase in CEO bonuses increases accruals by 6.8% (compared to 17.3% in the CEO only regression; Table 3). Turning to division manager pay, the remaining robust effect is the positive and slightly larger correlation between stock options and discretionary accruals: a one-standard deviation increase in division manager stock options increases accruals by 7.7% (compared to 4.3% in the division manager only regression; Table 4). (There is some weak evidence that division manager LTIP is positively correlated with accruals.) Note that the effect of pay on the incidence of future lawsuits is no longer statistically significant.

⁷ The sample of firms that report pay for all three positions is considerably smaller. When we repeat the analysis of individual positions (Tables 3-5) using this restricted sample, the results are qualitatively similar. All of the coefficients are the same sign, but the magnitudes and statistical significance vary somewhat across pay measures.

The most robust and notable results are the effects of CFO pay on earnings management. Higher CFO bonuses are associated with higher discretionary accruals and greater excess sales. The magnitudes of the bonus effects are similar to those in the CFO only regression (Table 5): a one-standard deviation increase in CFO bonuses increases accruals by 10.1% and excess sales by 74.2% of their mean value (compared to 15.0% and 71.4% in the CFO only regression, respectively; Table 5). More stock option grants to CFOs are positively correlated with excess sales and the magnitude of this effect is twice that in the regressions that include only CFO position: a one-standard deviation increase in CFO stock options increases excess sales by 139% of their mean value (compared to 66.6% in the CFO only regressions). Finally, there is some evidence that increases in CFO LTIP is associate with a higher incidence of future lawsuits.

In sum, our collective findings suggest that CFO pay has a robust effect on earnings management in comparison to both CEOs and division managers. CFO incentive pay—bonuses and stock option grants--has a large effect on excess 4th quarter sales. While we find that higher bonuses for CEOs and CFOs and more stock options for division managers are associated with higher discretionary accruals, the magnitudes of the effects are relatively small. Most notably, we find that increases in CFO bonuses and stock options are positively correlated with excess sales and that the economic magnitudes of the effects are large. Specifically, a one standard deviation increase in CFO bonuses and stock options is associated with a 74.2% and 139% increase in excess sales at their mean value, respectively (or 1.8% and 3.3% increase in excess sales). We believe that excess fourth-quarter sales are measured rather precisely, certainly relative to discretionary accruals, because identification stems from variation in the beginning of firms' fiscal years, which is plausibly exogenous to earnings manipulation.

Our findings suggest that the CFO has both the ability and the incentive to shift revenues to the 4th quarter of the fiscal year. By shifting revenue from the 3rd to the 4th quarter, CFOs meet bonus targets and increase bonus payouts. What is more puzzling is the positive relationship between current stock option grants for CFOs and excess sales. We would expect the opposite, that is, CFOs reducing revenues in the fourth quarter to lower the exercise price of stock options. One alternative explanation somewhat consistent with our results is that CFOs are rewarded with more option grants when sales are high thus giving them an incentive to shift revenues to the 4th quarter. Regardless, for discretionary current accruals and excess sales we consistently find that the CFO effects are significantly larger than the effects for either CEOs or division managers. This suggests that earnings manipulation is occurring at the corporate level in the finance function and not at the division level. Reducing high-powered incentives by one dollar would yield a greater improvement in the quality of financial reporting if CFO incentives were curtailed.

Our findings support the change in the SEC requirements regarding disclosure of CFO compensation. Much of the motivation for these changes were driven by concerns about increases in CFO equity incentives and the effect this might have on the quality of financial statements. We show that compensation committees should be equally concerned about CFO bonuses and their effect on earnings management.

6. Conclusions

Performance-based pay is an important instrument to align the interests of managers with the interests of shareholders. However, recent evidence suggests that high-powered incentives also provide managers with incentives to manipulate the firm's reported earnings. In this paper,

we study this question for a sample of large U.S. companies and extend the literature in four ways. First, unlike most previous studies that focused on CEO compensation alone, we analyze performance pay for CEOs, division managers, and CFOs. Second, our models measure earnings manipulation from changes in compensation for a particular position controlling for unobserved firm heterogeneity, providing cleaner identification than previous cross-sectional work. Third, we test for earnings manipulation using a variety of proxies, including a new measure of firm-specific excess 4th-quarter sales (which is arguably more precisely measured in comparison to discretionary accruals) and incidence of future lawsuits. Fourth, we are particularly careful to control for all components of incentive pay, which turns out to have a significant impact on our estimates.

Our models yield four broad results. First, we find a systematic association between pay below the level of CEO—and in particular, CFO pay—and our measures of earnings manipulation. In fact, this relationship is generally stronger than that for CEO and division manager pay. Second, in our data, earnings manipulation occurs through both changes in discretionary current accruals and through the manipulation of 4th-quarter sales. Third, stock options, the focus of many recent studies, seem to encourage earnings manipulation in our sample as well. For instance, firms whose CFOs receive a large number of options report higher discretionary current accruals, larger excess 4th quarter sales and greater likelihood of future lawsuits. Fourth, while the recent public debate has mostly focused on equity-based components of pay, we show that more traditional forms of compensation such as bonus schemes also invite gaming. In fact, in our models, bonus payments provide a very strong incentive for managers to manipulate earnings.

Our results demonstrate the importance of analyzing managerial pay at levels below the

CEO to capture a more accurate representation of how incentive pay affects the quality of information. While CEOs ultimately are responsible if inaccurate or misleading information is provided to the investment community, the incentive to misrepresent financial reporting is a problem that clearly stems from the “bottom up” and is not limited to “top down.” Our findings have implications for the optimal design of incentive pay throughout several levels of the management hierarchy.

References

- Aggarwal, Rajesh K., and Andrew A. Samwick. (2003). "Performance Incentives within Firms: The Effect of Managerial Responsibility." *Journal of Finance*, vol. 58, no. 4, August 2003, pp. 1613-49.
- Baker, George P. (1992). Incentive Contracts and Performance Measurement. *Journal of Political Economy* 100(3): 598-614.
- Bebchuk, L., J. Fried, and D. Walker, (2002). "Managerial Power and Rent Extraction in the Design of Executive Compensation." *The University of Chicago Law Review* 69: 751-846.
- Benabou, Roland and Jean Tirole (2003). Intrinsic and Extrinsic Motivation. *The Review of Economic Studies* 70(3): 489-520.
- Bergstresser, Daniel and Thomas Philippon (2006). "CEO Incentives and Earnings Management." *Journal of Financial Economics* Vol. 80, Issue 3, pp. 511-529.
- Burns, N. and S. Kedia, (2006). "The Impact of Performance-Based Compensation on Misreporting." *Journal of Financial Economics*. Vol. 79, Issue 1, pp. 35-67.
- Choi, Stephen J. (2007). "Do the Merits Matter Less After the Private Securities Litigation Reform Act?" *Journal of Law, Economics, & Organization*. Vol. 23, No. 3, 598-626.
- Courty, Pascal and Gerald Marschke. (2004). "An Empirical Investigation of Gaming Responses to Explicit Performance Incentives." *Journal of Labor Economics*. vol. 22, no. 1, 23-56.
- Dechow, P. M., Sloan, R. and Sweeney, A. (1995). "Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC." *Contemporary Accounting Research* 13, pp. 1-36.
- DuCharme, L., P. Malatesta, and S. Sefcik (2004), "Earnings Management, Stock Issues, and Shareholder Lawsuits." *Journal of Financial Economics* 71, 27-49.
- Frey, Bruno S. and Felix Oberholzer-Gee (1997) The Cost of Price Incentives: An Empirical Analysis of Motivation Crowding-Out. *American Economic Review* 87(4): 746-55.
- Gibbons, Robert, and Kevin J. Murphy. (1992). "Optimal Incentive Contracts in the Presence of Career Concerns." *Journal of Political Economy* 100, 468-505.
- Gibbs, M. (1995). "Incentive Compensation in a Corporate Hierarchy." *Journal of Accounting and Economics* 19, 247-277.
- Graham, J. R., Harvey, C.R., and Rajgopal, S. (2005). "The Economic Implications of Corporate Financial Reporting." *Journal of Accounting and Economics* 40; 3-73.
- Healy, P. (1985), "The Effect of Bonus Schemes on Accounting Practices," *Journal of Accounting and Economics*, 7, 85-107.
- Heron, R.A, and E. Lie (2007), "Does Backdating Explain the Stock Price Pattern Around Executive Stock Option Grants?," *Journal of Financial Economics*, 83, 271-295.
- Holmström, Bengt, and Paul Milgrom. (1991). "Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design," *Journal of Law, Economics and Organization*, 7 (Special Issue), 24-52.

- Jensen, M. and W. Meckling. (1976). "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure." *Journal of Financial Economics* 3, 304-360.
- Jiang, John; Kathy R. Petroni and Isabel Yanyan Wang. (2010). "Cfos and Ceos: Who Have the Most Influence on Earnings Management?" *Journal of Financial Economics*, 96(3), 513-26.
- Johnson, Marilyn F., Karen K. Nelson, and A.C. Pritchard. (2007). "Do the Merits Matter More? The Impact of the Private Securities Litigation Reform Act." *Journal of Law, Economics, & Organization*, Vol. 23, No. 3, 627-652.
- Larkin, Ian. (2008). "The Cost of High-Powered Incentives: Employee Gaming in Enterprise Software Sales." Working Paper, *Harvard Business School*.
- McNeil, C., Niehaus, G. and Powers, E. (2004). "Management Turnover in Subsidiaries of Conglomerates versus Stand-alone Firms." *Journal of Financial Economics* 72, 63-96.
- Murphy, Kevin J., 1999, "Executive Compensation," in Orley Ashenfelter and David Card, editors, *Handbook of Labor Economics*, New York: North Holland, Volume 3, Chapter 38, pp. 2485-2563.
- Murphy, Kevin J., (2000), "Performance Standards in Incentive Contracts." *Journal of Accounting and Economics*, 30, p. 245-278.
- Oyer, Paul, (1998), "Fiscal Year Ends and Nonlinear Incentive Contracts: The Effect on Business Seasonality," *Quarterly Journal of Economics*, vol. 113, no. 1, pp. 149-85
- Peng, L. and A. Roell (2008), "Executive Pay and Shareholder Litigation." *Review of Finance*, 12(1): 141-184.
- Rajan, R. and J. Wulf (2006), "The Flattening Firm: Evidence from Panel Data on the Changing Nature of Corporate Hierarchies," *Review of Economics and Statistics*. Vol. 88, No. 4, pp. 759-773.
- Roychowdhury, Sugata (2006). "Earnings Management through Real Activities Manipulation." *Journal of Accounting and Economics*, Vol. 42, No. 3, pp. 335-370.
- Teoh, S. H., I. Welch and T. J. Wong (1998), "Earnings Management and the Underperformance of Seasoned Equity Offerings." *Journal of Financial Economics* 50, 63-99.
- Thurm, Scott (2006). "Extra Pay: Many CEOs Receive Dividends on 'Phantom' Stock." *The Wall Street Journal*. May 4, 2006. Page A1.
- Van den Steen, Eric (2010). "Interpersonal Authority in a Theory of the Firm." *American Economic Review* 100, no. 1, (March 2010): 466-490.
- Wulf, Julie (2007). "Authority, Risk and Performance Incentives: Evidence from Division Manager Positions Inside Firms." *Journal of Industrial Economics*, Vol. 55, Issue 1, pp. 169-196.

Table 1 – Hypotheses about the effect of performance pay on measures of earnings management

Discretionary current accruals (DCA) measure the portion of current accruals that is not explained by the firm's industry, the year and the change in sales the firm experienced (based on approach outlined in Teoh, Welch and Wong (1998)). Excess sales represents firm-specific fiscal revenue effects and is measured by how much firm sales change from the 3rd to the 4th quarter of the firm's fiscal year relative to industry peers. LTIP or long-term incentive plans include performance units, performance shares and phantom stock.

Pay Measure	Conditions	Dependent Variable	Hypothesis	Mechanism
Bonus	Increases in reported earnings lead to increased bonus payments	DCA, excess sales	$\beta > 0$	Executives advance the receipt of bonus payments
Stock options	Current grants	DCA, excess sales	$\beta < 0$	As options are granted at the money, expected new grants provide incentives to lower reported earnings
	Unvested grants	DCA, excess sales	$\beta = 0$	
	Vested grants	DCA, excess sales	$\beta > 0$	
Restricted stock and Long-Term Incentive Plans		DCA, excess sales	$\beta < 0$	Discourages manipulation that hurts long-run firm performance
			$\beta = 0$	No effect on purely transitory forms of earnings management
			$\beta > 0$	Encourages manipulation that leads to increases in dividend payouts

Table 2 - Summary Statistics

Discretionary current accruals (DCA) and discretionary long-term accruals (DLA) measure the portion of current and long-term accruals, respectively, that is not explained by the firm's industry, the year and the change in sales the firm experienced (based on approach outlined in Teoh, Welch and Wong (1998)). Excess 4th-quarter sales represent firm-specific fiscal revenue effects and are measured by how much firm sales change from the 3rd to the 4th quarter of the firm's fiscal year relative to industry peers. Lawsuits represent the incidence of at least one filing in a given year of a shareholder class action lawsuit reported by Stanford Securities Class Action Clearinghouse. Bonus represents bonus payouts. Stock option grants are valued using a modified version of Black-Scholes that takes into account vesting and termination provisions in addition to the standard variables of interest rates, stock price volatility, and dividends. As is standard practice among compensation consulting firms, restricted stock and the other components of long-term incentives plans (or LTIP which includes performance units, performance shares and phantom stock) are valued using an economic valuation similar to Black-Scholes that takes into account vesting, termination provisions, and the probability of achieving performance goals. Division manager pay statistics represent a weighted sum for the division managers in a firm-year using division sales as weights.

	Obs	mean	std. deviation	min	max
Discretionary current accruals (DCA)	2959	0.058638	0.04459	-0.15444	0.693385
Discretionary long-term accruals (DLA)	2958	0.058979	0.500698	-1.84432	3.128485
Excess 4 th -quarter sales	2547	0.023557	0.235624	-2.8612	2.530566
Lawsuits	3336	0.010192	0.100454	0	1
CEO (\$10 millions)					
Bonus	3343	0.051867	0.049301	0	0.315
Stock Options	3337	0.101697	0.212676	0	3.735
Restricted Stock	3337	0.014236	0.045806	0	0.753838
Long-Term Incentive Plan	3337	0.022019	0.047265	0	0.9867
Division Manager (\$10 millions—wtd. sum)					
Bonus	2341	0.040569	0.047952	0	0.500092
Stock Options	2193	0.049084	0.090156	0	1.266462
Restricted Stock	2193	0.006479	0.024355	0	0.667277
Long-Term Incentive Plan	2341	0.013525	0.043132	0	1.081285
CFO (\$10 millions)					
Bonus	2472	0.017122	0.018339	0	0.31
Stock Options	2472	0.031203	0.064218	0	1.10336
Restricted Stock	2472	0.003665	0.011685	0	0.199519
Long-Term Incentive Plan	2472	0.007303	0.015323	0	0.249853
# firms	367				

Table 3 – Effect of CEO performance pay on measures of earnings management

The sample includes only CEO pay components. Discretionary current accruals (DCA) measure the portion of current accruals that is not explained by the firm's industry, the year and the change in sales the firm experienced (based on approach outlined in Teoh, Welch and Wong (1998)). Excess 4th-quarter sales represents firm-specific fiscal revenue effects and is measured by how much firm sales change from the 3rd to the 4th quarter of the firm's fiscal year relative to industry peers. Lawsuits is an indicator variable representing the incidence of at least one filing in a given year of a shareholder class action lawsuit reported by Stanford Securities Class Action Clearinghouse. Pay variables are defined in detail in Table 2. All specifications include year fixed effects. OLS estimates and Firm Fixed Effects estimates for DCA models. Generalized Least Squares estimates for excess sales models; logit estimates for lawsuit models; robust standard errors clustered at the firm level in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

	(1) DCA-OLS	(2) DCA-OLS	(3) DCA-FE	(4) DCA-FE	(5) excess 4th- quarter sales	(6) excess 4th- quarter sales	(7) Lawsuit	(8) Lawsuit
Bonus		0.170*** (0.0390)		0.208*** (0.0295)		0.221* (0.116)		7.860*** (3.034)
Stock options	0.0146** (0.00643)	-0.00324 (0.00559)	0.00698 (0.00431)	-0.00654 (0.00464)	0.0683*** (0.0234)	0.0468* (0.0260)	0.998*** (0.335)	0.511 (0.391)
Restricted stock	0.000470 (0.0177)	-0.0266 (0.0172)	0.0272 (0.0228)	0.00578 (0.0205)	-0.221** (0.0933)	-0.256*** (0.0950)	1.973 (1.974)	0.698 (2.178)
Other Long-Term Incentive Plans	0.000333 (0.0325)	-0.0482 (0.0382)	0.0615* (0.0338)	0.0386 (0.0397)	0.0710 (0.0935)	0.0271 (0.0962)	1.548 (2.057)	-0.176 (2.444)
Constant	0.0613*** (0.00568)	0.0575*** (0.00566)	0.0646*** (0.00546)	0.0610*** (0.00537)	0.0272 (0.0207)	0.0217 (0.0208)	-23.91 (11508)	-23.60 (8898)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2954	2954	2954	2954	2544	2544	3331	3331
Number of firms			356	356	286	286	367	367
R-square	0.030	0.049	0.050	0.073
*** p<0.01, ** p<0.05, *p<0.1								
Robust Standard errors								

Table 4 – Effect of Division Managers performance pay on measures of earnings management

The sample includes only division manager pay components (weighted sum of division managers in firm-year). Discretionary current accruals (DCA) measure the portion of current accruals that is not explained by the firm's industry, the year and the change in sales the firm experienced (based on approach outlined in Teoh, Welch and Wong (1998)). Excess 4th-quarter sales represents firm-specific fiscal revenue effects and is measured by how much firm sales change from the 3rd to the 4th quarter of the firm's fiscal year relative to industry peers. Lawsuits is an indicator variable representing the incidence of at least one filing in a given year of a shareholder class action lawsuit reported by Stanford Securities Class Action Clearinghouse. Pay variables are defined in detail in Table 2. All specifications include year fixed effects. OLS estimates and Firm Fixed Effects estimates for DCA models. Generalized Least Squares estimates for excess sales models; logit estimates for lawsuit models; robust standard errors clustered at the firm level in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DCA-OLS	DCA-OLS	DCA-FE	DCA-FE	excess 4th- quarter sales	excess 4th- quarter sales	Lawsuit	Lawsuit
Bonus		0.0464 (0.0380)		0.0783** (0.0393)		0.223 (0.160)		3.227 (4.645)
Stock options	0.0473*** (0.0139)	0.0337** (0.0167)	0.0460*** (0.0145)	0.0280* (0.0153)	0.139** (0.0616)	0.0779 (0.0756)	2.356** (1.185)	1.676 (1.574)
Restricted stock	0.0774 (0.0783)	0.0600 (0.0776)	0.204 (0.165)	0.182 (0.160)	0.0808 (0.254)	0.000362 (0.260)	-15.42 (20.95)	-18.40 (22.20)
Other Long-Term Incentive Plans	0.0382 (0.0357)	0.0184 (0.0440)	0.0656*** (0.0221)	0.0340 (0.0344)	0.210* (0.116)	0.124 (0.132)	-10.28 (9.619)	-12.07 (10.05)
Constant	0.0515*** (0.00461)	0.0508*** (0.00448)	0.0459*** (0.00405)	0.0441*** (0.00397)	-0.0426* (0.0253)	-0.0459* (0.0254)	-4.054*** (0.827)	-4.097*** (0.832)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1947	1947	1947	1947	1800	1800	2193	2193
Number of firms			282	282	241	241	292	292
R-square	0.066	0.068	0.097	0.101				
*** p<0.01, ** p<0.05, *p<0.1								
Robust Standard errors								

Table 5 - Effect of CFO performance pay on measures of earnings management

The sample includes only CFO pay components. Discretionary current accruals (DCA) measure the portion of current accruals that is not explained by the firm's industry, the year and the change in sales the firm experienced (based on approach outlined in Teoh, Welch and Wong (1998)). Excess 4th-quarter sales represent firm-specific fiscal revenue effects and are measured by how much firm sales change from the 3rd to the 4th quarter of the firm's fiscal year relative to industry peers. Lawsuits is an indicator variable representing the incidence of at least one filing in a given year of a shareholder class action lawsuit reported by Stanford Securities Class Action Clearinghouse. Pay variables are defined in detail in Table 2. All specifications include year fixed effects. OLS estimates and Firm Fixed Effects estimates for DCA models. Generalized Least Squares estimates for excess sales models; logit estimates for lawsuit models; robust standard errors clustered at the firm level in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

	(1) DCA-OLS	(2) DCA-OLS	(3) DCA-FE	(4) DCA-FE	(5) excess 4th- quarter sales	(6) excess 4th- quarter sales	(7) Lawsuit	(8) Lawsuit
Bonus		0.282** (0.119)		0.480*** (0.130)		1.105*** (0.377)		16.75** (7.813)
Stock options	0.0616** (0.0302)	0.0351 (0.0256)	0.0207 (0.0192)	-0.00127 (0.0178)	0.337*** (0.0910)	0.245** (0.0960)	4.787*** (1.251)	4.206*** (1.289)
Restricted stock	-0.0180 (0.0655)	-0.0389 (0.0666)	0.0375 (0.0788)	-0.00802 (0.0794)	-0.0376 (0.445)	-0.210 (0.448)	4.902 (10.34)	-3.637 (14.81)
Other Long-Term Incentive Plans	-0.0137 (0.137)	-0.0926 (0.154)	0.288*** (0.107)	0.222** (0.110)	0.505 (0.355)	0.134 (0.376)	9.090 (6.335)	0.0936 (8.388)
Constant	0.0684*** (0.00427)	0.0657*** (0.00389)	0.0688*** (0.00358)	0.0644*** (0.00333)	0.0283 (0.0213)	0.0183 (0.0215)	-23.72 (9713)	-24.80 (14940)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2034	2034	2034	2034	1748	1748	2321	2321
Number of firms			339	339	276	276	355	355
R-square	0.034	0.040	0.061	0.076				
*** p<0.01, ** p<0.05, *p<0.1								
Robust Standard errors								

Table 6 – Effect of CEO, Division Managers, and CFO performance pay on measures of earnings management

The sample includes CEO, division manager, and CFO pay components. Discretionary current accruals (DCA) measure the portion of current accruals that is not explained by the firm's industry, the year and the change in sales the firm experienced (based on approach outlined in Teoh, Welch and Wong (1998)). Excess 4th-quarter sales represent firm-specific fiscal revenue effects and are measured by how much firm sales change from the 3rd to the 4th quarter of the firm's fiscal year relative to industry peers. Lawsuits is an indicator variable representing the incidence of at least one filing in a given year of a shareholder class action lawsuit reported by Stanford Securities Class Action Clearinghouse. Pay variables are defined in detail in Table 2. All specifications include year fixed effects. OLS estimates and Firm Fixed Effects estimates for DCA models. Generalized Least Squares estimates for excess sales models; logit estimates for lawsuit models; robust standard errors clustered at the firm level in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.

	(1) DCA-OLS	(2) DCA-OLS	(3) DCA-FE	(4) DCA-FE	(5) excess 4th- quarter sales	(6) excess 4th- quarter sales	(7) Lawsuit	(8) Lawsuit
CEO Bonus		0.132*** (0.0448)		0.0863* (0.0440)		-0.0321 (0.206)		4.948 (5.146)
CEO Stock Options	0.0142 (0.0156)	0.00625 (0.0164)	-0.0138 (0.0115)	-0.0203* (0.0117)	-0.0296 (0.0507)	-0.0337 (0.0542)	0.271 (0.905)	0.219 (0.964)
CEO Restricted Stock	-0.00428 (0.0346)	-0.0242 (0.0331)	0.0184 (0.0361)	0.00700 (0.0361)	-0.0754 (0.183)	-0.0741 (0.185)	5.473 (4.743)	3.779 (5.105)
CEO Other Long-Term Incentive Plan	-0.0265 (0.0299)	-0.0695* (0.0362)	-0.0110 (0.0313)	-0.0290 (0.0335)	0.0141 (0.188)	0.0370 (0.190)	-6.286 (8.035)	-6.478 (7.969)
DM Bonus		0.0160 (0.0479)		-0.00513 (0.0441)		0.183 (0.210)		6.901 (5.474)
DM Stock Options	0.0304 (0.0195)	0.0190 (0.0229)	0.0500** (0.0193)	0.0501*** (0.0187)	-0.0109 (0.0817)	-0.0821 (0.104)	1.543 (1.717)	-0.782 (2.386)
DM Restricted Stock	0.0855 (0.130)	0.0848 (0.127)	0.256 (0.248)	0.273 (0.237)	0.653* (0.345)	0.564 (0.357)	-16.40 (21.68)	-18.37 (23.18)
CEO Other Long-Term Incentive Plan	0.102** (0.0491)	0.105* (0.0595)	0.0622* (0.0376)	0.0761 (0.0474)	0.116 (0.153)	0.0694 (0.172)	-10.65 (11.16)	-14.07 (11.83)
CFO Bonus		-0.190 (0.143)		0.320** (0.155)		1.171* (0.698)		7.290 (17.73)
CFO Stock Options	-0.0277 (0.0351)	-0.0212 (0.0341)	0.0510 (0.0405)	0.0364 (0.0379)	0.539*** (0.178)	0.512*** (0.180)	3.527 (2.730)	3.684 (2.770)
CFO Restricted Stock	-0.0805 (0.141)	-0.0540 (0.143)	-0.0846 (0.178)	-0.120 (0.172)	-0.439 (0.865)	-0.423 (0.865)	-11.28 (32.70)	-9.566 (34.04)
CFO Other Long-Term Incentive Plan	-0.171 (0.162)	-0.126 (0.186)	0.199 (0.133)	0.166 (0.147)	0.0657 (0.789)	-0.159 (0.799)	38.16* (21.31)	35.99* (21.47)
Constant	0.0535*** (0.00610)	0.0517*** (0.00613)	0.0447*** (0.00407)	0.0378*** (0.00423)	-0.0644** (0.0294)	-0.0893*** (0.0308)	-5.249*** (1.210)	-5.893*** (1.307)
Observations	1411	1411	1411	1411	1284	1284	1591	1591
Number of firms			261	261	226	226	275	275
R-squared	0.069	0.080	0.111	0.133				
Robust standard errors								

*** p<0.01, ** p<0.05, * p<0.1

Appendix A: Sample Representativeness

We evaluate the representativeness of the sample by comparing key financial measures of the survey participants to a matched sample from Compustat. We begin by matching each firm in our sample to the Compustat firm that is closest in sales within its two-digit SIC industry in the year the firm joins the sample. We then perform Wilcoxon signed rank tests to compare the sample firms with the matched firms. While the firms in the dataset are, on average, slightly larger in sales than the matched sample, we found no statistically significant difference in employment and profitability (return on sales).⁸ We also found no statistically significant difference in sales growth, employment growth, or annual changes in profitability for all sample years. In sum, while the sample firms are larger (measured by sales) on average than the matched sample, there is little additional evidence that these firms are not representative of the population of industrial firms that are leaders in their sectors.

We also calculate financial measures for the sample of Compustat firms with 10,000 employees or greater over the period from 1986 to 1999 (excluding firms operating in financial services). We find that, on average, survey participants are more profitable, but growing at a slower rate relative to the sample of large Compustat firms. Specifically, the sample average return on sales for survey participants is 17.8% versus 15.7% for the sample of large Compustat firms and the average sales growth is 5.7% vs. 7.4%. This is consistent with the observation that the firms in the sample are likely to be industry leaders (hence slightly more profitable) and also large (hence the slightly slower growth). To sum up, the survey sample is probably most representative of Fortune 500 firms.

⁸ The sample firms are larger in sales than the matched sample of firms because in a number of the cases, the sample firm is the largest firm in the industry thus forcing us to select a matched firm smaller in size.