

Outside Directors' Equity-based Compensation and Earnings Management

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Abstract

We examine the impact of equity-based compensation for outside directors on the board's monitoring effectiveness over the financial reporting process as reflected in the extent of earnings management. Based on a sample of S&P 1500 firms, we find that stock option incentives for outside directors are negatively associated with the likelihood of firm meeting/beating earnings benchmarks and the level of abnormal accruals. Moreover, the deterrence effect on earnings management is driven by the option incentive component predicted by firm-specific economic determinants. Finally, we find little evidence that outside directors exploit manipulated earnings in trading shares and granting stock options. The overall evidence suggests that stock option compensation in director pay improves board oversight of the financial reporting process and reduces earnings management.

Keywords: Director compensation; Equity incentives; Earnings management; Insider trading.

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I. INTRODUCTION

The past two decades have witnessed a rapid growth of option-based and stock-based compensation for corporate directors. According to Executive Compensation Reports, only about 1.6% of the 1,000 largest companies in the US offered equity-based compensation for directors in 1983, but by 1994, about 20% of firms did. Another survey conducted by Mercer Human Resource Consulting of 350 major companies reports that about 50% of firms offered stock options to directors in 1996, and about 80% did so in 2001 (Lublin and Bulkeley 2006). Similar to executive pay, outside director equity-based compensation has been a subject of heated debate, triggered by an unprecedented number of accounting and governance scandals in recent years. In this study, we examine how equity-based compensation for outside directors affects the board's monitoring effectiveness over the financial reporting process as reflected in the extent of earnings management.¹

Boards of directors serve as an important mechanism to monitor senior management and reduce agency costs arising from the separation of ownership and control (Fama and Jensen 1983). Among other tasks, boards are responsible for overseeing firm accounting, auditing and internal control to ensure the integrity of financial reports. Board compensation, particularly performance-based compensation, can influence directors' monitoring incentives. There are two competing views regarding the impact of equity-based compensation on directors' monitoring effectiveness. Firms that rely on options and stocks to compensate outside directors argue that exposing directors' wealth to the firm's stock price is an effective way to align directors'

¹ We define outside directors as board members who are not employed by the firm and have no other potential conflicts of interests stemming from business and family relationships or interlocking board memberships.

interests with those of shareholders. Some institutional investors and shareholder activists also advocate performance-based compensation such as option and stock awards for directors. Supporting this view, Yermack (2004) and Bryan and Klein (2004) show that the cross-sectional patterns of stock and option awards to outside directors conform to agency and contracting theories. In addition, Fich and Shivdasani (2005) and Becher et al. (2005) find that equity-based compensation for outside directors increases shareholder value. If equity-based compensation motivates outside directors to more effectively monitor executives and deter managerial opportunism, then greater equity incentives for outside directors would reduce opportunities for manipulation of accounting information and improve the integrity of financial reports.

On the other hand, in the aftermath of the accounting and governance scandals, some critics contend that equity-based compensation compromises directors' independence in overseeing corporate financial reporting. Outside directors may not directly involve in earnings manipulation, but some of them may know and choose to go along with such activities when they also benefit from manipulated earnings. For example, a *Wall Street Journal* article reports that "critics have claimed directors, motivated to boost returns on their stock options, turned a blind eye to problems" for firms with accounting irregularities including Enron and WorldCom (Lublin and Bulkeley 2006). *The New York Times* reports that in 2001, Enron's board received the seventh highest director compensation in the country with the majority of pays coming from options and stocks (Abelson 2001). The article also cites lawsuits accusing Enron's outside directors of selling large quantities of shares in the three years prior to the fall of the company. The view expressed in these business press articles implies a positive relation between equity incentives for outside directors and the extent of earnings management.

In this study, we examine the above two conflicting views by investigating the association between outside directors' equity incentives from option and stock holdings and the extent of earnings management. We find that firms of which outside directors have greater stock option incentives are less likely to report earnings that meet or just beat analysts' forecasts and are less likely to consistently meet or beat analysts' forecasts over consecutive quarters. In addition, stock option incentives for outside directors are negatively associated with both the level of abnormal accruals and the likelihood of reporting income-increasing abnormal accruals. We next model option incentives as a function of firm-specific economic determinants and decompose option incentives into the predicted and residual components. We find that the component predicted by economic determinants, not the residual value, is responsible for the deterrence of earnings management. Overall, the evidence suggests that stock option compensation improves outside directors' monitoring effectiveness in reducing opportunistic financial reporting behavior. On the other hand, we do not find consistent evidence that outside directors' stock holdings are associated with the extent to which their firms engage in earnings management.

To corroborate our main findings, we examine outside directors' stock trading activities. Bergstresser and Philippon (2006) and Cheng and Warfield (2005) find that CEOs sell more shares in periods of large income-increasing abnormal accruals or in periods of meeting or beating analysts' forecasts, especially when CEOs hold large equity holdings. These findings support their conclusion that equity incentives induce CEOs to manage earnings in order to realize greater profits from trading their options and stocks. However, given our main findings that directors' equity incentives improve, rather than impair, the oversight of financial reporting, we do not expect outside directors' trading activities to be associated with the extent of earnings

manipulation. Consistent with our expectation, we do not find a significant association between outside directors' stock sales and the extent of earnings management. We also find no evidence that outside directors receive more stock option grants in periods of missing analysts' earnings forecasts or in periods of large income-decreasing abnormal accruals, suggesting that outside directors do not grant options opportunistically in periods with earnings management activities that can potentially deflate stock prices.

It is important to discuss the potential endogeneity problem in our analyses because boards of directors generally set their own pay packages (Bryan and Klein 2004). Thus, some common factors might cause directors to be better monitors and to adopt more equity-based compensation. For example, Ryan and Wiggins (2004) argue that more independent boards have greater bargaining power over the CEOs, which leads to more performance-based pay providing better alignment of directors' and shareholders' interests. Consistent with their expectation, they find that more independent boards use more options and stocks to compensate directors. However, more independent boards are also more effective in deterring earnings management and accounting frauds (Klein 2002; Dechow et al. 1996; Beasley 1996). To rule out the possibility that board independence is driving our results, we control for six governance characteristics in our analyses, including G-index, the percentage of inside directors on the board, CEO and board chair duality, the percentage of outside directors sitting on more than two boards, board size, and CEO tenure. Our results are robust to including these governance attributes and other control variables such as CEO equity incentives and related firm characteristics.²

² Another potential endogeneity problem is that earnings management may be more prevalent in firms with greater monitoring difficulties, and firms with greater monitoring difficulties are likely to use more equity-based compensation for directors (Demsetz and Lehn 1995; Smith and Watts 1992). However, this problem would bias

Our study contributes to the literature by providing new evidence that director compensation is an important element of effective governance. Prior studies have examined the role of boards of directors in the oversight of financial reporting, but the focus has primarily been on the composition of the board. Klein (2002) finds that more independent boards and audit committees are associated with a smaller magnitude of abnormal accruals. Several studies investigate the relation between board characteristics and the incidence of accounting restatements or SEC Accounting and Auditing Enforcement Releases for alleged accounting frauds (Beasley 1996; Dechow et al. 1996; Abbott et al. 2003; Agrawal and Chadha 2005; Farber 2005; Baber et al. 2006). Ahmed and Duellman (2007) examine the relation between board characteristics and accounting conservatism. Some of these studies examine outside directors' stock ownership as one of the governance attributes and find mixed results (see Section 2 for a detailed discussion). Stock options represent the largest component of director compensation in recent years and serve as an important source of equity incentives for outside directors. However, none of the above studies examine outside directors' stock option holdings arising from director compensation. Our study fills this void.

Another stream of literature investigates the link between equity-based compensation for CEOs and earnings manipulation. Bergstresser and Philippon (2006), Cheng and Warfield (2005), Ke (2005), and Burns and Kedia (2006) provide empirical evidence that CEOs with higher equity incentives are more likely to manipulate earnings to increase the value of their options and stocks. Erickson et al. (2006), however, fail to find an association between CEO equity incentives and accounting fraud. Our results stand in contrast to the evidence in these studies regarding equity incentives and earnings management. Outside directors likely face

against finding a negative relation between outside directors' equity incentives and earnings management, which we document in this study.

different incentive mechanisms from CEOs. Fama and Jensen (1983) argue that reputation is the primary incentive for outside directors. Consistent with the notion that outside directors bear reputation costs for financial reporting failures, Srinivasan (2005) finds outside directors experience a higher turnover rate and are more likely to lose their seats on other boards after their companies disclose accounting irregularities that lead to earnings restatements. Moreover, Yermack (2004) shows that equity incentives for outside directors are on average lower than equity incentives for executives. Thus, relative to CEOs, outside directors likely have a greater concern for reputation costs and a smaller gain from temporarily inflated stock prices. These factors might explain why stock option compensation for outside directors helps align directors' interests with the long-term interests of shareholders, but the enormous size of stock option compensation for some executives appears to motivate them to focus on short-term gains from inflated stock prices.

Our study also adds to the growing evidence on the economic consequences of director compensation. Some critics allege that director pay is too inconsequential to have a significant impact on directors' actions. Our results do not support this claim. Bryan and Klein (2004), Fich and Shivdasani (2005), and Becher et al. (2005) find a positive relation between outside directors' stock option compensation and firm performance. We add to these studies by showing that stock option compensation improves outside directors' monitoring effectiveness over the financial reporting process. Furthermore, our study has implications for corporate decisions regarding the structure of director compensation. In recent years, some firms (e.g., General Electric and IBM) have eliminated stock option grants for directors in part due to the negative sentiment associated with stock options after the wave of accounting and governance scandals. Our results suggest that eliminating director stock options may not reduce opportunistic financial

reporting behavior. In contrast, director stock option compensation plays a positive role in maintaining the integrity of financial reports.

The remainder of the paper is organized as follows. In the next section we discuss related research on equity-based compensation and earnings management. Section 3 describes variable measurements and the sample. Section 4 presents empirical tests and findings. We summarize and conclude the paper in Section 5.

II. RELATED RESEARCH

The rise of equity-based compensation for directors parallels with the rapid growth of equity-based compensation for executives in the past two decades. Jensen (1993) argues that directors with greater equity ownership are more effective monitors. Equity-based compensation has been advocated as a tool to align outside directors' interests with those of shareholders, thereby motivating outside directors to diligently monitor executives to protect shareholder interests and enhance firm value.³ Supporting this view, Perry (1999) finds that greater incentive pay for outside directors is linked to a higher likelihood of CEO turnover following poor firm performance. Fich and Shivdasani (2005) find that the presence of a stock option plan for outside directors is positively related to firm value, and the market reacts favorably to adoption announcements of director stock option plans. In addition, Bryan and Klein (2004) find that the importance of stock options in director pay is positively related to future investment and firm performance. In the banking industry, Becher et al. (2005) show that the increase in the use of equity-based compensation for directors is associated with improved accounting profitability.

³ There are mechanisms other than equity-based compensation to motivate outside directors to monitor executives. Yermack (2004) examines incentives received by outside directors from compensation, replacement, and the opportunity to obtain other board seats. He finds these mechanisms provide nontrivial sensitivities of director wealth to firm performance with half of the sensitivities coming from equity-based compensation.

On the other hand, several studies suggest that equity-based compensation induces some agency conflicts between shareholders and outside directors. Brick et al. (2005) find that excess compensation for directors and executives are related and that both are associated with weaker future firm performance, consistent with the notion of “mutual back scratching” or cronyism. Bebchuk et al. (2006) find that a large number of outside directors’ option grants are likely to have been backdated, suggesting the recent option backdating scandal might involve outside directors in addition to executives. Moreover, Byard and Li (2005) find a positive relation between the importance of stock options in director pay and the extent of executives receiving options right before stock price rises and/or after stock price drops. Their finding suggests that when directors receive a greater proportion of their pay from stock options, they are less likely to constrain executives’ opportunistic timing of stock option grants at unusually low stock prices.

The influence of outside directors’ equity incentives on earnings management is thus *ex ante* ambiguous given these mixed findings on equity-based compensation for outside directors. Prior studies have examined various board characteristics in relation to the quality of firms’ financial reporting, but none considers the effect of equity-based compensation for outside directors. Klein (2002) finds that more independent boards and audit committees are associated with a smaller magnitude of abnormal accruals, suggesting that outside directors are more effective in limiting earnings management activities. Other studies, including Beasley (1996), Dechow et al. (1996), Abbott et al. (2003), Agrawal and Chadha (2005), Farber (2005), and Baber et al. (2006), examine whether certain corporate governance weaknesses are associated with the occurrence of accounting restatements and accounting frauds.⁴ Moreover, Ahmed and

⁴ These studies find mixed results regarding the specific corporate governance mechanisms that are important to prevent accounting restatements and/or accounting frauds. For example, Dechow et al. (1996), Beasley (1996) and Farber (2005) find that firms accused of accounting frauds have a greater proportion of inside directors on the boards. However, Agrawal and Chadha (2005) and Baber et al. (2006) find no significant association between board

Duellman (2007) show that stronger corporate governance is linked to a greater degree of accounting conservatism.

In some of the above studies (Beasley 1996; Abbott et al. 2003; Baber et al. 2006; Ahmed and Duellman 2007), outside directors' stock ownership is one of the governance attributes examined and the results are mixed. Beasley (1996) finds that firms accused of financial statement frauds have lower outside director ownership in the firm. However, Abbott et al. (2003) and Baber et al. (2006) find no significant relation between director stock ownership and the occurrence of financial statement restatements. Ahmed and Duellman (2007) find that outside director stock ownership is positively related to accounting conservatism. We extend these studies by examining the relation between outside directors' stock incentives and earnings manipulation as manifested in earnings benchmark meeting/beating behavior and accruals management. More importantly, outside directors' option holdings arising from option-based compensation is an important source of equity incentives that has not been examined in prior studies. We thus add to the literature by examining whether outside directors' option and stock incentives improve or impair their monitoring effectiveness over the financial reporting process.

In contrast to the sparse evidence on the relation between outside directors' equity-based compensation and earnings management, recent research provides extensive evidence regarding CEOs' equity incentives and their opportunism in financial reporting. Bergstresser and Philippon (2006), Cheng and Warfield (2005), and Ke (2005) show that CEOs with greater equity incentives more aggressively manipulate earnings to increase the value of their stocks and

independence and accounting restatements. Dechow et al. (1996) find the presence of an audit committee reduces the likelihood of fraud, but Beasley (1996) finds no such evidence. Other evidence includes: restatement firms have less independent audit committees that meet less often (Abbott et al. 2003) and are less likely to have a financial expert on the audit committee (Agrawal and Chadha 2005); Fraud firms have lower outside director ownership and more busy directors (Beasley 1996) and are more likely to have CEO/Chair duality, CEO being the founder and fewer outside blockholders (Dechow et al. 1996).

options. Burns and Kedia (2006) examine whether stock option compensation for CEOs increases the likelihood of earnings restatements and find a significantly positive link between CEO option incentives and earnings restatements. On the other hand, Erickson et al. (2006) find no consistent evidence that executive equity incentives are associated with accounting frauds based on the SEC Accounting and Auditing Enforcement Releases. With the exception of the last paper, the evidence generally supports the view that equity-based compensation generates incentives for executives to manage earnings to increase their personal wealth.⁵ In contrast, our results suggest that option and stock incentives do not induce outside directors to behave opportunistically in their oversight of the corporate financial reporting process.

III. EMPIRICAL MEASURES, SAMPLE SELECTION, AND DESCRIPTIVE STATISTICS

Option and stock incentives for outside directors

We utilize the Standard & Poor's ExecuComp database to estimate outside directors' option incentives and the Investor Responsibility Research Center (IRRC) database to measure outside directors' stock incentives. Following Jensen and Murphy (1990) and Yermack (1995), we measure stock option incentives as the change in the value of stock options for a dollar change in firm value. This measure is obtained by multiplying the option delta with the ratio of stock options held by each outside director to total shares outstanding. Execucomp provides information on annual stock option grants, but not stock option holdings, for each outside

⁵ Warfield et al. (1995) find a negative association between the magnitude of abnormal accruals and insider stock ownership (including executives, directors and large shareholders), consistent with the incentive alignment role of stock incentives. However, Warfield et al. (1995) examine an earlier time period (1988-1990) that precedes the rapid growth of equity-based compensation in the 1990s, and do not separately examine the impact of directors' and executives' stock ownership on abnormal accruals.

director. To estimate the number of stock options held by each outside director, we cumulate the annual stock option grants over the prior four years and the current year.⁶ Based on the Black-Scholes option pricing formula, the option delta is calculated as $e^{-dT}\Phi(Z)$, where $Z = [\text{Ln}(S/X) + T(r-d + 0.5\sigma^2)] / [\sigma T^{1/2}]$ and Φ is the cumulative distribution function of the standard normal distribution. The stock price (S) is measured at the end of the current year, and the exercise price (X) is set to be the average price over the year of the grant. The return volatility (σ) is estimated over the prior 60 months, and the dividend yield (d) is averaged over the prior three years, both provide by ExecuComp. The risk free rate (r) is the treasury T-bill rate obtained from the Federal Reserve Board. Consistent with the prevailing practice, we assume director stock option grants have a ten-year maturity life (T) upon grant. The deltas and the corresponding option incentive measures are estimated separately for stock options granted in each of the previous four years and the current year, and are then summed to obtain total stock option incentives for each outside director.

We measure stock incentives as the change in the value of stocks for a dollar change in firm value. Assuming a one-to-one change in the value of stocks for a change in stock price (i.e., delta = 1), outside directors' stock incentives are estimated as the number of shares held by each outside director divided by total shares outstanding. The number of shares held by each outside

⁶ Our estimation of director stock option holdings assumes that (1) outside directors do not exercise newly granted stock options within the initial five years, and (2) the average tenure of outside directors is at least five years. In practice, most stock option grants are vested within 3-5 years. As a robustness check, we also compute a weighted sum of the five-year stock option grants by assuming director option grants are vested and exercised ratably over five years. Results based on this alternative measure of director option holdings are qualitatively the same as results reported in the paper. Moreover, it is reasonable to expect a relatively low turnover rate among outside directors. Based on a sample of Fortune 500 firms, Yermack (2004) finds that the average turnover rate for all directors is 4.6% per year.

director is estimated as the average stock holdings by outside directors based on director stock holdings data from the IRRC database.⁷

Because our objective is to examine how outside directors' option and stock incentives affect their monitoring effectiveness of the financial reporting process, we measure outside directors' option and stock incentives at the end of year t , and firms' earnings management activities during year $t+1$. We next turn to our proxies for earnings management.

Earnings management proxies

We use two complementary approaches to identify earnings management. First, we identify earnings management based on earnings benchmark meeting/beating behavior. Recent research documents a disproportionate likelihood of meeting or just beating analysts' forecasts, consistent with firms engaging in earnings management to meet or beat analysts' forecasts (e.g., Degeorge et al. 1999). Moreover, Bartov et al. (2002) and Kasznik and McNichols (2002) show that the price premium associated with earnings benchmark meeting/beating is more pronounced for firms that *consistently* meet or beat analysts' forecasts. Thus, managers may have incentives to manipulate earnings to consistently meet or beat analysts' forecasts. We thus identify two sets of firms that potentially engage in earnings manipulation: (1) firms that consistently meet or beat analysts' consensus forecasts over all four quarters in year $t+1$; (2) firms that meet or beat analysts' consensus forecasts by less than 2¢ over one or more quarters in year $t+1$. Using IBES data, we measure analysts' consensus forecasts as the median of individual analysts' earnings forecasts issued over the 30 days prior to the announcement of quarterly earnings.

⁷ We exclude employee (i.e., inside) directors and affiliated directors in calculating outside directors' stock ownership. In IRRC, a director is defined as affiliated if he/she is a former employee; is an employee of a significant service provider, supplier or customer; is a recipient of charitable funds; is an interlocking director; or is a family member of an executive officer.

Our second approach relies on associations between accruals and accounting fundamentals to decompose total accruals into systematic, or normal, component and unsystematic, or abnormal, component. Specifically, we use the cross-sectional Jones (1991) model as described in DeFond and Jiambalvo (1994) to estimate the abnormal component of accruals. The following regression is estimated within each Fama-French 48 industry (excluding financial and utility industries), requiring at least 20 observations in each industry for each year:

$$TA_{t+1}/ASSET_t = a_0 + a_1(1/ASSET_t) + a_2(\Delta SALE_{t+1}/ASSET_t) + a_3(PPE_{t+1}/ASSET_t) + \varepsilon_{t+1}, \quad (1)$$

where TA is total accruals measured as income before extraordinary items (Compustat #123) minus operating cash flow (#308) following Hribar and Collins (2002); $ASSET$ is total assets (#6); $\Delta SALE$ is change in sales (#12); and PPE is gross property, plant, and equipment (#7). While the original Jones model does not include a constant term (a_0), we include a constant in the estimation to mitigate heteroskedasticity and model misspecification (Kothari et al. 2005). The proxy for earnings management, *Abnormal Accrual*, is then estimated as the residuals from the above cross-sectional regression.⁸ Positive (negative) *Abnormal Accrual* indicates income-increasing (income-decreasing) earnings management. Consistent with Cheng and Warfield (2005), we use the signed value of abnormal accruals in our analyses because equity incentives have been alleged to create incentives to inflate earnings for the purpose of boosting stock trading profits. We also create a dummy variable that equals 1 for positive abnormal accruals and 0 otherwise. The advantage of this dichotomous measure of accrual management is that it does not impose a linear relation between abnormal accruals and outside director's equity incentives.

⁸ Our results are qualitatively the same if we exclude the constant term in the estimation, or use a version of the Modified Jones (1991) model by subtracting the change in accounts receivables from the change in sales in the estimation, or use performance-matched abnormal accruals constructed following Kothari et al. (2005).

Control variables

In examining the relation between outside directors' equity incentives and earnings management, we control for various corporate governance variables and firm characteristics. Ryan and Wiggins (2004) find that more independent boards use more equity-based compensation for outside directors. Moreover, prior studies suggest that stronger governance mechanisms provide more effective monitoring over the financial reporting process (e.g., Klein 2002; Beasley 1996; Dechow et al. 1996; Abbott et al. 2003). Thus, it is important to control for governance attributes that might affect the tendency to use equity-based compensation for outside directors as well as the extent of earnings management. We construct six governance variables based on the IRRC database to capture the strength of corporate governance: (1) G-index as developed in Gompers, Ishii, and Metrick (2003), which is a summary measure of corporate governance based on 24 firm-specific anti-takeover and charter provisions; (2) the percentage of insiders on the board; (3) CEO serving as chairman of the board; (4) Busy directors, calculated as the percentage of outside directors holding an additional directorship in other firms; (5) Board size, calculated as the number of directors on the board; and (6) CEO tenure, calculated as the number of years that the CEO has served for the firm. We expect stronger governance, as indicated by lower G-index, fewer insiders on the board, and separation of CEO from the chairman position, to reduce earnings management. We have no predictions regarding the percentage of busy directors (i.e., directors holding additional directorships) and board size. Although additional outside directorships may signal a director's reputation and monitoring expertise (Fama and Jensen 1983), additional directorships may also decrease the amount of time allocated to each firm by the director and may result in inadequate monitoring (Beasley 1996). There are also competing views about the effect of board size. Larger boards

may face a greater coordination problem and may result in greater CEO power (Jensen 1993), but larger boards allow directors to specialize, which can lead to more effective monitoring. Finally, we control for CEO tenure because CEOs with longer tenure likely have accumulated greater power over other directors and hence have greater ability to thwart board monitoring of the financial reporting process.

Recent research finds that higher CEO equity incentives are associated with greater earnings management and a higher likelihood of accounting restatements (Bergstresser and Philippon 2006; Cheng and Warfield 2005; Ke 2005; Burns and Kedia 2006). Moreover, equity-based compensation for CEOs and outside directors are likely correlated because they share similar economic determinants (Yermack 2004; Bryan and Klein 2004). Thus, it is important to control for CEO equity incentives in our analyses. We measure CEO option and stock incentives in a similar manner to director option and stock incentives. Specifically, CEO stock option incentives are calculated as the option delta times the ratio of option holdings to total shares outstanding. Following Core and Guay (2002), we separately estimate the option delta for CEOs' new option grants, exercisable option holdings, and unexercisable option holdings using the Black-Scholes formula.⁹ We then sum the incentive measures from each component of the CEO's option holdings to obtain total stock option incentives. CEO stock incentives are calculated as the percentage of shares outstanding owned by the CEO.

We also control for several firm characteristics that relate to earnings management as documented in prior research. Prior studies suggest that firms manage earnings to decrease

⁹ As ExecuComp does not provide detailed information on CEOs' option holdings, Core and Guay (2002) make several assumptions about the expiration periods and exercise prices for exercisable and unexercisable option holdings in their estimation of CEO option incentives. Specifically, the expiration period for unexercisable option holdings is calculated as the expiration period of the most recent option grants minus one year. The expiration period for exercisable option holdings is estimated as the expiration period for unexercisable option holdings minus three years. Exercise prices are calculated as the price at fiscal year-end minus the profit per option, where profit per option is estimated as the realizable value of options divided by the number of options at fiscal year-end.

political costs and to avoid debt covenants violation (e.g., Watts and Zimmerman 1978 and 1990; DeFond and Jiambalvo 1994). We thus include firm size to proxy for political costs and book leverage to proxy for the closeness to debt covenant violation. We measure firm size as the logarithm of market value of equity and book leverage as the ratio of long-term debt over shareholders' equity. We also control for return-on-asset, measured as income before extraordinary items divided by lagged assets, since prior research shows that abnormal accrual models may not completely extract normal or non-discretionary accruals that are correlated with firm performance (e.g., Dechow et al. 1995; Kothari et al. 2005). In addition, we control for growth potential, estimated as the book-to-market ratio, since growth firms may be more concerned about missing earnings benchmarks (e.g., Matsumoto 2002). Firms with high net operating assets may have limited flexibility in managing earnings upward (Barton and Simko 2002). Thus, we also control for net operating assets, measured as shareholders' equity minus cash and marketable securities plus total debt scaled by lagged assets. Finally, as litigation risk might offset the incentives to manipulate earnings, we include an industry-based litigation dummy variable to control for litigation risk. Following Cheng and Warfield (2005), we define the litigation dummy variable as one if the firm is in one of the following industries: pharmaceutical/biotechnology (SIC codes 2833-2836, 8731-8734), computer (3570-3577, 7370-7374), electronics (3600-3674), or retail (5200-5961), and zero otherwise.

Description of the sample

The initial sample includes all firm-years with available information on director stock option compensation from ExecuComp and director stock holdings from IRRC for the period 1997-2003. We exclude financial industry (SICs between 6000-6999) and utility industry (SICs

between 4400 and 5000) because disclosure requirements and accounting rules are significantly different for these regulated industries. We then require available data from Compustat to estimate next year's abnormal accruals, which results in 5,648 firm-year observations. Requiring IBES analyst forecast data (issued within 30 days prior to quarterly earnings announcements) further reduces sample size to 2,734 firm-years. The final sample used for specific analyses varies due to additional requirements of governance data and related firm characteristics.

Table 1 reports descriptive statistics of the sample. Panel A summarizes director annual compensation, including cash retainers, meeting fees, stock options and restricted stocks.¹⁰ Stock options represent the largest component in director annual pay, ranging from 34.74% to 46.04% of total pay. The proportion of stock options in director compensation increases steadily from 1997 to 2001, and then slightly drops after 2001. Stocks comprise a smaller fraction of director annual pay, ranging from 10.40% to 12.64%. Panel B reports equity incentives for outside directors based on their option and stock holdings. On average, the value of outside directors' option (stock) holdings increases by \$0.292 (\$2.273) per \$1,000 increase in firm value. The change in the value of option holdings due to a \$1,000 change in firm value increases from \$0.258 in 1997 to \$0.403 in 2003, and the change in the value of stock holdings due to the same change in firm value is \$2.325 in 1998, peaks at \$2.656 in 2000, and then drops to \$2.220 in 2003.¹¹ Panel B also reveals that the average value of director option (stock) holdings amounts

¹⁰ ExecuComp provides the number of options and stocks granted to each outside director but does not provide their dollar values. We calculate the value of stock option grants based on the Black-Scholes formula. The assumptions are the same as those discussed in Section 3.1, except that stock price (S) is set to be the same as exercise price (X) because we assume options are granted at-the-money. The value of stock grants is obtained by multiplying the number of stocks by the average stock price over the year of grant.

¹¹ The mean and median values of stock holdings by outside directors for the year 1997 should be interpreted with caution. IRR database reports the *number* of shares held by each director (SHARESHELD) and the *percentage* of shares outstanding owned by each director (STKHOLDING). However, when a director owns less than 1% of shares outstanding, IRR reports 0% for STKHOLDING. In such cases, we compute ownership based on SHARESHELD (if not missing) divided by total shares outstanding. For 1997, the variable SHARESHELD is

to \$270,130 (\$6,836,129). The large stock holdings (relative to option holdings) for outside directors are partly due to the presence of large shareholders serving as outside directors. Untabulated results show that 748 (13%) firm-years have at least one outside director owning 5% or more of shares outstanding. For these 748 firm-years, the average stock holdings for each outside director amount to \$36,196,221. For the remaining 4,900 (87%) firm-years that have no blockholders on the board, the average stock holdings for each outside director are substantially lower (\$2,354,221).

Table 2 Panel A reports summary statistics of variables used in the main analyses. As shown, the mean (median) abnormal accruals are -0.015 (-0.010). The benchmark meeting/beating behavior appears prevalent in our sample with about 31% of firm-years consistently meeting or beating analysts' consensus forecasts over all four quarters of year $t+1$. An even higher proportion of firm-years (72%) meets or beats analysts' consensus forecasts by less than 2¢ over at least one quarter during year $t+1$. As expected, our sample is populated with large firms (with average market value of equity of \$7,553 millions) and profitable firms (with average return-on-assets of 5.4%) due to restriction to S&P1500 firms.

Table 2 Panel B shows that outside directors' stock option incentives are significantly negatively correlated with abnormal accruals (Pearson correlation = -0.09) and the incidence of marginally and consecutively meeting/beating analysts' forecasts (Pearson correlations are -0.09 and -0.07, respectively). Directors' stock incentives are also negatively associated with both marginal and consecutive benchmark meeting/beating (both correlations are -0.04). Outside directors' option incentives and stock incentives are positively correlated (0.08). Both option incentives and stock incentives are negatively correlated with *G-index*, *CEO/Chair*, *Busy*

missing for all directors, and we have to use STKHOLDING to compute average director ownership. Thus, the zero median value of stock holdings in 1997 is likely due to data truncation problem in IRRC. Results are slightly stronger if we exclude 1997 data from the analyses.

director, and *Board size*, and are positively correlated with *CEO option incentive*.¹² The unconditional correlations between outside directors' equity incentives and earnings management do not control for factors affecting both equity incentives and earnings management. We next conduct multivariate regression analyses to control for these factors.

IV. EMPIRICAL TESTS AND RESULTS

This section outlines the empirical tests and reports our findings. We first test the relation between outside directors' equity incentives measured at the end of year t and earnings management activities in year $t+1$ as captured by earnings benchmark meeting/beating behavior and abnormal accruals, controlling for corporate governance, CEO equity incentives, and related firm characteristics. We then decompose outside directors' equity incentives into predicted and residual components, and examine whether the two components have different effects on earnings management. Finally, we examine whether outside directors' stock trading and option granting activities are opportunistic in relation to the extent of earnings manipulation.

Equity incentives for outside directors and earnings management

To test the relation between outside directors' equity incentives and earnings management, we estimate the following model by regressing earnings management proxies on outside directors' option and stock incentives, controlling for governance attributes, CEO equity incentives and other related firm characteristics:

¹² The correlation between directors' option incentives and board dependence is positive (0.06), which appears inconsistent with Ryan and Wiggins (2004) that find a negative relation between director option compensation and board dependence. However, we measure option incentives based on the change in the value of option holdings due to changes in firm value, while Ryan and Wiggins (2004) use a compensation mix measure, calculated as the value of option grants divided by total director pay. We replicate their results using their measure. For our purpose, it is more appropriate to measure option incentives based on option holdings, which is theoretically appealing and is widely used in the literature (e.g., Jensen and Murphy 1990; Yermack 1995; Cheng and Warfield 2005).

$$\begin{aligned}
EM_{t+1} = & \beta_0 + \beta_{11} \times \text{Option incentive}_t + \beta_{12} \times \text{Stock incentive}_t \\
& + \beta_2 \times G\text{-index}_t + \beta_3 \times \text{Board dependence}_t + \beta_4 \times \text{CEO/Chair}_t + \beta_5 \times \text{Busy director}_t \\
& + \beta_6 \times \text{Board size}_t + \beta_7 \times \text{CEO tenure}_t + \beta_8 \times \text{CEO Option incentive}_t \\
& + \beta_9 \times \text{CEO Stock incentive}_t + \beta_{10} \times \text{Log}(MVE_t) + \beta_{11} \times \text{Return-on-asset}_t \\
& + \beta_{12} \times \text{Book-to-market}_t + \beta_{13} \times \text{Leverage}_t + \beta_{14} \times \text{Net-operating-asset}_t \\
& + \beta_{15} \times \text{Litigation industry} + \varepsilon_t,
\end{aligned} \tag{2}$$

where *EM* is earnings management proxy measured in four ways: (1) a dummy variable equal to one if the firm reports positive earnings surprises over all four quarters of year *t*+1, and zero otherwise (*Consecutive MBE*); (2) a dummy variable equal to one if the firm reports small positive earnings surprises of less than 2¢ over at least one quarter of year *t*+1, and zero otherwise (*Marginal MBE*); (3) abnormal accruals in year *t*+1 estimated based on a version of Jones (1991) model (*Abnormal Accrual*); and (4) a dummy variable equal to one if abnormal accruals in year *t*+1 are positive, and zero otherwise (*Abnormal Accrual*>0). Section 3 provides details about the measurement of each *EM* proxy and the independent variables. We use a logistic function to estimate the model when the dependent variable is dichotomous. When the dependent variable is continuous (i.e., *Abnormal Accrual*), we employ the Fama-MacBeth methodology to estimate the regression annually, and report the average coefficient estimates based on the 7 annual regressions from 1997-2003 (Fama and MacBeth 1973). To avoid undue influence of outlier observations, we winsorize abnormal accruals at ± 100% (of total asset) and the other control variables (except the six governance variables) at the 1st and 99th percentiles.

Table 3 reports the regression results on the relation between outside directors' equity incentives and earnings benchmark meeting/beating behavior. We find that option incentives for outside directors significantly reduce the likelihood of meeting/beating analysts' forecasts in the baseline model as well as in the model with control variables. The coefficient on outside directors' option incentives is significantly negative (coefficient = -353.4, p-value = 0.080) when predicting the likelihood of consecutively meeting/beating analysts' consensus forecasts, and is

also significantly negative (coefficient = -394.2, p-value = 0.004) when predicting the likelihood of marginally meeting/beating analysts' consensus forecasts, after controlling for governance attributes, CEO equity incentives, and related firm characteristics. Holding all the other variables at the median, a one standard deviation increase from the median value of director option incentives would reduce the probability of consecutively (marginally) meeting/beating analysts' forecasts by about 5% (1%).

The coefficients on director stock incentives are significantly negative in the baseline regressions, and remain negative but lose significance after we include the control variables. As discussed in Section 2, prior research finds mixed evidence regarding the effect of director stock ownership on the board's monitoring effectiveness over financial reporting. Beasley (1996) finds lower outside director ownership for firms committing accounting frauds. However, Abbott et al. (2003) and Baber et al. (2006) find no relation between outside director ownership and the incidence of accounting restatement. The results of our study, when combined with prior evidence, suggest that outside director stock ownership helps deter the most egregious cases of accounting manipulation (i.e., accounting frauds), but have a much smaller impact on less egregious earnings management activities. Another related study by Ahmed and Duellman (2007) finds a positive relation between director ownership and accounting conservatism. However, as the authors point out, conservatism differs from earnings management because their measures of conservatism reflect the *persistent* practice of underreporting earnings and net assets.¹³ In contrast, earnings management largely reflects *temporary* manipulation of accounting accruals.

¹³ Ahmed and Duellman (2007) measure conservatism using three proxies: (1) book-to-market ratio, capturing the cumulative effects of conservatism on book value; (2) three-year average total accruals, capturing the persistent conservatism in reporting accounting accruals; and (3) Basu's (1997) asymmetric timeliness of earnings measure, capturing asymmetric verification standards for recognizing good and bad news.

Turning to the governance variables, we find firms with larger boards and more recently appointed CEOs are more likely to meet or just beat analysts' consensus forecasts. The coefficients on board dependence are positive but are insignificant. Results for other control variables are generally consistent with those reported in prior research. Consistent with Cheng and Warfield (2005), CEO option incentives significantly increase the likelihood of meeting/beating analysts' forecasts.¹⁴ In addition, firm size, operating performance, and growth potential have significantly positive effects on the likelihood of marginally meeting/beating analysts' consensus forecasts.

Table 4 reports the regression results based on abnormal accruals. We find a significantly negative effect of outside directors' option incentives on abnormal accruals (coefficient = -6.244, p-value = 0.015), after controlling for governance attributes, CEO equity incentives, and firm characteristics. Thus, a one standard deviation increase in directors' option incentives is associated with a 0.3% decrease in abnormal accruals (over assets). Abnormal accruals are also significantly positively associated with G-index, board size, return on asset, leverage, and are significantly negatively associated with the litigation industry dummy. In addition, director option incentives significantly reduce the likelihood of reporting positive or income-increasing abnormal accruals (coefficient = -154.1, p-value = 0.043), after including control variables. Taken together, our findings in Tables 3 and 4 are consistent with the notion that stock option incentives enhance outside directors' monitoring effectiveness and reduce earnings manipulation.

¹⁴ Cheng and Warfield (2005) also find a significantly positive effect of CEO stock incentives on meeting/beating analysts' forecasts. We do not find significant results on CEO stock incentives, which may be due to different sample selection procedure used in the two papers. Specifically, Cheng and Warfield (2005) require CEO stock ownership to be higher than newly granted options and stocks, which reduces their sample size by about 25%. We do not impose such a restriction, but require available director compensation and stock holdings data from ExecuComp and IRRC. We qualitatively replicate their results by following their sample selection procedure and empirical design.

Predicted and residual equity incentives for outside directors and earnings management

Yermack (2004) and Bryan and Klein (2004) find that the cross-sectional patterns of equity incentives for outside directors are consistent with the optimal contracting theory, suggesting that director equity incentives serve as a means for reducing agency costs. If equity incentives improve outside directors' oversight of the financial accounting process, we expect the deterrence effect on earnings management to be primarily driven by the component of equity incentives that conforms to the optimal contracting theory. To examine this conjecture, we employ a two-stage least squares approach to first model outside directors' equity incentives as a function of firm-specific economic determinants, which allows the decomposition of directors' equity incentives into predicted and residual components, and then in the second stage we regress earnings management proxies on both predicted and residual equity incentives.

We follow Yermack (2004) and Core and Guay (1999) to identify firm-specific economic determinants in our first-stage regression model:

$$\begin{aligned} \text{Log}(\text{Opt or Stk sensitivity}_{t+1}) = & \beta_0 + \beta_1 \times \text{Log}(MVE_{t-1}) + \beta_2 \times \text{Log}(\text{Idiosyncratic risk}_{t-1}) \\ & + \beta_3 \times \text{Book-to-market}_{t-1} + \beta_4 \times \text{Free cash flow problem}_{t-1} \\ & + \beta_5 \times \text{Zero dividend payment}_{t-1} + \beta_6 \times \text{Leverage}_{t-1} \\ & + \beta_7 \times \text{Marginal tax rate}_{t-1} + \varepsilon_t \end{aligned} \quad (3)$$

where *Opt (Stk) sensitivity* is the change in the value of directors' stock options (stocks) holdings from a dollar change in stock price; *MVE* is market value of equity; *Idiosyncratic risk* is measured as the standard deviation of the residuals from the market model regression, estimated over a 36-month period prior to the end of the fiscal year; *Book-to-market* is book-to-market ratio; *Free cash flow problem* is estimated as the three-year average of the difference between operating cash flows and common and preferred dividends, deflated by total assets, if the firm has book-to-market ratio greater than one (indicating low growth options), and zero otherwise; *Zero dividend payment* is a dummy variable equal to one if common and preferred dividends are

zero, and zero otherwise; *Leverage* is long-term debt divided by shareholders' equity; and *Marginal tax rate* is corporate marginal tax rate.¹⁵

This first-stage regression model intends to capture the influences of firm size, risk, and growth potential on the use of options and stocks in director compensation. The model also considers the agency costs of free cash flow, scarcity of cash, agency costs of debt, and tax implications of equity-based compensation that may affect the decision to compensate directors through options or stocks.¹⁶ The predicted (residual) equity incentives are based on the predicted (residual) values from the above cross-sectional regressions. The estimation results are summarized in Table 5 Panel A. Consistent with Yermack (2004), outside directors of firms that are more risky, have higher growth potentials, and face more cash constraints have higher equity incentives.

Table 5 Panel B summarizes the second-stage regression results on the relation between the predicted and residual equity incentives for outside directors and earnings management. We find the negative associations between director option incentives and earnings management (as reported in Tables 3 and 4) are largely driven by the predicted component of director option incentives. The predicted value of director option incentives (*Option incentive_Pred*) is significantly negatively associated with the extent of earnings management for three of our earnings management proxies (the only exception is *Consecutive MBE*, which has a negative but insignificant coefficient). In contrast, the residual value of director option incentives (*Option incentive_Resid*) has little impact on the likelihood of meeting/beating earnings benchmark and the incidence of positive abnormal accruals. It is interesting to note that *Option incentive_Resid* is significantly positively related to *Abnormal Accrual*, suggesting excessive director option

¹⁵ We thank Professor John Graham for sharing the marginal tax rate data.

¹⁶ Yermack (2004) and Core and Guay (1999) discuss these variables in detail.

incentives may hamper, rather than enhance, directors' monitoring effectiveness over financial reporting. Overall, results in Table 5 provide further support for the positive role of stock option incentives in motivating outside directors to monitor the financial reporting process and deter earnings management.

Outside directors' trading activities and earnings management

To corroborate our main results, we next examine outside directors' stock sales. As we discuss earlier, opponents of equity-based compensation argues that it may reduce directors' incentives to constrain earnings manipulation because directors can benefit from selling their shares at inflated stock prices as a result of misstated earnings.¹⁷ This argument implies (1) a positive relation between directors' equity incentives and earnings management aimed at inflating stock prices and (2) a positive relation between directors' stock sales and earnings management and this relation would be stronger for directors with greater equity incentives. Our findings so far do not support the first link. We actually find a negative association, suggesting that equity incentives encourage directors to take a long-term perspective of the firm, rather than motivate them to focus on short-term gains from stock sales. Consequently, we do not expect to find support for the second link. To provide direct evidence on this conjecture, we examine the relation between outside directors' share sales, equity incentives and their firm's earnings management by estimating the following model:

$$NetSales_{t+1} = \beta_0 + \beta_{11} \times Option\ incentive_t + \beta_{12} \times Stock\ incentive_t \\ + \beta_2 \times EM_{t+1} + \beta_{21} \times Option\ incentive_t \times EM_{t+1} + \beta_{22} \times Stock\ incentive_t \times EM_{t+1}$$

¹⁷ Prior research provides evidence consistent with investors mispricing the discretionary component of earnings, thus providing potential opportunities for insiders to earn abnormal returns from trading stocks (Xie 2002). Several studies demonstrate that insiders trade on their private information about accounting information (e.g., Beneish and Vargus 2002; Ke, Huddart, and Pertroni 2003; Roulstone and Piotroski 2005; Cheng and Warfield 2005; Bergstresser and Philippon 2006). However, these studies either focus on executives, or do not differentiate trading behavior between executives and outside directors.

$$\begin{aligned}
& + \beta_3 \times \text{Log}(MVE_t) + \beta_4 \times \text{Return-on-asset}_t + \beta_5 \times \text{Book-to-market}_t \\
& + \beta_6 \times \text{Stock return}_t + \beta_7 \times \Delta \text{Cash flow}_t + \varepsilon_t,
\end{aligned} \tag{4}$$

where *NetSales* is the dollar value of outside directors' net sales (i.e., sales net of purchases) collected from Thomson Financial Insider Trading database over the 12-month period after year t 's earnings announcements, divided by beginning market value of equity; *Option incentive* and *Stock incentive* are outside directors' option and stock incentives measured at the end of year t ; *EM* is earnings management proxy measured in year $t+1$; *Stock return* is buy-and-hold raw returns cumulated over the 12 months after year $t-1$'s earnings announcements; and $\Delta \text{Cash flow}$ is the change in operating cash flow scaled by lagged total assets. Other variables are as defined in Section 3. We control for firm size, growth, operating performance and stock performance in the above regression since prior studies find that insiders' stock sales are related with firm size and growth potential, and that insiders tend to sell more shares following superior firm performance (e.g., Lakonishok and Lee 2001; Rozeff and Zaman 1998, among others).

Table 6 reports the regression results. We first estimate the model without the *EM* variables. We expect and find a positive relation between outside directors' future net sales and their stock incentives (coefficient = 7.815, p-value = 0.040), suggesting large share holdings lead to greater (net) selling activities. However, we find no significant relation between outside directors' option incentives and their future net sales.

We next add earnings management (*EM*) and its interactions with option and stock incentives for outside directors to the model. We use two alternative proxies for *EM*. *Consecutive MBE* is a dummy variable equal to one if the firm reports positive earnings surprises over all four quarters of year $t+1$, and zero otherwise.¹⁸ The second proxy is the annual decile ranking of *Abnormal accrual*. The variables of interests are the two interaction terms, *Option*

¹⁸ Results are qualitatively the same based on *Marginal MBE*. We focus on *Consecutive MBE* for a more powerful test to detect any relation between director's net sales and earnings management.

incentive×*EM* and *Option incentive*×*EM*. If outside directors with higher equity incentives are more likely to exploit their knowledge of manipulated earnings in trading shares, then the coefficients on the two interaction terms would be positive. On the other hand, insignificant coefficients on these interaction terms would suggest that equity incentives do not affect outside directors' tendency to exploit their private information about earnings manipulation in trading shares.

As reported in Table 6, the coefficients on *EM* and the interaction terms are statistically insignificant, suggesting that outside directors' stock sales are not related to the level of earnings management, irrespective of their equity holding positions. These results stand in contrast to the findings in Cheng and Warfield (2005), who report a significantly positive relation between CEOs' net sales and earnings management for highly equity-incentivized CEOs. It is reassuring that we find a null effect of earnings management on outside directors' net sales, which corroborates our earlier evidence that equity incentives enhance, rather than impair, outside directors' monitoring effectiveness over the financial reporting process.

Outside directors' stock option grants and earnings management

Our analysis so far has focused on whether outside directors' option and stock incentives at the end of year *t* affect the firm's earnings management and directors' stock trading in year *t*+1. We next examine whether outside directors' stock option grants in year *t*+1 are opportunistic in relation to earnings management. Most stock options are granted at-the-money, so the potential gains from stock option grants would be greater when the grant date stock price, and thus the exercise price, is relatively low. One way to temporarily dampen the stock price is

to deflate earnings through income-decreasing abnormal accruals (Baker et al. 2003). To examine this possibility, we estimate the following regression:

$$\begin{aligned}
 \text{Option comp}_{t+1} = & \beta_0 + \beta_{11} \times \text{Option incentive}_t + \beta_{12} \times \text{Stock incentive}_t \\
 & + \beta_2 \times \text{EM}_{t+1} + \beta_{21} \times \text{Option incentive}_t \times \text{EM}_{t+1} + \beta_{22} \times \text{Stock incentive}_t \times \text{EM}_{t+1} \\
 & + \beta_3 \times \text{Log}(MVE_t) + \beta_4 \times \text{Log}(\text{Idiosyncratic risk}_t) + \beta_5 \times \text{Book-to-market}_t \\
 & + \beta_6 \times \text{Free cash flow problem}_t + \beta_7 \times \text{Zero dividend payment}_t \\
 & + \beta_8 \times \text{Leverage}_t + \beta_9 \times \text{Marginal tax rate}_t + \varepsilon_t,
 \end{aligned} \tag{5}$$

where *Option comp* is the Black-Scholes value of stock option grants to each outside director in year *t+1* scaled by beginning market value of equity;¹⁹ and *EM* is earnings management proxy based on either earnings benchmark meeting/beating behavior or abnormal accruals. Section 3 and Section 4.2 describe the measurement of the other explanatory variables. Our focus is the coefficients on the two interaction terms, *Option incentive*×*EM* and *Stock incentive*×*EM*, which reflect the effect of earnings management on director stock option grants conditional on the level of equity incentives for outside directors. The regression results are summarized in Table 7. We find significantly positive coefficients on director option incentives, suggesting that outside directors who receive large option grants in the past continue to receive more stock options. Regarding our variables of interests, the coefficients on *EM* and the interaction terms are all statistically insignificant, suggesting that outside directors do not grant themselves more options in periods of missing analysts' forecasts or in periods of large income-decreasing abnormal accruals, irrespective of their option and stock holding positions. Thus, we find no evidence that outside directors grant options opportunistically in periods with earnings management activities that can potentially deflate stock prices.

¹⁹ We discuss how we estimate the Black-Scholes value of option grants for outside directors in footnote 10.

V. CONCLUSION

In this paper, we examine the influence of equity-based compensation for outside directors on the board's monitoring effectiveness over the financial reporting process as reflected in the extent of earnings management. Based on a sample of S&P 1500 firms, we find that firms with greater stock option incentives for outside directors have a lower incidence of meeting/beating analysts' forecasts. Outside directors' option incentives are also negatively related to both the level of abnormal accruals and the incidence of reporting positive abnormal accruals. Furthermore, the deterrence effect on earnings management is largely driven by the component of option incentives that is predicted by economic determinants based on optimal contracting theory. These findings are consistent with the notion that option incentives improve outside directors' monitoring effectiveness in limiting opportunistic financial reporting behavior. In supplementary analyses, we find no evidence that outside directors act opportunistically in trading shares and granting options by exploiting information about manipulated earnings. Taken together, our results are consistent with the incentive alignment view of using stock options to compensate corporate directors, and do not support the claim that equity-based compensation compromises the objectivity of outside directors in their oversight of the financial reporting process.

Our results are subject to several caveats. First, while we control for several governance attributes in our analysis to mitigate the correlated omitted variables problem, it is difficult to capture all relevant aspects of corporate governance. Second, we conduct our analyses based on a sample of S&P 1500 firms, thus our results may not generalize to smaller and less financially stable firms. Third, our estimate of director stock option incentives involves several assumptions and may have some measurement errors. Despite these limitations, our study contributes to the

literature by providing new evidence that director compensation is an important element of effective governance and thus has implications for corporate decisions regarding the structure of director compensation.

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Table 1
Equity-based compensation and equity incentives for outside directors

Panel A: Annual compensation for outside directors by year

Year	#Firms	<i>Cash retainer</i> (\$)	<i>Meeting fee</i> (\$)	<i>Option comp</i> (\$)	<i>Stock comp</i> (\$)	<i>Total comp</i> (\$)	<i>Option comp</i> (%)	<i>Stock comp</i> (%)
1997	741	19,157	7,253	49,718	7,615	83,695	34.74%	10.81%
1998	738	19,552	7,246	52,116	8,709	84,773	37.82%	12.30%
1999	763	19,737	7,495	84,756	9,204	116,872	41.10%	12.16%
2000	807	20,441	7,627	119,998	9,450	153,404	43.79%	11.47%
2001	842	20,847	7,324	104,908	9,718	139,212	46.04%	11.15%
2002	879	22,670	7,588	84,445	9,340	123,930	45.75%	10.40%
2003	878	26,602	8,042	85,322	13,611	133,394	45.68%	12.64%
Average		21,437	7,524	83,869	9,753	120,524	42.40%	11.55%

Panel B: Equity holdings and equity incentives for outside directors by year

Year	#Firms	<i>Option holding</i> (\$)		<i>Stock holding</i> (\$)		<i>Option incentive</i> (×1000)		<i>Stock incentive</i> (×1000)	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
1997	741	167,050	50,839	2,907,274	0	0.258	0.053	1.338	0.000
1998	738	158,143	45,571	8,014,150	552,961	0.210	0.044	2.325	0.503
1999	763	275,754	63,931	9,872,324	658,945	0.234	0.067	2.341	0.570
2000	807	329,638	83,377	8,634,264	744,242	0.259	0.075	2.656	0.610
2001	842	302,178	112,167	7,000,698	792,799	0.299	0.111	2.595	0.655
2002	879	253,739	130,454	5,086,939	657,630	0.352	0.144	2.352	0.739
2003	878	377,349	200,533	6,463,877	995,367	0.403	0.172	2.220	0.684
Average		270,130	91,910	6,836,129	595,540	0.292	0.090	2.273	0.491

Panel A reports mean annual compensation for outside directors. *Cash retainer* is cash compensation for each outside director. *Meeting fee* is total meeting fees for each outside director. *Option comp* is annual stock option grants for each outside director, presented in dollars (\$) based on the Black-Scholes value and as a percentage (%) of each outside director's total compensation. *Stock comp* is annual stock grants for each outside director, presented in dollars (\$) based on the number of stocks granted multiplied by the average stock price over the year and as a percentage (%) of each outside director's total compensation. *Total comp* is total compensation for each outside director, including cash retainer, meeting fee, stock option grants and stock grants. In Panel B, *Option holding* is the Black-Scholes value of stock options held by each outside director at the end of the year. *Stock holding* is the number of stocks held by each

outside director multiplied by stock price per share at the end of the year. *Option incentive* is the change in the value of option holdings for a dollar increase in firm value, estimated as total number of options received over the prior four years and the current year multiplied by option delta and deflated by shares outstanding (multiplied by 1000). *Stock incentive* is the change in the value of stock holdings held by each outside director for a dollar increase in firm value, estimated as number of shares held deflated by shares outstanding (multiplied by 1000).

Table 2:
Descriptive statistics and correlations

Panel A: Distributional properties of variables used in the main analyses

Variable	N	Mean	Median	Std Dev	1%	25%	75%	99%
<i>Option incentive</i> (×1000)	5,648	0.292	0.090	0.505	0	0	0.361	2.459
<i>Stock incentive</i> (×1000)	5,648	2.273	0.491	6.707	0	0.096	1.572	33.012
<i>Abnormal Accrual</i>	5,648	-0.015	-0.010	0.075	-0.277	-0.045	0.023	0.169
<i>Consecutive MBE</i>	2,734	0.307	0	0.461	0	0	1	1
<i>Marginal MBE</i>	2,734	0.720	1	0.449	0	0	1	1
<i>G-index</i>	5,311	9.155	9	2.738	4	7	11	15
<i>Board dependence</i>	5,648	0.224	0.200	0.121	0.077	0.125	0.286	0.600
<i>CEO/Chair</i>	5,648	0.653	1	0.476	0	0	1	1
<i>Busy director</i>	5,648	0.181	0.143	0.189	0	0	0.300	0.714
<i>Board size</i>	5,648	9.033	9.000	2.523	5	7	11	16
<i>CEO tenure</i>	5,362	7.369	5	7.994	0	2	10	37
<i>CEO Option incentive</i> (×1000)	5,578	11.368	7.952	12.510	0	3.081	15.351	56.690
<i>CEO Stock incentive</i> (×1000)	5,648	27.282	3.240	65.137	0	0.820	15.791	331.802
<i>MVE</i> (Million\$)	5,648	7,553	1,271	27,472	58	504	4,193	133,483
<i>Return-on-asset</i>	5,648	0.054	0.057	0.095	-0.345	0.018	0.101	0.299
<i>Book-to-market</i>	5,648	0.518	0.422	0.405	0.049	0.250	0.652	2.440
<i>Leverage</i>	5,635	0.569	0.376	0.711	0.000	0.049	0.784	4.295
<i>Net-operating-asset</i>	5,635	0.544	0.571	0.185	-0.009	0.435	0.682	0.861
<i>Litigation industry</i>	5,648	0.340	0	0.474	0	0	1	1

Panel B: Pearson correlations of variables used in the main analyses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1 <i>Option incentive</i>	1	0.08	-0.09	-0.09	-0.07	-0.15	0.06	-0.05	-0.20	-0.34	-0.01	0.36	0.03	-0.13	-0.10	0.06	-0.13	-0.06	0.11	
2 <i>Stock incentive</i>		1	0.00	-0.04	-0.04	-0.09	0.01	-0.06	-0.07	-0.06	0.07	0.07	0.03	-0.05	0.01	0.01	0.00	0.05	-0.07	
3 <i>Abnormal Accrual</i>			1	0.04	-0.02	0.06	0.02	0.01	0.02	0.09	0.01	-0.08	0.03	0.01	0.12	-0.04	0.08	0.07	-0.10	
4 <i>Consecutive MBE</i>				1	0.14	0.01	-0.02	0.01	0.10	0.10	-0.04	-0.06	-0.04	0.13	0.08	-0.13	-0.02	-0.06	0.10	
5 <i>Marginal MBE</i>					1	-0.01	0.05	-0.03	-0.01	0.04	-0.01	0.00	0.02	0.07	0.12	-0.14	-0.13	0.00	0.15	
6 <i>G-index</i>						1	-0.26	0.12	0.20	0.29	-0.12	-0.14	-0.19	-0.03	0.01	0.01	0.12	0.05	-0.17	
7 <i>Board dependence</i>							1	-0.11	-0.33	-0.21	0.24	0.03	0.30	-0.06	0.07	0.02	-0.15	0.05	0.10	
8 <i>CEO/Chair</i>								1	0.11	0.05	0.25	0.04	0.11	0.03	0.02	-0.04	0.06	-0.03	-0.06	
9 <i>Busy director</i>									1	0.28	-0.15	-0.16	-0.17	0.22	-0.03	-0.06	0.14	-0.11	-0.04	
10 <i>Board size</i>										1	-0.05	-0.34	-0.17	0.29	0.05	-0.06	0.21	0.09	-0.19	
11 <i>CEO tenure</i>											1	0.10	0.38	-0.03	0.07	0.03	-0.07	0.04	0.00	
12 <i>CEO Option incentive</i>												1	0.06	-0.17	-0.07	0.09	-0.07	-0.05	0.10	
13 <i>CEO Stock incentive</i>													1	-0.07	0.07	0.03	-0.13	-0.03	0.00	
14 <i>MVE</i>														1	0.14	-0.19	-0.01	-0.11	0.11	
15 <i>Return-on-asset</i>															1	-0.36	-0.19	0.05	-0.02	
16 <i>Book-to-market</i>																1	0.06	0.21	-0.13	
17 <i>Leverage</i>																	1	0.18	-0.25	
18 <i>Net-operating-asset</i>																		1	-0.28	
19 <i>Litigation industry</i>																				1

Option incentive is the change in the value of option holdings held by each outside director for a dollar increase in firm value, estimated as total number of options received over the prior four years and the current year multiplied by option delta and deflated by shares outstanding (multiplied by 1000). *Stock incentive* is the change in the value of stock holdings held by each outside director for a dollar increase in firm value, estimated as number of shares held deflated by shares outstanding (multiplied by 1000). *Abnormal Accrual* is abnormal accruals estimated based on a version of Jones' (1991) model. *Consecutive MBE* is a dummy variable which equals one if the firm consistently meets or beats analysts' quarterly earnings forecasts for all the four quarters in year $t+1$, and zero otherwise. *Marginal MBE* is a dummy variable which equals one if the firm meets or beats analysts' quarterly earnings forecasts by less than 2¢ for at least one quarter in year $t+1$, and zero otherwise. *G-index* is the governance index developed by Gompers et al. (2003). *Board dependence* is the proportion of insiders serving on the board of directors. *CEO/Chair* is a dummy variable, which equals one if the CEO is also the Chairman of the board, and zero otherwise. *Busy director* is the proportion of outside directors who hold an additional directorship in other firms. *Board size* is the number of directors serving on the board. *CEO tenure* is the number of years that the CEO has served for the firm. *CEO option incentive* is the change in the value of option holdings held by the CEO for a dollar increase in firm value, estimated as options holdings multiplied by option delta and deflated by shares outstanding

(multiplied by 1000). *CEO Stock incentive* is the change in the value of stock holdings held by the CEO for a dollar increase in firm value, estimated as number of shares held by the CEO deflated by shares outstanding (multiplied by 1000). *MVE* is market value of equity (in millions of dollars). *Return-on-asset* is income before extraordinary items divided by average total assets. *Book-to-market* is book value of common equity divided by market value of equity. *Leverage* is long-term debt divided by book value of common equity. *Net-operating-asset* is book value of common equity minus cash and marketable securities plus total debt, scaled by beginning total assets. *Litigation industry* is a dummy variable which equals one if the firm is in one of the following industries: pharmaceutical/biotechnology (SIC codes 2833-2836, 8731-8734), computer (3570-3577, 7370-7374), electronics (3600-3674), or retail (5200-5961), and zero otherwise. In Panel B, bold correlations indicate significant levels at 0.05 or lower.

Table 3
Equity incentives for outside directors and earnings benchmark meeting/beating behavior

Dependent variable	<i>Pr(Consecutive MBE_{t+1} = 1)</i>		<i>Pr(Marginal MBE_{t+1} = 1)</i>	
	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)
Director equity incentives				
<i>Option incentive_t</i>	-651.800*** (0.000)	-353.400* (0.080)	-358.300*** (0.000)	-394.200*** (0.004)
<i>Stock incentive_t</i>	-22.378* (0.065)	-1.875 (0.865)	-13.391* (0.099)	-9.342 (0.328)
Governance variables				
<i>G-index_t</i>		0.018 (0.365)		0.003 (0.858)
<i>Board dependence_t</i>		0.689 (0.177)		0.423 (0.382)
<i>CEO/Chair_t</i>		-0.059 (0.621)		-0.073 (0.516)
<i>Busy director_t</i>		0.044 (0.889)		-0.354 (0.230)
<i>Board size_t</i>		-0.010 (0.683)		0.058** (0.016)
<i>CEO tenure_t</i>		0.012 (0.850)		-0.104* (0.081)
Other control variables				
<i>CEO Option incentive_t</i>		10.300* (0.053)		15.069*** (0.005)
<i>CEO Stock incentive_t</i>		-1.709 (0.164)		1.041 (0.296)
<i>Log(MVE_t)</i>		0.331*** (0.000)		0.129*** (0.009)
<i>Return-on-asset_t</i>		0.377 (0.562)		1.466** (0.016)
<i>Book-to-market_t</i>		-0.204 (0.342)		-0.455*** (0.008)
<i>Leverage_t</i>		-0.004 (0.959)		-0.284*** (0.000)
<i>Net-operating-asset_t</i>		0.100 (0.737)		1.243*** (0.000)
<i>Litigation industry</i>		0.255** (0.026)		0.633*** (0.000)
<i>Intercept</i>	-1.192*** (0.000)	-4.289*** (0.000)	1.011*** (0.000)	-1.165** (0.023)
Likelihood Ratio	45.1	172.4	27.0	182.3
Firm-years	2,734	2,412	2,734	2,412

This table reports coefficient estimates and two-tailed *p*-values (in parentheses) from logistic regression of the incidence of meeting or beating analysts' earnings forecasts over year *t*+1 on outside directors' option and stock incentives at the end of year *t*. Year dummies are included to control for year fixed

effects (not reported). *Consecutive MBE* is a dummy variable which equals one if the firm consistently meets or beats analysts' quarterly earnings forecasts for all the four quarters in year $t+1$, and zero otherwise. *Marginal MBE* is a dummy variable which equals one if the firm meets or beats analysts' quarterly earnings forecasts by less than 2¢ for at least one quarter in year $t+1$, and zero otherwise. See Table 2 for definitions of other variables. Sample period is from 1997 to 2003. ***/**/* indicates significance level at less than 1%/5%/10% based on two-tailed chi-square tests on the coefficient estimates from logistic regressions.

Table 4
Equity incentives for outside directors and abnormal accruals

Dependent variable	<i>Abnormal Accrual_{t+1}</i>		<i>Pr(Abnormal Accrual_{t+1} > 0)</i>	
	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)
Director equity incentives				
<i>Option incentive_t</i>	-13.220*** (0.000)	-6.244** (0.015)	-280.3*** (0.000)	-154.100** (0.043)
<i>Stock incentive_t</i>	0.137 (0.239)	0.087 (0.616)	-0.4213 (0.917)	-2.512 (0.582)
Governance variables				
<i>G-index_t</i>		0.001** (0.018)		0.012 (0.334)
<i>Board dependence_t</i>		0.015 (0.274)		0.458 (0.112)
<i>CEO/Chair_t</i>		-0.001 (0.690)		-0.034 (0.621)
<i>Busy director_t</i>		0.005 (0.308)		0.135 (0.492)
<i>Board size_t</i>		0.001** (0.049)		0.211 (0.123)
<i>CEO tenure_t</i>		0.000 (0.846)		-0.020 (0.573)
Other control variables				
<i>CEO Option incentive_t</i>		-0.151 (0.164)		0.067 (0.982)
<i>CEO Stock incentive_t</i>		0.031 (0.369)		0.082 (0.879)
<i>Log(MVE_t)</i>		0.000 (0.843)		0.035 (0.225)
<i>Return-on-asset_t</i>		0.081** (0.013)		0.798** (0.033)
<i>Book-to-market_t</i>		-0.001 (0.377)		0.004 (0.969)
<i>Leverage_t</i>		0.007*** (0.005)		0.048 (0.280)
<i>Net-operating-asset_t</i>		0.008 (0.397)		0.632*** (0.000)
<i>Litigation industry</i>		-0.007*** (0.004)		-0.044 (0.532)
<i>Intercept</i>	-0.011*** (0.002)	-0.044** (0.024)	-0.077 (0.306)	-1.397*** (0.000)
Adjusted R ² (%)	0.9%	6.1%	--	--
Likelihood Ratio	--	--	56.0	90.8
Firm-years	5,648	4,896	5,648	4,896

This table reports (1) average coefficient estimates and two-tailed p-values (in parentheses) from annual OLS regressions of abnormal accruals in year $t+1$ on outside directors' option and stock incentives at the

end of year t , and (2) coefficient estimates and two-tailed p-values (in parentheses) from logistic regression of the incidence of positive abnormal accruals in year $t+1$ on outside directors' option and stock incentives at the end of year t . Year dummies are included in the logistic regression to control for year fixed effects (not reported). See Table 2 for the variable definitions. Sample period is from 1997 to 2003. ***/**/* indicates significance level at less than 1%/5%/10% based on two-tailed t tests on the coefficient estimates from annual OLS regressions or two-tailed chi-square tests on the coefficient estimates from logistic regressions.

Table 5
Predicted and residual equity incentives for outside directors and earnings management

Panel A: First-stage regression – director option and stock incentives and their economic determinants

Dependent variable	<i>Log(Opt sensitivity_t+1)</i> Coefficient (p-value)	<i>Log(Stk sensitivity_t+1)</i> Coefficient (p-value)
Intercept	3.292*** (0.000)	1.603*** (0.000)
<i>Log(MVE_{t-1})</i>	-0.005 (0.720)	0.066*** (0.000)
<i>Log(Idiosyncratic risk_{t-1})</i>	0.724*** (0.000)	0.377*** (0.000)
<i>Book-to-market_{t-1}</i>	-0.362*** (0.000)	-0.284*** (0.000)
<i>Free cash flow problem_{t-1}</i>	-0.312 (0.761)	-2.489** (0.047)
<i>Zero dividend payment_{t-1}</i>	0.513*** (0.000)	0.280*** (0.000)
<i>Leverage_{t-1}</i>	-0.043* (0.098)	-0.009 (0.781)
<i>Marginal tax rate_{t-1}</i>	-0.290 (0.201)	0.025 (0.931)
Adjusted R ² (%)	22.5%	35.4%
Firm-years	4,546	4,694

Panel B: Second-stage regression – Predicted and residual director equity incentives and earnings management

Dependent variables	<i>Pr(Consecutive MBE_{t+1} = 1)</i>	<i>Pr(Marginal MBE_{t+1} = 1)</i>	<i>Abnormal Accrual_{t+1}</i>	<i>Pr(Abnormal Accrual_{t+1} > 0)</i>
	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)
Director equity incentives				
<i>Option incentive_Pred_t</i>	-487.600 (0.198)	-395.200* (0.089)	-12.573*** (0.004)	-224.100* (0.093)
<i>Option incentive_Resid_t</i>	-4090.800 (0.101)	-344.9 (0.762)	48.054* (0.066)	390.000 (0.590)
<i>Stock incentive_Pred_t</i>	-1.273 (0.916)	-7.202 (0.495)	0.546 (0.252)	-2.456 (0.646)
<i>Stock incentive_Resid_t</i>	22.498 (0.798)	-27.706 (0.701)	-13.541 (0.380)	-12.716 (0.628)
Governance variables				
<i>G-index_t</i>	0.021 (0.337)	0.007 (0.731)	0.000 (0.204)	-0.001 (0.939)
<i>Board dependence_t</i>	0.480 (0.376)	0.271 (0.600)	0.011 (0.501)	0.517 (0.101)
<i>CEO/Chair_t</i>	-0.058 (0.649)	-0.170 (0.161)	0.001 (0.829)	-0.009 (0.909)
<i>Busy director_t</i>	0.184 (0.520)	-0.371 (0.188)	0.006 (0.321)	0.064 (0.740)
<i>Board size_t</i>	-0.130 (0.607)	0.497** (0.041)	0.009 (0.146)	0.301** (0.044)
<i>CEO tenure_t</i>	0.025 (0.715)	-0.080 (0.213)	-0.001 (0.803)	-0.039 (0.332)
Other control variables				
<i>CEO Option incentive_t</i>	12.510** (0.030)	19.359*** (0.001)	-0.130 (0.348)	0.019 (0.977)
<i>CEO Stock incentive_t</i>	-2.034 (0.154)	0.572 (0.624)	0.031 (0.456)	-0.136 (0.967)
<i>Log(MVE_t)</i>	0.299*** (0.000)	0.142*** (0.007)	0.000 (0.893)	0.050 (0.117)
<i>Return-on-asset_t</i>	-0.484 (0.495)	1.697** (0.014)	0.088** (0.017)	0.887** (0.041)
<i>Book-to-market_t</i>	-0.320 (0.160)	-0.487*** (0.007)	0.001 (0.921)	0.055 (0.610)
<i>Leverage_t</i>	-0.025 (0.744)	-0.277*** (0.000)	0.006*** (0.005)	0.045 (0.361)
<i>Net-operating-asset_t</i>	0.232 (0.477)	1.402*** (0.000)	0.012 (0.275)	0.786*** (0.000)
<i>Litigation industry</i>	0.223* (0.068)	0.560*** (0.000)	-0.004* (0.063)	-0.026 (0.733)
<i>Intercept</i>	-3.576*** (0.000)	-1.856*** (0.006)	-0.053*** (0.006)	-1.844*** (0.000)
Adjusted R ² (%)	--	--	6.8%	--

Likelihood Ratio	145.4	155.1	--	68.923
Firm-years	2,067	2,067	4,117	4,117

Panel A reports coefficient estimates and two-tailed p-values (in parentheses) from regressing logarithm of option and stock sensitivity on economic determinants of director equity incentives. *Opt (stk) sensitivity* is the change in the value of options (stocks) for a dollar change in stock price, measured as the number of options multiplied by option delta (the number of stocks). *MVE* is market value of equity (in millions of dollars). *Idiosyncratic risk* is the standard deviation of the residual from the market model regression, estimated over a 36-month period prior to the end of the fiscal year. *Book-to-market* is book value of common equity divided by market value of equity. *Free cash flow problem* is estimated as the three-year average of the difference between operating cash flow and common and preferred dividends, deflated by total assets, if the firm has book-to-market ratio greater than one (indicating low growth options), and zero otherwise. *Zero dividend payment* is a dummy variable, which equals one if common and preferred dividends are zero, and zero otherwise. *Leverage* is long-term debt divided by book value of common equity. *Marginal tax rate* is corporate marginal tax rate, provided by Professor John Graham. Fama French 12 industry dummies and year dummies are included (not reported) to control for industry and year fix effects. Sample period is from 1997 to 2003. ***/**/* indicates significance level at less than 1%/5%/10% based on two-tailed t tests.

Panel B reports (1) coefficient estimates and two-tailed p-values (in parentheses) from logistic regressions of the incidence of consecutively or marginally meeting/beating analysts' forecasts or positive abnormal accruals in year $t+1$ on predicted and residual outside directors' option and stock incentives at the end of year t , and (2) average coefficient estimates and two-tailed p-values (in parentheses) from annual OLS regressions of abnormal accruals in year $t+1$ on predicted and residual outside directors' option and stock incentives at the end of year t . Predicted option incentive (*Option incentive_Pred*) and predicted stock incentive (*Stock incentive_Pred*) are exponentials of predicted values (scaled by shares outstanding) based on the first-stage regression in Panel A. Residual option incentive (*Option incentive_Resid*) and residual stock incentive (*Stock incentive_Resid*) are director option and stock incentives minus predicted option and stock incentives. See Table 2 for other variable definitions. Sample period is from 1997 to 2003. ***/**/* indicates significance level at less than 1%/5%/10% based on two-tailed chi-square tests on the coefficient estimates from logistic regressions or two-tailed t tests on the coefficient estimates from annual OLS regressions.

Table 6
Outside directors' net sales and earnings management

		<i>EM =</i> <i>Consecutive MBE</i>	<i>EM = Decile rank of</i> <i>Abnormal Accrual</i>
	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)
Director equity incentives			
<i>Option incentive_t</i>	54.193 (0.150)	-28.075 (0.745)	-4.814 (0.927)
<i>Stock incentive_t</i>	7.815** (0.040)	15.672** (0.010)	11.271** (0.048)
<i>EM_{t+1}</i>		0.061 (0.261)	-0.018 (0.234)
<i>Option incentive_t × EM_{t+1}</i>		270.185 (0.150)	38.300 (0.202)
<i>Stock incentive_t × EM_{t+1}</i>		-0.092 (0.982)	-2.468 (0.122)
Control variables			
<i>Log(MVE_t)</i>	-0.059*** (0.005)	-0.071** (0.014)	-0.059*** (0.004)
<i>Return-on-asset_t</i>	0.382** (0.027)	0.281** (0.048)	0.369** (0.033)
<i>Book-to-market_t</i>	-0.131** (0.041)	-0.128* (0.059)	-0.131** (0.036)
<i>Stock return_t</i>	0.120** (0.041)	0.125** (0.027)	0.118** (0.041)
<i>ΔCash flow_t</i>	-0.123 (0.228)	-0.015 (0.963)	-0.115 (0.288)
<i>Intercept</i>	0.664*** (0.005)	0.747** (0.013)	0.692*** (0.004)
Adjusted R ²	7.2%	14.7%	8.4%
Firm-years	4,314	2,132	4,314

This table reports average coefficient estimates and two-tailed *p*-values (in parentheses) from annual regressions of outside directors' net sales over year *t*+1 on their option and stock incentives at the end of year *t* and earnings management in year *t*+1. The dependent variable is measured as dollar value of net sales (i.e., sales net of purchases) by outside directors during the 12-month period after year *t*'s earnings announcement scaled by market value of equity (in percentages). *EM* is earnings management proxies, measured as *Consecutive MBE* and decile rankings of *Abnormal Accrual*. *Stock return* is buy-and-hold raw returns cumulated over the 12-month period starting from the end of the third month after fiscal end of year *t*. *ΔCash-flow* is changes in operating cash flow scaled by total assets. See Table 2 for other variable definitions. Sample period is from 1997 to 2003. ***/**/* indicates significance level at less than 1%/5%/10% based on two-tailed *t*-tests.

Table 7
Outside directors' stock option grants and earnings management

	<i>EM =</i> <i>Consecutive MBE</i>	<i>EM = Decile rank of</i> <i>Abnormal Accrual</i>
	Coefficient (<i>p</i> -value)	Coefficient (<i>p</i> -value)
Director equity incentives		
<i>Option incentive_t</i>	18.637*** (0.000)	19.671*** (0.000)
<i>Stock incentive_t</i>	-0.007 (0.612)	-0.003 (0.876)
<i>EM_{t+1}</i>	0.012 (0.670)	0.010 (0.426)
<i>Option incentive_t × EM_{t+1}</i>	1.723 (0.620)	-0.488 (0.457)
<i>Stock incentive_{t-1} × EM_{t+1}</i>	0.001 (0.976)	-0.003 (0.756)
Control variables		
<i>Log(MVE_t)</i>	0.009 (0.375)	0.014 (0.120)
<i>Log(Idiosyncratic risk_t)</i>	0.224*** (0.006)	0.277*** (0.001)
<i>Book-to-market_t</i>	-0.003 (0.950)	0.023 (0.525)
<i>Free cash flow problem_t</i>	0.344 (0.507)	-0.578 (0.322)
<i>Zero dividend payment_t</i>	-0.039 (0.465)	-0.021 (0.625)
<i>Leverage_t</i>	-0.005*** (0.009)	-0.009** (0.047)
<i>Marginal tax rate_t</i>	-0.171 (0.418)	-0.171 (0.235)
Intercept	0.513*** (0.000)	0.573*** (0.004)
Adjusted R ²	81.1%	71.8%
Firm-years	2,248	4,541

This table reports average coefficient estimates and two-tailed *p*-values (in parentheses) from annual regressions of outside directors' stock option grants in year *t*+1 on their option and stock incentives at the end of year *t*, earnings management in year *t*+1, and other determinants of option grants. The dependent variable is outside directors' stock option grants, measured as the Black-Scholes value of stock option grants to each outside director scaled by beginning market value of equity (in percentages). *EM* is earnings management proxies, measured as *Consecutive MBE* and decile rankings of *Abnormal Accrual*. Fama-French 12 industry dummies are included (not reported) to control for industry fixed effects. See Tables 2 and 5 for other variable definitions. For ease of exposition, coefficient estimates on control variables are multiplied by 100. Sample period is from 1997 to 2003. ***/**/* indicates significance level at less than 1%/5%/10% based on two-tailed *t*-tests.