

# Corporate governance and pay-for-performance: The impact of earnings management<sup>☆</sup>

Marcia Millon Cornett<sup>a</sup>, Alan J. Marcus<sup>b</sup>, Hassan Tehranian<sup>b,\*</sup>

<sup>a</sup>*Southern Illinois University, Carbondale, IL, 62901, USA*

<sup>b</sup>*Boston College, Chestnut Hill, MA 02467, USA*

Received 12 May 2006; received in revised form 30 January 2007; accepted 2 March 2007

---

## Abstract

We ask whether the apparent impact of governance structure and incentive-based compensation on firm performance stands up when measured performance is adjusted for the effects of earnings management. Institutional ownership of shares, institutional investor representation on the board of directors, and the presence of independent outside directors on the board all reduce the use of discretionary accruals. These factors largely offset the impact of option compensation, which strongly encourages earnings management. Adjusting for the impact of earnings management substantially increases the measured importance of governance variables and dramatically decreases the impact of incentive-based compensation on corporate performance.

© 2007 Elsevier B.V. All rights reserved.

*JEL classification:* G30; G34; M41; M52

*Keywords:* Corporate governance; Earnings management; Financial performance; Stock options

---

## 1. Introduction

Both accountants and financial economists have devoted considerable attention to the impact of governance structures and compensation schemes on corporate behavior. The accounting literature documents that these factors have a substantial impact on earnings management, while the finance literature shows that they likewise affect financial performance. However, these two strands of literature, when considered together, raise another issue for study: if earnings management is affected by governance and compensation arrangements, then the apparent impact of these arrangements on reported financial performance may be at least in part merely cosmetic. In this paper we examine how governance structure and incentive-based compensation influence firm performance when measured performance is adjusted for the impact of earnings management.

---

<sup>☆</sup>The authors are grateful to Yin Duan, Alex Fayman, Karthik Krishnan, and Umut Gokcen for research assistance. We thank Mike Barry, Jim Booth, Susan Shu, Richard Evans, Wayne Ferson, Amy Hutton, Edith Hotchkiss, Darren Kisgen, Jeff Pontiff, Pete Wilson, and seminar participants at Boston College, Southern Illinois University, and the University of New Orleans for helpful comments.

\*Corresponding author. Tel.: +617 552 3944; fax: +617 552 0431.

*E-mail address:* [hassan.tehranian@bc.edu](mailto:hassan.tehranian@bc.edu) (H. Tehranian).

Our main result is that adjusting for the impact of earnings management substantially increases the measured importance of governance variables and substantially decreases the importance of incentive-based compensation for corporate performance. We focus on the role of discretionary accruals in earnings management. As in previous studies, we find that such management is sensitive to corporate governance structure. We extend this literature by showing that institutional investment in the firm also may be effective in reducing earnings management. Our more novel results address the impact of earnings management on the determinants of corporate performance. While we find a strong relation between incentive-based compensation and conventionally reported measures of firm performance, profitability measures that are adjusted for the impact of discretionary accruals show a far weaker relation with such compensation. In contrast, the estimated impact of corporate governance variables on firm performance is far greater when discretionary accruals are removed from measured profitability. We conclude that governance may be more important and the impact of incentive-based compensation less important to true performance than indicated by past studies.

The paper is organized as follows. Section 2 briefly reviews the literature on earnings management as it relates to our study. Section 3 discusses internal corporate governance mechanisms shown to be important in other contexts that might have an impact on both accounting choice and financial performance. Section 4 presents an overview of our data and methodology. Section 5 presents empirical results and Section 6 concludes the paper.

## 2. Earnings management

Accountants and financial economists have recognized for years that firms use the latitude in accounting rules to manage their reported earnings in a wide variety of contexts. Healy and Wahlen (1999) conclude in their review article on this topic that the evidence is consistent with earnings management “to window dress financial statements prior to public securities offerings, to increase corporate managers’ compensation and job security, to avoid violating lending contracts, or to reduce regulatory costs or to increase regulatory benefits.” Since that study, evidence of earnings management has only mounted. For example, Cohen, Dey, and Lys (2005) find that earnings management increased steadily from 1997 until 2002, and options and stock-based compensation emerged as a particularly strong predictor of aggressive accounting behavior (see also Gao and Shrieves, 2002; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006). However, several studies find that earnings management can be limited by well-designed corporate governance arrangements (Klein, 2002; Warfield, Wild, and Wild, 1995; Dechow, Sloan, Sweeney, 1996; Beasley, 1996).

### 2.1. Opportunistic earnings management

Early work on strategic accruals management focused on the manipulation of bonus income (Healy, 1985; Healy, Kang, and Palepu, 1987; Guidry, Leone, and Rock, 1999; Gaver, Gaver, and Austin, 1995; Holthausen, Larcker, and Sloan, 1995). More recent work addresses the use of earnings management to affect stock prices, and in turn, managers’ wealth. For example, Sloan (1996) finds that a firm can increase its stock price at least temporarily by inflating current earnings using aggressive accruals assumptions. Teoh, Welch, and Wong (1998a, b) find that firms with more aggressive accrual policies prior to IPOs and SEOs tend to realize poorer post-issuance stock price performance than firms with less aggressive accounting policies, which suggests that earnings management inflates stock prices prior to the offering. Similarly, Beneish and Vargus (2002) find that periods of abnormally high accruals (which temporarily inflate earnings) are associated with increases in insider sales of shares, and that after the “event period” stock returns tend to be poor.

Option and restricted stock compensation is a particularly direct route by which management can potentially increase its wealth by inflating stock prices in periods surrounding stock sales or option exercises. Indeed, considerable evidence links such compensation to a higher degree of earnings management. Bergstresser, Desai, and Rauh (2006) find that firms make more aggressive assumptions about returns on defined benefit pension plans during periods in which executives are exercising options. Burns and Kedia (2006) show that firms whose CEOs have large options positions are more likely to file earnings restatements. Gao and Shrieves (2002), Bergstresser and Philippon (2006), Cohen, Dey, and Lys (2005), and Cheng and

Warfield (2005) all find that the magnitude of discretionary accruals is greater and earnings management is more prevalent at firms in which managers' wealth is more closely tied to the value of stock, most notably via stock options.

## 2.2. Earnings management and corporate governance

The literature on the impact of corporate governance on earnings management is more sparse. Some authors (e.g., Dechow, Sloan, and Sweeney, 1996; Beasley, 1996) investigate the relation between outright fraud and board characteristics. However, these papers do not focus on the strategic use of allowable discretion in accounting policy.

Klein (2002) shows that board characteristics (such as audit committee independence) predict lower magnitudes of discretionary accruals. Warfield, Wild, and Wild (1995) find that a high level of managerial ownership is positively related to the explanatory power of reported earnings for stock returns. They also examine the absolute value of discretionary accruals and find that accruals management is inversely related to managerial ownership. Like Klein, they conclude that corporate governance variables may influence the degree to which latitude in accounting rules affects the informativeness of reported earnings. However, Bergstresser and Philippon (2006) find an inconsistent relation between accruals and an index of corporate governance quality.

## 3. Corporate governance mechanisms

Corporate governance variables have been shown in other contexts to affect firm performance and behavior. Such variables include institutional ownership in the firm, director and executive officer stock ownership, board of director characteristics, CEO age and tenure, and CEO pay-for-performance sensitivity. In this section we discuss these variables, which will be the focus of our empirical analysis.

### 3.1. Institutional ownership

McConnell and Servaes (1990), Nesbitt (1994), Smith (1996), Del Guercio and Hawkins (1999), and Hartzell and Starks (2003) find evidence that corporate monitoring by institutional investors can constrain managers' behavior. Large institutional investors have the opportunity, resources, and ability to monitor, discipline, and influence managers. These papers conclude that corporate monitoring by institutional investors can force managers to focus more on corporate performance and less on opportunistic or self-serving behavior. If institutional ownership enhances monitoring, it might be associated with lower use of discretionary accruals. In contrast, it is possible, at least in principle, that managers might feel more compelled to meet earnings goals of these investors, and thus engage in more earnings manipulation.

### 3.2. Director and executive officer stock and/or option ownership

Higher stock and/or option ownership by directors and executive officers may improve incentives for value-maximizing behavior, but also may encourage managers to use discretionary accruals to improve the apparent performance of the firm in periods surrounding stock sales or option exercises, thereby increasing their personal wealth. Stock options are particularly potent in making managers' wealth sensitive to stock prices, and so may have an even greater impact on earnings management.

### 3.3. Board of director characteristics

#### 3.3.1. Percent of independent outside directors on the board

There is a considerable literature on the impact of the composition of the board of directors, specifically, inside versus outside directors. Boards dominated by outsiders are arguably in a better position to monitor and control managers. Outside directors are likely to be more independent of the firm's managers, and to bring a greater breadth of experience to the firm. A number of studies link the proportion of outside directors to

financial performance and shareholder wealth (Brickley, Coles, and Terry, 1994; Byrd and Hickman, 1992; Rosenstein and Wyatt, 1990). These studies consistently find better stock returns and operating performance when outside directors hold a significant percentage of board seats. Moreover, if outside membership on the board enhances monitoring, it would also be associated with lower use of discretionary accruals.

### 3.3.2. CEO/Chair duality

In about 80% of U.S. companies, the CEO is also the chairman of the board (Brickley, Coles, and Jarrell, 1997). CEO/Chair duality concentrates power in the CEO's position, potentially allowing for more management discretion. The dual office structure also permits the CEO to effectively control information available to other board members and thus may impede effective monitoring (Jensen, 1993). If CEO/Chair duality does impede effective monitoring, it would also be associated with greater use of discretionary accruals.

### 3.3.3. Board size

Jensen (1993) argues that small boards are more effective in monitoring a CEO's actions, as large boards place a greater emphasis on "politeness and courtesy" and are therefore easier for the CEO to control. Yermack (1996) also concludes that small boards are more effective monitors than large boards. These studies suggest that the size of a firm's board should be inversely related to performance. If small boards enhance monitoring, they would also be associated with less use of earnings management.

## 3.4. Age and tenure of CEO

The age and tenure of the CEO may determine his or her effectiveness in managing the firm. Some studies suggest that top officials with little experience have limited effectiveness because it takes time to gain an adequate understanding of the company (Alderfer, 1986). These studies suggest that the older or the longer the tenure of the firm's CEO, the greater the understanding of the firm and its industry, and the better the performance of the firm. If older, more experienced CEOs enhance firm performance, they might also be associated with lower use of discretionary accruals, although Dechow and Sloan (1991) investigate the possibility that CEOs in their final years of service are more prone to manage reported short-term earnings.

## 4. Data and methodology

### 4.1. Sample

The sample examined here consists of firms included in the S&P 100 Index (obtained from Standard & Poor's) as of the start of 1994. Our sample period runs from 1994 to 2003. We use S&P 100 firms because they are among the largest firms (representing a large share of aggregate market capitalization), and consequently command great interest among institutional investors. Thus, these large firms enable us to test the impact of such investors on both performance and earnings management. While institutional ownership is most prevalent in large firms such as these, even in this group there is considerable variation in such ownership. The sample standard deviation of share ownership by institutional owners is 14.2%.

Moreover, this sample is interesting precisely because these firms are relatively stable. Prior studies show that earnings management is more prevalent in poorly performing firms (Cohen, Dey, and Lys, 2005; Kothari, Leone, and Wasley, 2005) and that standard models of discretionary accruals are least reliable when applied to firms with extreme financial performance (Dechow, Sloan, and Sweeney, 1995). Here, however, we look at factors that influence earnings management in "normal" times and on the degree to which measured performance of even "blue-chip" firms is affected by such management. The fact that these firms are all free of financial distress makes the potential limitations of empirical models of discretionary accruals less of an issue for our sample. This also is a conservative sample selection choice in that S&P 100 firms should be a relatively difficult sample in which to find heavy use of discretionary accruals.

Firms that were dropped from the S&P 100 after our sample period begins but that remained publicly traded and continued to operate remain in the sample. Removing these firms would have introduced sample

selection bias, as firm performance is associated with ongoing inclusion in the S&P index. However, some firms were lost due to nonperformance-related events. Eleven of the S&P 100 firms were eventually acquired by other firms over the sample period and are dropped from the sample in the year of the merger. Another nine firms were lost by the year 2003 due to the unavailability of proxy or institutional investor ownership data. After these adjustments, we are left with a sample of 834 firm-years. In the following analysis, we winsorize all variables at the top and bottom 1% of observations.<sup>1</sup>

#### 4.2. Discretionary accruals

Dechow, Sloan, and Sweeney (1995) compare several models of accruals management and conclude that the so-called “modified Jones (1991) model” provides the most power for detecting such management. Bartov, Gul, and Tsui (2001) also support the use of the modified Jones model, estimated in a cross-section using other firms in the same industry. Discretionary or abnormal accruals equal the difference between actual and “normal” accruals, using a regression formula to estimate normal accruals.

The modified Jones model first estimates normal accruals as a fraction of lagged assets from the following equation:

$$\frac{TA_{jt}}{Assets_{jt-1}} = \alpha_0 \frac{1}{Assets_{jt-1}} + \beta_1 \frac{\Delta Sales_{jt}}{Assets_{jt-1}} + \beta_2 \frac{PPE_{jt}}{Assets_{jt-1}}, \quad (1)$$

where  $TA_j$  denotes total accruals for firm  $j$  in year  $t$ ,  $Assets_{jt}$  denotes total assets for firm  $j$  in year  $t$  (Compustat data item 6),  $\Delta Sales_{jt}$  denotes change in sales for firm  $j$  in year  $t$  (Compustat data item 12), and  $PPE_j$  denotes property, plant, equipment for firm  $j$  in year  $t$  (Compustat data item 7).

Total accruals can be computed from successive balance sheet data or from the statement of cash flows. Hribar and Collins (2002) argue that the cash flow statement is preferred in the presence of “non-articulation” events such as mergers and acquisitions resulting in changes to the balance sheet that do not flow through the income statement. We therefore calculate total accruals as earnings before extraordinary items and discontinued operations (Compustat data item 123) minus operating cash flows from continuing operations (Compustat item 308—item 124).<sup>2</sup>

Discretionary accruals as a fraction of assets,  $\%DA_{jt}$ , are then defined as

$$\%DA_{jt} = \frac{TA_{jt}}{Assets_{jt-1}} - \left( \hat{\alpha}_0 \frac{1}{Assets_{jt-1}} + \hat{\beta}_1 \frac{\Delta Sales_{jt} - \Delta Receivables_{jt}}{Assets_{jt-1}} + \hat{\beta}_2 \frac{PPE_{jt}}{Assets_{jt-1}} \right), \quad (2)$$

where hats denote estimated values from regression Eq. (1). The inclusion of  $\Delta Receivables_{jt}$  (Compustat item 151) in Eq. (2) is the “modification” of the Jones model. This variable attempts to capture the extent to which a change in sales is due to aggressive recognition of questionable sales.

A criticism of the Jones model is that it may be important to control for the impact of financial performance on accruals. Kothari, Leone, and Wasley (2005) show that matching firms based on operating performance gives the best measure of discretionary accruals. Firm size may also affect accrual patterns. Therefore, we estimate Eq. (1) using firms with the same three-digit SIC code as the firms in our sample that have EBIT/Asset ratios within 75%–125% of the sample firms and that are at least half as large as the sample firms (measured by book value of assets).<sup>3</sup> Following Bartov, Gul, and Tsui (2001), Eq. (1) is estimated as independent cross-sectional regressions for each year in the sample period, allowing for industry fixed effects.

Large values of discretionary accruals are conventionally interpreted as indicative of earnings management. Because discretionary accruals eventually must be reversed, the absolute value of discretionary accruals is the appropriate measure to use to determine whether earnings management occurs (e.g., Klein, 2002 or Bergstresser and Philippon, 2006). Accordingly, to measure propensities for earnings management, we also use

<sup>1</sup>We also try eliminating rather than winsorizing extreme data points and find that our results are robust to these variations.

<sup>2</sup>Nevertheless, we also compute accruals from balance sheets and income statements as  $TA_j = \Delta$  current noncash assets  $- \Delta$  current liabilities  $+ \Delta$  long-term debt in current liabilities  $-$  Depreciation and find that our results are unaffected.

<sup>3</sup>As a robustness check, we also estimate an augmented version of the accruals model suggested by Cohen, Dey, and Lys (2005) that includes both operating return on assets and book-to-market ratio as additional right-hand side variables in Eq. (1). Our results using this augmented specification are essentially unchanged, so we report results using the more conventional modified Jones model.

the absolute value of discretionary accruals. However, when we examine measures of firm performance, we adjust reported profitability indicators to their unmanaged values by netting out discretionary accruals. This requires that actual discretionary accruals, not their absolute values, be deducted from reported earnings.

#### 4.3. Firm performance

We measure firm performance as well as the potential impact of earnings manipulation on such measures using accounting data. EBIT/Assets is the textbook measure of profitability relative to total capital employed by the firm.<sup>4</sup> It is commonly employed to measure firm performance.<sup>5</sup> However, managers can influence EBIT through their assumptions concerning accruals (e.g., sales and accounts receivable) as well as the treatment of depreciation and amortization.

To obtain a performance measure that is relatively free of manipulation, we need to strip away the impact of potential strategic choices concerning depreciation, amortization, and accruals. We therefore use (EBIT–Discretionary Accruals)/Assets or equivalently, EBIT/Assets–%DA as the measure of unmanaged performance. Because the discretionary components of accruals are eliminated, variation in this measure should reflect differences in true performance rather than cosmetic effects of discretion in accounting treatment.

#### 4.4. Other variables

Institutional investor ownership data for each year are obtained from the CDA Spectrum database, which compiles holdings of institutional investors from quarterly 13-f filings of institutional investors holding more than \$100 million in the equity of any firm. Institutional investors file their holdings as the aggregate investment in each firm regardless of the number of individual fund portfolios they manage. Following [Hartzell and Starks \(2003\)](#), we calculate for each firm the proportion of total shares owned by institutional investors.

As discussed above, several studies find that board composition and director and executive officer stock ownership affect a firm's performance. Accordingly, we use proxy statements for each year to obtain director and officer stock ownership, board size, independent outsiders on the board,<sup>6</sup> CEO/chair duality, CEO age, and CEO tenure.

Finally, we require a measure of the sensitivity of CEO wealth to firm performance. Because of the extensive stock and option portfolios of top management, this sensitivity is driven far more by changes in the value of securities held than by variation in annual compensation. Indeed, [Hall and Liebman \(1998\)](#) conclude that “changes in CEO wealth due to stock and stock option revaluations are more than 50 times larger than wealth increases due to salary and bonus changes.” In fact, option compensation has been used as a proxy for incentives to manage earnings in several papers (see, for example, [Bergstresser and Philippon, 2006](#); [Cheng and Warfield, 2005](#); [Cohen, Dey, and Lys, 2005](#)).

As in [Mehran \(1995\)](#), we measure compensation structure as the percentage of total CEO annual compensation comprised of grants of new stock options, with the options valued by the Black-Scholes formula. Data on option grants, salary, bonus, and other compensation are available from Standard and Poor's ExecuComp database, available through Compustat. As an alternative measure of option or stock-based compensation, we also use [Bergstresser and Philippon's \(2006\)](#) “incentive ratio.” This ratio employs the total holding of stock and options rather than annual grants, and is defined as follows:

$$\text{Incentive ratio} = \frac{\text{Increase in value of CEO stock and options for a 1\% increase in stock price}}{\text{Increase in value of CEO stock and options} + \text{annual salary} + \text{annual bonus}}$$

<sup>4</sup>See for example, [Damodaran, A., 2001. \*Corporate Finance: Theory and Practice\*, second ed., Wiley, New York, p. 95.](#)

<sup>5</sup>For example, [Eberhart, Maxwell, and Siddique \(2004\)](#), [Denis and Denis \(1995\)](#), [Hotchkiss \(1995\)](#), [Huson, Malatesta, and Parrino \(2004\)](#), and [Cohen, Dey, and Lys \(2005\)](#) all compute performance using either EBIT or operating income as a percent of total assets.

<sup>6</sup>Specifically, independent outside directors are directors listed in proxy statements as managers in an unaffiliated nonfinancial firm, managers of an unaffiliated bank or insurance company, retired managers of another company, lawyers unaffiliated with the firm, and academics unaffiliated with the firm.

Table 1  
Descriptive statistics on accruals and average performance

Financial statement data are obtained from the Compustat database for each year, 1994–2003. For each S&P 100 firm, we classify industry comparison firms as all firms listed on Compustat with the same three-digit SIC code and for which EBIT/Assets is within 75% and 125% of the sample firm and book value of assets is at least one-half that of the sample firm. Industry-adjusted performance is the sample firm's operating return in any year minus the total asset-weighted average industry value for that year. We measure performance alternatively as reported performance, EBIT/Assets, or performance adjusted for discretionary accruals, EBIT/Assets – %DA. Normal accruals are defined by the modified Jones model, given in Eq. (1). %DA (percentage discretionary accruals) are residuals between actual accruals and normal accruals as a fraction of assets predicted by the modified Jones model. We winsorize extreme observations of each variable.

Variable	Mean	Median	Standard deviation	25th percentile	75th percentile
$\%DA = \frac{\text{Discretionary accruals}}{\text{Assets}}$	0.0039	0.0028	0.0124	–0.0101	0.0271
Abs (%DA)	0.0061	0.0049	0.0121	0.0018	0.0357
Performance measures					
Reported: EBIT/Assets	0.1274	0.1238	0.0568	–0.0518	0.2052
Unmanaged: EBIT/Assets – %DA	0.1235	0.1221	0.0586	–0.0554	0.1803
Industry-adjusted performance					
Reported: EBIT/Assets	0.0029	0.0036	0.0033	–0.0017	0.0072
Unmanaged: EBIT/Assets – %DA	0.0021	0.0032	0.0029	–0.0019	0.0068

The ratio measures the incentive the CEO might have to increase his or her own wealth by increasing the stock price, possibly by manipulating reported earnings. The data on executive holdings of option and stock also are available in the ExecuComp database. As it turns out, our empirical results using either annual option grants or the incentive ratio are nearly identical, so in the interest of brevity we report our results only for the former measure.

#### 4.5. Summary statistics

Table 1 presents descriptive statistics of firm financial performance. Because discretionary accruals must be reversed at some point, their average value over long periods should be near zero. Indeed, as reported in Table 1, the average value of discretionary accruals for our sample is relatively small, 0.39% of assets using the modified Jones model as the basis for “normal” accruals. The average absolute value of discretionary accruals, 0.61%, is not dramatically higher than the average signed value.

We report two measures of performance in Table 1: EBIT/Assets and EBIT/Assets – %DA. While the mean EBIT/Assets based on reported earnings is 12.74%, the mean performance measure based on unmanaged earnings (i.e., using the modified Jones model to remove the impact of discretionary accruals on reported performance) is 12.35%.

In the last panel of Table 1, we examine whether the performance of our sample firms differs from that of the other firms in their industries. We show each firm's *industry-adjusted* performance, i.e., the firm's performance (measured alternatively as EBIT/Assets or (EBIT/Assets – %DA)) minus the industry-average value of that variable in that year. We define the industry comparison group for each firm as all firms listed on Compustat with the same three-digit SIC code.<sup>7</sup> The number of firms in each industry group ranges from a minimum of two to a maximum of 357. Industry-average performance is calculated as the total asset-weighted average performance measure of all firms in the industry. Industry-adjusted performance is nearly zero using either of these measures: 0.29% for EBIT/Assets, or 0.21% for EBIT/Assets – %DA. Thus, the financial performance of our sample firms is nearly identical on average to that of their industries' performance.

Table 2 presents summary statistics on corporate governance variables. Institutional ownership is significant: averaging across all firms in all years, institutions own 60.3% of the outstanding shares in each

<sup>7</sup>We remove all sample firms from any industry comparison groups. For example, General Motors and Ford (both S&P 100 firms) are not included in any industry comparison groups.

Table 2

Summary statistics on governance and CEO compensation variables

Data on institutional investor ownership for the period 1994–2003 are obtained from the CDA Spectrum database. These data include total shares outstanding, number of shares owned by all institutional investors, and the number of institutional investors. We use proxy statements for the sample firms for each year 1994–2003 to obtain data on the fraction of director and officer stock ownership, board size, the fraction of independent outsiders on the board, CEO/chair duality, CEO age, CEO tenure, and CEO compensation (salary, bonus, options, stock grants, long-term incentive plan payouts, and others). We winsorize the extreme observations of each variable.

Variable	Mean	Median	Standard deviation	25th percentile	75th percentile
Fraction of shares owned by all institutional investors	0.603	0.626	0.142	0.304	0.703
Number of Institutional investors	426	362	224	128	734
Fraction director + executive officer stock ownership	0.037	0.019	0.039	0.009	0.265
Number of directors on board					
Total	12.78	12	2.40	8	18
Inside directors	2.02	2	1.34	1	7
Affiliated outside	1.78	1	1.42	0	6
Independent outside	8.53	9	2.02	3	13
Institutional investors	0.75	1	0.79	0	3
Fraction of independent outside directors	0.703	0.714	0.152	0.268	0.801
Total assets (\$ billions)	41.83	20.97	50.97	8.90	498.42
CEO profile					
Age (years)	55	57	5	41	64
Tenure (years)	6	5	5	3	24
CEO compensation (\$000)					
Salary and bonus	2720	2071	2442	1343	3174
Annual option grants	5429	2302	13,129	738	5584
Option grants as fraction of total compensation	0.442	0.442	0.272	0.243	0.657
Incentive ratio <sup>a</sup>	0.280	0.238	0.189	0.150	0.369

<sup>a</sup>Following Bergstresser and Philippon (2006), we define the incentive ratio as the increase in the value of CEO stock and options due to a 1% increase in the firm's stock price expressed as a fraction of that increase plus total other compensation from salary and bonus.

firm, whereas directors and executive officers hold only 3.7% of the outstanding shares in their firms. On average, 426 institutional investor firms hold stock in the sample firms.

While institutional investors hold a large fraction of outstanding shares, they typically do not sit on the board of directors. On average, the boards of directors seat 12.78 members, and these seats are filled by 2.02 inside directors, 1.78 affiliated outside directors, and 8.53 independent outside directors. The average number of institutional investors on the board is 0.75 and the maximum for this group is three. Thus, the majority of the directors are independent outsiders (albeit not institutional investors).

The average age of the firms' CEOs is 55 years and, on average, the CEOs have been in place for six years. These CEOs are paid an average of \$2.720 million in salary and bonus annually and receive an additional \$5.429 million worth of stock options.

#### 4.6. Methodology

We estimate two broad sets of regressions. The first set examines earnings management, and treats the absolute value of discretionary accruals divided by assets as the dependent variable. The explanatory variables are corporate governance variables (described above) related to institutional ownership, management characteristics, and executive compensation. The second set of regressions examines how financial performance relates to the same set of variables, both with and without adjustment for earnings management. The explanatory variables and lag structure used in the regressions are listed in Table 3.

Both sets of regressions are subject to potential simultaneity bias. In addition to influencing accruals policy, institutional investors may merely be attracted to firms with more conservative accruals policy, which would

Table 3

## Regression variables

This table provides variable definitions and lag structure used in the regression analysis.

---

Fraction of shares of the firm owned by all institutional investors (lagged one year)
Natural log of the number of institutional investors holding stock in firm (lagged one year)
Natural log of one + the number of institutional investors on the board of directors (lagged one year) <sup>a</sup>
Fraction of board of directors composed of institutional investors (lagged one year)
Fraction of board of directors composed of independent outside directors
Fraction of shares in firm owned by directors and officers
Market-adjusted return on stock (lagged one year)
CEO/Chair duality dummy: equals one if the CEO is also the chair of the board of directors, and zero otherwise
Natural log of the size of the board of directors
Natural log of the CEO's age
Natural log of the CEO's tenure
Natural log of assets of the firm

$$\text{CEO option compensation (lagged one year)} = \frac{\text{Value of annual option grants}}{\text{Value of option grants} + \text{salary} + \text{bonus} + \text{other}}$$

$$\text{Incentive ratio} = \frac{\text{Increase in value of CEO stock and options for a 1\% increase in stock price}}{\text{Increase value of CEO stock and options} + \text{annual salary} + \text{annual bonus}}$$


---

<sup>a</sup>There are many firms with no institutional investors on the board of directors. Therefore, we must take log of one plus the number of such investors. In contrast, there are many institutional investors for each firm (median = 356), so adding one to that number would be irrelevant.

by itself induce a correlation between institutional ownership and accounting policy. Likewise, if institutions are attracted to firms with superior performance, then a positive association between institutional ownership and performance may be observed even if that ownership is not directly beneficial to performance.

We employ several tools to deal with these potential problems. First and foremost, we use instrumental variables. We use the market value of equity and annual trading volume of shares in each firm as instruments for percentage institutional share ownership and the number of institutional investors in both sets of regressions. These instruments will be correlated with institutional investment, but are not subject to reverse feedback from short-term variation in either accounting policy or expected operating performance. We also include as a right-hand side variable in the firm-performance regressions the lagged market-adjusted return of the firm (i.e., annual firm return minus the return on the S&P 500 Index). Increased expectations for improvements in future operating performance will result in a positive market-adjusted return. Thus, this variable helps control for already-anticipated changes in performance.

We lag all measures of institutional ownership and institutional board membership by one year. This lag allows for the effect of any change in governance structure to show up in firm behavior and performance. This also mitigates potential simultaneity issues: without the lag on institutional ownership, it would be hard to distinguish between the hypothesis that institutional investors improve firms' decisions and cash flows versus the hypothesis that they simply increase holdings in firms in which they anticipate improved performance. If institutions do affect management decisions, they presumably would do so prior to the year of better performance, which is consistent with the use of a lag.

The lag on the option compensation variable eliminates a simpler form of reverse causality. Because an option price is linked to its underlying stock price, the value of such compensation can be directly affected by contemporaneous operating performance. Using lagged compensation enables us to measure the impact of incentive structures on performance measures (both managed and unmanaged) uncontaminated by the impact of current performance on the value of compensation.

We might also have lagged other explanatory variables involving board membership. However, endogeneity concerns are not as significant here. As [Hermalin and Weisbach \(1988\)](#) demonstrate, board turnover is often a result of *past* performance, especially for poorly performing firms, rather than anticipated changes in the future prospects of the firm. Board turnover is also often related to CEO turnover. Thus, in contrast to institutional investment, there is far less danger that board composition will be causally affected by the

near-term prospects of the firm. Moreover, to the extent that the firm has control over board membership, board composition is less subject to the endogeneity problem that might affect institutional investment.<sup>8</sup>

Finally, our concerns over simultaneity are mitigated by the fact that the financial performance of our sample does not seem to be unusual. As noted above, the mean industry-adjusted performance measures of the sample firms is virtually zero, whether performance is calculated from EBIT or EBIT net of discretionary accruals, indicating financial performance about equal to that of their industry peer groups.

We estimate regressions explaining accruals policy as well as financial performance in two ways. First, we estimate pooled time-series/cross-sectional regressions allowing for firm fixed effects. However, a potential problem with the pooled regressions is the possibility of within-firm autocorrelation, which would bias the standard errors. To investigate this possibility, we also estimate each regression equation as a cross-sectional regression for each year of the sample independently and compute autocorrelation-corrected Fama-MacBeth (1973) estimates. We adjust the Fama-MacBeth estimates for autocorrelation using a method suggested by Pontiff (1996). Specifically, year-by-year coefficients for each variable are regressed on a constant, but allowing for the error term to be estimated as a moving average process. The intercept and its standard error in this regression are then autocorrelation-consistent estimates of the mean and standard error for that coefficient. We employ an MA(2) (moving average) process for the error term.

## 5. Regression results

### 5.1. Earnings management

Table 4 presents results on the use of discretionary accruals to manage earnings. Discretionary accruals in this table are estimated from the modified Jones model, using Eq. (2) above. Column 1 presents coefficient estimates and standard errors from a pooled time-series cross sectional regression with firm fixed effects. Column 2 presents Fama-MacBeth estimates of Eq. (2). As it turns out, the year-by-year estimates are so stable that the Fama and MacBeth (1973) estimates result in far higher significance levels than the pooled regressions.

The point estimates of the regression coefficients from both columns in Table 4 are highly similar. Earnings management is significantly reduced by institutional involvement in the firm, whether involvement is measured by the fraction of shares owned by all institutional investors (coefficients are  $-0.0315$  and  $-0.0320$  in the two regressions, respectively) or by the number of institutional investors (coefficients are  $-0.0286$  and  $-0.0292$ , respectively). These coefficients are all significant at better than the 1% level. As noted above, these results extend prior research (e.g., Klein, 2002) by showing that, like corporate governance arrangements, institutional investment also can serve to constrain firm discretion concerning accruals management. In fact, the economic impact of institutional investment is substantial. For example, an increase of one sample standard deviation in the number of institutional investors in a firm starting from the mean value would decrease the average magnitude of discretionary accruals by 1.2 percentage points. This is somewhat smaller than, but of the same order of magnitude as, the economic impact of variation in board composition (see below).

The other results in Table 4 are also largely consistent with past research. Board composition significantly affects earnings management. The impact of the number of institutional investors on the board is significant only in the Fama-MacBeth regressions, but the fraction of the board composed of either institutional investors or of independent outside directors has a negative and significant impact on earnings management in both specifications, consistent with Klein (2002). Again, the point estimates for the two specifications are nearly identical. The coefficients on the fraction of the board composed of institutional investors are both about  $-0.143$  and those on the fraction of the board composed of independent directors are about  $-0.109$ .

These coefficients are large enough to have a significant economic impact. For example, using a coefficient estimate of  $-0.109$  for independent directors, an increase of one (sample) standard deviation in this variable (i.e., using Table 2, an increase in the fraction of independent outside directors of 0.152 or 15.2

<sup>8</sup>Nevertheless, we experiment with lags on the board membership variables and find that such lags make virtually no difference in our regression results.

Table 4

Discretionary accruals from modified Jones model for S&amp;P 100 firms

The dependent variable is Abs(%DA), i.e., the absolute value of discretionary accruals (defined as the difference between actual accruals and accruals predicted from the modified Jones model, Eq. (1) as a percent of total assets. The sample period is 1994–2003. The Column 1 regression is estimated as a pooled time-series cross-section for S&P 100 firms, with fixed firm effects. Column 2 presents Fama-MacBeth results, adjusted for serial correlation using the methodology described in Pontiff (1996). Standard errors appear below coefficient estimates. Trading volume and the market value of equity are used as instruments for the fraction of shares owned by institutional investors and the number of institutional investors holding stock in firm. We winsorize extreme observations of each variable. The number of observations is 834.

Explanatory variable	Pooled time-series/cross-section regression	Fama-MacBeth regressions
Fraction of shares owned by all institutional investors	−0.0315 (0.0082)**	−0.0320 (0.0011)**
ln(Number of institutional investors)	−0.0286 (0.0091)**	−0.0292 (0.0011)**
ln(Number of institutional investors on board)	−0.0173 (0.0131)	−0.0168 (0.0008)**
Fraction of board composed of institutional investors	−0.1426 (0.0487)**	−0.1432 (0.0046)**
Fraction of firm owned by directors plus executive officers	0.0978 (0.0393)*	0.0975 (0.0038)**
Fraction of board composed of independent outside directors	−0.1097 (0.0306)**	−0.1090 (0.0049)**
CEO duality dummy	0.0062 (0.0063)	0.0060 (0.0007)**
ln(Board size)	−0.0045 (0.0145)	−0.0047 (0.0008)**
ln(CEO age)	0.0058 (0.0138)	0.0061 (0.0005)**
ln(CEO tenure)	0.0207 (0.0171)	0.0212 (0.0013)**
ln(Firm size)	−0.0009 (0.0008)	−0.0007 (0.0001)**
Option compensation as a fraction of total compensation (lagged one year)	0.1647 (0.0160)**	0.1640 (0.0048)**
<i>R</i> -squared, adjusted. (for Fama-MacBeth, the average <i>R</i> -square of year-by-year regressions)	41.8%	40.9%
Firm fixed effect <i>F</i> -statistic	9.69**	—

\*Significant at better than the 5% level.

\*\*Significant at better than the 1% level.

percentage points) would decrease the absolute value of discretionary accruals as a percentage of total assets by approximately  $0.152 \times 0.109 = 0.0166$ , or 1.66 percentage points. Similarly, an increase of two institutional investors on a 12-member board (an increase of 16.7%) would decrease the absolute value of discretionary accruals by approximately  $0.167 \times 0.143 = 0.0239$ , or 2.39 percentage points.

Table 4 also indicates that, consistent with other research, option compensation has a tremendous impact on earnings management in this sample. The coefficient on option grants as a fraction of total annual compensation is approximately 0.164 in both specifications, with both *t*-statistics above 10. Using a coefficient estimate of 0.164, an increase of one sample standard deviation in the option compensation variable increases the typical absolute value of discretionary accruals as a percentage of assets by about 4.5 percentage points.

The other governance variables have a weaker impact on discretionary accruals. Neither board size nor any of the CEO characteristics such as age, tenure, or duality have a significant impact on accruals policy in the full-sample pooled regression, although they are significant in the Fama-MacBeth specification. Not surprisingly, the firm fixed effects are significant at better than the 1% level in the pooled regression, with an *F*-statistic above nine.

## 5.2. Firm performance

Tables 5 and 6 present regression results of firm financial performance as a function of governance and compensation variables. In Table 5, we treat reported performance, EBIT/Assets, as the dependent variable. This may be viewed as “managed performance,” since EBIT reflects management choices for accruals as well as depreciation and amortization. In Table 6, we measure performance as EBIT/Assets – %DA, a measure that is unaffected by those choices. We also include firm size (log of total assets) as a control variable for operating performance in these regressions as well as the firm’s lagged market-adjusted return to absorb the potential impact of already-anticipated increases in performance. As in Table 4, we use market value of equity and share trading volume as instrumental variables for the fraction of shares owned by institutions as well as the number of institutional investors.<sup>9</sup>

As in Table 4, point estimates of regression coefficients are almost identical whether we estimate regressions using a pooled time-series/cross-section or a Fama-MacBeth approach. The coefficient on the fraction of shares owned by all institutional investors is positive (about 0.032 in both specifications) and significant at the 1% level in both specifications. However, the economic impact of the percentage of institutional ownership is relatively modest. The regression coefficient implies that an increase of one (sample) standard deviation in institutional ownership (i.e., using Table 2, an increase in fractional ownership of 0.142 or 14.2 percentage points) would increase industry-adjusted performance by only 0.0045%, or 0.45%.

The log of the number of institutional investors holding stock in the firm is far more influential in explaining reported performance. The coefficient on this variable is positive in each regression (0.0302 and 0.0307, respectively) and is significant at better than the 1% level in both specifications. This coefficient implies that a one-standard deviation increase in this variable starting from its mean value would increase EBIT/Assets by 1.28%. These results suggest that higher institutional investment is in fact associated with improved operating performance, consistent with the notion that institutional ownership results in better monitoring of corporate managers.

The coefficient on the number of institutional investors on the board is statistically insignificant in the pooled regressions. The coefficient on the % of institutional investors on the board is statistically significant, but has only minimal economic impact on firm performance. Given that so few representatives of institutional investor firms sit on boards of directors, it is not surprising that we find little quantitative importance for these variables.

Notice also the coefficients on the control variables. The coefficient on the fractional stock ownership of directors and executive officers is insignificant in the pooled regression, and the regression coefficient implies a minimal economic impact for any reasonable value of share ownership. This result likely reflects the fact that our sample includes only S&P 100 firms. For these firms, it would be hard for directors and officers to have anything but minimal fractional stock holdings in the firm (the mean for the sample is 3.7%). Accordingly, the lack of importance for this variable is not entirely surprising.

The coefficient on the fraction of the board composed of independent outside directors is 0.1437 and 0.1448 in the two regressions, respectively, and is significant at the 1% level for both specifications. Thus, increasing the representation of independent directors on the board tends to result in improved performance. Other characteristics of the board of directors have no significant impact on industry-adjusted performance, at least in the pooled regressions. The coefficients on the CEO/Chair duality dummy, board size, and CEO age and tenure are all insignificant.<sup>10</sup>

In contrast, the coefficient on CEO option compensation is positive, 0.1495 and 0.1492 in the two regressions and is highly significant (*t*-statistics are above 11 in each regression). Higher CEO compensation in the form of options seems to predict better performance. The economic impact of option compensation is

<sup>9</sup>We estimate variations on the specifications in these tables, for example, measuring the dependence of CEO wealth on option value using the incentive ratio (see Table 3), which is based on total holdings of stock or options rather than annual grants. We also experiment with measures of institutional ownership, for example, using total versus top-five institutional owners. These alternative specifications have little impact on our results. In light of the similarity of results across these specifications, we do not present results for these variations.

<sup>10</sup>CEO horizon may be more important than age or tenure (Dechow and Sloan, 1991), which might explain these results. However, we have no way of measuring horizon beyond the information contained in age.

Table 5

## Determinants of reported performance

The dependent variable is EBIT/Assets for firm  $j$  in year  $t$ . The sample period is 1994–2003. The Column 1 regression is estimated as a pooled time-series cross-section for S&P 100 firms, with fixed firm effects. Column 2 presents Fama-MacBeth results, adjusted for serial correlation using the methodology described in Pontiff (1996). Standard errors are in parentheses. Trading volume and the market value of equity are used as instruments for the fraction of shares owned by institutional investors and the number of institutional investors holding stock in firm. We winsorize extreme observations of each variable. The number of observations is 834.

Explanatory variable	Pooled time-series/ cross-section regression	Fama- MacBeth regressions
Fraction of shares owned by all institutional investors (lagged one year)	0.0321 (0.0106)**	0.0328 (0.0020)**
ln(Number of institutional investors) (lagged one year)	0.0302 (0.0111)**	0.0307 (0.0018)**
ln(one + number of institutional investors on board) (lagged one year)	0.0059 (0.0095)	0.0054 (0.0008)**
Fraction of board composed of institutional investors (lagged one year)	0.0487 (0.0166)**	0.0479 (0.0046)**
Fraction of firm owned by directors plus executive officers (lagged one year)	0.0275 (0.0262)	0.0284 (0.0023)**
Fraction of board composed of independent outside directors (lagged one year)	0.1437 (0.0361)**	0.1448 (0.0040)**
Market-adjusted returns (lagged one year)	0.0031 (0.0063)	0.0030 (0.0004)**
CEO duality dummy	-0.0042 (0.0076)	-0.0039 (0.0004)**
ln(Board size)	-0.0071 (0.0073)	-0.0070 (0.0006)**
ln(CEO age)	0.0085 (0.0102)	0.0082 (0.0007)**
ln(CEO tenure)	-0.0098 (0.0124)	-0.0099 (0.0008)**
ln(Firm Size) (lagged one year)	0.0011 (0.0014)	0.0010 (0.0001)**
Option compensation as a fraction of total compensation (lagged one year)	0.1495 (0.0132)**	0.1492 (0.0041)**
$R$ -squared, adjusted. (for Fama-MacBeth, the average $R$ -square of year-by-year regressions)	41.7%	40.3%
Firm fixed effect $F$ -statistic	8.92**	--

\*Significant at better than the 5% level.

\*\*Significant at better than the 1% level.

dramatic. An increase of one sample standard deviation in option grants as a fraction of total compensation would increase performance by 4.06 percentage points.

Broadly speaking, the Table 5 regressions seem consistent with conventional wisdom on firm performance. That is, performance improves with monitoring by disinterested institutional investors and independent board members, as well as with pay-for-performance compensation, measured here by option grants. However, recall that Table 4 showed that while earnings management decreases with institutional monitoring, it increases with option holdings. This implies that “unmanaged performance,” calculated from earnings free of the effects of managers’ choices for depreciation, amortization, and accruals, will be *more* responsive to the monitoring variables and *less* responsive to options.

Table 6 repeats the analysis of Table 5, but uses unmanaged performance, computed as EBIT/Assets – %DA, as the dependent variable. The coefficient on institutional ownership of shares, which was 0.0321 in the managed-earnings regression (Table 5), doubles to 0.0642 in the pooled regression of Table 6. Similarly, the coefficient on the number of institutional investors increases from 0.0302 in Table 5 to 0.0589 in Table 6, and the coefficient on the fraction of the board composed of institutional investors, increases from 0.0487 to 0.1569, all significant at better than the 1% level. Finally, the coefficient in Table 6 on independent directors as

Table 6

## Determinants of unmanaged performance

The dependent variable is (EBIT/Assets – %DA) for firm  $j$  in year  $t$ . The sample period is 1994–2003. The Column 1 regression is estimated as a pooled time-series cross-section for S&P 100 firms, with fixed firm effects. Column 2 presents Fama-MacBeth results, adjusted for serial correlation using the methodology described in Pontiff (1996). Standard errors are in parentheses. Trading volume and the market value of equity are used as instruments for the fraction of shares owned by institutional investors and the number of institutional investors holding stock in firm. We winsorize extreme observations of each variable. The number of observations is 834.

Explanatory variable	Pooled time-series/ cross-section regression	Fama- MacBeth regressions
Fraction of shares owned by all institutional investors (lagged 1 year)	0.0642 (0.0151)**	0.0625 (0.0040)**
ln(Number of institutional investors) (lagged one year)	0.0589 (0.0151)**	0.0594 (0.0029)**
ln(one + number of institutional investors on board) (lagged one year)	0.0204 (0.0169)	0.0199 (0.0024)**
Fraction of board composed of institutional investors (lagged one year)	0.1569 (0.0399)**	0.1589 (0.0053)**
Fraction of firm owned by directors plus executive officer (lagged one year)	–0.0148 (0.0178)	–0.0151 (0.0019)**
Fraction of board composed of independent outside directors (lagged one year)	0.2663 (0.0356)**	0.2673 (0.0100)**
Market-adjusted returns (lagged one year)	0.0024 (0.0055)	0.0026 (0.0005)**
CEO duality dummy	–0.0089 (0.0182)	–0.0091 (0.0013)**
ln(Board size)	–0.0043 (0.0116)	–0.0039 (0.0008)**
ln(CEO age)	0.0056 (0.0181)	0.0052 (0.0011)**
ln(CEO tenure)	–0.0094 (0.0152)	–0.0090 (0.0017)**
ln(Size) (lagged one year)	0.0035 (0.0046)	0.0037 (0.0008)**
Option compensation as a fraction of total compensation (lagged one year)	–0.0019 (0.0158)	–0.0020 (0.0004)**
<i>R</i> -squared, adjusted. (for Fama-MacBeth, the average <i>R</i> -square of year-by-year regressions)	42.9%	41.8
Firm fixed effect <i>F</i> -statistic	11.47***	—

\*Significant at better than the 5% level.

\*\*Significant at better than the 1% level.

a fraction of the board, 0.2663, is almost double the corresponding coefficient value in the Table 5 regression and again is significant at the 1% level. The economic impact of these variables increases commensurately.

In stark contrast to the results in Table 5 for reported performance, the impact of option compensation on performance disappears in Table 6 using unmanaged performance. The point estimate on option grants as a fraction of total compensation, which is positive and highly significant in the pooled regression of Table 5, is now slightly negative, –0.0019, but insignificant. Thus, while option compensation strongly predicts profitability using *reported* earnings (Table 5), its effect seems to derive wholly from the impact of such compensation on accounting choice. Unmanaged earnings adjusted for the impact of discretionary accruals shows no relation to option compensation.

A natural question to examine before we conclude the paper is whether the substantial increase in institutional ownership in the last decade could have affected our results. The consistency of these estimates provides support against this possibility. The year-by-year Fama-MacBeth regressions yield remarkably stable regression coefficients, all highly similar to the full-sample pooled regression results. Of particular interest may

be the results for 2003, the first full year after passage of the Sarbanes-Oxley Act, which created an independent auditing oversight board under the SEC, increased penalties for corporate wrongdoers, forced faster and more extensive financial disclosure, and created avenues of recourse for aggrieved shareholders. The goal of the legislation was to prevent deceptive accounting and management practices and bring stability to jittery stock markets battered in the summer of 2002 by the corporate scandals of Enron, Global Crossings, Tyco, WorldCom, and others. Table 7 reports results for that year. The first column treats EBIT/Assets as the dependent variable, and the second treats unmanaged performance, EBIT/Assets – %DA, as the dependent variable. The results of the regressions for this year are highly consistent with those for the full sample.

Finally, there is a bit of tantalizing evidence concerning earnings management in the period following the tech meltdown of 2000–2002. Fig. 1 presents the coefficients on option compensation from the year-by-year regressions on reported performance (EBIT/Assets). There seems to be an increase in the impact of option compensation from 1996 through 2000 and then a decline beginning with the tech bust. These trends are not statistically significant, but they are broadly consistent with the results of Cohen, Dey, and Lys (2005), who find similar trends in earnings management in this period.

Table 7  
Determinants of reported and unmanaged performance, 2003

The dependent variable is EBIT/Assets in column (1), and (EBIT/Assets – %DA) in column (2) for firm  $j$  in 2003. Regressions are estimated as a cross-section for S&P 100 firms. Standard errors are in parentheses. Trading volume and the market value of equity are used as instruments for the fraction of shares owned by institutional investors and the number of institutional investors holding stock in firm. We winsorize extreme observations of each variable. The number of observations is 80.

Explanatory variable	Dependent variable = EBIT/Assets	Dependent variable = (EBIT/Assets) – %DA
Fraction of shares owned by all institutional investors (lagged one year)	0.0328 (0.0106)**	0.0671 (0.0152)**
ln(Number of institutional investors) (lagged one year)	0.0299 (0.0112)**	0.0614 (0.0152)**
ln(one + number of institutional investors on board) (lagged one year)	0.0055 (0.0092)	0.0179 (0.0164)
Fraction of board composed of institutional investors (lagged one year)	0.0498 (0.0168)**	0.1640 (0.0395)**
Fraction of firm owned by directors plus executive officers (lagged one year)	0.0299 (0.0253)	–0.0132 (0.0181)
Fraction of board composed of independent outside directors (lagged one year)	0.1441 (0.0357)**	0.2760 (0.0354)**
Market-adjusted returns (lagged one year)	0.0032 (0.0063)	0.0036 (0.0056)
CEO duality dummy	–0.0033 (0.0077)	–0.0074 (0.0172)
ln(Board size)	–0.0065 (0.0074)	–0.0029 (0.0121)
ln(CEO age)	0.0079 (0.0103)	0.0047 (0.0181)
ln(CEO tenure)	–0.0092 (0.0123)	–0.0075 (0.0150)
ln(Size) (lagged one year)	0.0006 (0.0013)	0.0026 (0.0045)
Option compensation as a fraction of total compensation (lagged one year)	0.1485 (0.0132)**	–0.0025 (0.0147)
R-squared (adjusted)	40.7%	41.8%

\*Significant at better than the 5% level.

\*\*Significant at better than the 1% level.

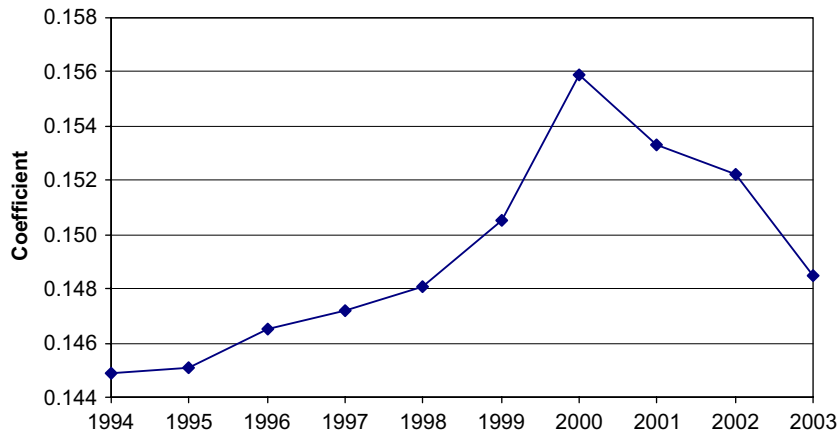


Fig. 1. Coefficient on option compensation in reported performance regression. This figure shows the coefficient on option compensation from year-by-year estimates of the regression specification of Table 5. The dependent variable is reported performance, EBIT/Assets.

## 6. Conclusions

The analysis in this paper suggests that earnings management through the use of discretionary accruals responds dramatically to management incentives. Earnings management is lower when there is more monitoring of management discretion from sources such as institutional ownership of shares, institutional representation on the board, and independent outside directors on the board. Earnings management increases in response to the option compensation of CEOs.

The results also suggest that the positive impact of option compensation on reported profitability in this sample may have been purely cosmetic, an artifact of the more aggressive earnings management elicited by such compensation. Once the likely impact of earnings management is removed from profitability estimates, the relation between performance and option compensation disappears. Conversely, the estimates of financial performance are far more responsive to monitoring variables when discretionary accruals are netted out from reported earnings. Therefore, the results reinforce previous research pointing to the beneficial impact of outside monitoring, but cast doubt on the impact of pay-for-performance compensation as a means of eliciting superior performance. The quality of reported earnings improves dramatically with monitoring, but degrades dramatically with option compensation.

## References

- Alderfer, C.P., 1986. The invisible director on corporate boards. *Harvard Business Review* 64, 38–52.
- Bartov, E., Gul, F.A., Tsui, J.S.L., 2001. Discretionary-accrual models and audit qualifications. *Journal of Accounting and Economics* 30, 421–452.
- Beasley, M.S., 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. *Accounting Review* 71, 443–465.
- Beneish, M.D., Vargus, M.E., 2002. Insider trading, earnings quality, and accrual mispricing. *Accounting Review* 4, 755–791.
- Bergstresser, D., Philippon, T., 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80, 511–529.
- Bergstresser, D., Desai, M., Rauh, J., 2006. Earnings manipulation, pension assumptions, and managerial investment decisions. *Quarterly Journal of Economics* 121, 157–195.
- Brickley, J.A., Coles, J.L., Terry, R.L., 1994. Outside directors and the adoption of poison pills. *Journal of Financial Economics* 35, 371–390.
- Brickley, J.A., Coles, J.L., Jarrell, G., 1997. Leadership structure: separating the CEO and chairman of the board. *Journal of Corporate Finance* 3, 189–220.
- Burns, N., Kedia, S., 2006. The impact of CEO incentives on misreporting. *Journal of Financial Economics* 79, 35–67.
- Byrd, J., Hickman, K., 1992. Do outside directors monitor managers? Evidence from tender offer bids. *Journal of Financial Economics* 32, 195–222.
- Cheng, Q., Warfield, T.D., 2005. Equity incentives and earnings management. *Accounting Review* 80, 441–476.

- Cohen, D.A., Dey, A., Lys, T.Z., 2005. Trends in earnings management and informativeness of earnings announcements in the pre- and post-Sarbanes Oxley periods. Available at SSRN: <<http://ssrn.com/abstract=658782>>.
- Dechow, P.M., Sloan, R.G., 1991. Executive incentives and the horizon problem. *Journal of Accounting and Economics* 14, 51–89.
- Dechow, P.M., Sloan, R.G., Sweeney, A.P., 1995. Detecting earnings management. *Accounting Review* 70, 193–226.
- Dechow, P.M., Sloan, R.G., Sweeney, A.P., 1996. Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research* 13, 1–36.
- Del Guercio, D., Hawkins, J., 1999. The motivation and impact of pension fund activism. *Journal of Financial Economics* 52, 293–340.
- Denis, D.J., Denis, D.K., 1995. Firm performance changes following top management dismissals. *Journal of Finance* 50, 1029–1057.
- Eberhart, A.C., Maxwell, W.F., Siddique, A.R., 2004. An examination of long-term abnormal stock returns and operating performance following R&D increases. *Journal of Finance* 59, 623–650.
- Fama, E., MacBeth, J., 1973. Risk, return, and equilibrium: empirical tests. *Journal of Political Economy* 81, 607–636.
- Gaver, J.J., Gaver, K.M., Austin, J.R., 1995. Additional evidence on bonus plans and income management. *Journal of Accounting and Economics* 19, 3–28.
- Gao, P., Shrieves, R.E., 2002. Earnings management and executive compensation: a case of overdose of option and underdose of salary? Available at SSRN.
- Guidry, F., Leone, A.J., Rock, S., 1999. Earnings-bonus plans and earnings management. *Journal of Accounting and Economics* 26, 113–142.
- Hall, B., Liebman, J., 1998. Are CEOs really paid like bureaucrats? *Quarterly Journal of Economics* 113, 653–691.
- Hartzell, J.C., Starks, L.T., 2003. Institutional investors and executive compensation. *Journal of Finance* 58, 2351–2374.
- Healy, P., 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7, 85–107.
- Healy, P., Kang, S.K., Palepu, K.G., 1987. The effect of accounting procedure changes on CEO's cash salary and bonus compensation. *Journal of Accounting and Economics* 9, 7–34.
- Healy, P.M., Wahlen, J.M., 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13, 365–383.
- Hermalin, B.E., Weisbach, M.S., 1988. The determinants of board composition. *Rand Journal of Economics* 19, 589–606.
- Holthausen, R., Larcker, D., Sloan, R., 1995. Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* 19, 29–74.
- Hotchkiss, E.S., 1995. Postbankruptcy performance and management turnover. *Journal of Finance* 50, 3–21.
- Hribar, P., Collins, D., 2002. Errors in estimating accruals: implications for empirical research. *Journal of Accounting Research* 40, 105–134.
- Huson, M.R., Malatesta, P.H., Parrino, R., 2004. Managerial succession and firm performance. *Journal of Financial Economics* 74, 237–275.
- Jensen, M., 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* 48, 831–880.
- Jones, J., 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29, 193–228.
- Klein, A., 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33, 375–400.
- Kothari, S.P., Leone, A.J., Wasley, C.E., 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39, 163–197.
- McConnell, J.J., Servaes, H., 1990. Additional evidence on equity ownership and corporate value. *Journal of Financial Economics* 27, 595–612.
- Mehran, H., 1995. Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics* 38, 163–184.
- Nesbitt, S.L., 1994. Long-term rewards from shareholder activism: a study of the 'CalPERS effect'. *Journal of Applied Corporate Finance* 6, 75–80.
- Pontiff, J., 1996. Costly arbitrage: evidence from closed-end funds. *Quarterly Journal of Economics* 111, 1135–1151.
- Rosenstein, S., Wyatt, J.G., 1990. Outside directors, board independence, and shareholder wealth. *Journal of Financial Economics* 26, 175–191.
- Sloan, R., 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *Accounting Review* 71, 289–316.
- Smith, M., 1996. Shareholder activism by institutional investors: evidence from CalPERS. *Journal of Finance* 51, 227–252.
- Teoh, S.H., Welch, I., Wong, T.J., 1998a. Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 50, 63–69.
- Teoh, S.H., Welch, I., Wong, T.J., 1998b. Earnings management and the long-run market performance of initial public offerings. *Journal of Finance* 53, 1935–1974.
- Warfield, T.D., Wild, J.J., Wild, K.L., 1995. Managerial ownership, accounting choices, and informativeness of earnings. *Journal of Accounting and Economics* 20, 61–91.
- Yermack, D., 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40, 185–211.