Revisiting the Relation between CEO Equity Incentives and Accounting Manipulation

Zhonglan Dai
University of Texas at Dallas
zdai@utdallas.edu

Shawn Kim
University of California, Berkeley
shawn_kim@haas.berkeley.edu

Wayne Landsman
University of North Carolina at Chapel Hill
Wayne_Landsman@UNC.edu

Feida Zhang
CEIBS
feidazhang@ceibs.edu

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Abstract

While the consensus belief is that CEO equity incentives are positively related to accounting manipulation, the empirical findings on this relation are inconclusive (Armstrong, Jagolinzer, and Larcker 2010; Edmans, Gabaix, and Jenter 2017). We revisit this relation by first recognizing that accounting manipulation exists along a spectrum, ranging from a permissible interpretation of Generally Accepted Accounting Principles (GAAP) to outright accounting fraud. Prior research often overlooks this distinction, conflating legitimate accrual earnings management with fraudulent reporting. We show that while equity incentives generally encourage CEOs to present favorable performance through accrual earnings management, they do not, in themselves, lead to accounting fraud. Fraud is more likely to occur when CEOs face extreme pressure, such as during periods of prolonged financial underperformance—a dynamic often referred to as the "slippery slope." We find that CEO's equity incentives, especially excessive equity incentives, lead to accounting fraud only under these circumstances. Overall, our results help resolve the puzzle in the existing literature—the elusive relation between CEO equity incentives and accounting manipulation—by distinguishing the effect of equity incentives on different forms of accounting manipulations and by identifying specific conditions under which equity incentives give rise to accounting fraud.

1. Introduction

The popular use of equity-based executive compensation is designed to alleviate the standard agency problem between executives and shareholders by aligning the interests of the two parties. However, this form of compensation also raises concerns from regulators and investors that managers may manipulate accounting reports or even commit accounting fraud for personal financial gain. The misreporting of the stock option backdating in financial statements is an illustration of how equity incentives can lead to accounting fraud.[1] A substantial body of research has attempted to find empirical support regarding the positive relation between equity incentives and accounting manipulation, employing various metrics to measure earnings management. Yet, the empirical findings remain inconclusive, leaving the issue unresolved (Armstrong, Jagolinzer, and Larcker 2010; Edmans, Gabaix, and Jenter 2017).[2] This paper seeks to reconcile the discrepancy between prevailing belief and empirical results by reexamining the relation between CEOs' equity incentives and accounting manipulation.[3] Specifically, we do so by separating accounting manipulation into legitimate accrual-based earnings management and illegitimate accounting fraud, and identifying necessary conditions under which CEO incentives may give rise to accounting fraud.

Managers may engage in accrual earnings management to present a more favorable picture of the company's performance. Although prior studies often do not distinguish between such within-GAAP accrual earnings management and outright accounting fraud, we believe the distinction between the two is important. First, within-GAAP accrual earnings management is

[1] See, e.g., Collins, Gong, and Li (2010), for a discussion of the stock option backdating scandal in mid-2000s and the role of corporate governance in influencing the incidence of such accounting frauds.
[2] Armstrong, Jagolinzer, and Larcker (2010) provides a list of related studies (Table 1, pp 229-230).
[3] The term accounting manipulation is used as a generic term for any form of misreporting of accounting performance. Thus, it could be accrual earnings management or any accounting irregularities including accounting fraud.

generally permissible and reversed in future periods. It may reflect a temporary adjustment to smooth earnings or signal managerial optimism. In contrast, accounting fraud involves intentional misrepresentation that violates accounting standards and is not subsequently reversed. As such, it carries severe legal and reputational consequences for both the CEO and the firm once detected (Karpoff, Lee, and Martin 2008a; Karpoff, Lee, and Martin 2008b). As noted in Jain and Nissim (2025): "[f]rom the manager's (CEO/CFO) perspective, accruals management within the bounds of GAAP is a legal but limited tool. When managers engage in accruals management that exceeds GAAP boundaries, they face risks of auditor or regulatory detection, potentially leading to legal consequences."[4]

Second, equity-based compensation is designed to align managers' wealth with firm performance, thus shareholders' interests, meaning inherently CEOs will not have incentives to defraud shareholders unless they are desperate. Given the significantly higher risks and costs associated with fraud relative to reversible accrual management, equity incentives are more likely to lead to within-GAAP earnings management than to outright fraud. Thus, we first predict that although CEO equity incentives may lead to within-GAAP accrual earnings management, they are unlikely to motivate accounting fraud.

Although CEO equity incentives generally do not lead to accounting fraud, they may under certain conditions. A CEO who commits accounting fraud must be sufficiently desperate to take such a gamble (Arif, Dong, and Ormazabal 2024). This desperation is most likely to arise after a firm has experienced a prolonged period of poor performance and the manager has exhausted all within-GAAP accruals earnings management tools available.[5] Thus, we predict that it is the

[4] Jain and Nissim (2025) provides various examples for different forms of earnings management.
[5] Each round of manipulation necessitates even larger adjustments later, is known as the "slippery slope." (Schrand and Zechman 2012).

cumulative poor performance—rather than CEO equity incentives per se—that constitutes a necessary condition for accounting fraud. Specifically, when firms experience a prolonged period of poor performance, a CEO without any equity incentives is primarily concerned about job security. In contrast, a CEO with equity incentives faces not only job security concerns but also potential financial losses tied to the CEO's equity holdings. The additional financial stakes may create stronger incentives to commit fraud as a last resort. Accordingly, we predict that CEO equity incentives are more likely to be positively related to accounting fraud when the firm has experienced persistent poor performance.

Although equity incentives are designed to align the interests of shareholders and managers, they may occasionally deviate from the optimal level. We expect suboptimal—especially, excessive—incentives to further motivate CEOs' fraudulent behavior. Using survey data, Edmans, Gosling, and Jenter (2023) shows that boards are constrained in significantly reducing grants due to labor market and CEO retention issues, suggesting that CEO equity incentives may be excessive and remain so for some time. Bushman, Dai, and Zhang (2025) further provides empirical evidence that when the equity incentives become excessive, the firm's performance suffers. More importantly, when incentives are excessive, CEOs may become more aggressive and be willing to take more risks. Following this logic, we also predict that excessive incentives will increase the likelihood of accounting fraud and exacerbate the positive relation between sustained poor performance and accounting fraud.

Using ExecuComp data covering CEOs of S&P 1500 firms from 1992 to 2024, we first establish that it is important to distinguish between accrual earnings management from accounting fraud when examining the relation between CEO equity incentives and earnings manipulation. We do so by replicating two representative studies: Bergstresser and Philippon (2006) and Erickson,

Hanlon, and Maydew (2006). We find that equity incentives have a strong positive relation with earnings management, using not only the accrual measure employed by Bergstresser and Philippon (2006), but also five other measures of earnings management. In the meantime, equity incentives are not associated with accounting fraud, which is consistent with Erickson et al. (2006). These results suggest that it is crucial to distinguish between accrual earnings management within the boundaries of GAAP and accounting fraud when examining the relation between CEO equity incentives and earnings manipulation. Furthermore, we show that accounting frauds, not accrual-based earnings management, are associated with future bankruptcy and CEO turnover, highlighting the significantly greater risks and costs linked to fraud. This evidence further reinforces the importance of separating accounting fraud from accrual earnings management.

Next, we explore how prolonged poor performance affects accounting fraud and the role that CEO equity incentives play in this relation. We first show that accounting fraud is preceded by accumulated accrual earnings management, suggesting that managers resort to accounting fraud only after exhausting within-GAAP accrual earnings management tools. We then show that sustained poor performance—measured by declining sales, recurring losses, and negative market reactions around earnings announcements over the past two and three years—strongly predicts accounting fraud. This pattern suggests the CEOs who eventually commit fraud are already on a slippery slope, marked by mounting pressure and deteriorating firm fundamentals. More importantly, we find that the interaction between CEO equity incentives and prolonged poor performance significantly predicts accounting fraud, whereas poor performance alone does not. These results suggest that equity incentives contribute to fraud risk primarily in the context of sustained underperformance. Finally, we examine cases where equity incentives are excessive and find that excessive equity incentives are associated with a greater likelihood of fraud, and that the

effect is further amplified by poor performance. Sensitivity tests using alternative CEO equity incentives measures or alternative accounting fraud measures yield consistent results, reinforcing the robustness of our conclusions.

Our paper contributes to both the literature on CEO compensation and earnings management. First, we are the first to highlight the importance of distinguishing between accrual-based earnings management and accounting fraud when examining the relation between equity incentives and accounting manipulation. This distinction serves as a starting point for solving the puzzle in the literature. We posit and empirically demonstrate that CEO equity incentives are generally associated with within-GAAP accrual earnings management, but not with accounting fraud, which entails substantially higher legal, reputational, and financial risks, including a greater likelihood of bankruptcy and CEO turnover.

Second, our study is the first to identify the specific conditions under which CEO equity incentives are more likely to lead to accounting fraud: prolonged poor performance and/or excessive equity incentives. Prior research documents mixed findings on the relation between equity incentives and accounting fraud, in part because of the failure to consider these conditional factors. We posit that equity incentives alone are not sufficient to motivate fraud. However, under the above conditions, i.e., prolonged poor performance and/or excessive equity incentives, CEOs may become increasingly desperate and aggressive, facing not only concerns about job security but also the potential loss of personal wealth tied to their equity holdings. By identifying these necessary conditions, our study clarifies when and why equity incentives might backfire and lead to costly corporate misconduct.

The rest of the paper is organized as follows. Section 2 provides a literature review and hypothesis development, and Section 3 discusses all empirical analyses. Section 4 covers sensitivity tests, and Section 5 concludes.

2. Related Literature and Hypothesis Development

2.1. Literature Review

It is well established in the literature that public firms are subject to agency problems arising from the separation between ownership and control that permits managers to pursue their personal benefits at the expense of shareholders (e.g., Jensen and Meckling 1976). A well-designed corporate governance system and well-functioning markets (capital markets, product markets, or labor markets) can help mitigate this problem. A key component of such a governance mechanism is a thoughtfully designed compensation contract that utilizes incentive-based compensation to motivate the managers to exert more effort and to align their interests with those of shareholders.

A typical manager's compensation package consists of salary, bonus, option grants, restricted stock grants, long-term incentive plans, and others. Since the 1990s, equity compensation (options and stocks) has become popular, comprising increasingly larger shares in CEOs' compensation packages.[6] Equity compensation directly links executives' payoffs to shareholder value, the shareholders' ultimate objective, thus aligning the interests of executives and shareholders. However, incentive-based or performance-based compensation implies that the managers receive payout only if they meet specific performance targets. Typically, the performance metrics are measured by accounting numbers and/or stock returns. Once these metrics are specified in their compensation contracts, they may create incentives for managers to

[6] See Figure 5 and Figure 6 in Edmans et al. (2017) for the change of CEO compensation structure over time.

manipulate reported accounting numbers, thus engaging in earnings management activities.[7] Specifically, managers could employ either financial estimates, financial reporting procedures/policies, or real operating activities to report earnings that meet their targeted benchmarks. As noted in Edmans et al. (2017): "even without discontinuities and nonlinearities, incentive schemes based on performance metrics different from long-term shareholder value (e.g., based on sales or profits) invite increases in these metrics unrelated or negatively related to shareholder value." Focusing on this unintended consequence, the consensus view is that compensation, especially equity-based compensation, is positively related to earnings management activities.

When bonus was the primary form of incentive compensation, Healy (1985) was among the first to consider how performance metrics could be manipulated especially when there is nonlinearity or discontinuity specified in the bonus contract. The study finds that managers use both accruals and changes in accounting procedures to maximize their bonuses. As equity compensation became more widely used beginning in the 1990s, most of the empirical studies focus on equity incentives and their positive relation with accounting manipulation.[8] Cheng and Warfield (2005) documents that un-exercisable options and stock ownership are associated with higher likelihoods of avoiding negative earnings surprises and meeting or just beating analyst forecasts. Similarly, Bergstresser and Philippon (2006) shows that equity incentives have a positive effect on accrual earnings management. Burns and Kedia (2006) finds that only stock options—among other incentive components—are positively related to accounting restatements, and Efendi, Srivastava, and Swanson (2007) provides evidence that the relation holds specifically for in-the-

[7] Although managers generally cannot directly influence stock prices or returns, they can do so indirectly by manipulating accounting amounts that are reported to shareholders.
[8] There is ample evidence that equity portfolio incentives dominate the incentives provided by cash-based pay (e.g., Hall and Liebman 1998; Core, Guay, and Larcker 2003; Guay, Kepler, and Tsui 2019).

money options. Taken together, these studies offer support for a relation between equity incentives and accounting manipulation, despite employing different measures of either equity incentives or earnings manipulation.

However, when accounting manipulation is measured using the SEC Accounting and Auditing Enforcement Releases (AAERs) as a proxy, Erickson, Hanlon, and Maydew (2006) finds no relation between managers' equity incentives and instances of accounting manipulation. Johnson, Ryan, and Tian (2009), on the other hand, finds a positive relation between unrestricted stocks and AAERs. O'Connor et al. (2006) presents more nuanced findings, identifying both positive and negative relations between stock options and accounting restatements, depending on factors such as CEO-board chair duality and whether directors also hold options. Adding further complexity to these mixed results, Armstrong et al. (2010) finds a negative relationship between equity incentives and the likelihood of AAERs, accounting restatements, or class action lawsuits, positing that better alignment of interests between managers and shareholders reduces the likelihood of accounting manipulation.

When studies distinguish between the equity incentives of CEOs and CFOs—who play a more direct role in financial reporting—Jiang, Petroni, and Wang (2010) finds that only CFOs' equity incentives are associated with accrual-based earnings management, while CEOs' incentives are not. In contrast, Feng, Ge, Luo, and Shevlin (2011) reports that CEOs' equity incentives are positively related to AAERs, whereas CFOs' are not. These findings add to the already inconclusive and complex evidence on the link between equity incentives and accounting manipulation.

Taken together, the prior literature reveals an elusive relation between equity incentives and accounting manipulation, with no consistent conclusions. However, two key observations

emerge. First, there is considerable disagreement over how to measure equity incentives or which components of the equity incentives are more relevant—for example, whether to focus on stock versus options, vested versus unvested grants, or restricted versus unrestricted grants. Studies also fail to measure incentives consistently, even when they focus on the same incentives, by differing on whether and how to scale the incentives measure (e.g., scaled by total compensation or outstanding shares). Among these alternatives, one widely used and well-accepted measure is the *delta* from Core and Guay (2002), which is defined as the change in the value of the CEO's stocks (both restricted and unrestricted) and options (both vested and unvested) for a one percent change in the firm's stock price. Second, there is no consensus on how to measure accounting manipulation. Studies have relied on a range of proxies, including accrual-based earnings management, meeting or just beating analyst forecasts, avoiding negative earnings surprises, accounting restatements, securities class action lawsuits, and AAERs. The use of varying measures for either CEO equity incentives or accounting manipulation in prior studies may have led them to different results, and thus different conclusions. This is not surprising given that each of these measures reflects different managerial motives and varying degrees of intent, risk, or desperation behind the manipulation—an issue we explore in the next section.

2.2. Hypothesis Development

We begin by recognizing that accounting manipulation exists along a spectrum, ranging from permissible within-GAAP accrual earnings management to outright accounting fraud. For example, estimating bad debt expense using 10% instead of 12% generally falls within the boundaries of GAAP and is considered legitimate, whereas recording fictitious sales is clearly fraudulent and illegitimate. The key feature associated with within-GAAP accrual-based earnings management is its temporary nature, as accruals generally reverse in future periods. Barton and

Simko (2002) predicts and empirically shows that the ability of managers to continue biasing earnings optimistically diminishes as previous accrual-based adjustments accumulate, thereby imposing a natural constraint on earnings management. Barber, Kang, and Li (2011) further considers accrual reversal speed and shows that the probability of managing earnings upward decreases with the reversal speed. Managers generally have an incentive to present a favorable picture of their firm performance to showcase their leadership to the capital market. When accrual-based earnings management within the bounds of GAAP carries no cost beyond future reversal, the financial reward tied to CEO equity incentives will certainly motivate such behavior. For instance, when earnings are short of analysts' consensus by one cent, CEOs may adjust reported earnings to just meet or beat it at a minimal marginal cost, such as changing the percentage of bad debt expense from 12% to 10%, thereby avoiding the "torpedo effect" associated with negative earnings surprises, a huge marginal benefit (Skinner and Sloan 2002). Accordingly, we predict a positive relation between equity incentives and within-GAAP accrual earnings management.

In contrast, accounting fraud involves the permanent inflation of earnings with the hope that such a misstatement will go undetected. Although fraud does not entail a natural reversal in future periods, it carries substantial costs arising from potential legal and regulatory consequences. First, detecting and reporting fraud is a core responsibility of independent auditors.[9] This heightens the likelihood that fraudulent activity will be uncovered, thereby exposing managers to serious consequences. Karpoff, Lee, and Martin (2008a) shows that 93 percent of managers caught by the SEC or DOJ are terminated. In a related study, Karpoff, Lee, and Martin (2008b) finds that

[9] See PCAOB AS 1001: Responsibilities and Functions of the Independent Auditor, paragraph .02: "The auditor has a responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud." Auditors also have responsibility to communicate possible fraud to appropriate levels of the management, the audit committee, and potentially the regulators (PCAOB AS 2401: Consideration of Fraud in a Financial Statement Audit).

although the average legal cost of fraud is $23.5 million per firm, the associated reputational damage is estimated to be 7.5 times greater. Second, equity incentives are designed to align managers' interests with those of shareholders. Engaging in fraud—such as by inflating revenues through fictitious sales—violates this alignment and undermines shareholder trust. In this sense, committing fraud is akin to "killing the goose that lays the golden egg"–a CEO is trading off her long term stream of benefits from her equity holding with temporary benefit of fooling the market. Therefore, we predict that although equity incentives potentially encourage within-GAAP earnings management, they do not motivate accounting fraud.[10] Based on this reasoning, we state our first set of hypotheses:

H1a: CEO equity incentives are positively associated with accrual-based earnings management.

H1b: CEO equity incentives are not associated with accounting fraud.

Although equity incentives alone do not directly lead to accounting fraud, such fraud nonetheless occurs. This prompts a critical question: what triggers accounting fraud if CEO equity incentives generally do not? When a firm initially experiences a small loss, a CEO may rely on accrual earnings management to obscure the setback—such as adjusting estimates to avoid reporting negative earnings. However, if losses persist and the CEO has exhausted all available within-GAAP earnings manipulation tools, the pressure intensifies. Each successive attempt to conceal performance shortfalls often necessitates increasingly aggressive accounting adjustments, making it harder and harder to apply within-GAAP tools. This escalating dynamic—where managers are pushed to a path of larger manipulation—is described by Schrand and Zechman (2012) as the "slippery slope." However, as noted by Barton and Simko (2002) and Barber et al.

[10] A helpful analogy to illustrate the difference between accrual earnings management and fraud is the distinction between borrowing and stealing. When you borrow, you will have to pay back later (reversal) and the larger the debt accumulate, the harder it gets for you to borrow more. In contrast, fraud involves no intention of repayment and the perpetrator will bear legal consequences after being caught.

(2011), there are limits to accrual earnings management. Consequently, the slippery slope may eventually drive CEOs to move beyond accrual earnings management and engage in outright accounting fraud. Relying on prospect theory to explain the tendency to engage in riskier activity after loss, Arif et al. (2024) shows that loss firms whose managers have high option-based vega[11] are prone to corporate overinvestment and experience higher crash risk. This suggests that when faced with mounting setbacks, CEOs become more risk-seeking. Together, these findings suggest that when a turnaround appears unlikely and the CEO's position is at stake, accounting fraud may emerge as a desperate last resort. Accordingly, we propose the following necessary conditions for fraud:

H2a: Accounting fraud is preceded by cumulative accrual-based earnings management.

H2b: A sustained period of losses increases the likelihood of accounting fraud.

Persistent losses may create conditions conducive to accounting fraud, particularly when a CEO faces the imminent threat of dismissal. A more pressing concern, however, may be the substantial financial losses tied to the CEO's equity holdings, which stand to decline sharply once the firm's true deteriorating fundamentals are fully revealed to the market. In this context, CEO equity incentives may play a significant role in accounting fraud—not inherently, but when layered on top of sustained poor performance. Accordingly, we predict the following:

H3: CEO equity incentives are positively associated with accounting fraud following a prolonged period of poor performance; that is, the effect of CEO equity incentives on the likelihood of accounting fraud operates only in conjunction with sustained poor performance.

As noted above, a well-designed incentive contract aligns the interests of shareholders and managers, thus equity incentives per se would not lead to accounting fraud. However, what if the

[11] Vega is the change in the dollar value of the executive's wealth (or the executive's option portfolio) for a 0.01 change in the annualized standard deviation of stock returns (Core and Guay 2002; Coles et al. 2006).

equity incentives become excessive? Survey evidence from Edmans et al. (2023) reveals that boards find it more challenging to reduce equity incentives when it is excessive than to provide more equity incentives when insufficient, due to labor market pressures and retention concerns. Additionally, the board's ability to use equity grants to adjust a CEO's equity incentives is limited by its non-negativity. Thus, once CEO equity incentives exceed optimal levels, it is likely to persist due to the difficulty in correcting them. In addition, Bushman et al. (2025) provides empirical evidence that when the equity incentives become excessive, the firm's performance suffers. Together, these studies suggest that CEO equity incentives could be suboptimal and that such deviations can lead to unintended consequences. As such, we posit that excessive equity incentives may encourage more aggressive behavior and increase a CEO's willingness to take risks, particularly in adverse performance environments. Accordingly, we predict:

H4: Excessive equity incentives are positively associated with accounting fraud and amplify the effect of sustained poor performance on the likelihood of accounting fraud.

3. Empirical Analyses

3.1. Sample, data, and measurement

We construct our main sample from Compustat Execucomp (1992-2024), from which we extract all CEO compensation information and other CEO-related information, including turnover, gender, age, and tenure. Compustat Execucomp covers S&P 1500 firms. We obtain accounting data from Compustat, which are used to construct accrual earnings management measures and extract firm characteristic variables, and stock price data is obtained from CRSP. We obtain SEC AAER data from USC Leventhal School of Accounting, securities class action lawsuit data from Stanford Law School (SCAC), and accounting restatement data from Audit Analytics. After

merging all datasets, our main sample has 32,406 firm-year observations covering 2,628 firms from 1992 to 2024. The sample size varies as we add or drop variables for different tests.

For CEO equity incentives, we employ the most widely used Core and Guay (2002) measure, which considers a CEO's entire portfolio holdings of stock and stock options (exercisable and unexercisable) as reported in Execucomp.[12] In particular, our measure captures equity portfolio incentives as the *delta* of an executive's equity portfolio, defined as the change in the dollar value of the portfolio for a one percent change in the underlying stock price. Specifically,

$$Portfolio\ Delta \equiv (\#\ of\ Shares + \#\ of\ Options \times Option\ Delta) \times (price \times 0.01)$$

Price refers to the firm's year-end stock price. Because *Portfolio Delta* is positive and right-skewed, we follow the literature by using the natural log of *Portfolio Delta* in our primary tests (Core and Guay 1999). We supplement this measure in our sensitivity tests (Table 10) using ownership in percentages (Cheng and Warfield 2005). For these tests, we compute the CEO equity incentives as:

$$Share\ Delta \equiv (\#\ of\ options\ and\ \#\ of\ stock)/\#\ of\ shares\ outstanding$$

To measure accrual earnings management, we start with the two most widely used input-based measures: the discretionary accruals (or DA) from the modified Jones model (Dechow, Sloan, and Sweeney 1995), and the discretionary accruals from the performance matched model (Kothari, Leone, and Wasley 2005). We also employ four output-based measures: incidents of negative earnings surprises, incidents of meeting/just beating analyst forecasts (Cheng and Warfield 2005), the variability of changes in net income, and the variability of changes in net income relative to the variability of changes in cash flow (Barth, Landsman, and Lang 2008). Although the input-

[12] Following Coles, Daniel, and Naveen (2013), we don't include unearned equity award (e.g. unvested awards for which future vesting is contingent or accelerated based on achieving stock price or accounting hurdle) due to data limitation. Thus, we acknowledge that the delta used in the paper underestimates the true delta.

based measures reflect how CEOs manage accruals to affect reported earnings (the amount of accruals affected), the output-based measures reflect the end results of accrual management, i.e., if the CEOs avoided reporting negative earnings surprise or reported earnings that meet or just beat the analyst forecast, and how smooth the earnings were.

For our primary tests, we measure accounting fraud using AAERs, which are issued by the SEC when it investigates a company, an auditor, or an officer for alleged accounting and/or auditing misconduct. In our sensitivity tests, we measure accounting fraud using accounting restatements and securities class action lawsuits (Table 9).

When evaluating the effect of accrual-based earnings management and accounting fraud on future CEO turnover, we focus on performance-induced CEO turnover events: replacements of poorly performing CEOs as proposed by Jenter and Lewellen (2021).[13] Following their approach, we identify performance-induced CEO turnovers by isolating the probability of dismissal attributable to poor performance from other factors. Specifically, the process involves estimating a probit model in which CEO turnover is predicted by the decile rank of average industry-adjusted monthly stock returns over a two-year period ([-1,0]) along with control variables (including CEO age, tenure, dividends, and firm size). Then, for each observation, we calculate two probabilities: (1) the total implied turnover probability using the decile the actual performance falls into, and (2) the implied "other turnover" probability that would have occurred if performance were falling into the top decile. The performance-induced turnover probability is derived as the difference between these two probabilities. We then classify each CEO turnover event into either performance-induced

[13] Jenter and Lewellen (2021) introduces two different methods to identify performance-induced turnovers. In this paper, we adopt their first approach.

turnover if the probability difference is above the sample median or non-performance-induced turnover otherwise.[14]

We measure prolonged poor performance in three ways: 1) an indicator for two consecutive years of annual sales reduction, 2) the number of quarters that reported negative net income in the past two years, and 3) the negative market reactions to the annual earnings announcements for the past two years (the sum of the abnormal returns in the [-1 day, 1 day] windows around annual earnings announcements if the sum is negative, and zero otherwise).[15] Sales reductions reflect the first sign of dwindling hope for a possible turnaround, negative earnings reflect poor financial outcomes, and the negative market reactions reflect the general investors' negative view about the firm's prospects. The Appendix provides definitions of these and all variables used in our analyses.

Table 1 Panel A reports the summary statistics, and Panel B shows the univariate comparison between the fraud subsample and the non-fraud subsample for some key variables.[16] Panel B reveals that there are only 417 AAER events among 35,332 firm-year observations, representing just 1.2% of the sample. This confirms that AAERs are rare, which is consistent with our premise that accounting fraud is a high-risk activity undertaken only under desperate conditions. We also observe significant differences in both firm and CEO characteristics between fraud firms and non-fraud firms. CEOs of fraud firms tend to be younger, have longer tenures, and hold larger equity incentives. Fraud firms are larger, have lower book-to-market ratios, and have a greater analyst following. They are also younger firms with higher sales growth, but with lower ROA and larger receivables as a fraction of total assets, and have a greater reliance on external

[14] CEO turnover variable is set to zero for non-performance-induced turnover firm-years. Removing these observations from the estimation does not affect our inferences.
[15] Using information from past three years yields similar inferences.
[16] Note that the mean value for our CEO turnover reported in Panel A of Table 1 is higher than those reported in other studies (Bushman et al. 2010; Jenter and Kanaan 2015). This is because we define CEO turnover aggregating over three years instead of one.

financing. All continuous variables are winsorized at 1% and 99%. In addition, when conducting our tests, we cluster standard errors at the firm level.

3.2. Estimating equations and results

3.2.1. Tests of H1a and H1b

We start the tests of our first set of hypotheses that CEO equity incentives are associated with accrual-based earnings management, but not with accounting fraud. Table 2 (Table 3) reports regression results based on accrual-based earnings management (accounting fraud). For Table 2, Panel A, we estimate the following OLS regression:

$$EM_{DA} = \alpha + \beta * Delta + \gamma * Controls + \epsilon \qquad (1)$$

where EM_{DA} is one of the two discretionary accrual-based earnings management measures: $|DACC|_{MJ}$ is based on the modified Jones model (Dechow, Sloan, and Sweeney 1995), $|DACC|_{PM}$ is based on the performance-matched model (Kothari, Leone, and Wasley 2005). Following the standard practice in accrual earnings management literature (e.g., Bergstresser and Philippon 2006), we use the absolute values of EM_{DA}.[17] *Delta* is the Core and Guay measure (2002) of CEO equity incentives. If H1a is empirically valid, then we expect $\beta > 0$.

For control variables, we mainly follow Bergstresser and Philippon (2006) and Cheng and Warfield (2005). Firm-level control variables include firm size, book-to-market, leverage, firm age, return on assets (ROA), stock return, net operating assets (NOA), intangible, labor intensity, cash flow volatility (σCFO), sales volatility ($\sigma SALE$), litigation risk, and analyst following. CEO-level control variables include CEO age and CEO tenure.

[17] Accrual earnings management could be income-increase or income-decreasing and we are not differentiating the two by using absolute values. Depending on the motivation the managers have and the structure of the compensation contract (such as discontinuities and nonlinearities), either one will help them to obtain personal benefits. For example, reporting smooth earnings will likely lead to income-decreasing accrual earnings management when earnings are abnormally high.

For Table 2, Panel B, we estimate Logit (columns 1 and 2) or OLS models (columns 3 and 4) based on the type of the dependent variable (binary or continuous):

$$EM = \alpha + \beta * Delta + \gamma * Controls + \epsilon \qquad (2)$$

EM is one of the following four output-based earnings management measures: (i) an indicator for reporting earnings lower than the analyst forecast consensus (*Negative Surprise*), (ii) an indicator for reporting earnings that meet or just beat analyst forecasts (*Meet or Beat*), (iii) the variability of changes in earnings (*Variability of ΔNI*), and (iv) the variability of changes in earnings scaled by the variability of changes in cash flow (*Variability of ΔNI over variability of ΔCF*). The first two measures are based on Cheng and Warfield (2005), and reflect the notion that if the managers use discretionary accruals to manipulate reported earnings, we should observe fewer incidents of earnings shocks and more incidents of meeting or just beating analyst forecasts. The last two measures are based on Barth, Landsman, and Lang (2008), and reflect the assumption that if managers use discretionary accruals to smooth earnings, we would observe less variability in reported earnings.[18] H1a predicts negative and significant β for the output-based earnings management measures (i), (iii), and (iv), and positive β for the earnings management measure (ii).

The findings in Table 2 Panel A reveal that β is significantly positive using both accrual measures, indicating that CEO *delta* has a positive effect on input-based accrual earnings management. These findings are consistent with managers using accruals to manage earnings when their equity incentives are high. Further, the findings in Table 2 Panel B reveal that β is significantly positive in column (2) and significantly negative in columns (1), (3), and (4). Thus, the likelihood of reporting an earnings shock decreases, and the likelihood of meeting or beating

[18] In other words, *Negative Surprise*, *Variability of ΔNI,* and *Variability of ΔNI over variability of ΔCF* are inverse measures of accrual earnings management, as these measures will be lower for firms actively engaging in accruals management.

analyst consensus increases with CEO *delta* (Panel B, columns 1 and 2), and the variability of earnings decreases as CEO *delta* rises (Panel B, columns 3 and 4). These findings are consistent with CEOs with larger equity incentives avoiding missing earnings benchmarks and engaging more in income smoothing.

Taken together, the findings in Table 2 using six different accrual-based earnings management measures are consistent with those of Cheng and Warfield (2005) and Bergstresser and Philippon (2006), but are inconsistent with those of Jiang et al. (2010).[19] Overall, our findings consistently support that CEO equity incentives motivate accrual-based earnings management.

Next, to examine the effect of equity incentive on accounting fraud (H1b), we estimate the following Logit regression model:

$$Fraud = \alpha + \beta * Delta + \gamma * Controls + \epsilon \qquad (3)$$

where *Fraud* is an indicator that equals one if the firm had an AAER in the year and zero otherwise. We follow Erickson et al. (2006) and Feng et al. (2011) in including the following firm-level controls: firm size, book-to-market, leverage, firm age, return on assets (ROA), stock return, property, plant, and equipment (PPE), financing, acquisition, firm growth, inventory, receivables, and analyst following. For CEO-level controls, we include CEO age and CEO tenure. H1b predicts β is insignificantly different from zero.

Table 3 reports the regression results. We find that *delta* is not significantly associated with accounting fraud, supporting that equity incentives do not lead to accounting fraud in general. The findings are consistent with those of Erickson et al. (2006), but inconsistent with the findings in Armstrong et al. (2010) and Feng et al. (2011).[20]

[19] Untabulated findings based on estimations in which we measure *delta* separately for stocks and options reveal the same inferences as those based on the total delta reported in Table 2.
[20] Untabulated findings based on estimations in which we measure *delta* separately for stocks and options reveal the same inferences as those based on the total delta reported in Table 3.

As discussed above, a key reason CEO equity incentives are unlikely to motivate accounting fraud is the substantial risk involved. Once exposed, fraud can lead to severe consequences, including CEO turnover and firm bankruptcy (Karpoff et al. 2008a; Karpoff et al. 2008b). To validate this conjecture and further justify our distinction between accrual-based earnings management and accounting fraud, we examine the consequences of the two types of accounting manipulation. We focus on future firm bankruptcy and future performance-induced CEO turnover and estimate the following models:

$$Bankrupcy_{t+1,t+3} = \alpha + \beta_1 * Fraud_t + \beta_2 * AEM_t + \gamma * Controls_t + \epsilon_t \quad (4a)$$

$$Turnover_{t+1,t+3} = \alpha + \beta_1 * Fraud_t + \beta_2 * AEM_t + \gamma * Controls_t + \epsilon_t \quad (4b)$$

These models can reveal the different effects of accrual-based earnings management and accounting fraud on critical future outcomes for the firms and CEOs. A large and significant β_1, coupled with an insignificant β_2, would indicate that accounting fraud entails substantially greater consequences and risks than accrual-based earnings management.

Given that it may take time for accounting fraud to be exposed, we measure bankruptcy or CEO turnover events over the next three years. We measure *Bankruptcy* as an indicator variable that equals one if bankruptcy occurred in any of the next three years, and zero otherwise. Similarly, we measure *Turnover* as an indicator variable that equals one if there is a performance-induced CEO turnover in any of the next three years and zero otherwise. When estimating equation (4a), we include as controls z-score, firm size, book-to-market, leverage, firm age, return on assets (ROA), PPE, sales growth, loss indicator, interest coverage, debt issue, debt cost, sales volatility ($\sigma SALE$), cash dividends, cash flow from operating activity (CFO), CEO age, and CEO tenure.

The findings, presented in Table 4 Panel A, show that accounting fraud significantly predicts future bankruptcy (column 1). However, we do not observe such a significant effect for

accrual earnings management using either measure (columns 2 and 3). Our results are consistent when we include both the accounting fraud and accrual earnings management measures in the model (columns 4 and 5). These results provide further support that accounting fraud involves much greater risks and costs compared to accrual-based earnings management.

When estimating equation (4b), we follow prior studies on CEO turnover, in particular Bushman, Dai and Wang (2010) and Jenter and Kanaan (2015), and include the following control variables: *Ret_idiosyncratic*, *Ret_peer* for both year t and year t-1, *Risk_idiosyncratic*, *Risk_peer*, ROA, *Risk_ROA*, sales volatility (*σSALE*), firm size, firm age, competition, CEO age, and CEO tenure. The regression results presented in Table 4 Panel B reveal similar results: accounting fraud strongly predicts future CEO turnover, while accruals earnings management do not. When examining the effect of accounting fraud alone, we find that fraud is significantly associated with future performance-induced CEO turnover (column 1). For accrual-based earnings management measures, one of the two discretionary accruals predicts future CEO turnover marginally (columns 2 and 3). However, when both accounting fraud and accrual earnings management measures are considered simultaneously, the predictive power increases significantly—both economically and statistically—for accounting fraud, but disappears for accrual earnings management measures (columns 5 and 6). These results further underscore that accounting fraud is an extremely high-risk activity—one that a CEO is unlikely to undertake unless in a state of desperation—and reinforce the importance of distinguishing between accrual-based earnings management and accounting fraud.[21]

3.2.2. Tests of H2a and H2b

[21] We add two notes on Table 4 Panel B. First, we did not include industry fixed effects when industry peer returns are used in the regression model (Jenter and Kanaan 2015). Second, the industry peer returns do not load across the board because of how we define CEO turnover (i.e., aggregating over future three years). When we use the standard CEO turnover definition, it loads as predicted in Jenter and Kanaan (2015).

Our results so far show that 1) it is important to separately consider within-GAAP earnings management and accounting fraud when evaluating the relation between CEO equity incentives and earnings manipulation, and 2) CEO equity incentives lead to accrual earnings management but not accounting fraud. Then, this raises a critical question: if CEO equity incentives do not motivate accounting fraud, what does? We now turn to our second set of hypotheses, which predicts that a prolonged period of poor performance is a key factor in motivating accounting fraud, and that CEOs resort to accounting fraud only after exhausting all available accrual-based earnings management tools. We estimate the following models:

$$Fraud = \alpha + \beta * Accum.|DACC| + \gamma * Controls + \epsilon \quad (5a)$$

$$Fraud = \alpha + \beta * PoorPerformance + \gamma * Controls + \epsilon \quad (5b)$$

Equation (5a) tests the association between accumulated discretionary accruals and fraud. A positive and significant β would suggest that CEOs commit accounting fraud only after depleting accrual-based earnings management tools, supporting H2a. Equation (5b) examines the relation between prior poor performance and accounting fraud. H2b predicts positive and significant β. The estimated results are presented in Tables 5 and 6, respectively.

In Table 5, we find that cumulative discretionary accruals over the prior three years strongly predict accounting fraud. This finding suggests that CEOs typically rely on accrual-based earnings management before escalating to accounting fraud. This also indicates that accounting fraud typically implies prior accrual earnings management, but accrual earnings management does not necessarily imply the presence of fraud.[22]

We next examine the effect of an extended period of poor performance on accounting fraud by incorporating relevant measures into equation (5b). As shown in Table 6, CEO *delta* continues

[22] In other words, accrual earnings management is a necessary, but not a sufficient condition for accounting fraud.

to exhibit no significant effect on accounting fraud by itself. In contrast, measures of prolonged underperformance—such as the indicator for consecutive sales reductions, the number of quarters reporting losses, and negative market reactions to earnings announcements over the past two years—consistently show strong positive associations with accounting fraud. These results suggest sustained poor performance as an important driver of accounting fraud.

Taken together, the findings from Tables 5 and 6 support the notion that CEOs resort to accounting fraud only after prolonged poor performance, which forces CEOs to exhaust all available accrual-based earnings management tools. This pattern is consistent with the "slippery slope" dynamic discussed in Schrand and Zechman (2012), as well as the limits to accrual manipulation documented in Barton and Simko (2002) and Barber et al. (2011). While a CEO may initially engage in accruals earnings management with the intention of reversing it once performance improves, sustained underperformance not only hinders such reversal but also pressures the CEO to engage in progressively larger manipulations—potentially culminating in accounting fraud.

3.2.3. Test of H3

Having established the central role played by the persistent poor performance in triggering accounting fraud, we now revisit the relation between CEO equity incentives and accounting fraud. As CEOs become increasingly desperate following a prolonged period of poor performance, the financial wealth tied to their equity holdings is placed at significant risk once the market fully recognizes the firm's true condition. In this context, CEO equity incentives may become a critical force that pushes CEOs further down the path toward fraud—consistent with our third hypothesis. To test this, we estimate the following regression:

$$Fraud = \alpha + \beta_1 * Delta * PoorPerformance + \beta_2 * Delta + \beta_3 * PoorPerformance + \gamma * Controls + \epsilon \quad (6)$$

β_2 and β_3 capture the main effect of CEO equity incentives and poor performance on accounting fraud. β_1 reveals the interaction effect of CEO equity incentives and poor performance. Positive and significant β_1 would support H3 and suggest that CEO equity incentives drive accounting fraud only when the firm is underperforming.

The estimated results are presented in Table 7. We find that once the interaction between CEO equity incentives and poor performance is included, only the interaction term (β_1) is statistically significant. Neither CEO equity incentives nor poor performance alone significantly predicts accounting fraud—except in column 1, where poor performance is measured using consecutive sales declines and CEO *delta* independently loads. These findings suggest that CEO equity incentives are positively associated with accounting fraud, but only when coupled with a sustained period of poor performance. This result supports our third hypothesis and reinforces the idea that equity incentives increase fraud risk primarily by amplifying the pressure CEOs face when firm performance consistently deteriorates.

3.2.4. Test of H4

CEO incentives may deviate from their optimal level for a variety of reasons (Edmans et al. 2023), and this may lead to poor performance (Bushman et al. 2025). We next test our last hypothesis (H4) regarding the effects of excessive equity incentives. We first estimate the "normal" or expected CEO equity incentives using models based on Core and Guay (1999) and Bushman et al. (2025):

$$Delta = \alpha + \beta * FirmCharacteristic + \gamma * CEOCharacteristics + \epsilon \quad (7)$$

Following Core and Guay (1999) and Bushman et al. (2025), we estimate equation (7) as a determinant model for CEO equity incentives. The predicted values from this model serve as proxies for equilibrium incentives, while the residuals capture deviations from that equilibrium. A

positive residual indicates that a CEO's equity incentives are excessive and a negative residual suggests they are deficient. The results from this estimation are presented in Panel A of Table 8. Most variables load significantly, with the exceptions of *Acquisition*, *CEO age*, and *CEO gender*.

Next, we investigate the effect of excessive equity incentives on accounting fraud. In Panel B of Table 8, we find that excessive equity incentives and poor performance measures are positively associated with fraud. This result contrasts with the findings in Table 6, where only poor performance had a significant effect, and equity incentives did not. The results again suggest that CEO equity incentives do not, in themselves, lead to accounting fraud, but when they become excessive, they do. Notably, we also observe that deficient incentives (equity incentives below the optimal level) have no effect on fraud. This further supports the idea that excessive incentives increase CEOs' willingness to take risks, thereby raising the likelihood of accounting fraud.

Finally, we test the joint effect of excessive equity incentives and poor performance by estimating the interaction effect of the two on accounting fraud. In Panel C of Table 8, we find that the interaction term is statistically significant. The main effect for poor performance is significantly positive, while it is not the case with excessive incentives. Comparing these results with those reported in Table 7, we find notable differences in the economic magnitudes and statistical significance of the interaction terms (the coefficient increases from 0.216 to 1.007, 0.116 to 0.418, or 1.416 to 6.438, depending on the measure of poor performance used). These findings suggest that while CEO equity incentives contribute to accounting fraud only when firm performance consistently deteriorates, excessive incentives substantially amplify this effect. In particular, excessive incentives appear to heighten CEOs' aggressiveness in the face of poor performance, thereby exacerbating the likelihood of fraudulent behavior.

4. Sensitivity Tests

Our paper addresses the puzzle in the literature by distinguishing between within-GAAP accrual management and accounting fraud and by identifying a necessary condition—sustained poor performance—for the link between CEO equity incentives and accounting fraud. However, another potential source of inconsistency in prior findings may stem from variation in how different studies define and measure key constructs. To further strengthen our evidence and inference, we conduct a series of sensitive tests. We first consider alternative measures for accounting fraud and then explore alternative CEO equity incentives measures.

Following Armstrong et al. (2010), we use incidents of accounting restatements and securities class action lawsuits as alternative measures for accounting fraud. Accounting restatements occur when firms restate their financial statements to correct their previous misstatements. This can result from a simple clerical error, accounting mistakes, noncompliance with GAAP, or accounting fraud. Therefore, we follow Hennes, Leone, and Miller (2008) and only include restatements that are identified as fraud by Audit Analytics.

Firms may become defendants in securities class action lawsuits for a variety of reasons, including defective products, misleading advertising, or financial misconduct, when a large group of investors or consumers is harmed by the same underlying issue. For our purposes, we focus only on securities fraud cases that involve violations of Section 10(b) of the Securities Exchange Act of 1934 or Section 11 of the Securities Act of 1933, as these are most directly related to accounting fraud. We report the results using the two alternative measures for accounting fraud in Table 9.

Our findings using these alternative measures of accounting fraud are consistent with our main results. As shown in Panel A of Table 9, CEO equity incentives do not directly predict the

occurrence of these events. Panel B shows that cumulative discretionary accruals over the prior three years continue to precede such incidents, supporting the idea that accrual-based earnings management often precedes more serious misconduct. In Panel C, we find that persistent poor performance significantly increases the likelihood of accounting restatements or class action lawsuits, while CEO equity incentives alone do not. Finally, Panels D and E demonstrate that CEO equity incentives contribute to the probability of these events only when coupled with prolonged poor performance, and that excessive incentives further exacerbate this effect.

Next, we employ an alternative measure of CEO equity incentives following Cheng and Warfield (2005), defined as the sum of the number of options and the number of shares held by the CEO, divided by the total number of shares outstanding. This measure (termed as share delta) serves as a proxy for the CEO's potential ownership stake in the firm. The results using this alternative measure are presented in Table 10.

We find that CEO equity incentives are associated with an increase in discretionary accruals (Panel A) and a decrease in earnings variability (Panel B). However, the incentives have only a modest effect on the probability of meeting or beating analyst forecasts and no discernible effect on avoiding negative earnings surprises (Panel B). Consistent with our earlier results, CEO equity incentives do not directly affect the likelihood of accounting fraud (Panel C). When combined with sustained poor performance, however, CEO equity incentives begin to strongly correlate with accounting fraud, while poor performance alone no longer does (Panel D). Moreover, when focusing on excessive incentives, we find that although poor performance continues to affect the likelihood of fraud, the interaction between excessive incentives and poor performance becomes substantially larger and more statistically significant, further exacerbating the effect (Panel E).

We also conduct a series of additional sensitivity tests (untabulated). These include disaggregating CEO equity incentives into stock and option components using both the Core and Guay (2002) and the Cheng and Warfield (2005) delta measures, as well as exploring alternative measures of accounting manipulation. Across all specifications, the results remain consistent with our main findings.

5. Concluding Remarks

This paper revisits a well-studied relation between CEO equity incentives and accounting manipulation. While the prevailing view holds that CEO equity incentives should positively influence accounting manipulation, empirical findings across a large body of research remain inconclusive (Armstrong et al. 2010; Edmans et al. 2017). We begin by distinguishing two forms of manipulation: within-GAAP accrual-based earnings management, which is legitimate and relatively low-risk, and accounting fraud, which is illegitimate and carries substantially greater legal and reputational risks. Building on this distinction, we predict and consistently find that CEO equity incentives are associated with increased accrual earnings management but not with accounting fraud.

We then posit and provide empirical evidence that CEOs resort to accounting fraud only after an extended period of poor performance and after exhausting all available accrual-based earnings management tools. It is under these conditions that equity incentives begin to play a role, motivating accounting fraud as a last-ditch effort. When CEO equity incentives are excessive, this effect is further amplified. A series of sensitivity tests supports the robustness of our findings. In sum, while CEO equity incentives are generally associated with accrual earnings management,

they contribute to accounting fraud only under sustained poor performance—particularly when those incentives are excessive.

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Appendix: Variable definitions

Variable Name	Definition	Source
Equity Incentive Variables:		
Delta	The natural logarithm of Delta: the sum of option delta and share delta (Core and Guay 2002). Specifically, *Delta* ≡ *(# of Shares + # of Options × Option Delta)× (price × .01)*	ExecuComp
Excessive Delta	*Excessive Delta* is set to the abnormal Delta if the abnormal Delta is positive and zero otherwise (Core and Guay 1999). Abnormal Delta is calculated by running a prediction model of *Delta* following Core and Guay (1999).	ExecuComp
Share Delta	(# of options and # of stock)/# of shares outstanding (Cheng and Warfield 2005).	ExecuComp
Excessive Share Delta	*Excessive Share Delta* is set to the abnormal share Delta if the abnormal Share Delta is positive and zero otherwise. Abnormal share Delta is calculated by running a prediction model of *Share Delta* following Core and Guay (1999).	ExecuComp
Deficient Delta	*Deficient Delta* is set to the absolute value of abnormal Delta if the abnormal Delta is negative and zero otherwise. Abnormal Delta is calculated by running a prediction model of *Delta* following Core and Guay (1999).	ExecuComp
Earnings Management Variables:		
$\|DACC\|_{MJ}$	Absolute value of discretionary accruals, which is computed by using modified Jones model (Dechow, Sloan, and Sweeney 1995).	Compustat, 10-K
$\|DACC\|_{PM}$	Absolute value of discretionary accruals, which is computed using performance-matched model (Kothari, Leone, and Wasley 2005).	Compustat, 10-K
Negative Surprise	An indicator that equals one when the actual earnings is less than the latest consensus forecast before the earnings announcement and zero otherwise (Cheng and Warfield 2005).	Compustat, 10-K
Meet or Beat	An indicator that equals one when the actual earnings is equal to, or greater than the consensus forecast before the earnings announcement by one cent and zero otherwise (Cheng and Warfield 2005).	Compustat, 10-K
Variability of ΔNI	The variance of residuals from a regression of the ΔNI on the control variables (Barth, Landsman, and Lang 2008).	Compustat, 10-K
Variability of ΔNI over variability of ΔCF	The ratio of the variability of *ΔNI* divided by the variability of *ΔCF*, where the variability of *ΔCF* is the variance of residuals from a regression of the *ΔCF* on the control variables (Barth, Landsman and Lang 2008)	Compustat, 10-K

Fraud	An indicator that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the fiscal year and zero otherwise.	AAER
Restate	An indicator that equals one when the firm had a restatement identified as fraud by Audit Analytics in the fiscal year and zero otherwise (Hennes, Leone, and Miller 2008).	Audit Analytics
Lawsuit	An indicator that equals one if the firm had at least one securities class action lawsuit alleging violation of Section 10(b) of the Securities Exchange Act of 1936 or Section 11 of the Securities Act of 1933 with class period starting in the fiscal year and zero otherwise.	SCAC
Firm/CEO Characteristics:		
Firm Size	The natural logarithm of the market value of equity.	Compustat, 10-K
Book-to-Market	Book value of equity/market value of equity.	Compustat, 10-K
Leverage	Total debt/total assets.	Compustat, 10-K
Firm Age	Number of years the firm appears on Compustat.	Compustat, 10-K
ROA	Net income/total assets.	Compustat, 10-K
Return	Buy-and-hold returns over the fiscal year.	CRSP
NOA	Net operating assets/sales.	Compustat, 10-K
Intangible	The sum of R&D expenses and advertising expenses/sales.	Compustat, 10-K
Labor Intensity	(One minus the ratio of gross property, plant and equipment)/total assets.	Compustat, 10-K
σCFO	Standard deviation of (cash flows from operations over the prior ten years/total assets).	Compustat, 10-K
σSALE	Standard deviation of (sales over the prior ten years/ total assets).	Compustat, 10-K
Litigation Risk	An indicator variable that equals one if the firm operates in a high-litigation industry (SIC codes 2833–2836; 3570–3577; 3600–3674; 5200–5961, and 7370–7374), and zero otherwise.	Compustat, 10-K
Analyst Following	The number of analysts following the company.	I/B/E/S
CEO age	CEO age in the year.	ExecuComp
CEO tenure	CEO tenure with the firm in the year.	ExecuComp
PPE	Net property, plant and equipment/total assets.	Compustat, 10-K
Financing	Amount raised from stock and debt issuances during the year scaled by total assets.	Compustat, 10-K
Acquisition	An indicator variable that equals one if an acquisition accounts for 20% or more of total sales and zero otherwise.	Compustat, 10-K
Sale Growth	Sales change from last year to this year/sales in the previous year.	Compustat, 10-K
Inventory	Inventory/total assets.	Compustat, 10-K
Receivable	Accounts receivable/total assets.	Compustat, 10-K
Z-score	The Z-score from Altman (1968): Z-score = 0.012 × (working capital divided by total assets) + 0.014 × (retained earnings divided by total assets) + 0.033 × (earnings before interest and taxes divided by total	Compustat, 10-K

	assets) + 0.006 × (Market value of equity divided by book value of total liabilities) + 0.999 × (sales divided by total assets).	
Loss	An indicator that equals one if the firm's net income is negative, and zero otherwise.	Compustat, 10-K
Interest Coverage	Earnings before interest and taxes/interest and related expense.	Compustat, 10-K
Debt Issue	Total liabilities change from last year to this year/ total liabilities in the previous year.	Compustat, 10-K
Debt Cost	Interest and related expense/book value of debt.	Compustat, 10-K
Cash Dividends	Cash dividends/total assets.	Compustat, 10-K
CFO	Net cash flow from operating activities/total assets.	Compustat, 10-K
Ret_Idiosyncratic	The residuals from the cross-sectional regressions (annual returns) that use industry median returns to predict firm stock returns.	Compustat, CRSP
Ret_Peer	The predicted values from the first-stage cross-sectional regressions (annual return) that use industry median returns to predict firm stock returns.	Compustat, CRSP
Risk_Idiosyncratic	The standard deviation of residuals from regression of daily stock returns on daily industry median returns.	Compustat, CRSP
Risk_Peer	The standard deviation of the predicted values from regression of daily stock returns on daily industry median returns from year t-1.	Compustat, CRSP
Risk_ROA	Standard deviation using 16 quarterly earnings growth rates after removing industrial median.	Compustat
Competition	The natural logarithm of one plus the number of potential CEO candidates measured as number of firms in the same two-digit SIC code.	Compustat
Economic Consequences:		
$Bankruptcy_{[t,t+3]}$	An indicator that equals one if the firm files bankruptcy in the next three years and zero otherwise.	CRSP, Compustat
$Turnover_{[t,t+3]}$	An indicator that equals one if there is a performance-induced CEO turnover in any of the next three years and zero otherwise. Performance-induced CEO turnover events are identified by applying the first method in Jenter and Lewellen (2021) after estimating the turnover probability associated with poor performance alone.	CRSP, Compustat
Accumulated Earnings Management:		
Accumulated $\lvert DACC\rvert_{MJ}$	The sum of $\lvert DACC\rvert_{MJ}$ in the past three years.	CRSP, Compustat
Accumulated $\lvert DACC\rvert_{PM}$	The sum of $\lvert DACC\rvert_{PM}$ in the past three years.	CRSP, Compustat
Prolonged Performance Measures:		
Number of Loss Quarters	Number of quarters reporting negative net income in the past two years.	Compustat

Negative Market Reactions	The absolute value of *Market Reactions* if *Market Reactions* is negative and zero otherwise, where *Market Reactions* is the sum of the abnormal returns in the window of [-1,+1] around the annual earnings announcement date in the past two years.	CRSP, Compustat
Consecutive Decreasing Sales	An indicator that equals one if the changes in annual sales is negative for the past two years and zero otherwise.	CRSP, Compustat

Table 1 Summary statistics

This table reports the summary statistics of our main variables (Panel A) and univariate comparison on the key variables between the fraud firm-years (AAER=1) and all other firm-years (AAER=0) (Panel B). The sample period is 1992-2024 except for AAER analyses which covers 1992-2019. See Appendix for variable definitions and measurement.

Panel A: Summary statistics

Variable	N	Mean	Q1	Median	Q3	Std.
Variables in Table 2:						
$\|DACC\|_{MJ}$	32,406	0.051	0.016	0.036	0.066	0.054
$\|DACC\|_{PM}$	32,406	0.051	0.016	0.035	0.065	0.053
Negative Surprise	32,406	0.306	0.000	0.000	1.000	0.461
Meet or Beat	32,406	0.193	0.000	0.000	0.000	0.395
Variability of ΔNI	32,406	0.010	0.000	0.001	0.005	0.032
Variability of ΔNI over variability of ΔCF	32,406	14.66	0.299	1.215	5.245	53.599
Delta	32,406	6.137	5.191	6.106	7.050	1.385
Firm Size	32,406	7.602	6.435	7.471	8.631	1.630
Book-to-Market	32,406	0.469	0.232	0.391	0.614	0.367
Leverage	32,406	0.229	0.067	0.214	0.343	0.187
Firm Age	32,406	24.17	11.000	21.000	34.000	16.043
ROA	32,406	0.043	0.017	0.053	0.091	0.098
Return	32,406	0.152	-0.143	0.097	0.357	0.477
NOA	32,406	0.738	0.334	0.560	0.901	0.650
Intangible	32,406	0.064	0.000	0.023	0.083	0.101
Labor Intensity	32,406	0.485	0.273	0.588	0.780	0.379
σCFO	32,406	0.048	0.026	0.039	0.058	0.034
σSALE	32,406	0.252	0.122	0.198	0.315	0.196
Litigation Risk	32,406	0.320	0.000	0.000	1.000	0.466
Analyst Following	32,406	2.239	1.792	2.303	2.773	0.718
CEO Age	32,406	56.13	51.000	56.000	61.000	7.370
CEO Tenure	32,406	7.164	2.000	5.000	10.000	7.716
New Variables in Table 3:						
Fraud	35,332	0.012	0.000	0.000	0.000	0.108
PPE	35,332	0.514	0.220	0.413	0.725	0.376
Financing	35,332	0.121	0.008	0.044	0.153	0.188
Acquisition	35,332	0.038	0.000	0.000	0.000	0.191
Sale Growth	35,332	0.110	-0.005	0.076	0.183	0.237
Inventory	35,332	0.121	0.021	0.094	0.175	0.121
Receivables	35,332	0.144	0.072	0.127	0.195	0.100

New Variables in Table 4:						
Bankruptcy$_{[t+1,t+3]}$	28,612	0.001	0.000	0.000	0.000	0.031
Turnover$_{[t+1,t+3]}$	31,233	0.148	0.000	0.000	1.000	0.355
Turnover$_{t+1}$	31,233	0.080	0.000	0.000	0.000	0.272
Z-Score	28,612	1.135	0.648	0.976	1.437	0.696
Loss	28,612	0.195	0.000	0.000	0.000	0.396
Interest Coverage	28,612	32.99	0.677	3.952	11.858	121.916
Debt Issue	28,612	0.155	-0.048	0.042	0.190	0.475
Debt Cost	28,612	0.093	0.040	0.059	0.085	0.130
Cash Dividends	28,612	0.012	0.000	0.003	0.018	0.019
CFO	28,612	0.097	0.057	0.097	0.142	0.084
Ret_Idiosyncratic$_{t-1}$	31,233	0.033	-0.229	-0.008	0.229	0.460
Ret_Peer $_{t-1}$	31,233	0.148	-0.029	0.110	0.263	0.309
Ret_Idiosyncratic $_{t-2}$	31,233	0.043	-0.226	-0.005	0.237	0.474
Ret_Peer $_{t-2}$	31,233	0.150	-0.029	0.110	0.267	0.310
Risk_Idiosyncratic	31,233	0.069	0.016	0.045	0.096	0.071
Risk_Peer	31,233	0.113	0.071	0.098	0.138	0.061
Risk_ROA	31,233	6.175	0.639	1.769	4.654	15.633
Competition	31,233	5.014	4.344	5.024	5.694	0.887
New Variables in Table 5						
Accum. $\|DACC\|_{MJ}$	28,425	0.159	0.079	0.125	0.199	0.121
Accum. $\|DACC\|_{PM}$	28,425	0.157	0.077	0.123	0.196	0.120
New Variables in Table 6:						
Number of Loss Quarters	28,317	1.082	0.000	0.000	1.000	1.833
Negative Market Reactions	28,317	0.038	0.000	0.000	0.049	0.069
Consecutive Decreasing Sales	28,317	0.110	0.000	0.000	0.000	0.313

[23] The large mean value associated with CEO turnover variable is the result from our non-standard CEO turnover definition (i.e., aggregating over future three years). The row below reports the summary statistics of CEO turnover using the standard definition (*Turnover*$_{t+1}$).

Panel B: Univariate analysis

Variable	*Fraud*=1	*Fraud*=0	Difference
	A	B	A-B
Delta	6.184	5.809	0.374***
CEO Age	53.189	56.100	-2.910***
CEO Tenure	7.264	7.018	0.246***
Firm Size	7.933	7.577	0.356***
Book-to-Market	0.450	0.465	-0.015***
Firm Age	19.878	23.576	-3.698***
ROA	0.031	0.043	-0.013***
PPE	0.340	0.516	-0.176***
Financing	0.134	0.121	0.012***
Sales Growth	0.182	0.109	0.073***
Receivables	0.176	0.144	0.032***
Analyst Following	2.410	2.216	0.194***
N	417	34,915	

Table 2 Equity incentives and earnings management

This table presents the results of the analysis on the effects of equity incentives on earnings management. The dependent variables in Panel A are input-based measures for accrual earnings management, and those in Panel B are output-based measures for accrual earnings management. $|DACC|_{MJ}$ is the absolute value of discretionary accruals, computed using the modified Jones model. $|DACC|_{PM}$ is the absolute value of discretionary accruals, computed using Kothari's (2005) performance-matched model. *Negative Surprise* is a dummy variable that equals one if the actual earnings is less than the latest consensus forecast before the earnings announcement and zero otherwise (Cheng and Warfield 2005). *Meet or Beat* is a dummy variable that equals one if the actual earnings is equal to, or greater than the consensus forecast before the earnings announcement by just one cent and zero otherwise (Cheng and Warfield 2005). *Variability of ΔNI* is the variance of the residuals from a regression of the ΔNI on the control variables (Barth, Landsman, and Lang 2008). *Variability of ΔNI over variability of ΔCF* is the ratio of the variability of ΔNI divided by the variability of ΔCF, where the variability of ΔCF is the variance of residuals from a regression of the ΔCF on the control variables (Barth, Landsman, and Lang 2008). All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Input-based measures of accrual earnings management

	(1)	(2)
Dep. Variable =	$\|DACC\|_{MJ}$	$\|DACC\|_{PM}$
Delta	**0.002*** **	**0.002*** **
	(0.000)	**(0.000)**
Firm Size	-0.001	-0.001
	(0.000)	(0.000)
Book-to-Market	-0.007***	-0.006***
	(0.001)	(0.001)
Leverage	-0.006**	-0.003
	(0.003)	(0.003)
Firm Age	-0.000***	-0.000***
	(0.000)	(0.000)
ROA	-0.126***	-0.118***
	(0.008)	(0.008)
Return	0.003***	0.004***
	(0.001)	(0.001)
NOA	-0.001	-0.001
	(0.001)	(0.001)
Intangible	-0.000	0.005
	(0.008)	(0.008)
Labor Intensity	0.013***	0.013***
	(0.002)	(0.002)
σCFO	0.291***	0.334***
	(0.020)	(0.020)
σSALE	-0.001	-0.002
	(0.003)	(0.003)
Litigation Risk	-0.000	0.002
	(0.006)	(0.006)
Analyst Following	-0.003***	-0.002***
	(0.001)	(0.001)
CEO Age	-0.000***	-0.000***
	(0.000)	(0.000)
CEO Tenure	-0.000**	-0.000***
	(0.000)	(0.000)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	32,406	32,406
R^2	0.173	0.174

Panel B: Output-based measures of accrual earnings management

Dep. Variable =	(1) *Negative Surprise*	(2) *Meet or Beat*	(3) *Variability of ΔNI*	(4) *Variability of ΔNI over variability of ΔCF*
Delta	**-0.030***	**0.056*****	**-0.001*****	**-1.891*****
	(0.017)	**(0.021)**	**(0.000)**	**(0.431)**
Firm Size	-0.009	-0.143***	0.000	1.326**
	(0.021)	(0.026)	(0.000)	(0.545)
Book-to-Market	0.047	-0.634***	-0.003***	0.824
	(0.050)	(0.080)	(0.001)	(1.609)
Leverage	0.210**	-0.692***	0.009***	9.534***
	(0.096)	(0.131)	(0.002)	(2.963)
Firm Age	0.001	-0.001	-0.000***	0.024
	(0.001)	(0.002)	(0.000)	(0.030)
ROA	-2.176***	1.683***	-0.080***	-85.586***
	(0.168)	(0.239)	(0.005)	(7.217)
Return	-0.495***	-0.000	0.004***	3.482***
	(0.033)	(0.033)	(0.001)	(0.825)
NOA	0.055	0.203***	-0.002**	-1.567
	(0.034)	(0.042)	(0.001)	(1.078)
Intangible	-0.491**	-0.538*	0.012*	-5.129
	(0.226)	(0.296)	(0.006)	(9.012)
Labor Intensity	-0.182***	0.129	0.001	-1.682
	(0.060)	(0.088)	(0.001)	(1.871)
σCFO	0.280	-2.120***	0.290***	-18.948
	(0.520)	(0.755)	(0.018)	(18.379)
σSALE	0.359***	0.029	0.002	4.079
	(0.095)	(0.131)	(0.002)	(3.187)
Litigation Risk	-0.132	0.287	0.002	-3.069
	(0.176)	(0.217)	(0.003)	(6.040)
Analyst Following	-0.336***	0.435***	-0.001	0.948
	(0.032)	(0.042)	(0.001)	(0.950)
CEO Age	0.001	-0.002	-0.000	-0.109*
	(0.002)	(0.003)	(0.000)	(0.058)
CEO Tenure	0.005**	-0.004	-0.000	-0.020
	(0.002)	(0.003)	(0.000)	(0.059)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	35,773	35,773	34,005	34,005
Pseudo R^2 or R^2	0.068	0.091	0.261	0.060

Table 3 Equity incentives and accounting fraud

This table presents the results of the analysis on the effects of equity incentives on accounting fraud (AAERs). The dependent variable, *Fraud,* is a dummy variable that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the year and zero otherwise. *Delta* is the natural logarithm of total Delta (Core and Guay 2002). All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dep. Variable =	*Fraud*
Delta	**0.209**
	(0.138)
Firm Size	0.305***
	(0.095)
Book-to-Market	0.654**
	(0.277)
Leverage	0.570
	(0.602)
Firm Age	-0.008
	(0.008)
ROA	-1.982***
	(0.763)
Return	-0.143
	(0.111)
PPE	2.207***
	(0.602)
Financing	-1.521
	(1.328)
Acquisition	0.425
	(0.462)
Growth	-0.403
	(0.313)
Inventory	0.337
	(0.216)
Receivables	1.906
	(1.273)
Analyst Following	1.911**
	(0.967)
CEO Age	0.077
	(0.175)
CEO Tenure	-0.032**
	(0.016)
Industry FE	Yes
Year FE	Yes
Observations	35,322
Pseudo R^2	0.174

Table 4 Consequences of accrual earnings management and accounting fraud

This table presents the results on the effects of earnings management and fraud on future bankruptcy and performance-induced CEO turnover. The dependent variable *Fraud* is a dummy variable that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the year and zero otherwise. $Bankruptcy_{[t,t+3]}$ is a dummy variable that equals one if the firm files bankruptcy in the next three years and zero otherwise. $Turnover_{[t,t+3]}$ is a dummy variable that equals one if the CEO is replaced in any of the next three years due to poor performance reasons alone and zero otherwise (Jenter and Lewellen, 2021). All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Future bankruptcy

Dep.Var. =	$Bankruptcy_{[t+1,t+3]}$				
	(1)	(2)	(3)	(4)	(5)
Fraud	**2.328***			**2.488***	**2.454***
	(1.350)			**(1.357)**	**(1.351)**
$\|DACC\|_{MJ}$		**4.028**		**4.361**	
		(2.892)		**(2.877)**	
$\|DACC\|_{PM}$			**2.716**		**3.135**
			(3.031)		**(3.005)**
Z-score	1.769**	2.016***	1.975***	1.857***	1.815**
	(0.738)	(0.693)	(0.695)	(0.714)	(0.716)
Firm Size	-0.721***	-0.687***	-0.695***	-0.702***	-0.710***
	(0.268)	(0.249)	(0.249)	(0.264)	(0.264)
Book-to-Market	0.153	0.203	0.188	0.236	0.217
	(0.518)	(0.500)	(0.506)	(0.483)	(0.492)
Leverage	2.984**	2.956**	2.974**	2.875**	2.873**
	(1.428)	(1.357)	(1.379)	(1.366)	(1.388)
Firm Age	-0.007	-0.010	-0.010	-0.005	-0.005
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
ROA	-2.262	-0.497	-0.694	-1.709	-1.942
	(3.717)	(3.341)	(3.507)	(3.254)	(3.411)
PPE	-0.104	0.153	-0.024	0.193	0.015
	(1.854)	(1.807)	(1.796)	(1.783)	(1.780)
Sale Growth	0.891	0.682	0.764	0.750	0.841
	(1.488)	(1.358)	(1.423)	(1.354)	(1.419)
Loss	0.301	0.345	0.378	0.244	0.277
	(0.598)	(0.574)	(0.575)	(0.599)	(0.600)

Interest Coverage	-0.477**	-0.530**	-0.515**	-0.511**	-0.496**
	(0.194)	(0.221)	(0.217)	(0.205)	(0.203)
Debt Issue	-0.487	-0.505	-0.470	-0.535	-0.500
	(0.366)	(0.364)	(0.360)	(0.359)	(0.356)
Debt Cost	-4.351	-4.665	-4.407	-5.139	-4.903
	(4.136)	(3.868)	(3.944)	(3.913)	(4.007)
σSALE	-4.197***	-4.743***	-4.569***	-4.591***	-4.409**
	(1.617)	(1.762)	(1.751)	(1.726)	(1.722)
Cash Dividends	4.849	4.794	4.396	5.979	5.520
	(14.345)	(13.585)	(13.485)	(13.965)	(13.904)
CFO	-7.566**	-7.896**	-7.688**	-7.587**	-7.307**
	(3.538)	(3.482)	(3.499)	(3.459)	(3.431)
CEO Age	0.009	0.005	0.004	0.007	0.006
	(0.038)	(0.039)	(0.038)	(0.039)	(0.038)
CEO Tenure	-0.006	0.003	0.002	-0.004	-0.005
	(0.057)	(0.054)	(0.055)	(0.057)	(0.058)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	28,612	28,612	28,612	28,612	28,612
Pseudo R^2	0.375	0.374	0.371	0.382	0.379

Panel B: Future CEO turnover

Dep. Var. =	*Turnover*$_{[t+1,t+3]}$				
	(1)	(2)	(3)	(4)	(5)
Fraud	**0.503*** **			**0.629*** **	**0.629*** **
	(0.169)			**(0.157)**	**(0.157)**
$\|DACC\|_{MJ}$		**0.528**		**0.316**	
		(0.374)		**(0.369)**	
$\|DACC\|_{PM}$			**0.641***		**0.423**
			(0.376)		**(0.372)**
Ret Idiosyncratic$_t$	0.041	0.041	0.041	0.026	0.026
	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)
Ret Peer $_t$	0.114	0.114	0.114	0.114	0.114
	(0.091)	(0.092)	(0.092)	(0.087)	(0.087)
Ret Idiosyncratic $_{t-1}$	0.043	0.043	0.043	0.028	0.028
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Ret Peer $_{t-1}$	0.098	0.096	0.096	0.095	0.095
	(0.091)	(0.091)	(0.091)	(0.088)	(0.088)
Risk Idiosyncratic	-0.294	-0.284	-0.287	-0.255	-0.256
	(0.670)	(0.671)	(0.671)	(0.669)	(0.669)
Risk Peer	0.634	0.596	0.580	0.449	0.432
	(0.577)	(0.579)	(0.578)	(0.566)	(0.565)
ROA	0.032	0.027	0.026	0.271	0.272
	(0.260)	(0.260)	(0.259)	(0.236)	(0.236)
Risk ROA	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
σSALE	-0.018	-0.032	-0.035	0.149	0.147
	(0.120)	(0.120)	(0.120)	(0.103)	(0.103)
Firm Size	0.012	0.015	0.015	-0.000	-0.000
	(0.016)	(0.016)	(0.016)	(0.015)	(0.015)
Firm Age	0.004**	0.004**	0.004**	0.002*	0.002*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Competition	0.042	0.042	0.042	0.006	0.006
	(0.088)	(0.088)	(0.088)	(0.025)	(0.025)
CEO Age	0.096***	0.096***	0.096***	0.093***	0.093***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
CEO Tenure	-0.034***	-0.034***	-0.034***	-0.036***	-0.036***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	31,233	31,233	31,233	31,233	31,233
Pseudo R^2	0.074	0.073	0.074	0.061	0.061

Table 5 Accumulated accrual earnings management and fraud

This table presents the results of the analysis on the effects of accumulated accrual earnings management on accounting fraud. The dependent variable, *Fraud,* is a dummy variable that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the year and zero otherwise. *Accumulated* $|DACC|_{MJ}$ is the sum of $|DACC|_{MJ}$ in the past three years. *Accumulated* $|DACC|_{PM}$ is the sum of $|DACC|_{PM}$ in the past three years. All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var. =	*Fraud*	
	(1)	(2)
***Accum.* $|DACC|_{MJ}$**	**1.116****	
	(0.550)	
***Accum.* $|DACC|_{PM}$**		**1.272****
		(0.552)
Firm Size	0.394***	0.395***
	(0.090)	(0.090)
Book-to-Market	0.791***	0.798***
	(0.270)	(0.268)
Leverage	1.436**	1.444**
	(0.605)	(0.603)
Firm Age	-0.017*	-0.016*
	(0.009)	(0.009)
ROA	-1.822*	-1.817**
	(0.934)	(0.921)
Return	-0.092	-0.093
	(0.118)	(0.118)
PPE	-2.811***	-2.790***
	(0.953)	(0.959)
Financing	0.328	0.330
	(0.478)	(0.478)
Acquisition	-0.504	-0.502
	(0.333)	(0.333)
Growth	0.618**	0.615**
	(0.243)	(0.244)
Inventory	2.190*	2.212*
	(1.277)	(1.279)
Receivables	2.379**	2.417**
	(1.008)	(1.009)
Analyst Following	0.067	0.066
	(0.183)	(0.183)
CEO Age	-0.032*	-0.032*
	(0.018)	(0.018)
CEO Tenure	0.027*	0.027*
	(0.015)	(0.015)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	28,425	28,425
Pseudo R^2	0.179	0.180

Table 6 Prolonged poor performance and fraud

This table presents the results of the analysis on the effects of prolonged poor performance on accounting fraud. The dependent variable, *Fraud,* is a dummy variable that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the year and zero otherwise. *Consecutive Decreasing Sales* is a dummy variable that equals one if the change in annual sales is negative for the past two years and zero otherwise. *Number of Loss Quarters* is the number of quarters reporting negative net income over the past two years. *Negative Market Reactions* is the absolute value of *Market Reactions* if *Market Reactions* is negative and zero otherwise, where *Market Reactions* is the sum of the abnormal returns in the window of [-1,+1] around the annual earnings announcement date in the past two years. All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var. =	*Fraud*		
	(1)	(2)	(3)
Poor performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*
Poor Performance	**0.916*** **	**0.091** **	**1.642** **
	(0.340)	**(0.043)**	**(0.764)**
Delta	0.073	0.085	0.072
	(0.095)	(0.095)	(0.096)
Firm Size	0.377***	0.393***	0.393***
	(0.110)	(0.112)	(0.112)
Book-to-Market	0.736**	0.748**	0.733**
	(0.300)	(0.297)	(0.297)
Leverage	1.215*	1.088	1.214*
	(0.653)	(0.665)	(0.663)
Firm Age	-0.017*	-0.017*	-0.017*
	(0.010)	(0.010)	(0.010)
ROA	-1.793*	-1.538	-2.056**
	(1.054)	(1.045)	(1.033)
Return	-0.127	-0.146	-0.104
	(0.132)	(0.134)	(0.130)
PPE	-2.751***	-2.746***	-2.746***
	(0.980)	(0.988)	(0.983)
Financing	0.132	0.131	0.115
	(0.540)	(0.539)	(0.548)
Acquisition	-0.401	-0.320	-0.370
	(0.341)	(0.342)	(0.339)
Growth	0.752**	0.492*	0.568*
	(0.292)	(0.291)	(0.291)
Inventory	2.939**	2.972**	2.894**
	(1.294)	(1.300)	(1.279)
Receivables	2.445**	2.501**	2.479**
	(1.060)	(1.059)	(1.052)
Analyst Following	0.053	0.041	0.024
	(0.185)	(0.189)	(0.188)
CEO Age	-0.032*	-0.031*	-0.031*
	(0.018)	(0.018)	(0.018)
CEO Tenure	0.018	0.017	0.017
	(0.015)	(0.015)	(0.015)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	26,840	26,840	26,840
Pseudo R^2	0.173	0.172	0.172

Table 7 Equity incentives and fraud conditioning on poor performance

This table presents the results of the analysis on the moderating effects of prolonged poor performance on the relationship between equity incentives and fraud. The dependent variable, *Fraud,* is a dummy variable that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the year and zero otherwise. All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var. =	*Fraud*		
	(1)	(2)	(3)
Poor Performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*
Delta*Poor Performance	**0.216***	**0.116*****	**1.416*****
	(0.112)	**(0.031)**	**(0.538)**
Delta	0.220**	0.007	0.038
	(0.111)	(0.143)	(0.106)
Poor Performance	-1.059	-0.017	1.306
	(0.747)	(0.082)	(0.972)
Firm Size	0.268**	0.347**	0.390***
	(0.114)	(0.141)	(0.114)
Book-to-Market	0.805***	0.792**	0.724**
	(0.295)	(0.347)	(0.285)
Leverage	1.275*	0.946	1.270**
	(0.663)	(0.733)	(0.615)
Firm Age	-0.017*	-0.013	-0.017*
	(0.010)	(0.011)	(0.009)
ROA	-1.876*	-1.710	-2.147**
	(1.081)	(1.244)	(1.013)
Return	-0.132	-0.069	-0.096
	(0.128)	(0.136)	(0.123)
PPE	-2.813***	-3.416***	-2.813***
	(0.956)	(1.116)	(0.945)
Financing	0.245	0.735	0.189
	(0.535)	(0.564)	(0.509)
Acquisition	-0.474	-0.613	-0.562*
	(0.337)	(0.389)	(0.333)
Growth	0.741***	0.591**	0.602**
	(0.273)	(0.283)	(0.260)
Inventory	2.588**	1.439	2.572**
	(1.317)	(1.387)	(1.265)
Receivables	2.186**	1.526	2.340**
	(1.038)	(1.142)	(0.996)
Analyst Following	0.117	0.207	0.077
	(0.191)	(0.221)	(0.186)
CEO Age	-0.027	-0.027	-0.031*
	(0.018)	(0.021)	(0.017)
CEO Tenure	0.010	0.027	0.019
	(0.015)	(0.017)	(0.015)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	26,840	26,840	26,840
Pseudo R^2	0.181	0.167	0.176

Table 8 Excessive equity incentives and fraud

This table presents the results of the analysis on the effects of excessive equity incentives on fraud. The dependent variable, *Fraud,* is a dummy variable that equals one if the firm had a SEC Accounting and Auditing Enforcement Release (AAER) event in the year and zero otherwise. Panel A presents the results of the first-stage prediction model. Panel B reports the result of the effects from excessive equity incentives alone. *Excessive Delta* is set to the abnormal Delta if the abnormal Delta is positive and zero otherwise (Core and Guay 1999). Panel C reports the result of the effects from the interaction of excessive equity incentives and poor performance. All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: First-stage prediction model

Dep. Var. =	*Delta*
Ln(MV)	0.720***
	(0.015)
Book-to-Market	-0.345***
	(0.029)
Leverage	-0.154**
	(0.074)
Sales Growth	0.212***
	(0.023)
ROA	0.031**
	(0.012)
Acquisition	-0.015
	(0.013)
CEO Tenure	0.030***
	(0.002)
CEO Age	0.001
	(0.002)
CEO Gender	0.046
	(0.074)
Constant	0.044
	(0.204)
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	37,359
Adjusted R-squared	0.774

Panel B: Excessive equity incentive and fraud

Dep. Var. =	*Fraud*		
Poor Performance =	(1) *Consecutive Decreasing Sales*	(2) *Number of Loss Quarters*	(3) *Negative Market Reaction*
Excessive Delta	**0.603****	**0.601****	**0.593****
	(0.264)	**(0.268)**	**(0.266)**
Poor Performance	**0.865****	**0.104****	**2.355****
	(0.438)	**(0.044)**	**(1.118)**
Deficient Delta	0.019	0.005	0.021
	(0.356)	(0.354)	(0.356)
Firm Size	0.357***	0.377***	0.371***
	(0.102)	(0.102)	(0.102)
Book-to-Market	0.804**	0.782**	0.810**
	(0.346)	(0.336)	(0.342)
Leverage	1.187	1.023	1.211
	(0.797)	(0.806)	(0.802)
Firm Age	-0.010	-0.011	-0.011
	(0.011)	(0.011)	(0.011)
ROA	-0.934	-0.005	-1.159
	(1.207)	(1.222)	(1.193)
Return	-0.086	-0.099	-0.059
	(0.134)	(0.134)	(0.133)
PPE	-3.255***	-3.285***	-3.266***
	(1.077)	(1.079)	(1.079)
Financing	0.804	0.833	0.798
	(0.570)	(0.565)	(0.579)
Acquisition	-0.581	-0.505	-0.580
	(0.392)	(0.389)	(0.390)
Growth	0.986***	0.838***	0.838***
	(0.285)	(0.291)	(0.294)
Inventory	1.905	1.981	1.911
	(1.356)	(1.373)	(1.344)
Receivables	1.323	1.441	1.341
	(1.139)	(1.133)	(1.138)
Analyst Following	0.212	0.208	0.184
	(0.207)	(0.213)	(0.210)
CEO Age	-0.026	-0.023	-0.026
	(0.020)	(0.020)	(0.020)
CEO Tenure	0.025	0.024	0.024
	(0.016)	(0.016)	(0.016)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	26,840	26,840	26,840
Pseudo R^2	0.172	0.173	0.172

Panel C: Interaction of excessive equity incentives and poor performance

Dep. Var. =	*Fraud*		
	(1)	(2)	(3)
Poor Performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reaction*
Excessive Delta*poor performance	**1.007***	**0.418*****	**6.438****
	(0.518)	**(0.137)**	**(3.175)**
Poor Performance	0.736*	0.692*	0.771**
	(0.406)	(0.409)	(0.367)
Excessive Delta	0.702**	0.169**	2.758**
	(0.293)	(0.077)	(1.128)
Deficient Delta	-0.293	0.211	-0.274
	(0.877)	(0.710)	(0.875)
Firm Size	0.329***	0.336***	0.334***
	(0.123)	(0.110)	(0.124)
Book-to-Market	0.564	0.605	0.566
	(0.408)	(0.372)	(0.410)
Leverage	0.776	0.687	0.754
	(0.751)	(0.756)	(0.759)
Firm Age	-0.019*	-0.017*	-0.018*
	(0.010)	(0.010)	(0.010)
ROA	-0.525	0.251	-0.717
	(1.222)	(1.262)	(1.253)
Return	-0.016	0.022	0.020
	(0.161)	(0.158)	(0.157)
PPE	-2.406**	-2.224**	-2.387**
	(0.945)	(0.950)	(0.940)
Financing	0.285	0.188	0.236
	(0.572)	(0.535)	(0.582)
Acquisition	-0.486	-0.269	-0.481
	(0.413)	(0.394)	(0.413)
Growth	1.433***	1.222***	1.208***
	(0.326)	(0.314)	(0.339)
Inventory	0.678	1.088	0.566
	(1.704)	(1.563)	(1.669)
Receivables	1.837	2.192**	1.790
	(1.123)	(1.113)	(1.118)
Analyst Following	0.584**	0.526**	0.559**
	(0.248)	(0.246)	(0.250)
CEO Age	-0.025	-0.024	-0.023
	(0.019)	(0.019)	(0.019)
CEO Tenure	0.016	0.014	0.015
	(0.019)	(0.016)	(0.019)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	26,840	26,840	26,840
Pseudo R^2	0.182	0.184	0.183

Table 9 Robustness Tests: Alternative Measures of Fraud

This table presents results from the robustness tests using two alternative measures of fraud: accounting restatements (*Restate)* and securities class action lawsuits (*Lawsuit)*. *Restate* is a dummy variable that equals one if the firm had a restatement identified as fraud by Audit Analytics in the fiscal year and zero otherwise. *Lawsuit* is a dummy variable that equals one if the firm had at least one securities class action lawsuit alleging violation of Section 10(b) of the Securities Exchange Act of 1936 or Section 11 of the Securities Act of 1933 with class period starting in the fiscal year and zero otherwise. All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equity incentives and fraud

	(1)	(2)
Dep. Var. =	*Restate*	*Lawsuit*
Delta	**0.050**	**0.026**
	(0.031)	**(0.042)**
Controls	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	39,192	39,192
Pseudo R^2	0.061	0.083

Panel B: Accrual earnings management and fraud

Dep. Var. =	*Restate*		*Lawsuit*	
	(1)	(2)	(3)	(4)
Accumulated |DACC|$_{MJ}$	**0.388*** **		**1.408*** **	
	(0.097)		**(0.205)**	
Accumulated |DACC|$_{PM}$		**0.389*** **		**1.333*** **
		(0.098)		**(0.208)**
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	61,675	61,675	61,675	61,675
Pseudo R^2	0.118	0.118	0.079	0.077

Panel C: Poor performance and fraud

Dep. Var. =	*Restate*			*Lawsuit*		
	(1)	(2)	(3)	(4)	(5)	(6)
Poor performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*
Poor Performance	**0.010**	**0.073****	**0.802****	**0.292****	**0.112****	**2.441*****
	(0.075)	**(0.031)**	**(0.359)**	**(0.136)**	**(0.052)**	**(0.614)**
Delta	0.044	0.064	0.043	0.001	0.068	-0.027
	(0.031)	(0.042)	(0.030)	(0.049)	(0.061)	(0.044)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32,177	32,177	32,177	32,177	32,177	32,177
Pseudo R^2	0.054	0.112	0.066	0.092	0.086	0.084

Panel D: Equity incentives and fraud conditioning on poor performance

Dep. Var. =	*Restate*			*Lawsuit*		
	(1)	(2)	(3)	(4)	(5)	(6)
Poor performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*
Delta*poor performance	**0.097** **(0.041)**	**0.062** **(0.028)**	**0.103** **(0.043)**	**0.183** **(0.080)**	**0.051** **(0.024)**	**0.770** **(0.365)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32,177	32,177	32,177	32,177	32,177	32,177
Pseudo R^2	0.021	0.134	0.066	0.084	0.069	0.086

Panel E: Excessive incentives and fraud

Dep. Var. =	*Restate*			*Lawsuit*		
	(1)	(2)	(3)	(4)	(5)	(6)
Poor Performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*
Excessive Delta*poor performance	**0.083** **(0.038)**	**0.177** **(0.066)**	**2.610** **(1.143)**	**0.152** **(0.056)**	**0.191** **(0.100)**	**4.313** **(1.673)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32,177	32,177	32,177	32,177	32,177	32,177
Pseudo R^2	0.094	0.059	0.059	0.076	0.080	0.081

Table 10 Robustness Tests: Alternative Measures of Equity Incentives

This table presents the results from the robustness tests using an alternative incentive measure (*Share Delta*) used in Cheng and Warfield (2005): the number of the CEO's shares and options scaled by the number of shares outstanding. *Excessive Share Delta* is set to the abnormal share Delta if the abnormal Share Delta is positive and zero otherwise based on a prediction model (Core and Guay 1999). All variables are defined in the Appendix. Robust standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equity incentives and input-based accrual earnings management

Dep. Var. =	(1) $\|DACC\|_{MJ}$	(2) $\|DACC\|_{PM}$
Share Delta	**0.002*** **	**0.002*** **
	(0.001)	**(0.001)**
Controls	Yes	Yes
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	32,406	32,406
R^2	0.172	0.174

Panel B: Equity incentives and output-based earnings management

Dep. Var. =	(1) *Negative Surprise*	(2) *Meet or Beat*	(3) *Variability of ΔNI*	(4) *Variability of ΔNI over variability of ΔCF*
Share Delta	**0.007**	**0.052***	**-0.002*** **	**-2.567*** **
	(0.026)	**(0.031)**	**(0.000)**	**(0.594)**
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	35,773	35,773	34,005	34,005
Pseudo R^2 or R^2	0.0680	0.0906	0.260	0.059

Panel C: Equity incentives and fraud

Dep. Var. = *Fraud*	(1)
Share Delta	**0.168**
	(0.122)
Controls	Yes
Industry FE	Yes
Year FE	Yes
Observations	35,332
Pseudo R^2	0.172

Panel D: Equity incentives and fraud conditioning on poor performance

Dep. Var. = *Fraud*	(1)	(2)	(3)
Poor Performance =	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reactions*
Share Delta*Poor Performance	**0.532****	**0.125****	**2.547****
	(0.257)	**(0.063)**	**(1.189)**
Share Delta	0.370***	0.158	0.333**
	(0.133)	(0.133)	(0.131)
Poor Performance	-0.508	-0.130	0.107
	(0.335)	(0.083)	(1.189)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	28,317	28,317	28,317
Pseudo R^2	0.185	0.168	0.186

Panel E: Excessive equity incentives and fraud

Dep. Var. = *Fraud*	(1)	(2)	(3)
Poor Performance=	*Consecutive Decreasing Sales*	*Number of Loss Quarters*	*Negative Market Reaction*
Excessive Share Delta*poor performance	**1.562*****	**0.491*****	**7.240***
	(0.504)	**(0.147)**	**(3.750)**
Excessive Share Delta	0.204	0.130	0.265
	(0.349)	(0.339)	(0.335)
Poor Performance	0.646**	0.175**	2.631**
	(0.294)	(0.075)	(1.090)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	28,317	28,317	28,317
Pseudo R^2	0.179	0.182	0.179