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The cost of refraining from managing earnings when an industry-leading peer is reporting fraudulently

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THE COST OF REFRAINING FROM MANAGING EARNINGS WHEN AN
INDUSTRY-LEADING PEER IS REPORTING FRAUDULENTLY

by

Justin Paul Wood

A thesis submitted in partial fulfillment
of the requirements for the Doctor of Philosophy
degree in Business Administration (Accounting) in the
Graduate College of
The University of Iowa

December 2017

Thesis Supervisors: Professor Daniel W. Collins
Associate Professor Richard D. Mergenthaler

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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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has been approved by the Examining Committee for
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For Jamie, Elise, Margaret, Grant, Spencer, Sterling, and Natalie – because you make me
happy.

ABSTRACT

In this study, I explore whether managers and firms are penalized when they face pressures to manage earnings, but chose not to do so. I use periods in which an industry-leading firm inflates earnings fraudulently, and in which the public is unaware of the fraud, as a setting where managers at industry peer firms face pressures to manage earnings. Using the Dechow et al. (2011) F-score, I identify two groups of industry peer firms: one group where firms show no evidence of having managed earnings in response to the industry leader's fraud, and another group where firms do show evidence of having managed earnings in response to the industry leader's fraud. I hypothesize that managers of firms in the first group face a penalty in terms of personal compensation, and that the firms they lead face an increase in the cost of equity, but not in the cost of debt.

I find evidence of a negative association between the decision to refrain from managing earnings and managerial compensation. However, I also observe declining compensation for managers who do manage earnings over the same period. This latter result precludes me from being able to entirely attribute the drop in compensation for the managers of the first group to the decision to refrain from managing earnings. I find that the cost of equity increases in the period of industry-leader fraud for firms that refrain from managing earnings, but the increase is statistically insignificant. The difference in the change in the cost of equity capital for these firms and for those who manage earnings is insignificant. The latter two results preclude me from being able to entirely attribute the increase in the cost of equity for firms in the first group to the decision to refrain from managing earnings. I find no evidence of changes in the cost of debt for firms in either group.

PUBLIC ABSTRACT

The United States Securities and Exchange Commission requires publicly traded firms to produce annual reports. These reports contain information that is used by investors and other stakeholders to evaluate firm performance. Firm executive officers have some ability to influence the information contained in annual reports. Executives also have an incentive to portray firm performance in the best light possible because the information in these reports can affect their personal compensation and their ability to raise capital for the firm. However, overstated performance can adversely affect investors and other stakeholders.

Executives choose to overstate firm performance when they expect to be better off for doing so. It is therefore important to understand the outcomes an executive can expect to realize under two scenarios: one where he chooses overstate performance and one where he does not. It is also important to understand the consequences firms and shareholders face under these two scenarios.

Research has already extensively explored the consequences executives, firms, and shareholders face when executives choose to overstate performance. In this study, I examine the consequences that managers and firms face when executives elect not to overstate performance when they face increased incentives to do so. More specifically, I examine whether executives who decide not to overstate suffer negative consequences in terms of personal compensation and ability to raise capital for the firm. I find that these managers experience a cut in pay and their firms experience an increase in the cost of equity, but not in the cost of debt.

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THE COST OF REFRAINING FROM MANAGING EARNINGS WHEN AN INDUSTRY-LEADING PEER IS REPORTING FRAUDULENTLY

1. Introduction

In this study, I explore whether managers and firms are penalized when they face pressures to manage earnings, but chose not to do so. Agency theory suggests managers have incentives to act in their own self-interest (Holmstrom, 1979; Jensen and Meckling, 1976; Berle and Gardiner, 1932; Smith, 1776). There is a vast literature that explores the consequences that accrue to stakeholders when managers manage earnings (see reviews by Healy and Wahlen, 1999; Dechow and Skinner, 2000; and Dechow et al., 2010 for an overview of the consequences of earnings quality). However, we know relatively little about the costs and benefits that accrue to managers and investors when managers do not succumb to the pressure to manage earnings. In this study, I explore the consequences firms and managers face when managers choose not to manage earnings when there are heightened incentives to do so. Specifically, I investigate the effect this decision has on executive compensation and the firm's cost of capital.

To examine my research question, I first identify a setting in which managers face an escalation in the incentive to manage earnings. Specifically, I explore the behavior of industry peers in a setting where the industry leader inflates earnings via accounting fraud and becomes the subject of a U.S. Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Release.¹ Figure 1 contains a basic representation of the

¹ In this paper I follow Beatty et al. (2013) and use income-increasing accounting misstatements that are identified in SEC AAERs as cases of accounting fraud. While fraud is often implied by the allegations in the SEC's AAERs, it is impossible to conclusively determine managerial intent in these cases. I therefore use the terms *fraud*, *accounting fraud*, *misstatement* and *accounting misstatement* interchangeably throughout the paper.

research design used in this study. Box 1 of Figure 1 captures this first step in my research design. It is important to note that managers and compensation committees at industry peers, as well as equity analysts, investors, and lenders are all typically ignorant of the misstatement until the financial press reveals some impropriety sometime after the fraud has ceased. In other words these frauds are unknown, or undetected, while being committed. The undetected industry-leader fraud setting is useful because of its potential to indirectly affect three things that managers (CEOs) at peer firms care enough about to motivate earnings management: peer firm stock price (Dye, 1988; Levitt, 1998; Healy and Wahlen, 1999; Fields et al., 2001; Graham et al., 2005), personal career prospects (Healy and Wahlen, 1999; Graham et al., 2005), and personal compensation (Watts and Zimmerman, 1978; Healy, 1985; Dechow and Sloan, 1991; Gaver et al., 1995; Holthausen et al., 1995; Guidry et al., 1999; Healy and Wahlen, 1999; Fields et al., 2001; Graham et al., 2005).²

Stock price and personal career concerns during undetected industry-leader fraud are indirectly affected by changes in analyst expectations (Figure 1, box 2). Beatty et al. (2013) find that industry-leader fraud causes analysts to be more optimistic regarding peer firm prospects during the period in which the fraud is ongoing, but undetected. Graham et al. (2005) find managers are concerned that failing to meet or beat earnings benchmarks will lead to declines in stock price and increases in managerial turnover. Together, results from Beatty et al. (2013) and Graham et al. (2005) suggest that fraud at an industry leader puts artificial upward pressure on analyst expectations for peer firms, which then creates greater incentives for managers at peer firms to manage earnings as they attempt to meet those higher expectations (Figure 1, box 4). Other studies show that these managerial

² Throughout this paper, when I use the word *manager*, I am referring to the firm's chief executive officer.

concerns are well founded: the meeting or beating of earnings benchmarks affects stock price (Barth et al., 1999; Skinner and Sloan, 2002), and CEOs who do not meet earnings expectations are more likely to be dismissed (Farrell and Whidbee, 2003). An increase in analyst expectations will therefore increase the incentive managers at peer firms face to manage earnings. I maintain that this will be especially true in my setting where the increase in earnings expectations for peer firms is driven by the fraudulent reporting of the industry leader, which likely does not reflect a reality that can be achieved through honest effort and accurate financial reporting (Jensen, 2005). In my analysis, I explore whether the result in Beatty et al. (2013) – namely that analysts issue more favorable recommendations for peer firms while an industry leader is covertly reporting fraudulently – is also true for my sample of frauds. My results are consistent with the main findings in Beatty et al. (2013).

The personal compensation of peer-firm CEOs during periods of undetected industry-leader fraud are indirectly affected via formal or informal use of relative performance evaluation (RPE). Compensation committees often consider the firm's performance, relative to that of its peers, in determining CEO compensation (Bizjak et al., 2011; Faulkender and Yang, 2010; Jenter and Kanaan, 2015; Gibbons and Murphy, 1990). While early empirical studies on RPE find very little evidence of the use of RPE in practice (e.g., Jensen and Murphy, 1990; Barro and Barro, 1990; Bertrand and Mullainathan, 2001; Garvey and Milbourn, 2003, 2006), later work finds widespread evidence of the use of RPE in CEO pay (Albuquerque, 2009; see also Murphy, 1999; Bannister and Newman, 2003; Bizjak et al., 2008; Faulkender and Yang, 2010). The use of RPE in managerial compensation increases the incentive to manage earnings at peer firms because managers

will not want to be seen as falling behind the observed performance of the fraudulently reporting industry leader (Figure 1, boxes 3 and 4). Theoretical work by Bagnoli and Watts (2000) shows how the use of RPE within an industry can cause industry members to manage earnings simply because they expect their rivals to manage earnings – exacerbating the underlying level of earnings management that would otherwise exist due to agency costs in the absence of RPE. In my setting, where an industry leader is enhancing its observed performance by reporting fraudulently, I conjecture that the use of RPE will push peers to increased levels of earnings management, on average.

The previous discussion can be summarized as follows: undetected accounting misstatement at industry leading firms (Figure 1, box 1) causes an escalation in the incentive managers at peer firms face to manage earnings (Figure 1, box 4). This escalation is facilitated through two main channels. First, undetected fraudulent reporting at an industry-leading firm causes analysts to become overly optimistic about the prospects for firms in that industry, leading to more challenging earnings benchmarks for managers at peer firms. Managers will find it more difficult to meet these elevated benchmarks without resorting to earnings management (Figure 1, box 2). Second, managers at firms where RPE is used to determine executive compensation will not want to be seen as underperforming, relative to the performance of the industry leader (Figure 1, box 3). They therefore face added incentive to manage earnings. I maintain that this increase in the incentive to manage earnings will persist so long as the fraud is ongoing and is not common knowledge.

The escalation in incentive to manage earnings that accompanies the initiation of fraud by industry leaders will elicit different responses from managers at peer firms (Figure 1, boxes 5 and 6). The response of a given manager to this escalation will depend on the

utility function of the manager. For example, a manager who derives significant personal utility from seeing one's self as an "honest" person is less likely to respond opportunistically to an increase in the incentive to manage earnings. Managerial response will also depend on the firm's financial reporting practices, governance and controls, auditors, and equity market incentives, (see Dechow, Ge, and Schrand, 2010 for an overview on these determinants of earnings quality). Heterogeneity in the way peer firms respond to undetected industry leader fraud enables me to test for differences in managerial compensation and the cost of capital among peer firms that respond differently to the escalation in the incentive to manage earnings (refer to the area outlined by a broken line in Figure 1).

In the first phase of my analysis, I use the Dechow et al. (2011) F-score to identify two samples of peer firms: a treatment sample where managers do not appear to manage earnings in response to the initiation of undetected industry-leader fraud (Figure 1, box 6), and a control sample where they do appear to have done so (Figure 1, box 5). Dechow et al. (2011) use SEC Accounting and Auditing Enforcement Releases (AAERs) to develop a model that predicts the likelihood of financial misstatement in a given firm-year. The output of their model is an F-score. A higher F-score indicates a higher likelihood of earnings management or accounting misstatement. Dechow et al. (2011) argue that this F-score can be used as a red flag or signal of the likelihood of earnings management or misstatement. I use the Dechow et al. (2011) F-score to identify a treatment sample where managers do not manage earnings in response to the increase in the incentive to manage earnings, and a control sample where they do. More specifically, I classify firms as "earnings managers" when the firm's F-score is in one of the four lower quintiles of F-

score for the industry during the period leading up to the industry-leader fraud (the pre-fraud period), but then increases such that it is in the highest quintile while the undetected industry-leader fraud is occurring (the fraud period). I also classify industry peers that initiate fraudulent reporting of their own during the fraud period as “earnings managers”. I classify firms as “non-earnings managers” when the firm’s F-score is in one of the four lower quintiles of F-score for the industry during the pre-fraud period, and does not move to a higher quintile during the fraud period. Appendix A and section 3.3 of this paper contain a more comprehensive explanation of this partitioning strategy.

In the second phase of my analysis, I test for significant changes in managerial compensation, the cost of equity, and the cost of debt for treatment firms (non-earnings managers) in the fraud period relative to the pre-fraud period. I also estimate the levels and changes in these measures for control firms in the pre-fraud and fraud periods for benchmarking purposes. I find that managers in the treatment sample are compensated at a discount when the undetected industry-leader fraud is ongoing relative to their compensation in the years leading up to the fraud. However, managers in the control group are also compensated at a discount relative to their pre-fraud compensation. The difference in the discount suffered by managers in the treatment group is statistically indistinguishable from the discount suffered by the managers in the control group. This latter result precludes me from being able to entirely attribute the drop in compensation for non-earnings managers to the decision to refrain from managing earnings. I also find that the cost of equity increases in the period of industry-leader fraud for non-earnings managers, but the increase is statistically insignificant. The difference in the change in the cost of equity capital for non-earnings managers and for earnings managers (control group) is

insignificant. The latter two results preclude me from being able to entirely attribute the increase in the cost of equity for the treatment group to the decision to refrain from managing earnings. Finally, I find no evidence of changes in the cost of debt for firms in either the treatment or control groups.

Previous research has explored the effects of earnings management on executive wellbeing. For example, studies have documented higher levels of executive turnover at firms with poor earnings quality (Desai et al., 2006; Karpoff et al., 2008a; Srinivasan, 2005; Menon and Williams, 2008). Other studies find that earnings management facilitates the meeting of earnings benchmarks (Burgstahler and Dichev, 1997; Donelson et al., 2013; Gilliam et al., 2014), which in turn affects managerial compensation (Matsunaga and Park, 2001).

Despite the preponderance of research on the effect of earnings management on executive wellbeing, we know very little about the executive-level labor market outcomes for cases where managers refrain from managing earnings. I address this deficiency in the literature by testing to see if chief executive officers in my sample of non-earnings managers experience a decline in compensation in the fraud period relative to the pre-fraud period. This examination constitutes an important contribution to the literature because it speaks to the executive's opportunity cost of not managing earnings – a crucial determinant in a manager's decision-making process as to whether or not to manage earnings.³ When faced with this decision, a rational executive will choose the option with the lowest opportunity cost. In other words, the manager will choose to manage earnings when the

³ The opportunity cost of not managing earnings is the utility the manager gives up by choosing to forego earnings management. In other words, it is the utility the manager “misses out on” by not managing earnings.

expected personal utility derived from managing earnings is greater than the expected personal utility derived from issuing a report that is free of earnings management.

It is also important to understand how refraining from earnings management affects a firm's cost of capital. A sizeable literature explores the determinants of the cost of capital (see Kothari, 2001 for a helpful review of cost of capital studies). This literature is important because capital is a scarce resource (Smith, 1776), and the allocation of this scarce resource across the economy is determined by the cost of equity and the cost of debt. Moreover, it is important to explore how refraining from earnings management affects the cost of capital because of its effect on shareholder wealth. A higher cost of capital limits the number of investments that are economically profitable for a firm to undertake, and can therefore have an adverse effect on shareholder wealth.

The paper proceeds as follows. Section 2 reviews the relevant literature and develops testable hypotheses. Section 3 describes the data and research design. Section 4 reports results. Section 5 concludes.

2. Literature and Hypotheses Development

2.1 Agency Conflict and its Impact on Earnings Management

Managers do not always act in the best interest of shareholders (Holmstrom, 1979; Berle and Gardiner, 1932; Smith, 1776). Jensen and Meckling (1976) observe that agents (managers) look to maximize their own utility, while principals (shareholders) want agents to maximize the net present value of the firm. Agents derive personal utility from pay and other perquisites (i.e. large office, access to a corporate jet, prestige among peers, etc.). As agents attempt to maximize personal utility, they will at times seek levels of compensation

and perquisites that decrease the net present value of the firm. Often, these managerial rents can impose substantial costs on shareholders (Bebchuck and Fried, 2003; Blanchard, Lopez-de-Silanes and Shleifer, 1994; Yermack, 1997; and Bertrand and Mullainathan, 2001). One of the ways in which managers act in their own interest, and to the detriment of investors, is by managing earnings (Fischer and Verrecchia, 2000). The cost that managers and investors bear as a result of earnings management has motivated a large literature on the causes and consequences of earnings management. Yet few studies have explored the consequences of not managing earnings. An understanding of the consequences to the managers and to the cost of capital of the firms they manage is important because it speaks to the opportunity cost managers and investors face when managers decide to not manage earnings when firm's managers face strong incentives to do so. This understanding sheds light on an important component of the rational manager's decision-making process when faced with the temptation to engage in earnings management.

2.2 Industry-leader Fraud and the Incentive for Earnings Management Among Industry Peers

In order to understand the consequences managers and shareholders face when managers withstand the temptation to manage earnings, I employ a setting where an industry-leader increases its earnings performance by engaging in accounting misstatement (Figure 1, box 1). I maintain that an accounting misstatement by an industry leader causes managers at industry peer firms to experience an escalation in the incentive they face to manage earnings (Figure 1, box 4). This escalation is an important part of the research design of this study. It enables me to identify peers who respond differently to the increase

in the incentive to manage earnings during the period in which the misstatement is occurring but is not public knowledge (Figure 1, boxes 5 and 6).

It is important to establish how industry-leader accounting fraud increases the incentive managers at industry peer firms face to manage earnings. I argue that industry-leader accounting fraud creates this escalation of incentive in two ways. First, by indirectly affecting peer firm stock price and peer-manager personal career concerns via changes in analyst expectations (Figure 1, box 2). Second, by indirectly affecting peer-manager compensation via relative performance evaluation (Figure 1, box 3).

Peer firm stock price and personal career concerns during periods when industry leaders are committing accounting fraud are indirectly effected via changes in analyst expectations (Figure 1, box 2). Analysts are often fooled by fraudulent financial reporting by industry leading firms. False reports can make analysts more optimistic about prospects for both the industry leader and its peers. Beatty et al. (2013) investigate how undetected high-profile accounting fraud affects peer firm investment. They find that peers react to the fraudulent reports by increasing investment over the fraud period, and that this investment spillover effect is likely facilitated by equity analysts. Two of the findings in Beatty et al. (2013) are particularly pertinent to this study. First, the authors partition their sample into two groups of peer and control firms: (1) a high-overlap sub-sample consisting of peer and control firms in industries where there is a high level of unexplained analyst overlap with the fraud firm and (2) a low-overlap sub-sample where there is not.⁴ Beatty et al. test for a

⁴ *Peer firms* are firms that share the scandal firm's three-digit SIC code. Control firms are firms that share the scandal firm's two-digit SIC code. *Unexplained analyst overlap* is the difference between the observed level of overlap and the level that would be expected given a set of industry characteristics. See page 191 of Beatty et al. (2013) for details.

relationship between the level of unexplained analyst overlap and investment in the fraud period. They find that investment increases for the high-overlap sub-sample, but not for the low-overlap sub-sample. This finding suggests that information intermediaries play an important role in transmitting misguided performance expectations from fraud firms to peers in cases where they are unaware of the fact that the industry leader is misstating earnings.

Next, in an effort to validate the conclusion that analysts' recommendations help transmit the distorted fraud signals across the affected industry, Beatty et al. look to see whether analyst recommendations are more optimistic for peer firms during the fraud period. They find that analyst recommendations are more optimistic during the fraud period for the high-overlap sample, but not for the low-overlap sample. These findings again suggest that information intermediaries (e.g. equity analysts) play an important role in disseminating artificially high earnings expectations across an industry when an industry leader is reporting fraudulently.

The incentive that executives face to manage earnings increases with analyst expectations because meeting (or missing) those expectations has implications for two things managers care about: the firm's stock price and their own career prospects. Research demonstrates that the market cares about earnings benchmarks. Bartov et al. (2002) find that firms that meet or beat analyst expectations often report superior future operating performance. Barth et al. (1999) find that firms that report continuous growth in annual earnings are priced at a premium relative to other firms. Skinner and Sloan (2002) show that when growth firms fail to meet earnings benchmarks, they suffer large negative stock price reactions. Thus, there is considerable research that suggests managers behave as

though they understand that there can be significant negative consequences to missing benchmarks, and that they respond to the incentives that benchmarks create to report higher earnings (see reviews by Healy and Wahlen, 1999; and Dechow et al., 2010 for a survey of the evidence on earnings benchmarks and earnings quality).

Other empirical work documents a connection between the meeting of earnings benchmarks and career prospects for managers. Farrell and Whidbee (2003) find that CEOs who do not meet benchmarks are more likely to be dismissed. In their survey, Graham et al. (2005) directly ask executives what drives their reported earnings and disclosure decisions. They find that stock price and career concerns are the two most dominant motivators that drive managers to meet or beat earnings expectations (e.g. the consensus analyst forecast). With respect to stock price driven motivation, they find that 86% of their respondents believe that meeting earnings benchmarks builds credibility with the capital market. More than 80% believe that meeting benchmarks helps maintain or increase the firm's stock price. They also find that 77% of survey participants believe that a manager's concern about her external reputation helps explain the desire to hit the earnings benchmark. Graham et al. survey results suggest that career concerns are important to managers. They summarize their findings on career concerns as a motivator to meet earnings benchmarks as follows:

Most CFOs feel that their inability to hit the earnings target is seen by the executive labor market as a "managerial failure." Repeatedly failing to meet earnings benchmarks can inhibit the upward or intra-industry mobility of the CFO or CEO because the manager is seen either as an incompetent executive or a poor forecaster. According to one executive, "I miss the target, I'm out of a job." (Graham et al., 28)

Theoretical work also suggests that an increase in analyst expectations will increase the incentive managers face to manage earnings. Povel et al. (2007) model a firm's fraud

decision based on investors' priors about the economy and the cost of monitoring executives. They find that when investors' prior beliefs about the state of the economy are fairly optimistic the fraud incentive is high because investors do not carefully monitor firms with confirming positive public reports. In my setting, overly optimistic reporting on the part of the industry leader as well as optimistic analyst recommendations or earnings forecasts create optimistic priors among investors for the fraud firm's peers. In line with Povel et al., these optimistic priors increase the incentive for executives at these peer firms to manage earnings (usually a precursor to committing fraud, see Jensen, 2005 and Badertscher, 2011).

Together, results from Beatty et al. (2013), Graham et al. (2005), and Povel et al. (2007) suggest that increased earnings as a result of accounting fraud by an industry leader puts artificial upward pressure on analyst expectations for peer firms, increasing the incentive managers at those peer firms face to manage earnings in an attempt to meet the higher expectations. To be more concise: industry-leader fraud creates an incentive for managers at peer firms to manage earnings. This should be especially true in my setting, where the increase in peer firm expectations is driven by a fraudulent report, which likely does not reflect a reality that can be achieved through honest effort (Jensen, 2005).

A peer firm executive's concern over his or her own compensation will also increase the incentive to manage earnings when an industry leader is reporting fraudulently (Figure 1, box 3). Personal compensation during this period can be indirectly effected via the formal or informal use of relative performance evaluation. Historically, results from the research on relative performance evaluation (RPE) has been somewhat mixed. Early theoretical research extolls RPE as an easy and effective way to exclude the components

of firm performance that are driven by shocks when tying executive compensation to observed firm performance (Holmstrom, 1982; Holmstrom and Milgrom, 1987). This separation of firm performance into the components that are due to the agent's actions and those that are due to exogenous factors outside the control of managers should allow principals to more effectively motivate CEOs to maximize shareholder value. However, for the most part, early empirical research fails to find evidence of the use of RPE in practice (see Table 1 in Albuquerque, 2009 for a concise summary of the findings in these empirical studies). However, later empirical work suggests that these earlier studies fail to find evidence of RPE due to differences in the way empiricists and boards (i) select peer groups and (ii) assign aggregation weights to each peer's performance (Albuquerque, 2009; Dikolli et al., 2013). Albuquerque (2009) argues that many of the characteristics that boards use to select peer groups can be effectively captured by empiricists who form peer groups by selecting firms from the same industry (using the first two digits of a firm's SIC code) and size quartile. Using this peer selection technique, and an equally-weighted aggregation of peer performance as a proxy for the systematic component of firm performance, Albuquerque (2009) finds evidence of widespread RPE usage in CEO pay. More recent field-based research (Matsumura and Shin, 2006) and descriptive archival studies (Murphy, 1999; Bannister and Newman, 2003; Bizjak et al., 2008; Faulkender and Yang, 2010) also support the conjecture that the use of RPE is widespread and has a significant impact on CEO compensation. Given the results of these later studies, I assume that the use of formal or informal RPE is pervasive enough to cause an increase in the incentives managers face to manage earnings when an important industry peer increases its performance by using aggressive or fraudulent accounting practices.

Theoretical work by Bagnoli and Watts (2000) is also pertinent to the current study. Bagnoli and Watts (2000) show how the use of RPE within an industry can cause industry members to manage earnings simply because they expect their rivals to manage earnings – exacerbating the underlying level of earnings management that would otherwise exist due to agency costs in the absence of RPE. I maintain that in my setting, when an industry leader is reporting fraudulently, the use of RPE will push peer firms to increased levels of earnings management, on average. Interestingly, the Bagnoli and Watts model does not require that managerial compensation be formally tied to peer performance. Their results hold so long as: (1) there is information asymmetry between equity and debt market participants and the firm, (2) investors and creditors make inter-firm comparisons when assessing firm value and deciding how to allocate funds, and (3) firms care about fundamental value as well as the market’s perception of firm value. To the extent that these three conditions are met in the industries included in my study, I expect industry-leader accounting fraud to increase the incentive to manage earnings among executives at peer firms, even in the absence of formal RPE compensation schemes.

Findings from Gleason et al. (2008) provide empirical support for the conjecture that fraud at an industry-leading firm increases the incentive that managers at peer firms face to manage earnings. Gleason et al. (2008) find that accounting restatements at large firms that adversely affect shareholder wealth at the restating firm also induce sharp price declines among non-restating industry peers with high industry-adjusted accruals. These price declines are unrelated to changes in analyst earnings forecasts and are negatively associated with the peer firm’s level of industry-adjusted total accruals. The authors observe that this restatement contagion effect appears to be due to investors’ accounting

quality concerns. The fact that this contagion effect is realized at the announcement of the restatement suggests that, *ex post*, investors believe that these high-accrual firms generated higher levels of accruals as managers either (i) responded to the same stimuli that caused managers at the restating firm to take the actions that lead to restatement or (ii) attempted to keep pace with the earnings increases of the leader firm to mitigate the likelihood that their personal compensation might be adversely affected by a disparity in the reported performance of their firm relative to the industry leader (see discussion on relative performance evaluation in the preceding two paragraphs). In either case, investors seem to believe that the penalized firms were responding to an increase in the incentive to manage earnings (using accruals) that was related to the events that lead to restatement at the industry leader.⁵ I suggest that managers of peer firms in my setting similarly face an increase in the incentives to manage earnings when an industry leader is reporting fraudulently.

In summary, periods of undetected industry-leader fraud provide a setting where I expect that managers at peer firms face an escalation in the incentive to manage earnings. These frauds cause analysts to be more optimistic regarding peer firm prospects during the fraud period (Beatty et al, 2013). Managers are highly motivated to meet earnings expectations because of the perceived rewards (consequences) of meeting (missing) the market expectations (Graham et al., 2005). The use of formal or informal RPE (Murphy,

⁵ Why else would firms with high industry-adjusted accruals be penalized disproportionately to their peers at the restatement announcement when investors had the information to identify high accrual firms all along? It must be the case that the revelation of the restatement changes investors' perceptions on the reasons for the relatively high accruals (e.g., it may be the case that investors initially thought the accruals were being used to communicate private information, but that the restatement announcement later caused them to suspect that the managers' motives were more opportunistic).

1999; Bagnoli and Watts, 2000; Bannister and Newman, 2003; Bizjak et al., 2008; Albuquerque, 2009; Faulkender and Yang, 2010) will also motivate executives to manage earnings in this setting.

2.3 Managerial Compensation

When managers face the decision of whether or not to manage earnings in an attempt to extract rents from shareholders, the decision will be a function of the opportunity cost of doing so. Opportunity cost is “the loss of potential gain from other alternatives when one alternative is chosen” (New Oxford American Dictionary, 2015). The opportunity cost to CEOs of not managing earnings is the personal utility that will be foregone by deciding not to manage earnings (relative to the personal utility derived from managing earnings without being caught). Rational decision makers seek to maximize their personal wellbeing by minimizing opportunity costs. When rational managers are confronted with the choice to either manage earnings or not manage earnings, they will choose to manage earnings only when the opportunity cost of doing so is less than the opportunity cost of not doing so. In other words, we should observe managerial bias in earnings when the expected utility to managers of biasing earnings is greater than the expected utility of not biasing earnings. It is therefore necessary for boards of directors, regulators, researchers, and anyone else who wishes to understand the determinants of earnings quality to understand the outcomes faced by managers who do not manage earnings.

Given the connection between the incentive to manage earnings and executive compensation as outlined in section 2.2, I hypothesize that CEOs are penalized for reporting without bias during the fraud period:

H1: CEOs of peer firms who choose not to manage earnings in periods of undiscovered industry-leader fraud suffer a reduction in personal compensation from the pre-fraud period to the fraud period.

2.4 Cost of Equity

A firm's cost of equity is determined by the level of risk equity investors associate with the future cash flows they expect to receive as a result of their investment in the firm's stock. In situations where there is an elevated incentive for firms in an industry to manage earnings, some managers will do so. This will likely lead investors to believe that the firms with unmanaged earnings are performing relatively poorly. The future cash flows of firms with relatively poor performance are exposed to greater levels of at least two types of risk: financial distress risk and litigation risk. If investors believe these firms to be more risky (due to either financial distress risk or litigation risk), then they should price protect by demanding a higher return for investing in these firms, resulting in an increase in the cost of equity.

Poor firm performance is associated with higher levels of financial distress risk. Financial distress exposes poorly performing firms to costs that are not borne by their more healthy peers. For example, firms in financial distress face an elevated risk of losing sales and profits when customers perceive that default is likely (Jensen and Meckling, 1976; Altman, 1984; Andrade and Kaplan, 1998). Customers are wary of investing in a product or service when there is an elevated risk that the provider may not be a going concern, and may not be able to honor warranties or supply replacement parts in the future. Other significant costs associated with financial distress include the undesired loss of suppliers (Andrade and Kaplan, 1998), the sale of assets at a discount (Andrade and Kaplan, 1998;

Pulvino, 1998), and lost capacity due to a forced curtailment of capital expenditures (Andrade and Kaplan, 1998).

Poor firm performance is also associated with higher levels of litigation risk. Section 2.2 of this paper outlines how industry-leader fraud puts artificial upward pressure on analyst expectations for peer firms. It is more difficult for managers to meet artificially high analyst expectations than it would be for them to meet the unbiased expectations that would likely prevail in a state without industry-leader fraud. Earnings surprises for managers who decide not to manage earnings during the period of industry-leader fraud will therefore be more negative, on average, than earnings surprises for managers who manage earnings. Because negative earnings surprises are more likely to trigger shareholder lawsuits (Francis et al., 1994; Skinner, 1994; Field et al., 2005), and because investors are unaware that industry-leader fraud is causing an artificial increase in analyst expectations, it follows that my sample of non-earnings managers likely has greater exposure to litigation risk than my sample of earnings managers.

To the extent that investors perceive the performance of non-earnings managers to be poor and believe that poor performance is associated with higher levels of risk, they will price protect by requiring a higher rate of return for their equity investments in those firms.⁶

⁶ To be precise, it is not my expectation that any increase in the cost of capital for non-earnings managers will be systematic across the entire sample of non-earnings managers. Rather, I expect that there will be a higher proportion of firms in the non-earnings-manager sample that investors believe is in danger of incurring the costs associated with financial distress or shareholder litigation. I expect that the cost of capital will be higher for this subsample of non-earnings managers. I do not focus my analysis on this subsample because I need the unmanaged earnings for the firms that manage earnings in order to identify an appropriate group of firms against which the cost of capital for non-earnings managers can be benchmarked. Unfortunately, this data is not available. As a result, I resort to testing for the *average* effect that the decision to not manage earnings has on firm cost of capital.

This line of reasoning, along with the positive relation between poor performance and both financial distress risk and litigation risk, lead to my second hypothesis:

H2: Firms that do not to manage earnings in periods of undiscovered industry-leader fraud experience an increase in the cost of equity from the pre-fraud period to the fraud period.

2.5 Cost of Debt

The relationship between deciding not to manage earnings and the cost of debt might be different than it is for the cost of equity. Credit rating agencies and bondholders may be better equipped or positioned to assess the riskiness of a firm's future cash flows than equity investors. Credit-rating agencies have access to nonpublic information like budgets and forecasts, financial statements on a stand-alone basis, and internal capital allocations and contingent risks (SEC, 2003). As a result of their access to more informative data, credit rating agencies may be better able to evaluate the risks associated with a firm's cash flows than the average equity investor. In this study, I test to see whether treatment firms experience an increase in the likelihood of a credit downgrade due to a perception among credit rating agencies that treatment firms experience an increase in financial distress risk, relative to control firms. Because credit ratings agencies have access to privileged information, they may be less susceptible to the belief that the relatively poor accounting performance of the firms in the treatment sample is necessarily due to relatively poor economic performance. I therefore state my third hypothesis in null form:

H3: Firms that do not to manage earnings in periods of undiscovered industry-leader fraud do not experience an increase in the likelihood of a credit downgrade from the pre-fraud period to the fraud period.

3. Data and Research Design

3.1 Sample Selection

To examine my research questions, I use the database compiled by Dechow et al. (2011) of U.S. Securities and Exchange Commission's *Accounting and Auditing Enforcement Releases* (AAERs) to identify a set of industry leading firms that commit fraud – escalating the incentive to manage earnings amongst its industry peers. I then identify two samples of industry peer firms for each undetected fraud. The first consists of firms that show no evidence of responding to the initiation of undetected industry-leader fraud by managing earnings (hereafter the non-earnings manager, NEM, or treatment sample). The second consists of firms that do (hereafter the earnings manager, EM, or control sample).

It is important that I identify cases of fraud at firms that are influential enough to have an effect on other firms (Gleason et al., 2008; Beatty et al., 2013; Gonen, 2003). Enforcement releases are issued when the SEC takes enforcement action against parties involved in violating SEC and federal financial reporting rules – these are generally cases of fraud. Because the SEC has limited resources and cannot pursue every case where it suspects foul play, the sample of AAERs is likely to consist of the cases the SEC expects *ex ante* to be relatively more material, influential, and where the SEC expects a favorable outcome. As a result, observations in this sample are likely to capture instances of fraud that are influential enough to affect decision making by peer firms. To further ensure that my industry-leader fraud sample consists of influential cases, I exclude all instances where the firm committing fraud is not either in the S&P 500 or in the top decile of market share for its two-digit Standard Industrial Classification (SIC) code, where market share is the

firm's share of total industry revenue. These sample selection criteria result in a final sample of 108 industry-leader frauds.

To facilitate my analysis of peer firm behavior during periods in which industry leaders are engaging in fraud, I use my set of industry-leader AAERs to identify a set of industry fraud periods. I also identify the pre-fraud period for each fraud. The sample of AAERs used in Dechow (2011) contained data for all AAERs spanning May 17, 1982 through June 10, 2005. Since then, the data have been updated to include records for all AAERs up through August 31, 2012. For each fraud event, these data contain the offending company's name, CIK number, and the release number for each relevant AAER (the SEC issues multiple AAERs for some fraud events). The data also indicate which fiscal years and quarters were affected by the fraudulent reporting. To construct my industry fraud periods, I identify industry-years where at least one industry-leader fraud was occurring, but was not public knowledge. I merge periods in which a single two-digit SIC industry experiences overlapping or consecutive years of fraudulent reporting by multiple firms. To illustrate, consider an industry with three separate frauds spanning 1991-1994, 1994-1995, and the year 2001. This industry would have two fraud periods: (1) 1991-1995 and (2) 2001, as well as two pre-fraud periods: (1) 1988-1990 and (2) 1996-2000. The first pre-fraud period begins in 1988 for reasons that are explained in the next paragraph.

Two data constraints require that I limit my sample of industry fraud periods to those that fall between 1989 and 2005. First, I cannot use any fraud periods that begin prior to 1989. The Dechow et al. (2011) F-score contains a measure of accruals that is based off of data from the balance sheet. Hribar and Collins (2002) show that measures of accruals that are derived from the balance sheet are potentially contaminated by measurement error

due to mergers, acquisitions, and divestitures. To eliminate this problem in my analysis, I modify the Dechow et al. (2011) F-score by replacing their measure of accruals, which is calculated using balance sheet data, with measures that are derived using data from the statement of cash flows. Because statement of cash flow data is not available until 1988, and since I need at least one year of pre-fraud period data, I cannot use any of the frauds that began before 1988 in my analysis.

Second, I do not use any years after 2005. Securities and Exchange Commission AAERs are not particularly timely. In my sample, 78 (50) percent of frauds are identified in an SEC AAER within seven (five) years of the release of the first fraudulent financial statement. In other words, there is roughly a 22 (50) percent chance that an industry that my AAER data leads me to classify as “fraud free” in 2006 (2008) was not actually fraud free in that year. For these cases, the SEC will release the AAER describing the 2006 (2008) fraud in some year after the termination of my sample. Because my sample of AAERs does not include AAERs released after August of 2012, I cannot reliably determine whether a later industry-year (e.g. 2006 – 2012) is free of fraud. To ensure that my data will enable me to more correctly identify an industry-year as fraud free or otherwise, I exclude the last seven years for which I have AAER data from my analysis. As a result of these two constraints, I am left with a sample of industry fraud periods occurring between 1989 and 2005.

3.2 Favorability of Analyst Recommendations for Peer Firms During Times of Industry-Leader Fraud

The finding in Beatty et al. (2013) that analysts issue more favorable recommendations for peer firms during periods of industry-leader fraud has an important

bearing on my research design. I argue that the Beatty et al. result provides support for my assertion that peer firms experience an escalation in the incentive to manage earnings during the fraud period and before the fraud has become public knowledge. If the Beatty et al. (2013) result holds for my sample of frauds, then my assertion is plausible. If the result does not hold for my sample of frauds, then my research design becomes suspect.

I follow Beatty et al. (2013) in testing for a relation between industry-leader fraud and the favorability of analyst recommendations for peer firms. After identifying my sample of industry-leader frauds, I collect all two-digit SIC peer firm-years for the pre-fraud and fraud periods for each case of fraud. I then use ordered probit to estimate the model used in Beatty et al. (2013):⁷

$$\begin{aligned}
 Recom_{i,t} = & \alpha + \beta_1 FraudYr_t + \beta_2 Size_{i,t} + \beta_3 MTB_{i,t} + \beta_4 Lev_{i,t} \\
 & + \beta_5 CFO_{i,t} + \beta_6 Rating_{i,t} + \beta_7 SG_{i,t} + \beta_8 CAPEX_F_{i,t} \\
 & + \beta_9 CoMove_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

where *Recom* is the median value of all analysts' recommendations for firm *i* in year *t* and is obtained from the Institutional Brokers' Estimate System (IBES). One represents strong buy and five represents strong sell. *FraudYr* is a dummy variable that equals one for all fraud firm-years, and zero for pre-fraud firm-years. *Size* is the natural log of lagged total assets (COMPUSTAT "at") and controls for firm size. *MTB* is the lagged ratio of market

⁷ My estimation deviates slightly from that of Beatty et al. (2013) in that I use a different variable of interest. Beatty et al. (2013) test for the favorability of analyst recommendations with a sample that includes both peers and non-peers of the misstating firm. Accordingly, their variable of interest is the interaction of the dummy that indicates that a firm is a peer of the fraud firm and another dummy that indicates that the year is in the fraud period. Since my sample consists exclusively of peer firms, my test doesn't include a dummy variable for peer firms, and I don't have an interaction between a peer variable and the fraud period dummy variable. Rather, my variable of interest is simply the fraud period dummy variable.

value of total assets. It equals total assets less total common equity plus the product of common shares outstanding and the closing price per share at the end of the fiscal year (COMPUSTAT “at”-“ceq”+“prcc_f”*“csho”), all over the book value of total assets (COMPUSTAT “at”). *MTB* controls for the firm’s growth prospects. *Lev* is long term debt (COMPUSTAT “dltt”) divided by total assets (COMPUSTAT “at”), measured at the beginning of the year and controls for the firm’s current level of debt. *CFO* is cash flow from operations (COMPUSTAT “oancf”) divided by lagged total assets (COMPUSTAT “at”) and controls for the firm’s ability to meet obligations to creditors. *Rating* is an indicator variable for firms with S&P credit ratings. *SG* is the change in revenues (COMPUSTAT “revt”) divided by lagged total assets (COMPUSTAT “at”) and controls for current firm growth. *CAPEX_F* is the fraudulent firms’ CAPEX. *CoMove* is the tercile ranking of the co-movement of change in market-to-book ratios between the fraudulent firms and sample or control firms in the pre-scandal period. The co-movement is measured as β in the regression $\Delta MTB = \alpha + \beta \Delta MTB_F + \varepsilon$, where ΔMTB is defined as annual change in MTB and ΔMTB_F represents fraudulent firms’ change in MTB. *CoMove* is included to ensure that I am not just capturing the similarity of growth opportunities between peers and the fraud firms.

The parameter of interest in this test is $\hat{\beta}_1$, the coefficient on *FraudYr*. Based on the findings in Beatty et al. (2013), I posit that analysts make more favorable recommendations for peer firms during the industry-leader fraud periods, and that this increases the pressure on peer firm managers to manage earnings. If it is true that analysts make more favorable

recommendations for peer firms during the fraud periods in my sample, $\hat{\beta}_1$ will be less than zero.⁸

Beatty et al. (2013) perform the test in Equation 1 on three different sets of firm-years. First, they include the entire sample of firm-years. They then split the sample into two subsamples based on the level of analyst coverage overlap in the industry. More specifically, they classify industries based on the extent to which peer and control firms are covered by the same analysts as the fraud firm. Because firms with more economic similarity are more likely to be covered by the same analysts, they adopt the following procedure to remove this component from the ratio of overlapped analysts. First, they run the following regression for each industry-year:

$$\begin{aligned} \text{Overlap} = & \alpha + \beta_1 \text{Comove_return} + \beta_2 \text{SIZE_m} + \beta_3 \text{MTB_m} \\ & + \beta_4 \text{LEV_m} + \beta_5 \text{SG_m} + \end{aligned} \quad (2)$$

where *Overlap* is measured as the ratio of the number of peer firms that have at least one analyst also covering the fraud firm to the total number of peer firms that have any analyst coverage at the 2-digit SIC code level. *Comove_return* is the R-squared of the regression of peer firms' daily returns on scandal firms' daily returns, measured annually. *SIZE_m* (*MTB_m*, *LEV_m*, and *SG_m*) is measured as the industry median *Size* (*MTB*, *LEV*, and *SG*). Firms belonging to industries that have a higher regression residual (unexplained overlap) than the median are included in a "High Overlap" subsample. The remaining firms constitute the "Low Overlap" subsample. Beatty et al. estimate Equation 1 for each of these two subsamples and expect to find a more negative coefficient estimate for *FraudYr* ($\hat{\beta}_1$)

⁸ Recall that the dependent variable, *Recom*, is smaller for more favorable recommendations.

for the “High Overlap” subsample, indicating more favorable analyst recommendations for this group of firms during the industry-leader fraud period. I also perform this partition of my sample and test for more favorable analyst recommendations for peer firms during the fraud period separately for the “High Overlap” and “Low Overlap” subsamples. Following Beatty et al., I expect a more negative estimate of $\hat{\beta}_1$ for the “High Overlap” subsample. This result suggests that analysts make more favorable recommendations for industry peer firms in industries with high analyst overlap in times of industry-leader fraud than they do in industries with low analyst overlap. As Beatty et al. point out, this finding supports the hypothesis that information intermediaries play an important role in transmitting information from scandal firms to peers.

3.3 Identification of the Non-Earnings Manager (Treatment) and Earnings Manager (Control) Samples

I use a modified version of the F-score developed in Dechow et al. (2011) as a proxy for earnings quality to generate a sample of non-earnings managers (treatment sample) and a sample of earnings managers (control sample). The F-score is a composite measure of the likelihood of earnings manipulation. A higher score indicates a higher probability of earnings management. Following Dechow et al. (2011), I calculate the F-score as follows:

1. I estimate the following logistic model for the determinants of misstatements from 1988 until 2009:⁹

$$\begin{aligned}
 AAER_{i,t} = & \alpha + \beta_1 RSST\ accruals_{i,t} + \beta_2 Change\ in\ receivables_{i,t} \\
 & + \beta_3 Change\ in\ inventory_{i,t} + \beta_4 \% Soft\ assets_{i,t} \\
 & + \beta_5 Change\ in\ cash\ sales_{i,t} \\
 & + \beta_6 Change\ in\ return\ on\ assets_{i,t} + \beta_7 Actual\ issuance_{i,t} \\
 & + \varepsilon_{i,t},
 \end{aligned} \tag{3}$$

The dependent variable, *AAER*, is equal to one for firm-years involving a misstatement (where the SEC has issued an AAER), and zero otherwise. I include all Compustat observations from my AAER sample period in this estimation. The independent variables include

- a. *RSST accruals*: An accrual measure used in Richardson et al. (2005). It is the difference between income before extraordinary items less total operating, investing and financing cash flows plus sales of common stock less stock repurchases and dividends.¹⁰
- b. *Change in receivables*: The change in accounts receivable scaled by average total assets.

⁹ I begin with 1988 because the cash flow data needed to calculate accruals becomes available then. I cut my analysis off at 2009 because Dechow et al. (2011) use Compustat data up through 2002, when their last full year of AAER releases is 2004 (a two-year lag). I also employ a two-year lag: my last full year of AAER releases is 2011. So 2011 - 2 = 2009.

¹⁰ This measure of accruals is used as a robustness test in Richardson et al. (2005). Dechow et al. (2011) use the main accrual measure from Richardson et al.'s analysis, which is derived from balance sheet data. The Richardson et al. design requires the use of a balance sheet measure for accruals. However, I face no such constraint here. I therefore use the second accrual measure from Richardson et al., which uses data from the statement of cash flows, in order to eliminate bias arising from the presence of M&A or divestitures in my sample (Hribar and Collins, 2002).

- c. *Change in inventory*: The change in inventory scaled by average total assets.
- d. *% Soft assets*: The percentage of assets on the balance sheet that are neither cash nor PP&E. It is equal to total assets less PP&E less cash and cash equivalents, all scaled by total assets.
- e. *Change in cash sales*: The percentage change in cash sales. It is equal to $\frac{(Sales_t - \Delta AR_t) - (Sales_{t-1} - \Delta AR_{t-1})}{(Sales_{t-1} - \Delta AR_{t-1})}$, where ΔAR is the change in accounts receivable.
- f. *Change in return on assets*: The difference in ROA between years t and $t-1$, where ROA is defined as earnings scaled by average total assets.
- g. *Actual issuance*: An indicator variable coded 1 if the firm issued securities during year t , zero otherwise.
2. I use the estimated coefficients from the logistic model to calculate the predicted dependent value for each firm-year using firm-year specific data.
3. I calculate the firm-year predicted probability of misstatement, where
- $$Probability = \frac{e^{(Predicted\ value)}}{(1 + e^{(Predicted\ value)})}$$
4. I calculate the unconditional probability of misstatement,
- $$\frac{Number\ of\ observed\ misstatements}{Number\ of\ firm\text{-}years\ in\ COMPUSTAT\ over\ this\ study's\ sample\ period}$$
5. I calculate the firm-year specific F-score: $\frac{Firm\text{-}year\ predicted\ probability}{Unconditional\ probability}$.

Once the F-score is calculated for each peer firm-year (where peers are firms that share the same two-digit SIC code), I identify a set of earnings managers and a set of non-earnings managers for each industry fraud period. Appendix A contains a matrix that outlines the identification of the two groups. As a first step, I calculate the average F-score

for each peer firm for both the pre-fraud and industry-fraud periods. I then rank and assign quintiles to these average F-scores by two-digit SIC and by period (pre-fraud and fraud). Peers that meet one of two criteria are classified as control firms (earnings managers, or EM firms). First, I use the AAER sample to identify non-leader peer firms that initiate their own fraud at least one year after industry leaders have already begun fraudulent reporting, but before industry-leader fraud has terminated, and before the industry-leader fraud has been announced. These are peers that follow the industry leader in committing fraud, and are classified as earnings managers. Second, peers with F-scores in the top quintile during the fraud period, but in one of the bottom four quintiles during the pre-fraud period are also classified as control firms (earnings managers). These peers show evidence of a change in reporting that suggests a higher likelihood of earnings management in the fraud period than in the pre-fraud period. I classify these firms as control firms because I do not expect to these firms and their managers to experience significant changes in managerial compensation or the cost of capital as a result of their financial reporting decisions during the period of undiscovered industry-leader fraud.

I classify all peers where the pre-fraud period F-score is in one of the first four (lower) quintiles of pre-fraud F-score, and where the F-score quintile decreases or remains the same from the pre-fraud period to the fraud period as treatment firms (non-earnings managers, or NEM firms). These are firms that did not change their financial reporting in a way that suggests a higher likelihood of earnings management in the fraud period than in the pre-fraud period. I classify these firms as treatment firms because I expect these firms and their managers to experience decreases in managerial compensation and increases in the cost of equity capital as a result of their financial reporting decisions during the period

of undiscovered industry-leader fraud. More specifically, I expect managerial compensation decreases and the cost of equity increases during the fraud period due to a perception among compensation committees and investors that these firms are performing poorly relative to their industry peers.

3.4 Executive Compensation Test

The previous three sections explain how I generate my treatment and control samples. Once these samples are identified, I proceed with my tests of H1-H3. I follow recent research on executive compensation and use the following model to test for a relation between the managerial decision to not manage earnings and executive compensation (Canyon, Core, and Guay, 2011; Armstrong, Core, and Guay, 2016; Gao, Luo, and Tang, 2015):

$$\begin{aligned}
 \ln(\text{Total Pay}_{i,t}) &= \alpha + \beta_1 NEM_{i,t-1} + \beta_2 \text{FraudPeriod}_{i,t-1} + \beta_3 (NEM_{i,t-1} \\
 &\quad * \text{FraudPeriod}_{i,t-1}) + \beta_4 \ln(\text{Sales}_{i,t-1}) + \beta_5 BM_{i,t-1} \\
 &\quad + \beta_6 \text{Return}_{i,t-1} + \beta_7 \text{Return}_{i,t} + \beta_8 \text{Leverage}_{i,t-1} \\
 &\quad + \beta_9 ROA_{i,t-1} + \beta_{10} ROA_{i,t} + \beta_{11} \text{Volatility}_{i,t-1} \\
 &\quad + \beta_{12} \text{Cash}_{i,t-1} + \beta_{13} \text{CAPEX}_{i,t-1} + \beta_{14} \text{R\&D}_{i,t-1} \\
 &\quad + \beta_{15} \text{Firm Age}_{i,t-1} + \beta_{16} \text{RelativePerf}_{i,t-1} + \varepsilon_{i,t} \quad (4)
 \end{aligned}$$

where Total Pay_t is the CEO's total annual compensation during the fiscal year t . NEM is an indicator variable which equals one for firm-years which have been classified as treatment firm-years (non-earnings manager firm-years), and zero otherwise. FraudPeriod is an indicator variable which equals one for firm-years in which the industry-leader fraud

is occurring, and zero otherwise. Extant research on executive compensation finds that larger firms with greater growth opportunities require more talented executives who command a compensation premium (e.g. Smith and Watts, 1992). $Sales_{t-1}$ proxies for firm size and is total revenues for fiscal year $t-1$. BM_{t-1} proxies for growth opportunities and is the ratio of the book value of equity to the market value of equity at the end of year $t-1$. Researchers also often include controls for company performance and firm risk as proxies for managerial ability or the firm's demand for ability. $Return_t$ ($Return_{t-1}$) proxies for managerial ability and is the cumulative stock return during the fiscal year t ($t-1$). $Leverage_{t-1}$ is the ratio of book value of debt to assets in year $t-1$. ROA_t (ROA_{t-1}) also proxies for managerial ability and is the return on average assets during the fiscal year t ($t-1$). $Volatility_{t-1}$ proxies for risk and the firm's demand for managerial ability and is the standard deviation of monthly stock returns for the 60 months ending with the fiscal year end for year $t-1$. Other conventional control variables include the availability of cash, capital investment, R&D, and firm age, and are proxied by $Cash_{t-1}$, $CAPX_{t-1}$, $R\&D_{t-1}$, and $Firm\ Age_{t-1}$ respectively. $Cash_{t-1}$ is cash plus short-term investments normalized by the book value of total assets at the end of year $t-1$. $CAPX_{t-1}$ is capital expenditures normalized by the book value of total assets at the end of year $t-1$. $R\&D_{t-1}$ is R&D expenditures normalized by the book value of total assets at the end of year $t-1$. $Firm\ Age_{t-1}$ is the number of years since a firm appears in CRSP as of the end of year $t-1$. Finally, $RelativePerf_{t-1}$ controls for the manager's relative performance and is the difference between the firm's ROA and the median ROA for its industry peers (where firms in the same two-digit SIC are considered industry peers). Appendix B contains a more thorough set of variable definitions for my main analyses. The model also includes year fixed effects. Industry is classified using the

first two digits of a firm's SIC code. I base test statistics on residuals clustered by firm (Petersen, 2009).

The parameters of interest in Equation 4 are β_1 , β_2 , and β_3 . These parameters are used to estimate the different intercepts in the model for estimating executive compensation for the non-earnings managers (treatment) and the earnings managers (control) in the pre-fraud and fraud periods. In other words, assuming that the slope coefficients for the control variables are the same for the treatment and control groups in each of the periods, I can use $\hat{\beta}_1$, $\hat{\beta}_2$, and $\hat{\beta}_3$ to estimate the changes in compensation for managers in these groups, as well as the difference in compensation between the two groups. Table 1 illustrates how to calculate the estimated intercept for the NEM (treatment) and EM (control) groups in each of the periods. Hypothesis 1 posits that non-earnings managers are compensated at a discount in the fraud period, relative to their own pre-fraud period levels of compensation. An examination of Table 1 will reveal that a test of H1 involves testing the constraint $\hat{\alpha} + \hat{\beta}_1 = \hat{\alpha} + \hat{\beta}_1 + \hat{\beta}_2 + \hat{\beta}_3$, which simplifies to $\hat{\beta}_2 + \hat{\beta}_3 = 0$. Hypothesis 1 posits that $\hat{\beta}_2 + \hat{\beta}_3 < 0$. The Wald test is a commonly used method for testing equality constraints within a model. I use the Wald test to test the constraint $\hat{\beta}_2 + \hat{\beta}_3 = 0$ (H1), where $\hat{\beta}_2$ and $\hat{\beta}_3$ are estimated using Equation 4. Results from the estimation of Equation 4 and the test of $\hat{\beta}_2 + \hat{\beta}_3 = 0$ will support H1 if two conditions are met. First, it must be the case that the sum of $\hat{\beta}_2$ and $\hat{\beta}_3$ is less than zero. Second, the F-statistic from the Wald test of $\hat{\beta}_2 + \hat{\beta}_3 = 0$ must be high enough that I can reject the null hypothesis that $\hat{\beta}_2 + \hat{\beta}_3 = 0$.

3.5 Cost of Equity Test

I use the implied cost of equity methodology developed by Gebhardt et al. (2001) to estimate the cost of equity for each of the peer firm-years in my sample. I then use this estimate as the dependent variable in my test for a relation between the cost of equity in the fraud period and the managerial decision to refrain from managing earnings. The Gebhardt et al. methodology is based on the residual income model developed in Ohlson (1995). The Gebhardt et al. methodology uses published forecasts of future earnings expectations and current stock prices as inputs into the following valuation model:

$$P_0 = BVE_0 + \sum_{t=1}^{T-1} \frac{(ROE_t - r_e)BVE_{t-1}}{(1 + Re)^t} + TV \quad (5)$$

where P_0 equals the price at time zero, BVE_t equals book value at time t , ROE_t equals return on beginning equity for year t , Re equals the cost of equity capital, and TV equals the terminal value at the end of a finite forecasting horizon.

To compute the implied cost of equity, Gebhardt et al. (2001) use the current book value of equity for BVE_0 , analyst forecasts of future earnings and long-term growth rates to estimate expected future residual income for the first seven periods, and assume mean reversion to the industry median ROE over a 12-year period. The mean one-year ahead forecast (F1), two-year ahead forecast (F2), and long-term growth rates (LTG) are obtained from IBES. The third year ahead forecast is estimated as: $EPS_{t+3} = F2(1+LTG)$. Earnings beyond year three are forecasted by linearly extrapolating future ROEs to the industry median ROE, where negative ROEs are removed when computing the industry average. Equation 5 is solved for Re to provide the estimated cost of equity for each firm-year.

I use the Gebhardt et al. (2001) estimation of the cost of equity in the following model to test for a relation between the cost of equity and the managerial decision to forego earnings management:

$$\begin{aligned}
 Re_t = & \alpha + \beta_1 NEM_t + \beta_2 FraudPeriod_t + \beta_3 NEM_t * FraudPeriod_t \\
 & + \beta_4 Beta_t + \beta_5 Volatility_t + \beta_6 Ln(MVE_t) + \beta_7 BM_t \\
 & + \beta_8 Leverage_t + \beta_9 LTG_t + \varepsilon_t
 \end{aligned} \tag{6}$$

where Re_t is the Gebhardt et al. (2001) estimation of the cost of equity. The variables of interest, NEM and $FraudPeriod$, remain as defined previously. I control for CAPM Beta ($Beta$), firm size ($Ln(MVE)$), the book-to-market ratio (BM), leverage ($Leverage$), and the forecast of long-term earnings growth (LTG) as these variables are correlated with the cost of equity (Botosan et al., 2011; Campbell et al., 2011; Ben-Nasr et al., 2012; Chen et al., 2016; Dhaliwal et al., 2016). I also control for idiosyncratic risk ($Volatility$) as idiosyncratic volatility should matter in an environment where each investor knows only about a subset of the available securities (Merton, 1987). $Beta$ is estimated by regressing the firm's monthly stock returns on the corresponding monthly market premium for the 60 months leading up to the end of fiscal year t . $Ln(MVE)$ equals the natural log of the market value of equity, where the market value of equity is the product of the number of common shares outstanding and the price of common shares at the close of the fiscal year. LTG is the mean analyst long-term growth rate estimate as of year t . The remaining control variables in Equation 6 are as defined in section 3.5. I follow the cost of equity literature and include year and industry fixed effects (Ben-Nasr et al., 2012; Chen et al., 2016; Dhaliwal et al., 2016), and cluster standard errors by firm.

The parameters of interest in Equation 6 are the same parameters that were of interest in Equation 4: β_1 , β_2 , and β_3 . The estimates of these parameters will be used to estimate the changes in the cost of equity in the treatment and control groups, as well as the difference in the cost of equity between the two groups. In section 2.4 I argue that investors will perceive that non-earnings managers are performing poorly in the fraud period, relative to earnings managers. Investors will believe that non-earnings managers are more vulnerable to financial distress risk and litigation risk, and will price protect. Accordingly, H2 posits that non-earnings managers experience an increase in the cost of equity during the period of undiscovered industry-leader fraud. I use a Wald test of the equality $\hat{\beta}_2 + \hat{\beta}_3 = 0$ to test this hypothesis (see Table 1 for intercept calculations). Hypothesis 2 posits that $\hat{\beta}_2 + \hat{\beta}_3 > 0$.

3.6 Cost of Debt Test

To investigate the relationship between the managerial decision to refrain from managing earnings and the cost of debt, I use Standard & Poor's senior debt rating as a proxy for the cost of debt. These ratings reflect Standard & Poor's opinion regarding the credit worthiness of a firm. Prior research has used credit ratings as a cost of debt proxy (Jiang, 2008; Ahmed et al., 2002; Francis et al., 2005; Minton and Schrand, 1999; Shi, 2003). I modify the ordered logit model in Jiang (2008) to test for changes in the likelihood of a credit rating downgrade for peer firms in the fraud period, relative to the pre-fraud period:

$$\begin{aligned}
\Delta Rating_{i,t+1} = & \alpha + \beta_1 NEM_{i,t} + \beta_2 FraudPeriod_t + \beta_3 NEM_t \\
& * FraudPeriod_t + \beta_4 \Delta CFO_{i,t} + \beta_5 \Delta StdROA_{i,t} \\
& + \beta_6 \Delta Times_{i,t} + \beta_7 \Delta R\&D_{i,t} + \beta_8 \Delta StdRet_{i,t} + \beta_9 \Delta BM_{i,t} \\
& + \beta_{10} \Delta Size_{i,t} + \beta_{11} \Delta Lev_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{7}$$

where $\Delta Rating_{t+1} = Rating_{t+1} - Rating_t$, where $Rating_t$ is the firm's Standard & Poor's senior debt rating in year t . Standard & Poor's rates a firm's debt from AAA (indicating a strong capacity to pay interest and repay principle) to D (indicating default). I follow Jiang (2008) and translate ratings letters into ratings numbers, with a smaller number indicating a better rating. Please see Appendix C for the complete conversion table between ratings letters and numbers. Prior studies find that firms with better performance and less risk have lower cost of debt (Ahmed et al., 2002; Campbell and Taksler, 2003; Kaplan and Urwitz, 1979; Sengupta, 1998; Shi, 2003). Because the dependent variable in my model is the change in credit rating, I measure each of these control variables in changes. $\Delta CFO_t = CFO_t - CFO_{t-1}$, where CFO_t is operating cash flows in year t deflated by total assets at the beginning of the year. $\Delta StdROA_t = StdROA_t - StdROA_{t-1}$, where $StdROA_t$ is the standard deviation of the firm's ROA calculated using five years' data from year $t-4$ to t . ROA is net income before extraordinary items deflated by total assets at the beginning of the year. $\Delta Times_t = Times_t - Times_{t-1}$, where $Times_t$ is the natural log of $(1 + \text{times-to-interest-earned ratio})$, where the times-to-interest-earned ratio is the firm's operating income before depreciation and interest expense divided by interest expense, both from year t . $\Delta RND_t = RND_t - RND_{t-1}$, where RND_t is the firm's research and development expense in year t deflated by total assets at the beginning of the year. $\Delta StdRET_t = StdRET_t - StdRET_{t-1}$, where $StdRET_t$ is the standard deviation of the firm's stock returns during year t . $\Delta BM_t = BM_t - BM_{t-1}$, where BM_t is the

natural log of the firm's book value of equity divided by its market value of equity, both measured at the end of year t . $\Delta Size_t = Size_t - Size_{t-1}$, where $Size_t$ is the natural log of the firm's total assets at the end of year t . $\Delta Lev_t = Lev_t - Lev_{t-1}$, where Lev_t is the firm's long-term debt divided by total assets at the end of year t . Following Jiang (2008), I expect the performance and risk variables to be positively associated with the cost of debt except for operating cash flows, times-to-interest-earned ratio, and size. I include year fixed effects and report p-values based on robust standard errors (White 1980).

The parameters of interest in this analysis are, once again, β_1 , β_2 , and β_3 from Equation 7. The estimates of these parameters are used to estimate the changes in the cost of debt in the treatment and control groups, as well as the difference in the cost of debt between the two groups. In section 2.5 I argue that credit rating agencies have access to nonpublic firm-specific information which may better enable them to assess the default risk of non-earnings managers. Credit rating agencies may not be as susceptible to the belief that the relatively poor accounting performance of the firms in the treatment sample is necessarily due to relatively poor economic performance. Hypothesis 3 posits that non-earnings managers will not experience a change in the likelihood of a credit rating downgrade. The Wald test for H3 is $\hat{\beta}_2 + \hat{\beta}_3 = 0$ (see Table 1 for intercept calculations).¹¹

3.7 Data

Annual financial statement data and S&P ratings are obtained from the Compustat annual files. Monthly (daily) security return data is supplied by the CRSP monthly (daily)

¹¹ Recall that the rating variable for a AAA rating is one, for AA+ it is two, so on and so forth. The rating variable for CCC+ and below is 17.

security files. I obtain monthly Fama and French factor data, momentum factor data, and monthly risk-free rates from Ken French's data library.¹² Data on chief executive compensation are obtained from the Compustat Execucomp file, directEDGAR, and by hand from firms' annual proxy statements or 10-Ks. One-year and two-year earnings forecasts, and long-term earnings forecasts are obtained from IBES. I use the database compiled by Dechow et al. (2011) of the SEC's AAERs to identify a set of industry leading firms that commit fraud. I classify a firm as an industry leader if, for at least one year during the fraud, it is either (1) a member of the S&P 500 or (2) in the top decile of market share for its two-digit Standard Industrial Classification (SIC) code, where market share is the firm's share of total industry revenue.

4. Results

4.1 Favorability of Analyst Recommendations During the Fraud Period

Table 2 reports the results from my replication of the Beatty et al. (2013) finding that analysts issue more favorable recommendations for peer firms when an industry leader is reporting fraudulently.¹³ The table contains the results from the estimation of Equation 1. It is important to my research design that I establish that the same dynamic is occurring with my sample of fraud firms. The results in Table 2 support the conjecture that cases of undetected industry-leader fraud increase the incentive peer managers face to manage earnings when the fraud is ongoing and undiscovered. The coefficient for *FraudYr* in the high overlap column is negative and significant ($\hat{\beta}_1 = -0.069$, t-statistic = -2.14), suggesting

¹² This data can be obtained from http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

¹³ The formatting of Table 2 is slightly different from that of the other tables in this paper. This is by design. I format Table 2 to mirror the formatting of Table 8 in Beatty et al. (2013) to facilitate a direct comparison, should the reader be inclined to do so.

that analysts are more likely to issue a favorable recommendation for peer firms in industries with high analyst overlap during the fraud period than in the pre-fraud period. I fail to find a significant difference for pre-fraud and fraud period recommendations in either the full sample of firms or the low overlap sample. Beatty et al. (2013) find a significant difference for both their overall sample and the high overlap sample, but not the low overlap sample. This discrepancy in results is likely due to the way Beatty et al. (2013) define industry peers. They use three-digit SIC codes to identify peers, whereas I use two-digit SIC codes. A three-digit SIC code definition will yield a set of peers that is more similar to the fraud firm than a two-digit definition. Because Beatty et al.'s overall sample is more similar to their set of fraud firms, they are more likely to find a significant increase in the favorability of analyst recommendations for peer firms in the fraud period.

The coefficients on the control variables in Table 2 are generally consistent with the findings in Beatty et al. (2013) and are in line with expectations. Growing firms are more likely to receive favorable analyst recommendations than mature firms that have already realized most of their growth potential. Consequently, we find that firms with higher market-to-book ratios, sales growth, and leverage (presumably because they are taking on debt financing to take advantage of growth opportunities) receive more favorable analyst recommendations. Larger, more mature firms do not receive as favorable recommendations. Overall, the results in Table 2 provide support for the conjecture that undiscovered industry-leader fraud increases the incentive managers at peer firms face to manage earnings in an attempt to meet higher analyst expectations.

4.2 Descriptive Statistics

Descriptive statistics for the treatment (NEM) and control (EM) samples used in my tests of H1 through H3 are presented in Table 3. Panels A, B, and C contain basic summary statistics for the variables used in my executive compensation, cost of equity, and cost of debt tests for the NEM sample. These first three panels also include the results from a series of t-tests testing for differences across the NEM and EM samples. Panels D, E, and F contain the same set of summary statistics, but for the EM sample. Panels G, H, and I contain correlation tables for the variables used in the executive compensation, cost of equity, and cost of debt tests, respectively. Panel A contains summary statistics for the NEM firm-years used in the executive compensation test. Results in Panel A suggest that NEM firm performance generally declines in the fraud period relative to the pre-fraud period. For example, contemporaneous ROA and returns decline in the fraud period by one and six basis points, respectively. Lower efficiency in the fraud period seems to drive down cash, which in turn may limit NEM firms' ability to invest in capital expenditures and R&D. The decline in the average book-to-market ratio suggests that investors see less growth opportunity for NEM firms in the fraud period than they did in the pre-fraud period. Interestingly, NEM executive pay seems to be unaffected by declining fraud-period performance in this univariate analysis, running contrary to the expectations embodied by H1. Panel B shows that the univariate relation between the fraud period and the implied cost of equity for NEM firms is also contrary to expectations. Hypothesis 2 posits that the cost of equity will increase for NEM firms in the fraud period, due to a belief among investors that these firms are performing relatively poorly, and that they are therefore exposed to elevated levels of financial default risk and litigation risk. However, Panel B

shows that the implied cost of equity decreases in the fraud period. Results in Panel C are consistent with H3: there is no discernable change in the cost of debt for NEM firms in the fraud period relative to the pre-fraud period.

Descriptive statistics for the EM (control) firms across the pre-fraud and fraud periods are included in panels D, E, and F for comparison. The changes documented in the second-to-last column of these panels are generally of the same direction as the changes for the NEM sample in panels A, B, and C. The results for future returns ($Return_{t+1}$) provide an interesting exception. The change in contemporaneous returns ($Return_t$) for both NEM and EM firms, as well as future returns ($Return_{t+1}$) for EM firms is negative. However, the change in future returns for NEM firms is positive, increasing from two to nine basis points. Taken together, these results suggest that returns for the NEM sample are significantly improved in the first year after the fraud period has ended, and that this improvement is unique to the NEM sample. It is possible that the revelation of industry-leader fraud causes investors to take a closer look at the financial reports of peer firms. If investors are able to discern, *ex post*, which peers are likely to have managed earnings over the fraud period (EM firms), they will respond by purchasing more shares from firms that did not manage earnings during the fraud period (NEM firms). The result will be an increase in the price of NEM shares, and will lead to high returns in the period in which the fraud is revealed (i.e. the year after the fraud ceases). I do not test for changes in the cost of equity in the period following the revelation of industry-leader fraud in this analysis. However, such a line of inquiry may yield interesting results.

Panels G, H, and I of Table 3 contain the Spearman and Pearson correlation coefficients for the variables used in the executive compensation, cost of equity, and cost

of debt tests, respectively. Panel G shows that, as expected, total pay is positively correlated with performance (*ROA* and *RelativePerf*), firm age, and demand for managerial ability (*Volatility*). The correlations in panel H suggest that larger firms ($\ln(MVE)$), and firms with higher risk profiles (*Beta* and *Volatility*), lower growth potential (*BM*), higher leverage (*Leverage*), and higher long-term analyst growth estimates (*LTG*) have a higher cost of equity. These correlations are consistent with the findings of other studies on the cost of equity (Chen et al., 2016; Dhaliwal et al., 2016). Panel I documents that as firm performance becomes more volatile ($\Delta StdROA_t > 0$, or $\Delta StdRet_t > 0$) credit ratings are likely to decline ($\Delta Rating_{t+1} > 0$). As firms gain the ability to pay interest and principal ($\Delta CFO_t > 0$ and $\Delta Times_t > 0$), credit ratings are likely to improve ($\Delta Rating_{t+1} < 0$).

4.3 Executive Compensation

Table 4 presents the results from my estimation of Equation 4. The estimated parameters $\hat{\beta}_2$ and $\hat{\beta}_3$ from Equation 4 are the inputs for the Wald tests I use to test H1, which posits that managers who choose to forego managing earnings experience a decline in personal compensation during the fraud period. As section 3.4 outlines, two conditions must be met before I can confidently conclude that my findings support H1. First, it must be the case that $\hat{\beta}_2 + \hat{\beta}_3 < 0$. Second, the F-statistic from the Wald test of $\hat{\beta}_2 + \hat{\beta}_3 = 0$ must be high enough that I can reject the null hypothesis of $\hat{\beta}_2 + \hat{\beta}_3 = 0$. Table 4 shows that the estimates of β_2 (-0.268) and β_3 (0.1) sum to -0.169, satisfying the first criterion. The Wald test of $\hat{\beta}_2 + \hat{\beta}_3 = 0$ confirms that the second criterion is also satisfied (F-score = 6.91 and $\text{prob} > F = 0.0090$). This result supports the conjecture that CEOs of peer firms who choose not to manage earnings in periods of undiscovered industry-leader fraud suffer a reduction in personal compensation (H1).

The estimates of $\hat{\beta}_1$, $\hat{\beta}_2$, and $\hat{\beta}_3$ in Table 4 also allow me to draw inferences about executive compensation for the sample of earnings managers, the control group, for benchmarking purposes. The coefficient for *NEM*, $\hat{\beta}_1$, is a statistically significant -0.352, indicating that the CEOs in the control group received more generous compensation than the CEOs in the treatment group during the pre-fraud period. The coefficient for *FraudPeriod*, $\hat{\beta}_2$, is also negative and statistically significant (-0.268). This result, in conjunction with the result from my test of H1 ($\hat{\beta}_2 + \hat{\beta}_3 = 0$), suggests that CEOs in both the treatment and control groups experienced a decline in personal compensation in the fraud period relative to the pre-fraud period. The coefficient on the interaction term, $\hat{\beta}_3$, estimates the difference in the decline in compensation between the two groups. The estimate $\hat{\beta}_3$ is statistically indistinguishable from zero. Finally, results from a Wald test of the restriction $\hat{\beta}_1 + \hat{\beta}_3 = 0$ indicate that personal compensation for the CEOs of the treatment sample receive less compensation than CEOs in the control sample during the fraud period (F-score=3.08, prob > F=0.08).

To summarize, the data reveal that CEOs who refrain from managing earnings during periods of industry-leader fraud experience a decrease in their personal compensation during that period, supporting H1. Chief executives who manage earnings in response to the increased pressure to do so during the fraud period experience a similar decline in personal compensation. The difference in the decline in executive compensation for the treatment (NEM) and control (EM) samples, $\hat{\beta}_3$, is not statistically distinguishable from zero. While the data provide strong evidence to support the conjecture that NEM CEOs experience a decline in compensation during the fraud period, the $\hat{\beta}_3$ result limits

my ability to infer that the decline is solely due to the managerial decision to refrain from managing earnings.

4.4 Cost of Equity

Table 5 presents the results from my test of the conjecture that non-earnings managers experience an increase in the cost of equity during the fraud period (H2). As outlined in section 3.5, the test for H2 is a Wald test for the restriction that $\hat{\beta}_2 + \hat{\beta}_3 = 0$, where $\hat{\beta}_2$ and $\hat{\beta}_3$ are obtained from the estimation of Equation 6. Hypothesis 2 is validated if $\hat{\beta}_2 + \hat{\beta}_3 > 0$. The results in Table 5 reveal that $\hat{\beta}_2 + \hat{\beta}_3 = 0.257$, suggesting that NEM firms experience an increase of about 26 basis points in their cost of equity in the fraud period, relative to the pre-fraud period. However, the difference between the estimate of $\hat{\beta}_2 + \hat{\beta}_3$ and zero is not statistically significant (F-score=0.75, prob > F=0.39). The $\hat{\beta}_3$ estimate represents the difference in the changes in the cost of equity for the NEM and EM firms. It's estimation provides a check to make sure that any change in the cost of equity in the NEM sample is due to the treatment effect (the managerial decision to refrain from managing earnings). The estimate of $\hat{\beta}_3$ (-0.482) is statistically insignificant, suggesting that the changes in the cost of equity capital for the NEM sample may not be different than that of the EM sample. This result limits my ability to infer that any change in the cost of equity for the NEM sample is solely due to the managerial decision to refrain from managing earnings.

An analysis of the parameter estimates in Table 5 reveals that firms in the treatment sample (NEM firms) have a higher cost of equity than their peers in the control sample during the pre-fraud period ($\hat{\beta}_1 = 1.103$, p-value=0). The coefficient on *FraudPeriod* (0.739)

suggests that control firms experience a bump of about 74 basis points in their cost of equity in the fraud period. The difference in the cost of equity for treatment and control firms in the fraud period continues to be significant ($\hat{\beta}_1 + \hat{\beta}_3=0.62$, F-value=2.84, p-value=0.09).

In summary, the data suggests that the cost of equity increases for NEM firms in the fraud period, relative to the pre-fraud period. This finding supports H2. However, the estimated increase is not statistically significant. Moreover, the change in the cost of equity for the NEM sample is not statistically different from that of the EM sample, suggesting that the increase in the cost of equity for the NEM sample may not be wholly due to the treatment effect. While H2 is supported by the estimate of $\hat{\beta}_2 + \hat{\beta}_3$, these latter two points should be considered when making inferences about the relation between the managerial decision to refrain from managing earnings and the cost of equity.

4.5 Cost of Debt

Table 6 presents the results from my test of the conjecture that non-earnings managers will not experience an increase in the likelihood of a credit downgrade during the fraud period (H3). The logic underlying H3 is that credit rating agencies have access to more firm-specific information than equity investors, and that this information mitigates the likelihood that their interpretation of the firm's economic performance will be negatively biased due to relatively poor accounting performance. In other words, credit rating agencies may not be as susceptible to being fooled by the relatively negative accounting reports as equity investors. As outlined in section 3.6, the Wald test for H3 is $\hat{\beta}_2 + \hat{\beta}_3=0$, where the estimates for β_2 and β_3 are obtained by estimating Equation 7. In a

Wald test of H3, I find that the null of $\hat{\beta}_2 + \hat{\beta}_3 = 0$ cannot be rejected ($\chi^2 = 0.17$, $\text{prob} > \chi^2 = 0.68$).¹⁴ This result is consistent with H3.

5. Conclusion

While a robust body of literature addresses how a manager's decision to bias earnings affects managers and shareholders, we know relatively little about what happens when a manager decides not to manage earnings. An important part of understanding why some managers use their discretion to bias earnings in the first place is comprehending the opportunity costs that managers face when they elect not to bias reported earnings. The extant literature speaks to the managerial consequences of earnings management. However, we know little about the managerial consequences of unbiased reporting in the face of increased incentives to manage earnings in order to match the performance of industry leaders. In this study, I explore the impact of refraining from managing earnings on CEOs and firms. I speak to the opportunity costs that managers and their firms face when managers decide to report consistently in cases where fraud at an industry-leading peer might increase their incentive to report with bias.

Using the updated Dechow et al. (2011) set of AAERs, I identify cases of fraud committed by an industry leader. I use the Dechow et al. (2011) AAER data and F-score to identify industry peers that show evidence of high and increased likelihood of earnings management (earnings managers, EM, or control firms), and peers that show no evidence of such behavior (non-earnings managers, NEM, or treatment firms). The latter group is my treatment sample because it is the group for which I expect to see negative

¹⁴ The output for a Wald test of parameters, when those parameters are estimated using ordered logit, is a χ^2 statistic. The output for a Wald test when parameters are estimated using OLS is an F-statistic.

consequences as a result of the decision to forego earnings management. I test for differences in managerial compensation, the cost of equity, and the cost of debt across these two samples. I find that CEO compensation for NEM firms declines in the period of industry-leader fraud relative to the pre-fraud period. However, CEO compensation for EM (control) firms also declines over the same period. This latter result makes it difficult to conclude that the observed decline in CEO compensation for the treatment sample is due to the decision to refrain from managing earnings (the treatment effect). I also find that NEM firms experience an increase of about 26 basis points in their cost of equity capital in the fraud period, though this result is statistically insignificant. I also find that the cost of equity for EM firms increases, and the difference in the increase in the cost of equity across the NEM and EM samples is also statistically insignificant. These results make difficult to conclude that the increase in the cost of equity for the NEM sample can be attributed to the treatment effect. Finally, consistent with my expectations, I do not find any evidence of an increase in the cost of debt for NEM firms in the fraud period, relative to the pre-fraud period.

This study has some limitations that should be considered when reviewing the results. First, the Dechow et al. F-score is a noisy proxy for earnings management, which adversely affects testing for differences between treatment and control firms. Second, my sample may contain many peer firms for which managers do not experience a meaningful increase in the incentive to manage earnings during the fraud period. There are at least two reasons for this potential problem. First, I use a two-digit SIC code definition of an industry peer which may be too coarse of a way of identifying industry peers. There is considerable variation in the types of firms that fall under some of the two-digit SIC codes. Many of the

peers in my sample may not be similar enough to the industry leader to experience an increase in the incentive manage earnings via heightened analyst expectations or the use of relative performance evaluation. Second, some of the firms in my sample come from industries with low analyst coverage overlap (Beatty et al., 2013). Managers at these firms are less likely to experience a meaningful increase in the incentive to manage earnings during the fraud period via heightened analyst expectations. The inclusion of these firms in my sample has the potential to add noise to my tests and mitigate the likelihood of finding evidence consistent with my hypotheses. The third limitation affects only the tests on the relation between the managerial decision to refrain from managing earnings and the cost of capital. I include my entire sample of firms in these tests. However, the disparity in economic and reported accounting performance in treatment firms should only affect the cost of capital for a small subset of those firms. I argue in sections 2.3 and 2.4 that the cost of equity increases for treatment firms in the fraud period because investors believe that these firms face higher financial distress risk and shareholder litigation risk. The ideal sample of firms for the cost of capital tests therefore consists of those firm-years for which a firm's accounting performance leads investors to infer a much higher level of financial distress risk or shareholder litigation risk than would be inferred if true economic performance were observable. I will explore this in future research by incorporating measures of financial distress (i.e. the Altman Z-score) into my research design.

There is room for refinement in my research design, which may lead to more powerful tests. The first two limitations listed in the preceding paragraph can be addressed by limiting my sample of peer firms to those that share a three-digit SIC code with the industry leader, and those belonging to industries with high analyst coverage overlap

(Beatty et al., 2013). The third limitation is more challenging because true economic performance is unobservable.

Further exploration of the effects of the managerial decision to forego earnings management may be profitable. At some point, each of the frauds in my sample of industry-leader frauds is revealed and becomes public knowledge. It would be interesting to know if boards of EM firms recognize in the post-revelation period that earnings quality in the fraud period was likely compromised? Is there a higher rate of forced managerial turnover among EM firms in the post-revelation period than among NEM firms? How might managerial compensation and forced turnover for earnings managers in the post-revelation period be related to board independence, governance, or the level of institutional equity ownership? Finally, what happens when we define industries in terms of the three-digit SIC code and focus on the subset of industries with high analyst overlap? Do we find significant changes in executive compensation for the NEM and EM firms in the post-revelation period in that case? Might we observe statistically significant results for the cost of capital tests when focusing on these industries?

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**Appendix A: Identification of the Earnings Manager and Non-Earnings Manager
Samples**

Classification	Industry Period	
	Pre-Fraud	Fraud
Control Firms Earnings Manager (EM) (criteria 1)	Peer not reporting fraudulently (no AAER for the firm in this period)	Per AAER, peer begins reporting fraudulently sometime after the industry leader(s), but before the fraud period is over
Control Firms Earnings Manager (EM) (criteria 2)	Peer's average F-score is in one of the four lower quintiles of average F-score for the industry	Peer's average F-score is in the highest quintile of average F-score for the industry
Treatment Firms Non-Earnings Manager (NEM)	Peer's average F-score is in one of the four lower quintiles of average F-score for the industry	Peer's average F-score does not belong to a higher industry quintile of average F-score than it did in the pre-fraud period

Appendix B: Variable Definitions for Main Analyses

Executive Compensation

- $Ln(Total\ Pay_t) =$ the natural log of a CEO's total annual compensation during the fiscal year t . Total compensation is obtained from the Compustat Execucomp file, directEDGAR's ExtractionPreprocessed file, or by hand from firms' annual proxy statements or 10-Ks. For hand collected data, security option awards are recorded at the potential realizable value at a 5% annual stock price appreciation rate for the option term.
- $NEM_{t-1} =$ an indicator variable which equals one (zero) for firm-years which have been classified as NEM (EM) firm years.
- $FraudPeriod_{t-1} =$ an indicator variable which equals one for firm-years in the fraud period and zero otherwise.
- $Ln(Sales_{t-1}) =$ the natural log of a firm's total revenues for fiscal year $t-1$.
- $BM_{t-1} =$ a firm's ratio of the book value of equity to the market value of equity at the end of year $t-1$.
- $Return_t (Return_{t-1}) =$ a firm's cumulative stock return during the fiscal year $t (t-1)$, where the stock return for year t is computed as the price of the firm's stock at the end of fiscal year t less the price at the end of fiscal year $t-1$, scaled by the ending price in fiscal year $t-1$.
- $Leverage_{t-1} =$ the ratio of a firm's book value of debt to assets in year $t-1$.
- $ROA_t (ROA_{t-1}) =$ a firm's return on average assets during the fiscal year $t (t-1)$. ROA_t is computed as net income in year t , scaled by average total assets for years t and $t-1$.
- $Volatility_{t-1} =$ the standard deviation of a firm's monthly stock returns for the 60 months leading up to the end of fiscal year $t-1$.
- $Cash_{t-1} =$ a firm's cash plus short-term investments normalized by the book value of total assets at the end of year $t-1$.
- $CAPX_{t-1} =$ a firm's capital expenditures normalized by the book value of total assets at the end of year $t-1$.
- $R\&D_{t-1} =$ a firm's R&D expenditures normalized by the book value of total assets at the end of year $t-1$.
- $Firm\ age_{t-1} =$ the number of years since the firm appears in CRSP as of year $t-1$.

$RelativePerf_{t-1}$ = the difference between the firm's ROA and the median ROA for its industry peers (where firms in the same two-digit SIC are considered industry peers).

Cost of Equity

P_0 = the price of the firm's stock at time zero.

BVE_t = the firm's book value at time t .

ROE_t = the return on beginning equity for year t .

TV = the firm's terminal value at the end of the finite forecasting horizon (see section 3.5 of the paper for more details on the computation of this variable).

Re = the firm's estimated cost of equity capital for year t (estimated using the methodology in Gebhardt et al., 2001).

$Beta_t$ = the firm's CAPM Beta for year t . Estimated by regressing the firm's monthly stock returns on the corresponding monthly market premium for the 60 months leading up to the end of fiscal year t .

$Ln(MVE_t)$ = the natural log of the market value of equity, where the market value of equity is the product of the number of common shares outstanding and the price of common shares at the end of fiscal year t .

LTG_t = the mean analyst long-term growth rate estimate as of year t .

All other relevant variables are defined in the previous section of Appendix B.

Cost of Debt

$\Delta Rating_{t+1}$ = $Rating_{t+1} - Rating_t$, where $Rating_t$ is the firm's Standard & Poor's senior debt rating in year t . Standard & Poor's rates a firm's debt from AAA (indicating a strong capacity to pay interest and repay principle) to D (indicating default). I follow Jiang (2008) and translate ratings letters into ratings numbers, with a smaller number indicating a better rating. Appendix C contains the conversion table used to transform rating letters to numbers.

ΔCFO_t = $CFO_t - CFO_{t-1}$, where CFO_t is operating cash flows in year t deflated by total assets at the beginning of the year.

$\Delta StdROA_t =$	$StdROA_t - StdROA_{t-1}$, where $StdROA_t$ is the standard deviation of the firm's ROA calculated using five years' data from year $t-4$ to t . ROA is net income before extraordinary items deflated by total assets at the beginning of the year.
$\Delta Times_t =$	$Times_t - Times_{t-1}$, where $Times_t$ is the natural log of (1 + times-to-interest-earned ratio), where the times-to-interest-earned ratio is the firm's operating income before depreciation and interest expense divided by interest expense, both from year t .
$\Delta RND_t =$	$RND_t - RND_{t-1}$, where RND_t is the firm's research and development expense in year t deflated by total assets at the beginning of the year.
$\Delta StdRET_t =$	$StdRET_t - StdRET_{t-1}$, where $StdRET_t$ is the standard deviation of the firm's stock returns during year t .
$\Delta BM_t =$	$BM_t - BM_{t-1}$, where BM_t is the natural log of the firm's book value of equity divided by its market value of equity, both measured at the end of year t .
$\Delta Size_t =$	$Size_t - Size_{t-1}$, where $Size_t$ is the natural log of the firm's total assets at the end of year t .
$\Delta Lev_t =$	$Lev_t - Lev_{t-1}$, where Lev_t is the firm's long-term debt divided by total assets at the end of year t .

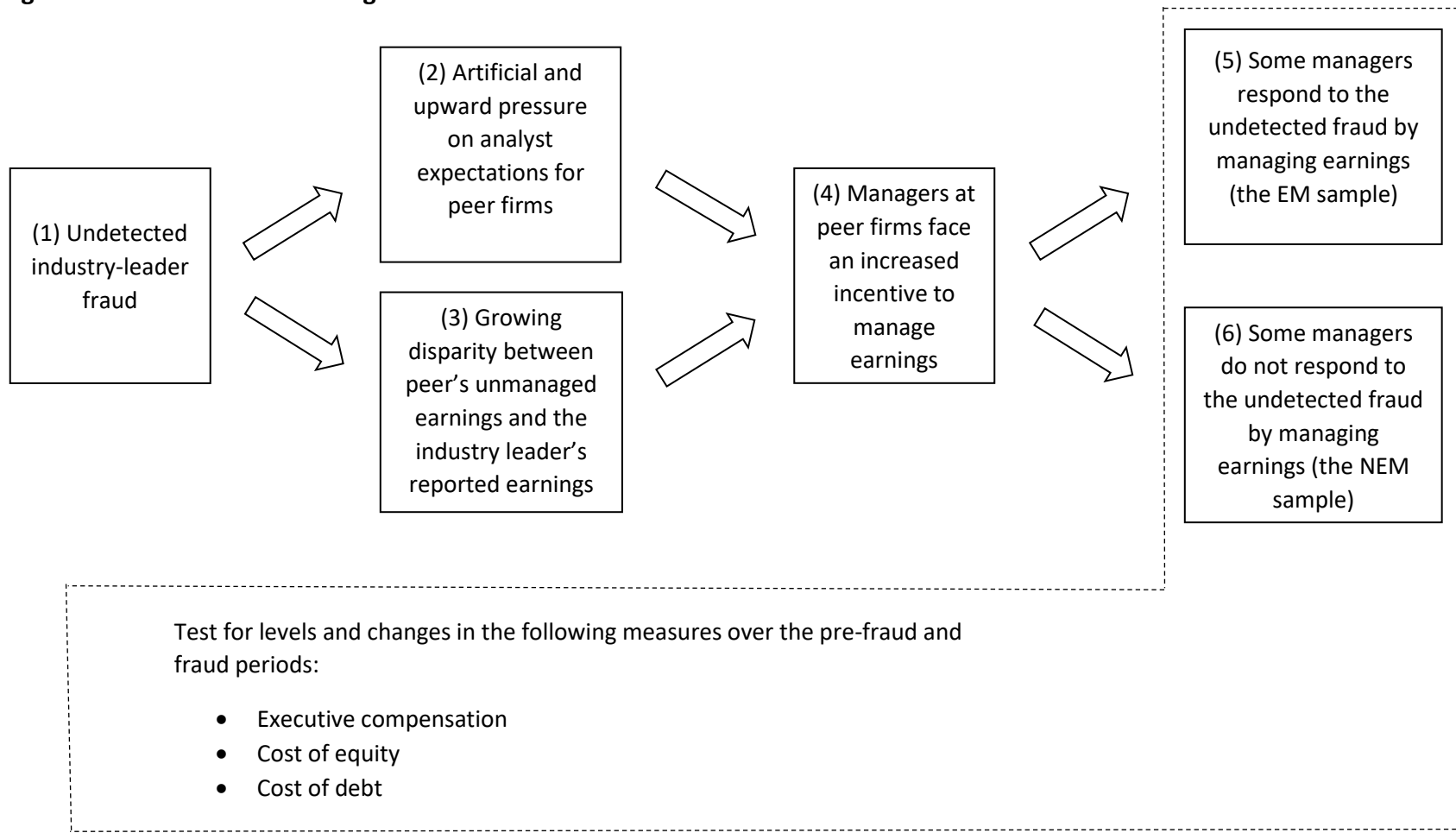
All other relevant variables are defined in the previous sections of Appendix B.

Appendix C: Transformation of S&P Ratings

<u>S&P Credit Rating</u>	<u>Transformation to $Rating_t$</u>
AAA	1
AA+	2
AA	3
AA-	4
A+	5
A	6
A-	7
BBB+	8
BBB	9
BBB-	10
BB+	11
BB	12
BB-	13
B+	14
B	15
B-	16
CCC+ and below	17

Figures

Figure 1: General Research Design



Tables

Table 1: CEO Compensation Intercept Matrix

Estimating the Intercept Term in a Model of CEO Compensation, the Cost of Equity, or the Cost of Debt for EM and NEM Firms Across the Pre-Fraud and Fraud Periods

		Period	
		Pre-fraud	Fraud
Peer Type	EM	α	$\alpha + \beta_2$
	NEM	$\alpha + \beta_1$	$\alpha + \beta_1 + \beta_2 + \beta_3$

Where the parameters are estimated using equation 4, 6, or 7

Table 1 summarizes which parameter estimates are needed to estimate the intercept term for each peer type and period in equations 4, 6, and 7. In each of these equations the variables of interest are NEM , $FraudPeriod$, and the $NEM * FraudPeriod$ interaction. Equations 4, 6, and 7 can be generalized as follows:

$$\begin{aligned}
 DepVar = & \alpha + \beta_1 NEM_t + \beta_2 FraudPeriod_t + \beta_3 NEM_t \\
 & * FraudPeriod_t + \sum_{n=4}^k \beta_n Control_n + \varepsilon_t.
 \end{aligned} \tag{A1}$$

The intercept terms in Table 1 are generated by substituting the appropriate dummy variables into NEM and $FraudPeriod$ in Equation A1, ignoring the control variables, and simplifying. For example, the intercept term for non-earnings managers ($NEM=1$) in the pre-fraud period ($FraudPeriod=0$) is estimated as follows:

$$Intercept_{NEM=1, FraudPeriod=0} = \alpha + \beta_1 * 1 + \beta_2 * 0 + \beta_3(1 * 0) = \alpha + \beta_1,$$

which is the sum contained in the lower-left cell in Table 1. The other intercept terms in Table 1 are solved for in the same manner: by appropriately substituting 1 or 0 in for NEM and $FraudPeriod$.

Table 2: Ordered Probit Analysis of Analyst Recommendations

$$\begin{aligned}
 & Recom_{i,t} \\
 & = \alpha + \beta_1 FraudYr_t + \beta_2 Size_{i,t} + \beta_3 MTB_{i,t} + \beta_4 Lev_{i,t} + \beta_5 CFO_{i,t} + \beta_6 Rating_{i,t} + \beta_7 SG_{i,t} + \beta_8 CAPEX_F_{i,t} \\
 & + \beta_9 CoMove_{i,t} + \varepsilon_{i,t}
 \end{aligned}$$

Variable		Overall	High overlap_R	Low overlap_R
		Coefficient (z-stats)	Coefficient (z-stats)	Coefficient (z-stats)
FRAUDYR	β_1	0.014 (0.77)	-0.069 -(2.14) **	0.041 (1.60)
SIZE	β_2	0.085 (17.91) ***	0.074 (7.02) ***	0.083 (15.50) ***
MTB	β_3	-0.032 -(11.39) ***	-0.029 -(5.03) ***	-0.028 -(8.91) ***
LEV	β_4	-0.200 -(4.90) ***	-0.003 -(0.03)	-0.176 -(3.58) ***
CFO	β_5	-0.111 -(3.86) ***	-0.017 -(0.39)	-0.257 -(6.71) ***
RATING	β_6	-0.027 -(1.27)	0.076 (1.83) *	-0.051 -(2.03) **
SG	β_7	-0.448 -(25.94) ***	-0.494 -(11.95) ***	-0.436 -(22.86) ***
CAPEX_F	β_8	0.000 -(7.01) ***	0.000 -(1.83) *	0.000 -(5.43) ***
COMOVE	β_9	-0.013 -(1.30)	0.133 (7.18) ***	-0.073 -(6.13) ***
Pseudo R ²		0.02	0.03	0.03
No. of observations		22,153	5,980	16,173

Overlap_R: the residual from the following regression: $Overlap = \alpha + \beta_1 Comove_return + \beta_2 SIZE_m + \beta_3 MTB_m + \beta_4 LEV_m + \beta_5 SG_m + \varepsilon$ for each industry-year, where *Overlap* is measured as the ratio of the number of firms that have at least one analyst also covering the scandal firm to the total number of firms that have any analyst coverage at the 2-digit SIC code level. *Comove_return* is the R-squared of the regression of peer firms' daily returns on scandal firms' returns, measured annually, and *SIZE_m* is measured as the industry median size, etc. High (Low) Overlap_R: Industries with above (below) the median Overlap_R.

Recom (dependent variable): the median value of all analysts' recommendations during a year. 1 represents strong buy and 5 represents strong sell. *FRAUDYR*: an indicator variable equal to one for years in which an industry leading firm was committing fraud, zero for the years preceding the fraud. *SIZE*: the natural log of lagged total assets. *MTB*: lagged ratio of market value of total assets to book value of total assets. *LEV*: long-term debt divided by total assets, measured at the beginning of the year. *CFO*: cash flow from operations divided by lagged total assets. *RATING*: an indicator variable for firms with S&P credit ratings. *SG*: change in revenues divided by lagged total assets. *CAPEX_S*: industry-leader fraud firms' CAPEX. *COMOVE*: tercile rankings of the co-movement of change in market-to-book ratios between the industry-leader fraud firms and peer firms in the pre-fraud period (at the 2-digit SIC code level). The co-movement is measured as β in the regression $\Delta MTB = \alpha + \beta \Delta MTB_F + \varepsilon$, where ΔMTB is defined as annual change in MTB and ΔMTB_F represents industry-leader fraud firms' change in MTB.

Table 3: Descriptive Statistics

Panel A: Variables Used in the Executive Compensation Test for the NEM Sample										
Variable	Pre-Fraud Period				Fraud Period				Change (Fraud Less Pre-Fraud)	
	Mean	Median	Std	N	Mean	Median	Std	N	Mean	Std
Ln(Total Pay _{t+1})	7.19	7.09	0.97	610	7.21	7.08	1.07	709	0.02	1.02
Ln(sales _t)	6.59	6.77	1.74	610	6.82	6.92	1.49	709	0.23 ***	1.62
BM _t	0.50	0.43	0.32	610	0.69	0.63	0.42	709	0.19 ***	0.38
Return _t	0.10	0.04	0.46	610	0.04	0.00	0.46	709	-0.06 ***	0.46
Return _{t+1}	0.02	0.01	0.40	610	0.09	0.06	0.40	709	0.07 ***	0.40
Leverage _t	0.26	0.27	0.17	610	0.31	0.33	0.15	709	0.05 ***	0.16
ROA _t	0.04	0.05	0.10	610	0.03	0.04	0.08	709	-0.01 **	0.09
ROA _{t+1}	0.04	0.05	0.10	610	0.03	0.04	0.08	709	-0.01	0.09
Volatility _t	0.10	0.09	0.04	610	0.09	0.08	0.06	709	0.00 *	0.05
Cash _t	0.11	0.03	0.17	610	0.07	0.02	0.13	709	-0.04 ***	0.15
CAPX _t	0.08	0.06	0.06	610	0.07	0.06	0.05	709	-0.01 ***	0.05
R&D _t	0.03	0.00	0.06	610	0.01	0.00	0.04	709	-0.01 ***	0.05
Ln(firm age _t)	2.79	3.09	0.84	610	3.12	3.30	0.63	709	0.33 ***	0.74
RelativePerf _t	0.03	0.02	0.10	610	0.01	0.01	0.08	709	-0.02 ***	0.09

Panel B: Variables Used in the Cost of Equity Test for the NEM Sample										
Re _t	11.51	10.51	4.70	1146	10.42	9.28	4.68	1060	-1.09 ***	4.69
Beta _t	0.90	0.84	0.55	1146	0.74	0.61	0.51	1060	-0.16 ***	0.53
Volatility _t	0.10	0.09	0.05	1146	0.10	0.09	0.05	1060	0.00 **	0.05
Ln(MVE) _t	6.40	6.45	1.65	1146	6.62	6.67	1.48	1060	0.21 ***	1.57
BM _t	0.58	0.53	0.35	1146	0.66	0.62	0.34	1060	0.08 ***	0.34
Leverage _t	0.28	0.31	0.17	1146	0.32	0.34	0.16	1060	0.04 ***	0.17
LTG _t	15.40	14.00	9.60	1146	11.85	10.43	8.80	1060	-3.56 ***	9.22

Panel C: Variables Used in the Cost of Debt Test for the NEM Sample										
ΔRating _{t+1}	0.13	0.00	0.91	274	0.11	0.00	0.66	421	-0.02	0.77
ΔCFO _t	0.00	0.00	0.07	274	0.00	0.00	0.05	421	0.01	0.06
ΔStdROA _t	0.00	0.00	0.02	274	0.00	0.00	0.01	421	0.00 *	0.02
ΔTimes _t	-0.07	0.00	0.47	274	0.00	0.03	0.37	421	0.07 **	0.41
ΔRND _t	0.00	0.00	0.00	274	0.00	0.00	0.00	421	0.00	0.00
ΔStdRET _t	0.00	0.00	0.01	274	0.00	0.00	0.01	421	0.00	0.01
ΔBM _t	0.07	0.01	0.44	274	-0.01	-0.03	0.42	421	-0.07 **	0.43
ΔSize _t	0.11	0.06	0.23	274	0.04	0.03	0.17	421	-0.07 ***	0.19
ΔLev _t	0.02	0.00	0.09	274	-0.01	-0.01	0.07	421	-0.02 ***	0.08

Variable descriptions can be found in Appendix B.

Statistical significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Panel D: Variables Used in the Executive Compensation Test for the EM Sample

Variable	Pre-Fraud Period				Fraud Period				Change (Fraud Less Pre-Fraud)	
	Mean	Median	Std	N	Mean	Median	Std	N	Mean	Std
Ln(Total Pay _{t+1})	7.99	7.78	0.95	106	7.89	7.92	1.22	126	-0.09	1.11
Ln(sales _t)	7.18	7.01	1.46	106	7.26	7.22	1.61	126	0.07	1.54
BM _t	0.37	0.30	0.23	106	0.43	0.38	0.25	126	0.07 **	0.24
Return _t	0.23	0.11	0.49	106	0.15	0.05	0.51	126	-0.08	0.50
Return _{t+1}	0.15	0.06	0.42	106	0.09	0.01	0.47	126	-0.07	0.45
Leverage _t	0.28	0.28	0.20	106	0.28	0.29	0.18	126	0.00	0.19
ROA _t	0.06	0.06	0.09	106	0.05	0.05	0.07	126	-0.01	0.08
ROA _{t+1}	0.06	0.06	0.06	106	0.04	0.04	0.08	126	-0.02 **	0.07
Volatility _t	0.10	0.08	0.04	106	0.11	0.10	0.05	126	0.02 ***	0.04
Cash _t	0.12	0.04	0.16	106	0.08	0.03	0.13	126	-0.04 *	0.14
CAPX _t	0.07	0.06	0.05	106	0.05	0.03	0.04	126	-0.02 ***	0.05
R&D _t	0.03	0.00	0.04	106	0.02	0.00	0.05	126	-0.01	0.04
Ln(firm age _t)	2.62	2.40	0.96	106	2.74	2.56	0.73	126	0.12	0.84
RelativePerf _t	0.05	0.04	0.07	106	0.03	0.03	0.08	126	-0.02 **	0.08

Panel E: Variables Used in the Cost of Equity Test for the EM Sample

Re _t	10.39	10.01	3.67	201	10.44	9.79	4.35	221	0.06	4.04
Beta _t	1.07	1.06	0.55	201	0.88	0.84	0.60	221	-0.20 ***	0.57
Volatility _t	0.11	0.10	0.04	201	0.13	0.12	0.05	221	0.02 ***	0.05
Ln(MVE) _t	6.56	6.31	1.81	201	6.92	6.71	1.74	221	0.37 **	1.77
BM _t	0.46	0.40	0.30	201	0.49	0.44	0.31	221	0.04	0.31
Leverage _t	0.26	0.25	0.21	201	0.31	0.30	0.22	221	0.05 **	0.22
LTG _t	17.56	15.97	7.59	201	17.27	16.56	6.76	221	-0.29	7.17

Panel F: Variables Used in the Cost of Debt Test for the EM Sample

ΔRating _{t+1}	-0.06	0.00	0.86	51	0.10	0.00	0.80	82	0.16	0.82
ΔCFO _t	0.01	0.00	0.06	51	-0.01	0.00	0.07	82	-0.02	0.07
ΔStdROA _t	0.00	0.00	0.01	51	0.00	0.00	0.02	82	0.00	0.02
ΔTimes _t	-0.04	0.00	0.32	51	-0.10	-0.02	0.44	82	-0.07	0.40
ΔRND _t	0.00	0.00	0.01	51	0.00	0.00	0.01	82	0.00	0.01
ΔStdRET _t	0.00	0.00	0.00	51	0.00	0.00	0.01	82	0.00	0.01
ΔBM _t	-0.01	0.00	0.23	51	0.09	0.04	0.47	82	0.10	0.40
ΔSize _t	0.20	0.12	0.28	51	0.19	0.13	0.25	82	-0.01	0.26
ΔLev _t	0.03	0.02	0.10	51	0.00	0.00	0.09	82	-0.03 *	0.09

Variable descriptions can be found in Appendix B.

Statistical significance at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Panel G

Significant Correlations for the Executive Compensation Sample

	Ln(Total Pay _{t+1})	NEM _t	Fraud Period _t	Ln(Sales _t)	BM _t	Return _t	Return _{t+1}	Leverage _t	ROA _t	ROA _{t+1}	Volatility _t	Cash _t	CAPX _t	R&D _t	Ln(Firm Age _t)	Relative Perf _t
Ln(Total Pay _{t+1})		-0.24	-0.01	0.53	-0.24	0.11	0.12	0.07	0.04	0.10	0.08	0.02	-0.07	0.07	0.14	0.17
NEM _t	-0.25		0.00	-0.10	0.21	-0.10	-0.04	0.03	-0.10	-0.09	-0.10	-0.07	0.15	-0.02	0.11	-0.10
FraudPeriod _t	0.00	0.00		0.05	0.25	-0.08	0.06	0.13	-0.10	-0.10	-0.10	-0.18	-0.10	-0.17	0.17	-0.14
Ln(sales _t)	0.48	-0.11	0.06		0.03	-0.01	0.02	0.26	0.00	0.01	-0.35	-0.31	-0.01	-0.12	0.54	0.03
BM _t	-0.19	0.19	0.22	0.03		-0.26	0.14	0.31	-0.43	-0.48	-0.19	-0.36	-0.06	-0.36	0.28	-0.51
Return _t	0.10	-0.09	-0.06	-0.10	-0.23		-0.12	-0.03	0.14	0.19	-0.02	0.05	-0.08	-0.01	-0.02	0.18
Return _{t+1}	0.12	-0.05	0.06	-0.03	0.14	-0.09		0.02	-0.07	0.12	-0.03	0.01	-0.05	-0.02	0.04	0.12
Leverage _t	0.12	0.01	0.12	0.33	0.24	-0.04	0.02		-0.38	-0.33	-0.24	-0.51	0.09	-0.48	0.19	-0.35
ROA _t	0.05	-0.09	-0.06	0.26	-0.23	0.06	-0.08	-0.15		0.60	-0.11	0.15	0.10	0.10	-0.06	0.55
ROA _{t+1}	0.09	-0.07	-0.05	0.26	-0.27	0.10	0.09	-0.12	0.67		-0.14	0.16	0.05	0.14	-0.02	0.88
Volatility _t	0.02	-0.06	-0.02	-0.46	0.06	0.17	0.10	-0.23	-0.26	-0.29		0.41	-0.07	0.23	-0.59	-0.02
Cash _t	-0.09	-0.03	-0.13	-0.58	-0.27	0.14	0.03	-0.52	-0.17	-0.17	0.49		-0.13	0.41	-0.30	0.23
CAPX _t	-0.02	0.11	-0.11	-0.07	-0.10	-0.08	-0.07	0.08	0.07	0.02	0.05	-0.11		-0.03	-0.02	0.04
R&D _t	-0.02	-0.01	-0.13	-0.41	-0.25	0.00	0.03	-0.45	-0.32	-0.29	0.30	0.59	-0.06		-0.15	0.24
Ln(firm age _t)	0.11	0.13	0.19	0.48	0.18	-0.12	-0.05	0.18	0.07	0.11	-0.52	-0.37	-0.12	-0.21		-0.06
RelativePerf _t	0.12	-0.08	-0.09	0.23	-0.31	0.10	0.08	-0.16	0.63	0.93	-0.22	-0.09	0.03	-0.19	0.09	

N = 1,551

Spearman (Pearson) correlations are above (below) the diagonal.

Significant coefficients (p -value < 0.05) are in bold.

Model variables are defined in Appendix B.

Panel H

Significant Correlations for the Cost of Equity Sample

	Re _t	NEM _t	Fraud Period _t	Beta _t	Volatility _t	Ln(MVE) _t	BM _t	Leverage _t	LTG _t
Re _t		0.02	-0.14	0.15	0.22	-0.30	0.13	0.04	0.21
NEM _t	0.05		-0.03	-0.12	-0.16	-0.04	0.18	0.07	-0.21
FraudPeriod _t	-0.10	-0.03		-0.16	-0.05	0.08	0.13	0.10	-0.18
Beta _t	0.15	-0.10	-0.15		0.54	-0.04	-0.23	-0.24	0.51
Volatility _t	0.29	-0.14	-0.01	0.53		-0.39	-0.15	-0.19	0.73
Ln(MVE) _t	-0.32	-0.06	0.08	-0.07	-0.40		-0.24	0.09	-0.22
BM _t	0.16	0.15	0.11	-0.16	0.00	-0.27		0.29	-0.44
Leverage _t	0.04	0.04	0.11	-0.25	-0.16	0.09	0.24		-0.26
LTG _t	0.27	-0.15	-0.16	0.48	0.65	-0.22	-0.32	-0.25	

N = 2,628

Spearman (Pearson) correlations are above (below) the diagonal.

Significant coefficients (*p* -value < 0.05) are in bold.

Model variables are defined in Appendix B.

Panel I

Significant Correlations for the Cost of Debt Sample

	ΔRating _{t+1}	NEM _t	Fraud Period _t	ΔCFO _t	ΔStdROA _t	ΔTimes _t	ΔRND _t	ΔStdRET _t	ΔBM _t	ΔSize _t	ΔLev _t
ΔRating _{t+1}		0.02	0.00	-0.12	0.07	-0.25	-0.03	0.14	0.12	-0.02	0.05
NEM _t	0.04		-0.01	0.03	-0.03	0.07	-0.08	0.04	-0.03	-0.23	-0.04
FraudPeriod _t	0.00	-0.01		0.03	-0.07	0.05	-0.02	-0.04	-0.05	-0.13	-0.12
ΔCFO _t	-0.10	0.02	0.02		-0.07	0.24	0.05	-0.04	-0.01	0.03	-0.12
ΔStdROA _t	0.05	-0.01	-0.08	-0.06		-0.17	-0.02	0.08	0.01	-0.03	0.10
ΔTimes _t	-0.19	0.05	0.06	0.23	-0.32		-0.03	-0.15	-0.09	-0.02	-0.29
ΔRND _t	0.02	-0.07	0.01	0.00	0.01	-0.08		-0.02	-0.01	0.11	0.04
ΔStdRET _t	0.17	0.06	-0.05	-0.01	0.05	-0.15	-0.08		0.29	-0.06	-0.04
ΔBM _t	0.10	-0.03	-0.05	-0.01	-0.08	-0.05	-0.02	0.35		0.04	-0.05
ΔSize _t	0.00	-0.22	-0.13	0.00	-0.04	-0.02	0.19	-0.05	0.04		0.10
ΔLev _t	0.06	-0.04	-0.13	-0.03	0.13	-0.34	0.11	0.00	-0.05	0.17	

N = 828

Spearman (Pearson) correlations are above (below) the diagonal.

Significant coefficients (*p* -value < 0.05) are in bold.

Model variables are defined in Appendix B.

Table 4: OLS Analysis of the Change in CEO Compensation Over the Pre-Fraud and Fraud Periods

$$\begin{aligned} \text{Ln}(\text{Total Pay}_{i,t}) &= \alpha + \beta_1 \text{NEM}_{i,t-1} + \beta_2 \text{FraudPeriod}_{i,t-1} + \beta_3 (\text{NEM}_{i,t-1} * \text{FraudPeriod}_{i,t-1}) + \beta_4 \text{Ln}(\text{Sales}_{i,t-1}) + \beta_5 \text{BM}_{i,t-1} + \beta_6 \text{Return}_{i,t-1} \\ &+ \beta_7 \text{Return}_{i,t} + \beta_8 \text{Leverage}_{i,t-1} + \beta_9 \text{ROA}_{i,t-1} + \beta_{10} \text{ROA}_{i,t} + \beta_{11} \text{Volatility}_{i,t-1} + \beta_{12} \text{Cash}_{i,t-1} + \beta_{13} \text{CAPEX}_{i,t-1} + \beta_{14} \text{R\&D}_{i,t-1} \\ &+ \beta_{15} \text{Firm Age}_{i,t-1} + \beta_{16} \text{RelativePerf}_{i,t-1} + \varepsilon_{i,t} \end{aligned}$$

		Ln(Total Pay _{i,t})
NEM _{t-1}	β ₁	-0.352 *** (0.00)
FraudPeriod _{t-1}	β ₂	-0.268 ** (0.05)
NEM _{t-1} *FraudPeriod _{t-1}	β ₃	0.100 0.475
Ln(sales _{t-1})	β ₄	0.418 *** (0.00)
BM _{t-1}	β ₅	-0.463 *** (0.00)
Return _{t-1}	β ₆	0.174 *** (0.00)
Return _t	β ₇	0.317 *** (0.00)
Leverage _{t-1}	β ₈	0.650 *** (0.00)
ROA _{t-1}	β ₉	-0.453 (0.25)
ROA _t	β ₁₀	-1.482 (0.12)
Volatility _{t-1}	β ₁₁	2.578 ** (0.01)
Cash _{t-1}	β ₁₂	0.757 ** (0.04)
CAPX _{t-1}	β ₁₃	0.802 (0.29)
R&D _{t-1}	β ₁₄	3.692 *** (0.00)
Firm age _{t-1}	β ₁₅	0.036 (0.62)
RelativePerf _{t-1}	β ₁₆	1.444 * (0.09)
Intercept	α	3.656 *** (0.00)
Wald Test Results		
β ₂ + β ₃ (H1)		-0.169 *** (0.01)
β ₁ + β ₃		-0.252 * (0.08)
Year fixed effects		Yes
R ²		0.46
No. of observations		1,538

Variable definitions: the CEO's total annual compensation during the fiscal year t (*Total Pay*); classification as a non-earnings manager (NEM); classification as a fraud-period year (FraudPeriod); total revenues for the fiscal year (*Sales*); the ratio of the book value of equity to the market value of equity at the end of the fiscal year (*BM*); the cumulative stock return during the fiscal year (*Return*); the ratio of book value of debt to assets (*Leverage*); the return on average assets (*ROA*); the standard deviation of monthly stock returns for the prior 60 months (*Volatility*); cash plus short-term investments normalized by the book value of total assets at the end of the year (*Cash*); capital expenditures normalized by the book value of total assets at the end of the year (*CAPX*); R&D expenditures normalized by the book value of total assets at the end of the year (*R&D*); the number of years since a firm appears in CRSP (*Firm Age*); the difference between the firm's ROA and the median ROA for its industry peers, where an industry is classified using the first two digits of a firm's SIC code (*RelativePerf*). All continuous variables are winsorized at their 1st and 99th percentiles. p -values are reported below coefficient estimates in parentheses and are calculated based on robust standard errors clustered by firm. Statistical significance (two-sided) at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Table 5: OLS Analysis of the Change in the Implied Cost of Equity Capital Over the Pre-Fraud and Fraud Periods

$$Re_t = \alpha + \beta_1 NEM_t + \beta_2 FraudPeriod_t + \beta_3 NEM_t * FraudPeriod_t + \beta_4 Beta_t + \beta_5 Volatility_t + \beta_6 Ln(MVE_t) + \beta_7 BM_t + \beta_8 Leverage_t + \beta_9 LTG_t + \varepsilon_t$$

		Re _t
NEM _t	β ₁	1.103 *** (0.00)
FraudPeriod _t	β ₂	0.739 * (0.097)
NEM _t *FraudPeriod _t	β ₃	-0.482 (0.25)
Beta _t	β ₄	0.217 (0.40)
Volatility _t	β ₅	1.947 (0.66)
Ln(MVE _t)	β ₆	-0.500 *** (0.00)
BM _t	β ₇	2.333 *** (0.00)
Leverage _t	β ₈	1.641 ** (0.04)
LTG _t	β ₉	0.123 *** (0.00)
Intercept	α	7.731 *** (0.00)
Wald Test Results		
β ₂ + β ₃ (H2)		0.257 (0.39)
β ₁ + β ₃		0.620 * (0.09)
Year fixed effects		Yes
Industry fixed effects		Yes
Adjusted R ²		0.29
No. of observations		2,628

Variable definitions: estimation of the implied cost of equity following Gebhardt, Lee, and Swaminathan (*Re*); systematic risk estimated by regressing monthly individual stock returns over the 60 months ending with the firm's fiscal year on the market risk premium (*Beta*); the market value of equity (*MVE*); the mean analyst forecast of the long-term earnings growth rate (*LTG*). All other variables are as defined in previous tables. All continuous variables are winsorized at their 1st and 99th percentiles. *p-values* are reported below coefficient estimates in parentheses and are calculated based on robust standard errors clustered by firm. Statistical significance (two-sided) at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.

Table 6: Ordered Logit Analysis of Credit Ratings Changes Over the Pre-Fraud and Fraud Periods

$$R\Delta Rating_{i,t+1} = \alpha + \beta_1 NEM_{i,t} + \beta_2 FraudPeriod_t + \beta_3 NEM_t * FraudPeriod_t + \beta_4 \Delta CFO_{i,t} + \beta_5 \Delta StdROA_{i,t} + \beta_6 \Delta Times_{i,t} + \beta_7 \Delta R\&D_{i,t} + \beta_8 \Delta StdRet_{i,t} + \beta_9 \Delta BM_{i,t} + \beta_{10} \Delta Size_{i,t} + \beta_{11} \Delta Lev_{i,t} + \varepsilon_{i,t}$$

		<u>$\Delta Rating_{t+1}$</u>
NEM _t	β_1	0.501 (0.25)
FraudPeriod _t	β_2	0.189 (0.70)
NEM _t *FraudPeriod _t	β_3	-0.288 (0.57)
ΔCFO_t	β_4	-3.150 ** (0.03)
$\Delta StdROA_t$	β_5	0.195 (0.98)
$\Delta Times_t$	β_6	-0.915 *** (0.00)
ΔRND_t	β_7	-12.795 (0.62)
$\Delta StdRET_t$	β_8	34.237 ** (0.01)
ΔBM_t	β_9	0.463 * (0.07)
$\Delta Size_t$	β_{10}	0.143 (0.72)
ΔLev_t	β_{11}	0.271 (0.82)
<u>Wald Test Results</u>		
$\beta_2 + \beta_3$ (H3)		-0.100 (0.68)
$\beta_1 + \beta_3$		0.213 (0.45)
Year fixed effects		Yes
Pseudo R ²		0.06
No. of observations		828

Variable definitions: the firm's Standard & Poor's senior debt rating in year t, where I have employed Jiang's numerical transformation of debt ratings (*Rating*); operating cash flows in year t deflated by total assets (*CFO*); the standard deviation of the firm's ROA calculated using five years' data from year t-4 to t (*StdROA*), where ROA is net income before extraordinary items deflated by total assets; the natural log of (1 + times-to-interest-earned ratio), where the times-to-interest-earned ratio is the firm's operating income before depreciation and interest expense divided by interest expense (*Times*); the firm's research and development expense in year t deflated by total assets (RND); the standard deviation of the firm's stock returns during year t (*StdRET*); the natural log of the firm's book value of equity divided by its market value of equity (*BM*); the natural log of the firm's total assets (*Size*); the firm's long-term debt divided by total assets (*Lev*). All other variables are as defined in previous tables. All continuous variables are winsorized at their 1st and 99th percentiles. *p-values* are reported below coefficient estimates in parentheses and are based on robust standard errors. Statistical significance (two-sided) at the 10%, 5%, and 1% levels are denoted by *, **, and ***, respectively.