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# The Impact of Accounting and Auditing Enforcement Releases on Firms' Cost of Equity

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THE IMPACT OF *ACCOUNTING AND AUDITING ENFORCEMENT RELEASES*  
ON FIRMS' COST OF EQUITY CAPITAL

by

CURTIS MICHAEL NICHOLLS

B.S., Brigham Young University, 2001

A thesis submitted to the  
Faculty of the Graduate School of the  
University of Colorado in partial fulfillment  
of the requirement for the degree of  
Doctor of Philosophy  
Department of Accounting and Business Law

2010

This thesis entitled:  
The Impact of *Accounting and Auditing Enforcement Releases* on  
Firms' Cost of Equity Capital  
written by Curtis Michael Nicholls  
has been approved for the Department of Accounting and Business Law

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Steven Rock

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Katherine Gunny

Date\_\_\_\_\_

The final copy of this thesis has been examined by the signatories, and we  
Find that both the content and the form meet acceptable presentation standards  
Of scholarly work in the above mentioned discipline.

## ABSTRACT

Nicholls, Curtis Michael (Ph.D., Accounting, Department of Accounting and Business  
Law)

The Impact of *Accounting and Auditing Enforcement Releases* on Firms' Cost of Equity  
Capital

Thesis directed by Associate Professor Steven Rock

I study the impact of an SEC investigation (as captured by *Accounting and Auditing Enforcement Releases*, or *AAERs*) on a firm's cost of equity capital. *AAERs* are often used in accounting literature as a proxy for fraudulent financial reporting. Fraudulent financial reporting should lead to an increase in cost of equity capital as a firm's future cash flows become less certain. Several factors could contribute to the increase in risk surrounding future cash flows, such as renegotiation of contracts with the firm's suppliers and lenders, or a decrease in the reliability of management disclosures. Cross-sectional variation likely exists in the relation between receiving an *AAER* and firms' cost of equity capital. One attribute of that variation may be the 'severity' of the *AAER*. Using shareholder lawsuits, management turnover, core earnings and auditor censure, I attempt to correlate the severity of the *AAER* with changes in cost of equity capital. The economic consequences of accounting-related enforcement actions as captured by my study should be of interest to analysts selecting a discount rate to apply to future earnings in determining target prices, regulators interested in the impact of

regulatory action and the effectiveness of the SEC, and academics interested in measuring the impact of accounting-related government regulation and the performance of cost of equity capital measures in capturing expected changes in discount rates.

Overall, I find that my study provides evidence of changes in cost of equity capital for firms targeted by an SEC *AAER* on the date the investigation is first made public. Multivariate tests of changes in cost of equity capital surrounding *AAER* issue dates do not yield changes in cost of equity capital that differ from the corresponding change for a matched sample of firms. Furthermore, I do not find an association between the ‘severity’ of an *AAER* and the change in cost of equity capital for sample firms.

## **DEDICATION**

To Cammie, Joshua, Andrew, Ty, and Clark, for their willing sacrifice throughout all the years it took us to get here. Also dedicated to Steve Thomas who saved me from missing out on the best two years.

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## CHAPTER 1

### INTRODUCTION

I study the impact of SEC investigations (as indicated by SEC *Accounting and Auditing Releases*, or *AAERs*) on a company's cost of equity capital. Prior academic research analyzes the impact of *AAERs* on share price [(e.g., Feroz *et al.* (1991) and Karpoff *et al.* (2008)] and documents the types of investigations that are more likely to result in subsequent litigation against the firm's auditor (Bonner *et al.* 1998). Several studies use *AAERs* as a proxy for fraudulent financial reporting.<sup>1</sup> In a related stream, recent research studies the impact of earnings restatements on cost of equity capital (Hribar and Jenkins 2004), indicating that an earnings restatement increases the cost of equity capital. While these studies and others examine SEC investigations or use such investigations as a proxy for fraudulent activity, the impact of an *AAER* on a company's cost of equity capital remains undocumented.

Though my study does not directly examine earnings restatements, it extends research relating to the impact of an earnings restatement on cost of equity capital (Hribar and Jenkins 2004) by focusing on a specific set of firms accused of fraudulent financial reporting. Hribar and Jenkins (2004) do not distinguish their sample firms' intent in originally misreporting financial results. Research by Hennes *et al.* (2008) suggests that earnings restatements can be the result of unintentional misreporting (accounting errors) or intentional misreporting (accounting

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<sup>1</sup> e.g., Dechow *et al.* (1996), Beneish (1997 and 1999), Hennes *et al.* (2008) and Dechow *et al.* (2008).

irregularities). My study furthers this stream of research by focusing on a specific group of firms cited by the SEC for fraudulent misreporting of financial results.

Beginning with the Sarbanes-Oxley Act passed in 2002, the past few years have seen a significant increase in government regulation centered on financial reporting. SEC investigations culminating in an *AAER* increased dramatically in 2002 (by 28% over 2001 cases) and have maintained increased levels in subsequent years. The chairman of the SEC, Christopher Cox, called 2006 ‘a banner year for enforcement’ (Hume 2006) citing its perfect court record during the year and two record settlements (related to AIG and Fannie Mae). Recently appointed SEC chairman Mary Schapiro suggests that she will seek to expand the responsibilities and funding of the SEC (Ackerman 2009), aiming to further increase its enforcement capacity. Given the increase in government regulation and oversight, this study is a timely review of the repercussions of company actions that lead to government sanctions.

This study also attempts to measure the severity of the fraud underlying the SEC investigation and test for its differential impact on targeted firms’ cost of equity capital. Several prominent accounting scandals involving financial misreporting have gained widespread press coverage over the past decade. For example, in 2002, auditors at WorldCom uncovered financial misreporting in excess of \$3.8 billion (Pulliam and Solomon 2002), prompting an immediate SEC investigation which culminated in a settlement payment to the SEC of \$750 million and WorldCom’s eventual bankruptcy (*AAER*-1811). *AAERs* can also target other corporate actions such as backdating stock options. Pediatrix Medical Group provides a recent example in which the SEC cited the firm for backdating stock options. By failing to recognize employee expenses associated with the stock options (by selecting favorable option grant dates), Pediatrix Medical Group overstated earnings by \$8.8 million (6.4 percent of net income) (*AAER*-

2943). The \$3.8 billion WorldCom fraud is many orders of magnitude higher than option backdating at Pediatrix Medical Group and thus likely to result in greater consequences. This dissertation also attempts to capture the impact of the perceived difference in severity on a firm's cost of equity capital.

My study also offers indirect evidence of the SEC's effectiveness in addressing emerging areas of fraudulent reporting. The SEC's stated intent in issuing *AAERs* is to curtail fraudulent accounting activity by sending a clear message to the market indicating types of reporting that the SEC finds illegal (Feroz *et al.* 1991). If investigated firms suffer an increased cost of equity capital, then managers' incentives to avoid fraudulent behavior become stronger, providing evidence that the SEC's enforcement action is achieving the desired result: a curtailment of fraudulent financial reporting at publicly-traded firms (SEC 2008).

This study should be of interest to regulators interested in the impact of regulatory action as they consider future enforcement actions and directives. The insights gained here could help regulators evaluate the effectiveness of recent changes introduced at the SEC.<sup>2</sup> Analysts should find aspects of this study interesting when refining the discount factor applied to a firm after it has been targeted by an SEC investigation by using this study's results related to severity. Both academics interested in measuring the cost to a firm for engaging in fraudulent behavior subsequently sanctioned by the SEC, as well as academics interested in the ability of the employed cost of equity capital measures to capture the expected change in discount rates, should also find this study of interest.

Using a composite measure for cost of equity capital and the first public disclosure of an investigation, I find that a firm's cost of equity capital does change significantly as a result of an

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<sup>2</sup> For example, the SEC recently announced the creation of teams of specialists focused on specific types of fraud in response to criticisms that its current, more general staff has difficulty identifying fraud involving complex transactions (Scannell 2009).

SEC investigation, relative to matched firms not subject to an SEC investigation. My results do not indicate a differential impact on firms' cost of equity capital in the period surrounding the issuance of an *AAER*, again relative to a matched sample of firms that do not receive an *AAER*. The results are robust to using individual measures of cost of equity capital. Multivariate testing of the differential impact of proxies of severity, which include shareholder lawsuits, management turnover, auditor censure, and impact on core earnings, do not provide evidence that the severity of the fraudulent behavior is associated with the change in equity capital at a firm targeted by an *AAER*. Empirical results of severity hold for both the investigation date and the *AAER* issue date.

The remainder of this dissertation is organized as follows: Chapter 2 reviews existing literature related to SEC investigations and restatements, Chapter 3 develops the hypotheses tested in this paper, Chapter 4 outlines the methodology I use to test the impact of SEC *AAERs* on a firm's cost of equity capital including the development of the various cost of equity capital measures, Chapter 5 reports results of empirical testing and tests of robustness, Chapter 6 offers concluding remarks and suggestions for future research, and the appendix reviews a selection of papers related to the evaluation of the cost of equity capital measures and suggestions for improving the measures.



## CHAPTER 2

### II. EXISTING LITERATURE

#### 2.1 ACCOUNTING AND AUDITING ENFORCEMENT RELEASES

Introduced in 1982, *Accounting and Auditing Enforcement Releases (AAERs)* were initiated by the SEC to replace *Accounting Series Releases* (Feroz *et al.* 1991). The stated purpose of the *AAER* series is “to enable interested persons to easily distinguish enforcement releases involving *accountants* from other Commission releases” (AAER-1).

Typically, enforcement actions that involve accountants are related to financial reporting, which has led to a number of studies using *AAERs* as a proxy for fraudulent reporting; examples include Dechow *et al.* (1996), Beneish (1997 and 1999), Dechow *et al.* (2008) and Hennes *et al.* (2008). Other enforcement actions are often issued in conjunction with *AAERs* and can relate to a wide assortment of illegal behavior (e.g., insider trading, tax evasion).

Bonner *et al.* (1998) evaluate *AAERs* by examining the types of fraudulent activity cited and find that litigation against the firm’s auditor is more likely to arise when the fraudulent behavior relates to fictitious transactions or in instances when the fraudulent reporting is common in nature.<sup>3</sup> Geiger *et al.* (2007) use *AAERs* as a proxy for lower financial reporting quality in a study examining company hiring of former external auditors. The primary focus of Geiger *et al.* (2007) is the pre-SOX practice of “revolving door” hires: the employment of

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<sup>3</sup> Bonner *et al.* (1998) suggest an increase in revenue or decrease in expenses as an example of common fraudulent activities, as opposed to overstating accounts payable as an example of uncommon fraudulent behavior.

individuals from the company's external auditors as accounting or finance executives.<sup>4</sup> Geiger *et al.* (2007) find that 'revolving door' hires comprise a small percent of hires made in the period 1985-2002; furthermore the market views these hires favorably for small companies (evidenced by 3-day cumulative abnormal returns surrounding the announcement of the hire). Geiger *et al.* (2007) extend their research by examining post-hiring financial reporting quality, with *AAER*'s and abnormal accruals providing alternative proxies for financial reporting quality. The authors document that "revolving door" hires do not appear to be associated with lower financial reporting quality.

Feroz *et al.* (1991) (hereafter FPP) examine 224 *AAERs* issued from 1982 to 1989 and find that the majority of releases are related to overstatements that ultimately impact income, with average downward income restatements of over 50 percent. Furthermore, FPP find that top management changed, through attrition or dismissal, for 72 percent of the sample firms, and that 81 percent were targeted by shareholder lawsuits, additional indications that the market, and firms' boards, react negatively to SEC investigations. FPP also find a substantial negative market reaction to *AAERs*, with two-day negative abnormal returns averaging about 13 percent.

The SEC selects cases based on its ability to successfully prosecute and the potential market message produced by issuing the *AAER* (Feroz *et al.* 1991).<sup>5</sup> The SEC's success rate<sup>6</sup> exceeded 90 percent during the period 2004-2007, the most recent period for which success rates are available (across all investigations, including investigations into areas outside of accounting) (SEC 2008). *AAERs* are filed in successful accounting-related investigations, with the typical

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<sup>4</sup> The Sarbanes-Oxley Act of 2002 barred "revolving door" hires by preventing audit firms from auditing firms in which a company executive performed audit services for the firm within the previous one-year period (SEC 2003).

<sup>5</sup> 'Market message' is defined by the ability of the investigation to address current and emerging disclosure issues as well as the targeted firm's level of visibility in the market (Feroz *et al.* 1991).

<sup>6</sup> Success rate is determined by litigation successfully levied against the offender (SEC 2008).

*AAER* outlining the action or settlement and details of the fraudulent behavior, often including financial figures.<sup>7</sup>

By initiating an investigation into a company, the SEC provides disclosure to the market of suspected fraudulent behavior. Assuming the SEC is successful, future earnings of the targeted firm become more risky, as the firm will likely cease income-increasing fraudulent activities, as well as restate past earnings, a key predictor of expected future earnings. Feroz *et al.* (1991) reveal the additional company risk stemming from the investigation announcement by documenting abnormal returns. As noted above, FPP find two-day abnormal negative returns of about 13 percent surrounding the initial announcement of the SEC investigation. Feroz *et al.* (1991) further examine the cumulative abnormal return surrounding the SEC investigation announcement for firms that previously disclosed accounting concerns. The cumulative abnormal return for this subsample is about -6.0 percent in days  $\{-1,0\}$ . Feroz *et al.* (1991) conclude:

This implies that the market reacts negatively to the SEC's investigation, even with prior knowledge of the error. This incremental market effect of investigations may be related to negative publicity and the impact of the SEC's position on future third-party lawsuits. At a minimum, the ability of the SEC investigations to affect targets' market prices indicates that the agency possesses a viable sanction because managers have market-based incentives to avoid investigations. (Feroz *et al.* 1991, p. 124)

Karpoff *et al.* (2008) (hereafter KLM) extend this stream of research by studying a sample of SEC and Department of Justice enforcement actions issued from 1978 to 2002. Similar to Feroz *et al.* (1991), KLM find a significant decline in one-day market-adjusted returns surrounding what the authors classify as the 'trigger event', the first public indication of the enforcement action. The most common 'trigger events' include company restatements, company

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<sup>7</sup> All *AAERs* are assigned an associated litigation number by the SEC. A manual check confirmed that all *AAERs* within the sample contain an associated litigation number. Furthermore, a manual search of the targeted firms confirmed that no targeted firm was first targeted by SEC litigation which preempted the *AAER*.

announcements of irregularities or government inquiries, class-action filings, auditor departures, and unusual trading activity.<sup>8</sup> KLM suggest three components to the market loss associated with the enforcement action. First, KLM note a market loss related to the correction of reported financial results. The authors measure the market loss by applying the market-to-book and price-earnings ratios from before the enforcement action to the restated results. For example, consider a firm with reported earnings of \$1 per share and a price-earnings ratio of 10 (share price of \$10) before restating earnings. After restating earnings, the corrected earnings-per-share equals \$0.50. Applying the pre-restatement P/E ratio (10) to the corrected EPS, the resulting share price is \$5 per share, a decline in share price of 50 percent. Next, KLM measure the expected government fines and lawsuit damages. After measuring these two components, KLM find that a significant amount of market loss is still unaccounted for, which the authors attribute to reputational loss. KLM suggest the lost reputation results in renegotiations with suppliers and lenders that will increase the cost of operations and cost of capital.

KLM rely on an important assumption in applying pre-restatement ratios to post-restatement prices and earnings. KLM assume that the trigger event does not change the expected risk and subsequent ratios applied to the identified firm, which allows the application of pre-restatement ratios to restated results. This study differs from KLM by attempting to capture the changes in risk surrounding future cash flows, as indicated by a change in the discount factor applied to cash flows (or cash flow proxies) used in determining a firm's market price. In other words, an *AAER* or factors leading to an *AAER*, likely cause a change in the rate used to discount future cash flows or similarly, the P/E multiple, both of which are not addressed in the KLM study.

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<sup>8</sup> Other 'trigger events' documented by KLM include 'investigations by other federal agencies..., delayed SEC filings, management departures, whistleblower charges, and routine reviews by the SEC.' (Karpoff *et al.* 2008, p. 587)

Similar to KLM, Murphy *et al.* (2007) examine cases of corporate misconduct reported in the *The Wall Street Journal Index*. The authors test the impact of corporate misconduct on firm's future profitability and cost of equity capital. Two features distinguish this dissertation from Murphy *et al.* (2007). First, their measure of profitability and cost of equity capital include changes in earnings, EBIDTA, earnings forecast dispersion, and stock return volatility, but do not directly include cost of equity capital measures. Second, the authors do not exclusively focus on events involving fraudulent reporting, instead they consider any form of misconduct (e.g., antitrust, bribery, price-fixing). Murphy *et al.*'s (2007) results mirror those documented by Feroz *et al.* (1991) and Karpoff *et al.* (2008): corporate misconduct negatively impacts cited firms, with decreases in expected earnings and increases in stock return volatility surrounding the misconduct.

Murphy *et al.*'s (2007) findings are subject to alternative explanations: by selecting a sample based on a news agency's reporting, the sample is potentially biased by any predisposition of the agency's employed reporters. Furthermore, the sample contains any form of news related to a wide range of topics classified as 'corporate misconduct',<sup>9</sup> which is a sub-sample of the larger body of any negative news reported about a firm. Murphy *et al.*'s (2007) results could be capturing the market's negative reaction to bad news. This dissertation focuses on a specific set of firms clearly distinguished, or marked, for fraudulent behavior, avoiding the potential bias introduced by reliance on a news agency for reporting violations. In addition, by using SEC *AAERs* to identify firms, this dissertation focuses on bad news specifically related to fraudulent financial reporting.

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<sup>9</sup> Murphy *et al.* (2007) define corporate misconduct as "the subject keywords adopted by *The Wall Street Journal Index* such as, antitrust, breach of contract, bribery, business ethics, conflict of interest, copyright/patent infringement, fraud, kickbacks, price-fixing, securities fraud, and white-collar crime" (Murphy *et al.*, 2007, p. 5).

## 2.2 RESEARCH RELATED TO FINANCIAL MISREPORTING

A large body of relevant accounting research examines the causes and consequences of earnings restatements. Hribar and Jenkins (2004) provide the most closely-related study to this dissertation, using three of the cost of equity capital measures outlined in Chapter V to evaluate the impact of an earnings restatement on a restating firm's cost of equity capital. The authors document a significant increase in restaters' cost of equity capital (with average increases ranging from 7 to 19% depending on the model of cost of equity capital).

This paper differs from Hribar and Jenkins (2004) (hereafter HJ) along several important dimensions. First, HJ evaluate the impact of restatements without consideration of the nature of the restatement. As described earlier, Hennes *et al.* (2008) (hereafter HLM) suggest that all restatements do not represent intentional misrepresentation of financial results. HLM develop a system to separately identify a restatement that results from intentional misreporting (irregularities) as opposed to unintentional misreporting (errors). HLM's system of capture includes examining individual restatements for the presence of the words 'fraud' or 'irregularity', identifying firms that undergo additional investigations into the source of the restatement, and including firms targeted by SEC or DOJ investigations. Using a sample of restatements in the period 2002 to 2005, HLM find that 24 percent of the restatements included are the result of accounting irregularities (intentional misreporting). HLM then utilize their subsample of firms to document more severe market reactions (measured as negative cumulative abnormal returns surrounding the restatement), increased likelihood of civil lawsuits levied against the firm, and increased likelihood of management turnover relative to firms that restated financial reporting unrelated to irregularities. HLM's results provide strong evidence that firms engaging in fraudulent behavior face less forgiving consequences. My dissertation attempts to

capture the ‘fraudulent’ component of restatements which are not separately considered in Hribar and Jenkins’ (2004) related cost of equity capital research.

Another distinction of this study from Hribar and Jenkins (2004) is that while HJ include an indicator variable for SEC-initiated restatements, they do not attempt to capture firms that may have misled the market via mechanisms other than income or income-related accounts, which likely still have implications for risk. Companies receiving an SEC *AAER* may be required to restate balance sheet information or be cited for misbehavior that does not require any restatement of financial data. HJ do not find that SEC initiation of a restatement impacts cost of equity capital (when controlling for other factors). In fact, according to HJ, only restatements initiated by a company itself or its auditor differentially impact the cost of equity capital.<sup>10</sup>

In Kasznik’s (2004) discussion of HJ, he notes several challenges to HJ’s findings. First, Kasznik documents the downward revision in analyst forecasts over the forecast horizon for the entire I/B/E/S universe of firms during HJ’s test period. By using the sample firms in prior periods as their own match, HJ increase the likelihood that cost of equity capital changes over the event period as analyst forecasts were revised downward for firms on average. This study addresses the bias from downward forecast revision by using a matched sample. The matched firm will likely incur its ‘normal’ downward revision, allowing me to isolate the investigated firm’s downward revision. Next, Kasznik suggests that restatements, which often follow the announcement of SEC investigations or delayed government filings, decrease the risk or uncertainty surrounding a firm’s future cash flows. If an earnings restatement does *decrease* the risk surrounding a firm’s future cash flows, then the cost of equity capital measures’ ability to proxy for risk becomes less clear in the context of restatements. Kasznik (2004) argues that the

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<sup>10</sup> Initiation by the company or auditor increases the cost of equity capital beyond increases associated with SEC initiation or an unidentified initiator.

restatement announcement itself generates the increased risk surrounding future cash flows as the market is uncertain of the extent and nature of possible a restatement. My study builds on Kasznik's (2004) argument by focusing on both the investigation announcement, an event that more clearly creates greater uncertainty about future cash flows, and the subsequent issue of the related SEC *AAER*.



## CHAPTER 3

### HYPOTHESIS DEVELOPMENT

Feroz *et al.* (1991) document negative consequences associated with firms receiving *AAERs* including shareholder lawsuits, management turnover, and declining market value. These results indicate that the market punishes firms that are caught reporting fraudulent financial results. The decline in market value is the possible result of several factors; for example, many market valuation models assume past performance is a determinant in future profitability. Restatements cause the inputs in such valuations to change, resulting in a revision in the expected future profitability. Furthermore, valuations based on ratio analysis would also require revisions as the ratios are adjusted for the corrected financial data. The firm may also be impacted by violation of debt covenants and changes in future contracting.

Central to the decline in market value associated with an *AAER* is an increase in the risk surrounding future cash flows. KLM suggest the higher cost of capital is a result of contracting changes with suppliers, buyers, and lenders, as these interested parties adjust expectations about the company's reliability, capacity to fill future orders, and ability to service debt. Future cash flows become less predictable and more risky because the contracting changes are not immediately clear. In addition to contracting changes, the firm may be subjected to related shareholder lawsuits and government penalties which may or may not be estimable from the commencement of the SEC's investigation. Focusing on the commencement of the SEC's

investigation is critical to this hypothesis as the implications for cost of equity capital change once the SEC issues its findings.

The increase in cost of equity capital hypothesized is based on recent research indicating that firm-specific information risk is a non-diversifiable risk factor in determining firms' cost of equity capital. Easley and O'Hara (2004) document that "information asymmetry between informed (those with private information) and uninformed (those with only public information) investors causes both the quality and quantity of information available to investors to affect the required rate of return and, in turn, the cost of capital" (Kravet and Shevlin 2010, p. 265) This information asymmetry argument is applied to earnings restatements by Kravet and Shevlin with the following: "when firms restate their financial statements, investors reassess their perceptions of those firms' financial information" (Kravet and Shevlin, 2010, p. 265). Using the restatement literature presented in Chapter 2, I apply Kravet and Shevlin's argument that the announcement of an SEC investigation causes a "decrease in the credibility of management and an increase in investors' concerns that management is opportunistically making accounting decisions" (Kravet and Shevlin, 2010, p. 265), which leads to an increase in the information risk of the firm.

Measuring the change in cost of equity capital related to the SEC's investigation as detailed above is the foundation for my first hypothesis, stated in the alternative form:

***H1.1:** Firms convicted of fraudulent financial reporting, as indicated ex-post by an SEC Accounting and Auditing Enforcement Release (AAER), will experience an increase in cost of equity capital surrounding the public announcement of an **investigation** by the SEC.*

Complicating the timing of expected impacts is the presence of a related restatement issued by the targeted firm which preempts the announcement of an SEC investigation. As indicated earlier, firms issuing a restatement appear to bear an increased cost of equity capital (Hribar and Jenkins 2004) independent of the underlying cause of the restatement. By identifying

the underlying cause of individual restatements, Hennes *et al.* (2008) find a more pronounced decrease in a firm's stock price when its restatement is related to an accounting irregularity.

Figure 1 models the possible timing of restatements related to the announcement and subsequent issue of an SEC *AAER*. If a firm restates its financial reports, the restatement can occur before, in conjunction with, or subsequent to either the investigation announcement date or the *AAER* issue date. Based on Hribar and Jenkins (2004) and Hennes *et al.*'s (2008) findings, the market has likely increased a firm's cost of equity capital as a result of the financial restatement. Therefore, the subsequent announcement of an SEC investigation is likely attenuated by the preemptive restatement.

If a company issues a restatement in conjunction with the announcement of an SEC investigation, or following the announcement of an SEC investigation, the restatement likely contains additional information content, but should not impact prior announcements of SEC investigations. The SEC does not issue notices for unsuccessful closure of investigations, therefore the market could perceive a restatement as a successful resolution of the SEC investigation without an associated *AAER*. However, the market could also perceive the restatement as confirmation of fraudulent behavior and expect a subsequent *AAER*.<sup>11</sup>

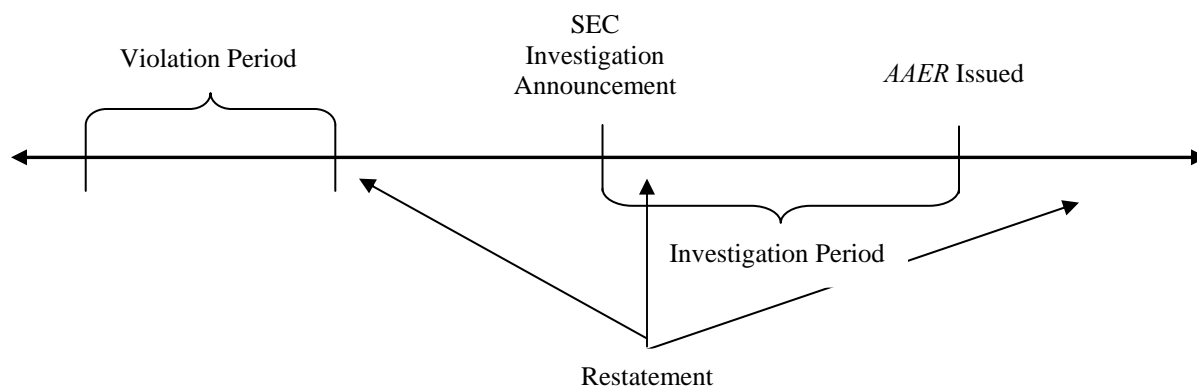
The complications introduced by a related restatement form the core of hypothesis *H1.2*:

***H1.2:*** *The magnitude of change in a fraudulent (identified via a subsequent SEC AAER) firm's cost of equity capital surrounding the announcement of an SEC investigation will be decreased by a preemptive restatement.*

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<sup>11</sup> Because my sample employs *AAER* issuances to identify firms, my study does not capture information related to firms investigated by the SEC that do not receive a subsequent *AAER*

FIGURE 1

**Timeline of AAERs and Associated Events**

Paralleling the impact of the announcement of an SEC investigation, the bookend event: closure of the investigation indicated by the issuance of an *AAER*, may also impact a firm's cost of equity capital. Upon announcement of the SEC's investigation, the company faces a variety of financial and legal challenges, including the possibility of civil lawsuits, adverse market reaction, and the considerable resources of the SEC's investigation, all of which contribute to the change in cost of equity capital hypothesized in hypotheses *H1.1* and *H1.2* above. If the SEC unsuccessfully investigates the company, or uses other means to settle the investigation (e.g., a deferred prosecution agreement),<sup>12</sup> then the market receives no formal indication of the conclusion. If the SEC successfully investigates the company and subsequently issues their findings in an *AAER*, the market receives formal information related to the conclusion of the SEC's investigation. The *AAER* provides details of the company's fraudulent behavior, possibly providing additional information for civil lawsuits and criminal investigations, thereby increasing the riskiness associated with future cash flows.

My second hypothesis, stated in the alternative form, attempts to capture this uncertainty initiated by the release of an SEC *AAER*:

***H2.1:*** *Firms convicted of fraudulent financial reporting, as indicated ex-post by an SEC Accounting and Auditing Enforcement Release (AAER), will experience an increase in cost of equity capital surrounding the issuance of an SEC AAER.*

As previously outlined, a related restatement of financial statements by the targeted firm provides additional information to the market. The timing of the restatement in relation to the issuance of the *AAER* is again critical to assessing the information delivered to the market. If the restatement arrives before the *AAER*, it could preempt the information content of the *AAER*,

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<sup>12</sup> A deferred prosecution agreement includes a form of settlement without court proceedings, similar to the agreement reached between KPMG, the Department of Justice, and the IRS in 2005. KPMG admitted to creating phony tax shelters and agreed to pay \$456 million in restitution (IRS 2005). Thanks to Professor Lance Cole for indicating deferred prosecution agreements as an alternative to *AAERs* as an investigation resolution.

thereby negatively attenuating the impact of the *AAER*. If the restatement occurs in conjunction with, or following, the *AAER* issuance, it likely does not impact the change in cost of equity capital surrounding the issuance of the *AAER*. Hypothesis *H2.2* endeavors to measure the additional implications of a related restatement of financial statements:

***H2.2:*** *The magnitude of change in a fraudulent firm's cost of equity capital surrounding the issuance of an SEC AAER will be decreased by a preemptive restatement.*

In summary, two dates related to the SEC's decision to investigate a company become relevant in examining the impact of the investigation. First, the date the SEC initially announces its intent to investigate a firm, and second, the date the SEC concludes its investigation by issuing an *AAER*.

As documented by Feroz *et al.* (1991), not all *AAERs* result in shareholder lawsuits, management turnover, or auditor censure. This suggests that interested parties assign a measure of severity to the *AAER* and subsequently take action if they find the fraudulent reporting to be of an adequate level to warrant action. Shareholders must weigh the cost of litigation against their probability of success; more extreme cases of fraudulence likely result in a higher probability of success for shareholder lawsuits. In the case of management turnover, if the board believes current management is responsible for the government sanction and the behavior is egregious enough, they will replace management. Finally, the government assesses the auditor's role in fraudulent reporting to determine the need to censure the auditor via additional litigation.<sup>13</sup>

Each of these situations adds a level of severity to the *AAER*, increasing the potential impact on the firm's cost of equity capital. My final hypothesis, stated in alternative form, examines this role of severity in determining the change in cost of equity capital:

***H3:*** *The increase in cost of equity capital will be greater when the fraudulent reporting is more severe.*

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<sup>13</sup> Auditor censure typically takes the form of an additional *AAER* filed against the company's external auditor.

Mirroring my outlook captured by hypotheses *H1.1* and *H2.1*, my hypothesis related to severity applies to both the **investigation announcement** and **AAER issue** dates as the severity of the investigation and associated *AAER* should be consistent for both dates. In other words, I test hypothesis *H3* in the periods surrounding both the investigation announcement and the *AAER* issue. Furthermore, analogous to the attenuation effect hypothesized in *H1.2* and *H2.2*, an associated restatement by the targeted firm before the event dates could provide preemptive information to the market, causing the market to adjust the firm's cost of equity capital in expectation of an SEC investigation. I control for the preemptive information provided by an associated restatement issued prior to the event date.

## CHAPTER 4

### METHODOLOGY

#### 4.1 SAMPLE SELECTION

To test my hypotheses, I begin with a sample of 454 unique firms targeted by an SEC *AAER* between December 1996 and August 2007. This sample of 454 firms includes 1,205 *AAERs*, resulting in an average of 2.7 *AAERs* issued per firm. After collecting the necessary data to calculate the variables included in my models, 156 firms with available data in both *Compustat* and *CRSP* remain.

Feroz *et al.* (1991) examine the date that the reporting violation begins, which is separate from the investigation announcement date. The mean interval between the reporting violation and the disclosure of the SEC investigation is ten months, with a range of zero days to four years. It is important to note that not all investigations result in an *AAER*; therefore, studying the initial date of reporting violations *does not* capture the impact of the SEC's decision to investigate the firm. This is an important distinction separating my study from Feroz *et al.* and Murphy *et al.* (2007), which captures any public disclosure of 'corporate wrongdoing', independent of regulatory action.

For each of the 156 firms, I manually collect the announcement date of the SEC's investigation via a Lexis/Nexis search covering the two years prior to the issuance of the *AAER*. The search is conducted using the search terms 'SEC investigation' coupled with the firm name,



and simply ‘SEC’ when the search including ‘investigation’ delivers no results. Search results including ‘SEC’ and ‘investigation’ in the two years prior to the *AAER* resulted in varying numbers of ‘hits’. In the case of high-profile companies, the search often resulted in hundreds of ‘hits’; for smaller firms, the search results were often inconclusive or limited in number. In the event that a search in the two years preceding the *AAER* issue did not provide an investigation date, I extended the search another two years. If no investigation announcement is discovered in the four years prior to the issue of an *AAER*, the firm is not included in the *investigation announcement* date sample.

Once the investigation dates are collected, I check for required *Compustat* and *CRSP* data for each of the 156 firms in the period surrounding the *investigation announcement* date and *issue* date. These data requirements cause the samples surrounding each of the dates to be different, as some firms have available data for one date and not the other.<sup>14</sup> The sample related to the *investigation announcement* date contains 64 firms from the original 454 firms, whereas the sample related to the *AAER issue* date contains 67 firms. The *investigation announcement* and *issue* date samples contain 49 common firms.<sup>15</sup>

Using the firms in the *investigation announcement* date sample, I collect a matched set of firms; matching on both size and industry. First, I narrow my search for a ‘control’ firm using the four-digit Standard Industry Classification code (per *Compustat*) to identify a possible set of matches. In all but one case I was able to find a suitable match within the first four digits of the assigned classification system; for the exception firm, no comparison firm existed within the

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<sup>14</sup> For example, *Sunbeam* contains the necessary forecasts and accounting data when the SEC investigation is announced. However, the SEC investigation and related restatements cause *Sunbeam* to enter bankruptcy and subsequent delisting (Atlas and Tanner 2001) before the SEC issues its *AAER*. *Sunbeam* is included in the *investigation announcement* date sample, but not in the subsequent *issue* date sample.

<sup>15</sup> Nine of the firms in the *investigation announcement* sample eventually declared bankruptcy (identified via *CRSP* delisting codes 552, 560, 561, 570, 574 and 584), four of which declared bankruptcy before the *AAER issue* date. The remaining five bankrupt firms are included in both samples.

group of firms matched on four digits, therefore I used only the first two digits to identify a set of appropriate match firms. Next, I sort the firms using market capitalization at the end of the firm's fiscal year prior to the event. I then assign the firm with the closest market capitalization to the 'treatment' firm as the 'control' firm.

Following the process used to collect the match sample for firms surrounding the *AAER* *issue* date, I collect a second matched sample based on both size (market capitalization) and industry (SIC codification). It is important to note that the control sample identified for the *AAER* *issue* date is different from the control sample selected for the sample of firms surrounding the *investigation announcement* date. For firms in both samples (the *investigation announcement* date and *AAER issue* date), it is possible to have a different matched firm as firm size for both 'treatment' and 'control' firms is subject to change between the event periods.<sup>16</sup>

## 4.2 MODELS

### 4.2.1 THE VARYING MODELS OF COST OF EQUITY CAPITAL

After I identify a matched sample, I calculate cost of equity capital using the composite method outlined at the end of this chapter. The composite measure of cost of equity capital<sup>17</sup> has been used in a number of recent studies which evaluate changes in cost of equity capital.<sup>18</sup> The composite measure of cost of equity capital is the average of four measures of cost of equity capital that have been used in various forms throughout the past several years in

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<sup>16</sup> No observations were dropped as a result of there being available information in the month prior to the event, but missing data in the month directly subsequent the event. Observations dropped due to missing information subsequent to the event could introduce a survivorship bias to the results.

<sup>17</sup> Firms' cost of capital is not restricted to equity capital. Modern finance theory often employs the Weighted Average Cost of Capital (WACC) when considering the cost of capital for a firm. WACC is calculated as  $\text{Cost of Equity} \times (\text{Equity} / (\text{Debt} + \text{Equity})) + \text{Cost of Debt} \times (1 - \text{Tax Rate}) \times (\text{Debt} / (\text{Debt} + \text{Equity}))$  (Ogier et al. 2004, p. 8). Because the cost of equity is a core component in calculating WACC, any change in Cost of Equity will impact the firm's WACC. Therefore, a change in cost of equity is sufficient in signifying a change in a firm's WACC.

<sup>18</sup> Examples include Dhaliwal, Heitzman and Li (2006), Hail and Leuz (2006), Cheng and Lin (2008) and Li (2010).

published accounting research. The validity and usefulness of the four measures, as well as the composite, are widely debated and often discounted.<sup>19</sup> The purpose of this paper is not to evaluate the measures, but instead to measure the impact of *AAERs*.<sup>20</sup> In untabulated results, using Cronbach's alpha I test the internal consistency of the four measures and the composite measure. Cronbach's alpha is 0.73 for the measures calculated around the investigation date, and 0.83 for the measures calculated surrounding the *AAER* issue date. As both alpha's exceed 0.7, the measures appear to consistently measure the same object (which is intended to be the directly unobservable cost of equity capital).

Contemporary accounting research often employs one of the following models to measure cost of equity capital.<sup>21</sup> The models are founded on derivations from the dividend growth model,<sup>22</sup> with differences in models largely related to assumptions regarding the terminal value.

The basic dividend growth model is as follows:

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1 + r_E)^t} \quad (1)$$

where:

$P_0$  = price at time  $t = 0$ ;

$D_t$  = dividends (per share) at time  $t$ ;

$r_E$  = cost of equity capital.

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<sup>19</sup> See the appendix for a sample of the criticisms surrounding the various cost of equity capital measures.

<sup>20</sup> As outlined in the conclusion to this paper, once the impact of SEC *AAERs* on cost of equity capital is established, future research could use this setting to evaluate the four measures of cost of equity capital, or subsequently proposed measures from future studies.

<sup>21</sup> Cost of equity capital is often associated with more explanatory measures that utilize historic information to forecast future cost of equity capital (e.g., CAPM or APT). Accounting research is often concerned with measuring the current cost of equity capital being applied by the market, which is the main objective of the models described in this paper. This measure is often referred to as the 'implied cost of equity capital applied by the market'.

<sup>22</sup> See Ehrhardt (1998) for information on the origin and derivation of the dividend growth model. The model is also referred to throughout this chapter as the dividend discount model.

Because the entire stream of future dividends cannot be forecast, measures often truncate the model by utilizing a terminal value to capture the future cash stream. The remainder of this section recounts the measures employed in this paper (the measures and descriptions are adopted as outlined in Botosan and Plumlee (2005)).

### **Gordon Growth Model**

Gordon and Gordon (1997) transform the dividend growth model using analysts' forecasts of dividends and earnings as proxies for the market's expectations. Gordon and Gordon (1997) further suggest that individual firm *ROE* reverts to its equity cost of capital beyond the forecast horizon (Botosan and Plumlee, 2005). The resulting transformation is given below:

$$P_0 = \sum_{t=1}^4 \frac{dps_t}{(1+r_{GGM})^t} + \frac{E_5}{r_{GGM}(1+r_{GGM})^4} \quad (2)$$

where:

$E_t$  = forecasted earnings per share for time  $t$ ; forecasted EPS numbers are collected from *I/B/E/S*.

$dps_t$  = the actual dividends as calculated by the dividend payout ratio in the current year.

$P_0$  = the average daily price collected from *CRSP*

$r_{GGM}$  = cost of equity capital as measured by the Gordon Growth Model.

### Gebhardt et al. (2001) Industry Model

Gebhardt et al. (2001) transform the dividend growth model by inserting an ROE term calculated using the firm's industry ROE. The resulting equation is:

$$P_0 = bv_0 + \sum_{t=1}^{11} \frac{((ROE_t - r_{GLS})bv_{t-1})}{(1 + r_{GLS})^t} + \frac{(ROE_{12} - r_{GLS})bv_{11}}{r_{GLS}(1 + r_{GLS})^{11}} \quad (3)$$

where:

$$ROE_t = \frac{e_t}{bv_{t-1}}$$

$bv_t$  = book value per share at time  $t$

$r_{GLS}$  = cost of equity capital as measured by the Industry Method.

$P_0$  = the average daily price collected from *CRSP*.

*ROE* in the first seven years of the model is calculated using analysts' forecasts of earnings, growth, and dividends (book value is calculated assuming clean surplus). *ROE* in the following years is calculated by assuming that *ROE* reverts to the industry median in a straight-line manner. The terminal value is assumed to carry into perpetuity. Therefore, Gebhardt *et al.* (2001) rely on a 100 percent dividend payout ratio beyond year  $t = 11$  (Botosan and Plumlee 2005). The Gebhardt *et al.* (2001) industry model is derived from the Residual Income model proposed by Ohlson (1995). The relationship between the Residual Income model and the Industry model can be derived from the Industry model by including clean surplus assumptions.

### Ohlson and Juettner-Nauroth (2005) Economy-Wide Growth Model<sup>23</sup>

Ohlson and Juettner-Naroth (2005) utilize a series of mathematical transformations and assumptions to convert the Gordon growth model to the following:

$$P_t = \frac{eps_1}{r_{OJ}} + \frac{eps_2 + r_{OJ}dps_1 - (1 + r_{OJ})eps_1}{r_{OJ}(r_{OJ} - g)} \quad (4)$$

where:

$eps_t$  = One and two-year ahead analysts' forecasts collected from I/B/E/S.

$dps_t$  = the actual dividends paid in year  $t$ , collected from *Compustat*.

$P_t$  = the average daily price collected from *CRSP*

$r_{OJ}$  = cost of equity capital as measured by the economy-wide growth model.

Growth, as represented by  $g$ , is the risk-free interest rate less 3%. The risk-free interest rate is represented by the yield on 10-year Treasury notes. Gode and Mohanram (2003) point out that the economy-wide growth model is an attractive measure of cost of equity capital because it does not constrain assumptions about the dividend payout ratio and allows the short-term and long-term growth rates to differ (with the long-term growth rate moving asymptotically to the economy-wide growth rate).

### Price Earnings Growth (PEG) Ratio Method

Easton and Monohan (2005) convert the economy-wide growth model by assuming a no abnormal earnings growth beyond the second period and  $dps_1 = 0$ . These two assumptions allow the economy-wide growth model to be converted to:

$$r_{PEG} = \sqrt{\frac{eps_2 - eps_1}{P_0}} \quad (5)$$

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<sup>23</sup> See Gode and Mohanram (2003) for a discussion of the assumptions and mathematical transformations necessary to derive the economy-wide growth model.

where:

$eps_t$  = One and two-year ahead analysts' forecasts collected from I/B/E/S.

$P_0$  = the average daily price collected from *CRSP*

$r_{PEG}$  = cost of equity capital as measured by the PEG ratio model.

### **Composite Measure**

I aggregate the cost of equity capital measures into one measure by using the average of the four measures. This average measure is similar to the measure used in many recent studies including Hope et al. (2008) and Cheng and Lin (2008). This measure is calculated as:

$$r_{AVG} = \frac{r_{OJ} + r_{GLS} + r_{PEG} + r_{GGM}}{4} \quad (6)$$

This composite measure is used to conduct the tests outlined in the paper. To measure the change, I first calculate each of the four models and, subsequently, the composite measure in the month directly preceding the announcement of an SEC investigation. I re-calculate each of the four measures and associated composite measure in the month directly subsequent to the announcement. This mirrors the method utilized by Hribar and Jenkins (2004).

#### 4.2.2 MODELS TO TEST HYPOTHESES

After calculating the change in cost of equity capital for the sample of firms targeted by an *AAER* and the matched sample, I test the first hypothesis, the impact of receiving an *AAER*, by utilizing the following model:

$$\Delta CEC_{it} = \beta_0 + \beta_1 AAER_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \sum_0^7 Industry + \varepsilon_{it} \quad (7)$$

where:

$\Delta CEC$  = the change in cost of equity capital using the composite method constructed in model (6) for the month prior to the investigation announcement date and the month immediately following the announcement date.

*AAER* = an indicator variable set equal to one for firms targeted by an SEC investigation *and* do not experience an associated restatement, or have an *AAER* investigation announcement in concurrence with a restatement.

*Size* = natural log of total assets

*Industry* = indicator variable for a firm's industry membership based on the Standard Industry Classification codes using the first digit from *Compustat's* codification.

*Leverage* = the sum of long and short-term debt divided by common equity.

*Size* and *Industry* are included as a control variables in the model based on Hribar and Jenkin's (2004) results. The *Industry* variable is constructed using the first digit of the firm's Standard Industry Classification code. Using only one-digit classifications allows the model to avoid over specification. In addition to *size* and *industry*, Hribar and Jenkin's core results document that firm leverage is significantly associated with the change in cost of equity capital (higher levels of leverage result in a larger increase in cost of equity capital). I include the variable *Leverage*, measured as the sum of long and short-term debt divided by equity, to control



for the influence of leverage. The choice of levels of leverage as a control variable is deliberate for two reasons: 1) leverage is unlikely to change in the two-month period surrounding the event, and 2) a higher level of leverage is likely to be associated with more restrictive debt covenants, contributing to the possibility of a covenant violation and thereby increasing the related future cash flow risk.

Model (7) is modified by adding a restatement variable to test hypothesis 1.2, as follows:

$$\Delta CEC_{it} = \beta_o + \beta_1 AAER_{it} + \beta_2 Rstate_{it} + \beta_3 Size_{it} + \beta_4 Leverage_{it} + \sum_0^7 Industry + \varepsilon_{it} \quad (8)$$

where all variables, excepting *Rstate*, are as defined for model (7). *Rstate* captures company restatements of financial reports in the period beginning two years before the announcement of an SEC investigation. I identify restatements during this window using the GAO database.<sup>24</sup> This variable is included to control for the negative impact an earnings restatement has on cost of equity capital, as documented by Hribar and Jenkins (2004), and the attenuation effect a restatement may cause on the subsequent announcement of an SEC investigation. *Rstate* is calculated as the change in earnings (as a result of the restatement) divided by total assets. The original company earnings data is collected from the *Compustat* unrestated quarterly earnings file.

Testing hypothesis H2 follows the pattern employed to test hypothesis H1, utilizing a mirror image of model (7), as shown below:

$$\Delta CEC_{it} = \beta_o + \beta_1 AAER_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \sum_0^7 Industry + \varepsilon_{it} \quad (9)$$

All variables in model (9) are calculated as defined in model (7) by substituting **AAER issue date** for the **investigation announcement date**. In other words, the only exception from

<sup>24</sup> GAO database information is provided, with permission, from Andy Leone's website: (<http://sbaleone.bus.miami.edu/>), including the 'irregularity vs. error' classification outlined in Hennes *et al.* (2008).

model (7) is the event, with model (9) capturing the issue of an SEC *AAER* as its study event.

Similarly, model (10), as outlined below, copies model (8), adding the *Rstate* variable, but for the period surrounding the issuance of an *AAER*:

$$\Delta CEC_{it} = \beta_0 + \beta_1 AAER_{it} + \beta_2 Rstate_{it} + \beta_3 Size_{it} + \beta_4 Leverage_{it} + \sum_0^7 Industry + \varepsilon_{it} \quad (10)$$

Feroz *et al.* (1991) identify several significant non-quantitative factors related to firms being issued an *AAER*, including management turnover in 72 percent of the cases, and shareholder lawsuits in 81 percent of the cases. Bonner *et al.* (1998) find that the auditor is censured in 39 percent of the cases in their sample of 261 firms targeted by *AAERs* between 1982 and 1995. To test hypothesis *H3* I employ these non-quantitative factors to measure the severity of the *AAER*. The model to test hypothesis 3, which is repeated both for the **investigation announcement date** and the ***AAER* issue date** is:

$$\begin{aligned} \Delta CEC_{it} = & \beta_0 + \beta_1 SeverityComposite_{it} + \beta_4 Rstate_{it} + \beta_5 Size_{it} \\ & + \beta_6 Leverage_{it} + \sum_0^7 Industry + \varepsilon_{it} \end{aligned} \quad (11)$$

where:

$\Delta CEC$  = the change in cost of equity capital using the composite method constructed in model

(6) for the month prior to the event and the month immediately following the event date.

$SeverityComposite = MgmtTurn + ShldLawst + CoreEarnings + AudCen$

$MgmtTurn$  = indicator variable set equal to one if the CEO or CFO is terminated or resigns from their post in the two-year window before and after the event date.

$ShldLawst$  = indicator variable set equal to one if the company is targeted by a shareholder lawsuit related to the financial reporting in the period from the initial SEC investigation to one year after the final *AAER*.

*CoreEarnings* = indicator variable set equal to one if the SEC *AAER* specifically indicates manipulation of revenue, cost of sales, or operating expenses from continuing operations.

*AudCen* = indicator variable set equal to one if the firm's auditor is targeted by an associated SEC *AAER*.<sup>25</sup>

All other variables are as previously defined.

*MgmtTurn* is included in the model based on Hennes *et al.*'s (2008) finding that management turnover is more likely in restatement cases identified as fraudulent. The authors assert that boards force management out in an effort to restore financial reporting credibility. I collect management turnover data from ExecuComp for the one year before and after the investigation announcement and subsequent *AAER* issue date.

In cases of fraudulent financial reporting, shareholders can bring a class action suit against the company. Shareholders must evaluate the extent of their loss before deciding to embark on the costly litigation process. Shareholders will engage in a class action lawsuit against the firm in cases where the shareholders believe their loss, and consequential recourse, exceeds the legal costs. Furthermore, by taking legal action the shareholders increase the severity of the *AAER* as the company will likely be forced to incur additional legal costs and punitive damages associated with the *AAER*, which may or may not be estimable. The possibility of legal costs and punitive damages cause additional uncertainty about the firm's future cash flows. *ShldLawst* is included in the model to proxy for the severity implied by the shareholder lawsuit. Following Hennes *et al.* (2008), shareholder lawsuits are collected manually using a Lexis/Nexis search and from the Stanford Class Action Clearinghouse (<http://securities.stanford.edu>) in the period from the initial SEC investigation to one year after the final *AAER* for the firm is issued. Once

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<sup>25</sup> An additional *AAER* targeting the firm's auditor is typically issued in conjunction with the *AAER* targeting the firm (in some cases the auditor is addressed directly in the *AAER* targeting the firm). However, in some cases the censuring *AAER* occurred on a different date, but references the *AAER* targeting the firm.

potential lawsuits are identified, I verify the lawsuit is related to financial reporting by reading the summary of the lawsuit provided by the Stanford Class Action Clearinghouse.

In Hribar and Jenkins' (2004) study of restating firms, one variable consistently surfaces as a factor in the magnitude of change in a restating firm's cost of equity capital: *Core Earnings*. *Core Earnings*, as it relates to restatements, is defined as a restatement that impacts revenue recognition, cost of sales or operating expenses from continuing operations. This paper defines *Core Earnings* as an SEC *AAER* that specifically designates behavior manipulating revenue recognition, cost of sales, or operating expenses from continuing operations. This data was collected by reading the text of each *AAER* related to a company within the sample.

As documented above, on average 2.7 *AAERs* are associated with each firm in the sample. Often the additional *AAERs* target the company's auditor or individuals within the firm. For the SEC to censure the auditor denotes that the auditor was aware of the financial misreporting and may have engaged in some form of collusion to allow the misreporting to occur, presenting a more severe form of reporting fraud.<sup>26</sup> *AudCen* is collected by manual review of *AAERs* related to a given firm with the purpose of capturing the severity associated with the auditor censure issued in conjunction with the *AAER*.

*Rstate*, *Size*, *Leverage*, and *Industry* continue to be included in the model as control variables based on Hribar and Jenkins (2004). *Rstate* in this model is included to control for the preemptive impact a restatement may have on a firm's cost of equity capital. In other words, according to Hribar and Jenkins the market increases the cost of equity capital for a firm that issues a restatement and therefore has already increased the cost of equity capital for a firm that issues a preemptive restatement.

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<sup>26</sup> Alternatively, the SEC may be punishing the auditor for failing to capture the fraudulence.

Many of the severity measures utilized in this study are constructed using *ex post* measures to determine the perceived *ex ante* severity. For example, shareholder lawsuits are often generated by shareholders that become aware of corporate misconduct via an SEC investigation. However, all SEC investigations do not lead to shareholder lawsuits; therefore, I am making the assumption that shareholders examine their expected rewards measured against their expected costs. A contributing factor to the expected rewards is the probability of successful litigation, which would be impacted by shareholder's perceptions about the severity of corporate misconduct. Associated arguments can be made for assumptions relating to auditor censure (the SEC only prosecutes in cases in which they believe the auditor acted fraudulently), and management turnover (the board acts to punish executives if the misconduct is egregious).

As noted above, *SeverityComp* is the summary measure capturing the presence or absence of management turnover, a shareholder lawsuit, core earnings, and auditor censure. *SeverityComp* is calculated using the following equation:  $SeverityComp = MgmtTurn + ShdlLawst + Core Earnings + AudCen$ ; therefore, *SeverityComp* takes a value ranging from zero to four, hypothesis *H3* indicates that the change in cost of equity capital is an increasing function in the severity of the SEC investigation; therefore, I expect the coefficient for  $\beta_1$  to be positive.

It is possible that the component measures included in *SeverityComp* have a differential impact on the change in cost of equity capital. As a final test I separate *SeverityComp* into its components using the following model:

$$\Delta CEC_{it} = \beta_0 + \beta_1 MgmtTurn_{it} + \beta_2 ShdlLawst_{it} + \beta_3 CoreEarnings_{it} + \beta_4 AudCen_{it} + \beta_5 Rstate_{it} + \beta_6 Size_{it} + \beta_7 Leverage_{it} + \sum_0^7 Industry + \varepsilon_{it} \quad (12)$$

where all variables are as defined above. Separation of the variables into the individual components allows for an empirical test of the differential impacts the four proxies for severity

may have on the change in cost of equity capital, relative to firms not experiencing these severity indicators.

## CHAPTER 5

### EMPIRICAL RESULTS

#### 5.1 DESCRIPTIVE STATISTICS

Descriptive statistics are reported in Table 1. Table 1, Panel A contains descriptive statistics for the sample surrounding the SEC *investigation announcement* date. The average (median) cost of equity capital for the combined sample is 11.97% (9.00%) before the event date, and 12.97% (10%) after the event date, resulting in an average (median) change of 0.81% (.11%). Breaking the combined sample in to its respective components (treatment and control firms) provides some clarity to the change in cost of equity capital. The average (median) change in cost of equity capital for the firms targeted by an SEC investigation is 1.54% (0.40%), whereas for the match firms the change is lower, with an average (median) change of 0.08% (0.03%). Univariate tests of mean differences are included in the next section.

Of the firms investigated by the SEC, 84.4% (54 firms) have an associated restatement. The matched sample contains no restatements during the event window. The majority of firms (74.1%) issue their associated restatement prior to the announcement of an SEC investigation.<sup>27</sup> The average magnitude of earnings restated is -.111, which indicates that the average restatement

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<sup>27</sup> I assume that any restatement issued in close proximity to the SEC investigation announcement or *AAER* is an associated restatement. It is possible that a restatement in this period is unrelated. My assumption is based on the reverse argument in Hennes *et al.* (2008) that a restating firm with an *AAER* has engaged in ‘irregular’ reporting.

**Table 1, Panel A: Descriptive Statistics, Announcement Date Related to SEC Investigation Date**

	<i>AAER Firms</i> ( <i>n=64</i> )		<i>Match Firms</i> ( <i>n=64</i> )		<i>Combined Sample</i> ( <i>n=128</i> )	
	<b>Mean</b>	<b>Median</b>	<b>Mean</b>	<b>Median</b>	<b>Mean</b>	<b>Median</b>
<b>Cost of Equity Capital, Prior</b>	12.86%	10.00%	11.08%	9.00%	11.97%	9.00%
<b>Cost of Equity Capital, After</b>	14.41%	11.00%	11.17%	8.00%	12.79%	10.00%
<b><math>\Delta</math> in Cost of Equity Capital</b>	1.54%	0.40%	0.08%	0.03%	0.81%	0.11%
<b>Size</b>	3.18	3.05	3.18	3.17	3.18	3.13
<b>Leverage</b>	6.32	1.29	2.12	0.94	4.23	1.18
<b># Restate Before</b>	40		0			
<b>Magnitude of Restatement</b>	-0.111	0	0	0	-0.056	0

**Table 1, Panel B: Descriptive Statistics, Announcement Date Related to AAER Issue Date**

	<i>AAER Firms</i> ( <i>n=67</i> )		<i>Match Firms</i> ( <i>n=67</i> )		<i>Combined Sample</i> ( <i>n=134</i> )	
	<b>Mean</b>	<b>Median</b>	<b>Mean</b>	<b>Median</b>	<b>Mean</b>	<b>Median</b>
<b>Cost of Equity Capital, Prior</b>	11.91%	9.00%	11.31%	9.00%	11.61%	9.00%
<b>Cost of Equity Capital, After</b>	12.33%	10.00%	11.55%	8.00%	11.94%	9.00%
<b><math>\Delta</math> in Cost of Equity Capital</b>	0.35%	0.01%	0.22%	0.06%	0.28%	0.02%
<b>Size</b>	3.21	3.05	3.16	3.15	3.19	3.11
<b>Leverage</b>	5.53	0.97	2.10	0.94	3.81	0.96
<b># Restate Before</b>	48		0			
<b>Magnitude of Restatement</b>	-0.104	0	0	0	0.052	0

*CEC* measures are calculated using the composite method outlined in Chapter 4. *Change in Cost of Equity Capital* is the difference between the Cost of Equity Capital measures before and after the event. *# Restate Before* represents the number of firms issuing a coinciding restatement of financial statements formally filed with the SEC which preempt the event. *Size* is measured as the natural log of total assets. *Leverage* is calculated as the Sum of Long-term and Short-term Debt divided by Total Equity at the end of the fiscal year of the announcement. *Magnitude of Restatement* is calculated as the % change in earnings as a result of the firm's earnings restatement for all firms that restate prior to the event date.



reduced earnings by 11.1 percent of total assets. Only a small number of cases (four firms) issue a restatement in concurrence with the SEC's announcement. The average size (measured as the log of total assets) of the combined sample is 3.18, Leverage (measured as the sum of short-term and long-term debt divided by equity) is 4.26 (debt exceeds equity by more than four times).

Table 1, Panel B contains similar descriptive statistics for the sample collected surrounding the *AAER issue* date. Average (median) cost of equity capital for the combined sample is 11.61% (9.00%) before the event date, and 11.94% (9.00%) after the event date. For this sample, the differences between the sample and control group do not appear to be sizable but are tested using statistical methods in the next section. The mean (median) leverage for the combined sample is 3.81 (0.96). Of the firms targeted by the SEC, 79.1% (48 firms) issue an associated restatement, with the majority of restatements (71.6%) preempting the issuance of an *AAER*. The average restatement for this sample reduced earnings by 10.4 percent.

Table 2 contains industry information for sample firms in both the *investigation* and *AAER* date samples. Several industries are represented within the samples, with no industry dominating the sample. Business Services contains the largest number of targeted firms (nine and twelve, respectively for the *investigation* and *AAER* date samples). Business Services includes many software companies, consistent with SEC statements regarding its intent to target emerging industries (Feroz *et al.* 1991).

**Table 2: Industry Classifications**

<b>Two-digit SIC Industry</b>	<b>Investigation Date</b>		<b>AAER Issue Date</b>	
	<b># of firms</b>	<b>% of sample</b>	<b># of firms</b>	<b>% of sample</b>
Metal, Mining	1	1.56%	1	1.49%
Oil & Gas Extraction	2	3.13%	3	4.48%
Food & Kindred Products	1	1.56%	3	4.48%
Apparel & Other Textile Products	1	1.56%	2	2.99%
Paper & Allied Products	2	3.13%	2	2.99%
Chemical & Allied Products	2	3.13%	2	2.99%
Petroleum & Coal Products	1	1.56%	1	1.49%
Fabricated Metal Products	2	3.13%	2	2.99%
Industrial Machinery & Equipment	3	4.69%	2	2.99%
Electronic & Other Electrical Equipment	6	9.38%	6	8.96%
Instruments & Related Products	6	9.38%	7	10.45%
Communications	2	3.13%	2	2.99%
Wholesale Trade-Durable Goods	2	3.13%	2	2.99%
Wholesale Trade-Nondurable Goods	5	7.81%	1	1.49%
General Merchandise Stores	1	1.56%	1	1.49%
Apparel & Accessory Stores	1	1.56%	1	1.49%
Furniture & Home Furnishings Stores	1	1.56%	1	1.49%
Miscellaneous Retail	2	3.13%	1	1.49%
Depository Institutions	3	4.69%	3	4.48%
Security & Commodity Brokers	1	1.56%	1	1.49%
Insurance Carriers	2	3.13%	3	4.48%
Holding & Other Investment Offices	2	3.13%	1	1.49%
Personal Services	1	1.56%	1	1.49%
Business Services	9	14.06%	12	17.91%
Educational Services	1	1.56%	1	1.49%
Engineering & Management Services	2	3.13%	2	2.99%
Transportation Equipment	0	0.00%	2	2.99%
Electric, Gas & Sanitary Services	2	3.13%	1	1.49%
<b>Total Firms</b>	<b>64</b>	<b>100.00%</b>	<b>67</b>	<b>100.00%</b>

\*Note the match sample contains match firms with the same distribution across industries.

## 5.2 UNIVARIATE RESULTS

Table 3 contains univariate tests of differences for several key variables. Results in Panel A document that both parametric and non-parametric tests are statistically significant for the cost of equity capital after the announcement of an SEC investigation. In other words, the cost of equity capital is statistically different between the treatment and control firms. This result is repeated using parametric tests for the change in cost of equity capital. In Panel B, both parametric and non-parametric tests fail to document statistically significant differences between the treatment and control firms. Overall, univariate results specify a relationship between the announcement of an SEC investigation, but no convincing evidence concerning changes surrounding the issuance of an SEC *AAER*.

Table 4 reports the Spearman (above the diagonal) and Pearson (below the diagonal) correlation matrix for the independent variables found in models (7), (8), (9) and (10). The *AAER* and restatement variables are highly correlated in both samples, which is not surprising given the high number of restatements for firms that receive an *AAER*.

The Spearman (above the diagonal) and Pearson (below the diagonal) correlation matrix for model (11) is found in Table 5. The final correlation matrix, contained in Table 6, records the independent variables found in model (12). Several of the proxies for severity are correlated. In summary, univariate results indicate that several of the component measures may be collinearly associated, potentially limiting multivariate results.

**Table 3, Panel A: Univariate Tests, Announcement Date Related to SEC Investigation Date**

	<i>AAER Firms</i> ( <i>n=64</i> )		<i>Match Firms</i> ( <i>n=64</i> )		<b>t-test</b>	<b>p-value</b>	<b>z-test</b>	<b>p-value</b>
	<b>Mean</b>	<b>Median</b>	<b>Mean</b>	<b>Median</b>				
<b>Cost of Equity Capital, Prior</b>	12.86%	10.00%	11.08%	9.00%	-1.21	0.114	-1.47	0.143
<b>Cost of Equity Capital, After</b>	14.41%	11.00%	11.17%	8.00%	-1.82	0.036**	-2.24	0.025**
<b>Δ in Cost of Equity Capital</b>	1.54%	0.40%	0.08%	0.03%	-1.70	0.046**	-1.14	0.173
<b>Size</b>	3.18	3.05	3.18	3.17	0.01	0.994	0.23	0.817
<b>Leverage</b>	6.32	1.29	2.12	0.94	-1.42	0.161	-1.65	0.010*

**Table 3, Panel B: Univariate Tests, AAER Issue Date**

	<i>AAER Firms</i> ( <i>n=67</i> )		<i>Match Firms</i> ( <i>n=67</i> )		<b>t-test</b>	<b>p-value</b>	<b>z-test</b>	<b>p-value</b>
	<b>Mean</b>	<b>Median</b>	<b>Mean</b>	<b>Median</b>				
<b>Cost of Equity Capital, Prior</b>	11.91%	9.00%	11.31%	9.00%	-0.42	0.337	-1.05	0.294
<b>Cost of Equity Capital, After</b>	12.33%	10.00%	11.55%	8.00%	-0.51	0.304	-1.16	0.246
<b>Δ in Cost of Equity Capital</b>	0.35%	0.01%	0.22%	0.06%	-0.31	0.377	0.28	0.781
<b>Size</b>	3.21	3.05	3.16	3.15	-0.33	0.744	-0.16	0.875
<b>Leverage</b>	5.53	0.97	2.10	0.94	-1.21	0.232	0.07	0.949

\*\* (\*) significant at the 5 (10) percent level using one-tailed p-values; except *Size* and *Leverage*, which use two-tailed p-values.

*CEC* measures are calculated using the composite method outlined in Chapter 4. *Change in Cost of Equity Capital* is the difference between the Cost of Equity Capital measures before and after the announcement of an SEC investigation. *Size* is measured as the natural log of total assets. *Total Assets* are measured at the end of the fiscal year of the announcement. *Leverage* is calculated as the Sum of Long-term and Short-term Debt divided by Total Equity at the end of the fiscal year of the announcement. T-test and associated p-values are reported using tests of mean differences. Z-test and the associated p-values are calculated using the Wilcoxon Signed-Rank Test.

**Table 4: Spearman and Pearson Correlation Matrix, Variables in Models (7), (8), (9), and (10):  
Panel A: Investigation Announcement Date Sample (n=128)**

	<i>AAER</i>	<i>Rstate</i>	<i>Size</i>	<i>Leverage</i>
<i>AAER</i>	<b>1.000</b>	-0.187**	-0.021	0.146
<i>Rstate</i>	0.056	<b>1.000</b>	-0.022	0.043
<i>Size</i>	-0.001	0.042	<b>1.000</b>	0.606***
<i>Leverage</i>	0.125	-0.010	0.392	<b>1.000</b>

**Panel A: *AAER* Issue Date Sample (n=134)**

	<i>AAER</i>	<i>Rstate</i>	<i>Size</i>	<i>Leverage</i>
<i>AAER</i>	<b>1.000</b>	-0.228***	0.014	-0.006
<i>Rstate</i>	-0.084	<b>1.000</b>	-0.057	0.050
<i>Size</i>	0.029	0.029	<b>1.000</b>	0.590***
<i>Leverage</i>	0.105	0.105	0.065	<b>1.000</b>

\*\* (\*\*, \*) significant at the 1 percent (5, 10 percent) level using two-tailed tests.

Above the diagonal reports Spearman rank correlations, below the diagonal reports Pearson correlations.

*AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

**Table 5: Spearman and Pearson Correlation Matrix, Variables in Model (11):  
Panel A: Investigation Announcement Date Sample (n=64)**

	Severity Composite	Rstate	Size	Leverage
SeverityComposite	<b>1.000</b>	0.049	-0.223	-0.125
Rstate	-0.069	<b>1.000</b>	0.008	0.083
Size	-0.134	0.062	<b>1.000</b>	0.602***
Leverage	-0.017	-0.017	0.041	<b>1.000</b>

**Panel B: Issue Date Sample (n=67)**

	Severity Composite	Rstate	Size	Leverage
SeverityComposite	<b>1.000</b>	0.098	-0.242*	-0.101
Rstate	0.097	<b>1.000</b>	-0.032	0.070
Size	-0.204	0.164	<b>1.000</b>	0.552***
Leverage	0.062	0.012	0.020	<b>1.000</b>

\*\* (\*\*,\*) significant at the 1 percent (5, 10 percent) level using two-tailed tests.

Above the diagonal reports Spearman rank correlations, below the diagonal reports Pearson correlations.

*Severity Composite* is the sum of four variables: *MgmtTurn*, *ShldLawst*, *Core Earnings*, and *AudCen*. *MgmtTurn* is an indicator variable equal to 1 if the firm is fires the CEO or CFO in association with the *AAER*, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the *AAER* targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC *AAER*. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

**Table 6: Spearman and Pearson Correlation Matrix, Variables in Model (12):**

**Panel A: Investigation Announcement Date Sample (n=64)**

	<b>Mgmt Turn</b>	<b>Shld Lawst</b>	<b>Core Earnings</b>	<b>AudCen</b>	<b>Rstate</b>	<b>Size</b>	<b>Leverage</b>
<b>MgmtTurn</b>	<b>1.000</b>	0.156	-0.061	0.029	0.210	0.004	0.029
<b>ShldLawst</b>	0.156	<b>1.000</b>	-0.091	0.017	0.136	0.130	-0.010
<b>CoreEarnings</b>	-0.061	-0.091	<b>1.000</b>	0.232	-0.048	-0.358***	-0.200
<b>AudCen</b>	0.029	0.017	0.232	<b>1.000</b>	-0.169	-0.020	0.096
<b>Rstate</b>	0.109	0.101	-0.223	-0.104	<b>1.000</b>	0.008	0.083
<b>Size</b>	0.041	0.114	-0.358***	-0.014	0.062	<b>1.000</b>	0.602
<b>Leverage</b>	0.089	-0.236	0.119	-0.046	-0.017	0.041	<b>1.000</b>

**Panel B: Issue Date Sample (n=64)**

	<b>Mgmt Turn</b>	<b>Shld Lawst</b>	<b>Core Earnings</b>	<b>AudCen</b>	<b>Rstate</b>	<b>Size</b>	<b>Leverage</b>
<b>MgmtTurn</b>	<b>1.000</b>	-0.301**	-0.088	-0.034	0.092	-0.050	-0.073
<b>ShldLawst</b>	-0.301**	<b>1.000</b>	-0.146	-0.025	0.149	0.027	0.059
<b>CoreEarnings</b>	-0.088	-0.146	<b>1.000</b>	0.111	0.027	-0.353***	-0.074
<b>AudCen</b>	-0.034	-0.025	0.111	<b>1.000</b>	-0.201	0.036	-0.091
<b>Rstate</b>	0.149	0.190	-0.146	-0.073	<b>1.000</b>	-0.032	0.070
<b>Size</b>	-0.007	0.014	-0.336**	0.047	0.164	<b>1.000</b>	0.552***
<b>Leverage</b>	0.137	-0.212	0.147	-0.027	0.018	0.020	<b>1.000</b>

\*\* (\*\*, \*) significant at the 1 percent (5, 10 percent) level using two-tailed tests.

Above the diagonal reports Spearman rank correlations, below the diagonal reports Pearson correlations.

*Severity Composite* is the sum of four variables: *MgmtTurn*, *ShldLawst*, *Core Earnings*, and *AudCen*. *MgmtTurn* is an indicator variable equal to 1 if the firm is fires the CEO or CFO in association with the *AAER*, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the *AAER* targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC *AAER*. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

### 5.3 CHANGE IN COST OF EQUITY CAPITAL AS A RESULT OF INVESTIGATION

Table 7 contains results related to tests of the first set of hypotheses. Table 7 captures the impact of an *AAER* at the *announcement date* of the investigation on the change in a firm's cost of equity capital. If the market perceives the announcement as negative information, thereby suggesting the company's future cash flows are more risky, we would expect the coefficient for *AAER* to be positive. If the announcement instead alleviates market concerns about the potential for an SEC investigation, the coefficient could be insignificant (indicating the increased riskiness was captured by a prior event, the announcement confirms the increased riskiness, thereby reducing uncertainty). As hypothesized, the coefficient for the *AAER* independent variable is positive and statistically significant. This provides evidence that firms targeted by an SEC investigation do in fact suffer an increased cost of equity capital. The coefficient of 0.015 indicates that a firm targeted by an SEC investigation, on average, experience an increase in cost of equity capital of 1.5 percent, controlling for other factors.

Once the restatement variable is included (model (8)), the coefficient on *AAER* remains positive and significant. However, the variable *Rstate* (which represents firms with a preemptive restatement) is not statistically significant, providing evidence that a preemptive restatement does not appear to preempt the impact of an *AAER* investigation announcement on the change in cost of equity capital. This evidence is not inconsistent with results by Hribar and Jenkins (2004) since they measure the change in cost of equity capital surrounding the actual restatement date as opposed to the investigation and issue dates utilized in my study. In addition to inconclusive results related to *Rstate*, another variable Hribar and Jenkins (2004) find to be significant in explaining cost of equity capital changes surrounding restatements: *Leverage*, has no impact on the change in a firm's cost of equity capital in this model.



**Table 7: Impact of SEC Investigation on Firm's Cost of Equity Capital, Investigation Announcement Date, Dependant Variable=  $\Delta$  in CEC**

Variable	Model (7), Coefficient (t-stat)	Model (8), Coefficient (t-stat)
<b>Intercept</b>	0.015	0.016
<i>t</i> -stat	(0.84)	(0.85)
<b>AAER</b>	0.015*	0.016*
<i>t</i> -stat	(1.76)	(1.86)
<b>Rstate</b>		-0.004
<i>t</i> -stat		(-0.87)
<b>Size</b>	-0.004	-0.038
<i>t</i> -stat	(-0.89)	(-0.87)
<b>Leverage</b>	-0.000	-0.000
<i>t</i> -stat	(-0.62)	(-0.63)
<b>R<sup>2</sup></b>	3.34%	4.16%
<b>Adjusted R<sup>2</sup></b>	0.19%	0.16%

\*\*,\* significant at the 5 (10) percent level using one-tailed tests

(n=128)

This table reports results related to testing of models (7) and (8) surrounding the investigation announcement date, controlling for industry fixed-effects. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

Table 8 provides results for Models (9) and (10) for the sample surrounding the issue of the SEC's *AAER*. In contrast to the results reported in Table 7, the *AAER* variable is insignificant in explaining the change in a firm's cost of equity capital. Paralleling Table 7, the coefficients on *RState* and *Leverage* are similarly insignificant. Together, the results of Table 7 and Table 8 suggest that the issue of an *AAER* appears to increase the discount factor applied to a firm's valuation surrounding the date the investigation is announced, but does not appear to subsequently impact the change when the *AAER* is issued by the SEC.

#### **5.4 CHANGE IN COST OF EQUITY CAPITAL RELATED TO SEVERITY OF THE ASSOCIATED *AAER***

Table 9 reports the results of tests of my third hypothesis related to the severity of the *AAER* by providing analysis of Model (11) for the sample at both the investigation and *AAER* issue dates. The results associated with *SeverityComp* correspond to tests of the first hypothesis, in that no coefficient is significantly correlated with the change in a firm's cost of equity capital. Coefficients on *Rstate*, *Size* and *Leverage* continue to insignificantly different from zero. Table 10 documents the additional testing of severity from Model (12). The results in Table 10 are largely representative of those in Table 9 in that most of the variables are significantly associated with the change in a firm's cost of equity capital. However, *MgmtTurn* is associated with the change in cost of equity capital in the opposite direction from that hypothesized. According to the results contained in Table 10, firms with management turnover surrounding the *investigation announcement* appear to have a reduction in cost of equity capital. Based on this result, a company could mitigate the increasing cost of equity capital associated with an SEC investigation by replacing the CEO or CFO.

**Table 8: Impact of SEC Investigation on Firm's Cost of Equity Capital, *AAER* Issue Date, Dependant Variable=  $\Delta$  in CEC**

Variable	Model (9), Coefficient (t-stat)	Model (10), Coefficient (t-stat)
<b>Intercept</b>	0.009	0.010
<i>t</i> -stat	(1.10)	(1.25)
<b>AAER</b>	0.002	0.003
<i>t</i> -stat	(0.40)	(0.61)
<b>Rstate</b>		0.008
<i>t</i> -stat		(1.30)
<b>Size</b>	-0.002	-0.002
<i>t</i> -stat	(-0.89)	(-1.16)
<b>Leverage</b>	-0.000	-0.000
<i>t</i> -stat	(-0.65)	(-0.70)
<b>R<sup>2</sup></b>	1.20%	1.25%
<b>Adjusted R<sup>2</sup></b>	-1.86%	-1.50%

\*\*,\* significant at the 5 (10) percent level using one-tailed tests  
(n=134)

This table reports results related to testing of models (9) and (10) surrounding the investigation announcement date, controlling for industry fixed-effects. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

**Table 9: Influence of Severity on the Change in Cost of Equity Capital (Dependent Variable=  $\Delta$  in CEC)**

<b>Panel A: Investigation Announcement Date Sample (n=64)</b>		
<b>Variable</b>	<b>Coefficient</b>	<b>t-stat</b>
<b>Intercept</b>	0.045	1.00
<b>Severity Composite</b>	-0.002	-0.16
<b>Rstate</b>	-0.003	-0.58
<b>Size</b>	-0.008	-0.92
<b>Leverage</b>	-0.000	-0.54
<b>R<sup>2</sup></b>	2.77%	
<b>Adjusted R<sup>2</sup></b>	-5.76%	

<b>Panel B: AAER Issue Date (n=67)</b>		
<b>Variable</b>	<b>Coefficient</b>	<b>t-stat</b>
<b>Intercept</b>	0.024	1.84
<b>Severity Composite</b>	-0.003	-0.84
<b>Rstate</b>	0.008	1.68
<b>Size</b>	-0.004	-1.45
<b>Leverage</b>	-0.000	-0.23
<b>R<sup>2</sup></b>	4.96%	
<b>Adjusted R<sup>2</sup></b>	1.83%	

\*Significant at the 10 percent level using two-tailed tests.

Reports for model (11), where *Severity Composite* is the sum of four variables: *MgmtTurn*, *ShldLawst*, *Core Earnings*, and *AudCen*. *MgmtTurn* is an indicator variable equal to 1 if the firm is fires the CEO or CFO in association with the *AAER*, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the *AAER* targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC *AAER*. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

**Table 10: Influence of Severity on the Change in Cost of Equity Capital, Individual Measures (Dependent Variable=  $\Delta$  in CEC)**

<b>Panel A: Investigation Announcement Date Sample (n=64)</b>		
<b>Variable</b>	<b>Coefficient</b>	<b>t-stat</b>
<b>Intercept</b>	0.040	0.84
<b>MgmtTurn</b>	-0.043*	-2.06
<b>ShldLawst</b>	0.029	1.29
<b>CoreEarnings</b>	0.016	0.76
<b>AudCen</b>	-0.012	-0.40
<b>Rstate</b>	-0.002	-0.33
<b>Size</b>	-0.006	-0.65
<b>Leverage</b>	-0.000	-0.16
<b>R<sup>2</sup></b>	13.02%	
<b>Adjusted R<sup>2</sup></b>	0.13%	

<b>Panel B: AAER Issue Date (n=67)</b>		
<b>Variable</b>	<b>Coefficient</b>	<b>t-stat</b>
<b>Intercept</b>	0.019	1.30
<b>MgmtTurn</b>	-0.002	-0.40
<b>ShldLawst</b>	-0.001	-0.16
<b>CoreEarnings</b>	-0.001	-0.12
<b>AudCen</b>	-0.015	-1.29
<b>Rstate</b>	0.008	1.40
<b>Size</b>	-0.003	-1.13
<b>Leverage</b>	-0.000	-0.69
<b>R<sup>2</sup></b>	14.74%	
<b>Adjusted R<sup>2</sup></b>	2.98%	

\*Significant at the 10 percent level using two-tailed tests.

Reports for model (12), where *AudCen*, *MgmtTurn* is an indicator variable equal to 1 if the firm is fires the CEO or CFO in association with the *AAER*, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the *AAER* targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC *AAER*. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

Overall, the results from Table 7 provide evidence that the announcement of an SEC investigation is associated with an increasing cost of equity capital relative to a matched sample of firms. Table 8 provides no evidence that the presence of an SEC investigation, as evidenced by an *AAER*, increases or decreases the cost of equity capital for targeted firms when an *AAER* is issued. Finally, Tables 9 and 10 provide no evidence (with the exception of management turnover) that several proxies for the severity of an SEC *AAER* are associated with the change in a firm's cost of equity capital. Several explanations exist to explain my inconclusive results related to tables 8, 9, and 10. First, it is possible the market is not concerned with the conclusion of the SEC's investigation. Alternatively, the market is capturing the impact of the SEC's investigation via an alternative information source, such as expectations based on details surrounding a preceding restatement or actions by other government agencies (e.g., The Department of Justice). My inconclusive findings may also be the result of measurement error in variables or power issues related to the relatively small sample size. In other words, the hypothesized relations may exist, but my study is not powerful enough to capture the effect. Additionally, the use of *ex post* proxies of severity to determine *ex ante* severity assumes the market can anticipate the potential severity of the investigation before receiving confirmation. Although I argue for the inclusion of *ex post* measures in Chapter 4 (p. 32), it is possible this assumption is invalid.

## 5.5 ROBUSTNESS CHECKS

As robustness checks, I employ the following modifications to the models and results described above. First, I rerun all tests using each individual cost of equity capital measure in place of the composite measure. Tables 11-18 document the results of each regression using the individual measures of cost of equity capital. Although each measure produces different coefficients the overall results remain mostly unchanged from the core results using the composite measure, which is unsurprising given the consistency measured by Cronbach's alpha as reported in Chapter 4. However, notable differences exist across the measures. The Gordon Growth Model performs differently from any of the other measures, yielding no significant coefficients in any model, including those that are significant using the composite or any of the other three measures. Each of the other three measures continues to exhibit a significant association between an *AAER* and the change in cost of equity capital surrounding the investigation announcement date. All of the individual measures, except again the Gordon Growth Model, also continue to manifest a significant association between management turnover and the change in cost of equity capital. In most cases, the adjusted  $R^2$  is very similar for each model, as well as the level of significance documented for relevant variables. These results could suggest that the individual measures, with the exception of the Gordon Growth Model, may be sufficient for calculating the change in cost of equity capital.

**Table 11: Impact of SEC Investigation on Firm's Cost of Equity Capital, Investigation Announcement Date, Dependent Variable=  $\Delta$  in CEC**

Variable	Gordon Growth	Gebhardt <i>et al.</i> (2001)	OJN (2005)	PEG Ratio
	Model	Industry Model	Economy-wide Growth Model	Method
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
<b>Intercept</b>	-0.006	0.026	0.019	0.014
<i>t</i> -stat	(1.66)	(1.37)	(1.02)	(0.96)
<b>AAER</b>	-0.000	0.015*	0.015*	0.011*
<i>t</i> -stat	(-0.27)	(1.76)	(1.76)	(1.74)
<b>Size</b>	0.005	-0.004	-0.004	-0.030
<i>t</i> -stat	(0.58)	(-0.89)	(-0.92)	(-0.86)
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<i>t</i> -stat	(-0.68)	(-0.62)	(-0.61)	(-0.66)
<b>R<sup>2</sup></b>	4.38%	3.34%	3.38%	3.23%
<b>Adjusted R<sup>2</sup></b>	1.27%	0.19%	0.23%	0.08%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=128)

This table reports results related to testing of model (7) surrounding the investigation announcement date. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.



**Table 12: Impact of SEC Investigation on Firm's Cost of Equity Capital, Investigation Announcement Date, Dependent Variable=  $\Delta$  in CEC**

Variable	Gordon Growth	Gebhardt <i>et al.</i> (2001)	OJN (2005)	PEG Ratio
	Model	Industry Model	Economy-wide Growth Model	Method
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
<b>Intercept</b>	-0.006	0.026	0.020	0.014
<i>t</i> -stat	(1.63)	(1.38)	(1.03)	(0.98)
<b>AAER</b>	-0.001	0.016*	0.016*	0.012*
<i>t</i> -stat	(-0.28)	(1.86)	(1.86)	(1.84)
<b>RState</b>	-0.000	-0.004	-0.004	-0.003
<i>t</i> -stat	(-0.15)	(-0.87)	(-0.86)	(-0.88)
<b>Size</b>	0.001	-0.004	-0.004	-0.003
<i>t</i> -stat	(0.58)	(-0.87)	(-0.90)	(-0.84)
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<i>t</i> -stat	(-0.66)	(-0.63)	(-0.62)	(-0.67)
<b>R<sup>2</sup></b>	4.40%	4.16%	4.20%	4.06%
<b>Adjusted R<sup>2</sup></b>	0.42%	0.16%	0.20%	0.06%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=128)

This table reports results related to testing of models (8) surrounding the investigation announcement date. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

**Table 13: Impact of SEC Investigation on Firm's Cost of Equity Capital, AAER Issue Date, Dependent Variable=  $\Delta$  in CEC**

Variable	Gordon Growth	Gebhardt <i>et al.</i> (2001)	OJN (2005)	PEG Ratio
	Model	Industry Model	Economy-wide Growth Model	Method
	Coeffient (t-stat)	Coeffient (t-stat)	Coeffient (t-stat)	Coeffient (t-stat)
<b>Intercept</b>	-0.009	0.019	0.006	0.011
<i>t</i> -stat	(0.92)	(0.29)	(.75)	(1.28)
<b>AAER</b>	0.004	0.002	0.002	0.002
<i>t</i> -stat	(0.89)	(0.40)	(0.41)	(0.55)
<b>Size</b>	-0.002	-0.002	-0.002	-0.002
<i>t</i> -stat	(-0.72)	(-0.89)	(-0.89)	(-0.86)
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<i>t</i> -stat	(-0.65)	(-0.65)	(-0.61)	(-0.65)
<b>R<sup>2</sup></b>	1.41%	1.20%	1.16%	1.25%
<b>Adjusted R<sup>2</sup></b>	-1.64%	-1.86%	-1.91%	-1.81%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=134)

This table reports results related to testing of model (9) surrounding *AAER* issue date. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

**Table 14: Impact of SEC Investigation on Firm's Cost of Equity Capital, AAER Issue Date, Dependent Variable=  $\Delta$  in CEC**

Variable	Gordon Growth	Gebhardt <i>et al.</i> (2001)	OJN (2005)	PEG Ratio
	Model	Industry Model	Economy-wide Growth Model	Method
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
<b>Intercept</b>	0.010	0.020**	0.007	0.007
<i>t</i> -stat	(1.06)	(2.45)	(0.89)	(0.89)
<b>AAER</b>	0.005	0.003	0.003	0.003
<i>t</i> -stat	(1.10)	(0.61)	(0.63)	(0.63)
<b>RState</b>	0.008	0.008	0.008	0.008
<i>t</i> -stat	(1.24)	(1.30)	(1.31)	(1.33)
<b>Size</b>	-0.002	-0.002	-0.002	-0.002
<i>t</i> -stat	(-0.98)	(-1.16)	(-1.16)	(-1.13)
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<i>t</i> -stat	(-0.70)	(-0.70)	(-0.66)	(-0.70)
<b>R<sup>2</sup></b>	5.02%	5.12%	5.10%	5.25%
<b>Adjusted R<sup>2</sup></b>	1.32%	1.42%	1.39%	1.55%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=134)

This table reports results related to testing of models (10) surrounding the *AAER* issue date. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

**Table 15: Influence of Severity on the Change in Cost of Equity Capital, Investigation Announcement Date, Dependent Variable=  $\Delta$  in CEC**

Variable	Gordon Growth	Gebhardt <i>et al.</i> (2001)	OJN (2005)	PEG Ratio
	Model	Industry Model	Economy-wide Growth Model	Method
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
<b>Intercept</b>	-0.007	0.055	0.048	0.035
<i>t</i> -stat	(-1.06)	(1.22)	(1.07)	(1.05)
<b>Severity Composite</b>	-0.001	-0.002	-0.002	-0.002
<i>t</i> -stat	(-0.48)	(-0.16)	(-0.17)	(-0.19)
<b>RState</b>	-0.000	-0.003	-0.003	-0.003
<i>t</i> -stat	(-0.23)	(-0.58)	(-0.57)	(-0.59)
<b>Size</b>	0.001	-0.008	-0.008	-0.006
<i>t</i> -stat	(0.87)	(-0.92)	(-0.93)	(-0.88)
<b>Leverage</b>	-0.000	-0.002	-0.000	-0.000
<i>t</i> -stat	(-0.79)	(-0.54)	(-0.53)	(-0.58)
<b>R<sup>2</sup></b>	5.55%	2.77%	2.78%	2.80%
<b>Adjusted R<sup>2</sup></b>	-2.79%	-5.76%	-5.75%	-5.73%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=64)

Reports for model (11) surrounding the investigation announcement date, where *Severity Composite* is the sum of four variables: *MgmtTurn*, *ShldLawst*, *Core Earnings*, and *AudCen*. *MgmtTurn* is an indicator variable equal to 1 if the firm fires the CEO or CFO in association with the *AAER*, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the *AAER* targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC *AAER*. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

**Table 16: Influence of Severity on the Change in Cost of Equity Capital, Investigation Announcement Date, Individual Measures, Dependent Variable=  $\Delta$  in CEC**

<b>Variable</b>	<b>Gordon Growth Model</b>	<b>Gebhardt <i>et al.</i>(2001) Industry Model</b>	<b>OJN (2005) Economy-wide Growth Model</b>	<b>PEG Ratio Method</b>
<b>Intercept</b>	-0.006	0.050	0.043	0.032
<b>MgmtTurn</b>	-0.002	-0.043*	-0.044*	-0.033*
<b>ShldLawst</b>	-0.002	0.029	0.030	0.022
<b>CoreEarnings</b>	0.000	0.016	0.015	0.012
<b>AudCen</b>	0.001	-0.012	-0.012	-0.009
<b>RState</b>	-0.000	-0.002	-0.002	-0.002
<b>Size</b>	0.001	-0.006	-0.006	-0.004
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<b>R<sup>2</sup></b>	6.72%	13.02%	13.28%	13.24%
<b>Adjusted R<sup>2</sup></b>	-7.10%	0.13%	0.43%	0.39%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=64)

Reports for model (12) surrounding the investigation announcement date, where all variables are as defined in Table 10.

**Table 17: Influence of Severity on the Change in Cost of Equity Capital, AAER Issue Date, Dependent Variable=  $\Delta$  in CEC**

<b>Variable</b>	<b>Gordon Growth Model</b>	<b>Gebhardt <i>et al.</i>(2001) Industry Model</b>	<b>OJN (2005) Economy-wide Growth Model</b>	<b>PEG Ratio Method</b>
<b>Intercept</b>	0.033*	0.034**	0.021	0.028**
<i>t</i> -stat	(2.20)	(2.60)	(1.62)	(2.11)
<b>Severity Composite</b>	-0.005	-0.003	-0.003	-0.004
<i>t</i> -stat	(-1.08)	(-0.84)	(-0.74)	(-0.89)
<b>RState</b>	0.009	0.008	0.008	0.008
<i>t</i> -stat	(0.69)	(0.68)	(0.67)	(0.73)
<b>Size</b>	-0.005*	-0.004	-0.004	-0.004
<i>t</i> -stat	(-1.76)	(-1.45)	(-1.50)	(-1.57)
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<i>t</i> -stat	(-0.72)	(-0.64)	(-0.58)	(-0.66)
<b>R<sup>2</sup></b>	4.02%	2.96%	2.94%	3.58%
<b>Adjusted R<sup>2</sup></b>	-6.97%	-5.83%	-5.80%	-6.50%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=67)

Reports for model (11) surrounding the AAER issue date, where *Severity Composite* is the sum of four variables: *MgmtTurn*, *ShldLawst*, *Core Earnings*, and *AudCen*. *MgmtTurn* is an indicator variable equal to 1 if the firm is firing the CEO or CFO in association with the AAER, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the AAER targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC AAER. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

**Table 18: Influence of Severity on the Change in Cost of Equity Capital, AAER Issue Date, Individual Measures, Dependent Variable=  $\Delta$  in CEC**

<b>Variable</b>	<b>Gordon Growth Model</b>	<b>Gebhardt <i>et al.</i>(2001) Industry Model</b>	<b>OJN (2005) Economy-wide Growth Model</b>	<b>PEG Ratio Method</b>
<b>Intercept</b>	0.028	0.029	0.016	0.023
<b>MgmtTurn</b>	-0.006	-0.002	-0.001	-0.003
<b>ShldLawst</b>	-0.002	-0.001	-0.001	-0.001
<b>CoreEarnings</b>	-0.002	-0.001	-0.001	-0.001
<b>AudCen</b>	-0.014	-0.015	-0.015	-0.015
<b>RState</b>	0.009	0.008	0.008	0.008
<b>Size</b>	-0.005	-0.003	-0.003	-0.004
<b>Leverage</b>	-0.000	-0.000	-0.000	-0.000
<b>R<sup>2</sup></b>	15.11%	14.74%	14.65%	15.10%
<b>Adjusted R<sup>2</sup></b>	3.40%	2.98%	2.87%	3.39%

\*\* (\*) significant at the 5 (10) percent level using one-tailed tests.

(n=67)

Reports for model (12) surrounding the AAER issue date, where all variables are as defined in Table 10.

I conduct non-parametric testing by converting all variables to ranks and running each model with the ranked variables. The results of these rank regressions are consistent with all the core results in tables 7, 8, 9 and 10. I then use Huber and Tukey bi-weights to reduce the influence of outliers by scaling residuals by the absolute median residual. Results using the bi-weights are similar to the core results of the paper reported on Table 7, which indicates that the positive association between the change in cost of capital and an AAER investigation announcement is robust to non-parametric testing. There are, however, using bi-weighted regressions reveals two notable inconsistencies in the statistical results. First, *leverage* is negative and significant in the robust regressions. The second notable difference surfaces in the severity components surrounding the investigation date. Table 20 provides results for non-parametric regressions of the component variables. Noteworthy differences from Table 10 include the weakened significance for the management turnover variable, and the significant results for leverage. Overall, non-parametric testing does not change the core findings of this paper; however, the results indicate that *leverage* may be more significant than results using parametric testing.

Next, I rerun each model removing industry fixed-effects, also resulting in no change in core results. I run each model with two-digit SIC fixed-effects in place of one-digit SIC fixed-effects; this takes the number of industry indicator variables from seven (eight industries) to 27 (28 industries). With the two-digit SIC codes my results related to change in cost of equity capital surrounding the investigation announcement become marginally less significant and the models become over specified (resulting in a negative  $R^2$  for almost all models). Additional testing is also conducted by replacing the *Rstate*



**Table 19: Impact of SEC Investigation on Firm's Cost of Equity Capital, Investigation Announcement Date Using Robust Regression, Dependant Variable=  $\Delta$  in CEC**

Variable	Model (7), Coefficient (t-stat)	Model (8), Coefficient (t-stat)
<b>Intercept</b>	-0.006	-0.006
<i>t</i> -stat	(-1.10)	(-1.15)
<b>AAER</b>	0.004	0.005*
<i>t</i> -stat	(1.56)	(1.95)
<b>Rstate</b>		-0.001
<i>t</i> -stat		(-0.89)
<b>Size</b>	0.001	0.001
<i>t</i> -stat	(0.65)	(0.66)
<b>Leverage</b>	-0.000*	-0.000**
<i>t</i> -stat	(-1.97)	(-2.09)
<b>R<sup>2</sup></b>	3.45%	5.04%
<b>Adjusted R<sup>2</sup></b>	1.12%	1.90%

\*\*,\* significant at the 5 (10) percent level using one-tailed tests  
(n=128)

This table reports results related to testing of models (7) and (8) surrounding the investigation announcement date, controlling for industry fixed-effects. *AAER* is a dichotomous variable equal to 1 if the investigation announcement is concurrent with an associated restatement or the firm does not issue a restatement. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation. *Size* is measured as the log of total assets as reported at the end of the fiscal year of the announcement of an SEC investigation. *Leverage* is the sum of total long-term debt and short-term debt over total equity at the end of the fiscal year of the announcement of an SEC investigation.

**Table 20: Influence of Severity on the Change in Cost of Equity Capital Using Robust Regression, Individual Measures (Dependent Variable=  $\Delta$  in CEC)**

<b>Panel A: Investigation Announcement Date Sample (n=64)</b>		
<b>Variable</b>	<b>Coefficient</b>	<b>t-stat</b>
<b>Intercept</b>	0.011	1.14
<b>MgmtTurn</b>	-0.008	-1.56
<b>ShldLawst</b>	0.006	1.19
<b>CoreEarnings</b>	-0.001	-0.32
<b>AudCen</b>	0.009	1.33
<b>Rstate</b>	-0.001	-0.67
<b>Size</b>	-0.003	-1.23
<b>Leverage</b>	0.001**	2.88
<b>R<sup>2</sup></b>	11.48%	
<b>Adjusted R<sup>2</sup></b>	0.96%	

\*\*\*,\*\*, \* significant at the 5 (10,20) percent level using two-tailed tests

Reports for model (12), where *AudCen*, *MgmtTurn* is an indicator variable equal to 1 if the firm is fires the CEO or CFO in association with the *AAER*, *ShldLawst* is an indicator variable equal to 1 if the firm is targeted by a class-action lawsuit, *Core Earnings* is an indicator variable equal to 1 if the *AAER* targets core earnings, and *AudCen* is an indicator variable equal to 1 if the firm's auditor is targeted by an associated SEC *AAER*. *Rstate* is the magnitude change in earnings for a firm that issues a restatement prior to the announcement of an SEC investigation, *Size* is measured as the natural log of total assets, and *Leverage* is calculated as the sum of long and short term debt divided by equity.

variable (which captures the magnitude of earnings changes for restating firms) with an indicator variable set equal to one for firms that restate earnings prior to an SEC investigation. Results using the indicator restatement variable are consistent with the results presented in the all tables. Finally, I test each model after winsorization at 1%/99% on the change in cost of equity capital variable. Results from the regressions using winsorization continue to be significant for the investigation announcement date (the t-stat for *AAER* in Table 7 becomes 1.92). All other results maintain insignificance after winzORIZATION.

## CHAPTER 6

### CONCLUSION

Prior research uses SEC *AAERs* as a proxy for fraudulent financial reporting and documents some of the negative consequences suffered by targeted firms. However, the impact of an *AAER* on a firm's cost of equity capital is largely unexamined; I examine the impact of SEC *AAERs* on a firm's cost of equity capital. Furthermore, I use proxies for the severity of an *AAER* to further refine our understanding of the impact of an *AAER* on a firm's cost of equity capital. The results of my statistical analysis provide evidence of the impact of an SEC *AAER* on a firm's cost of equity capital *when the investigation is first disclosed to the public*. My results are exclusive to the period surrounding the announcement of the SEC investigation; similar statistical analysis does not provide evidence of an impact on a firm's cost of equity capital surrounding the period *when the SEC issues an AAER*. Proxies for severity yield no statistical associations between the perceived severity of the *AAER* and the change in a firm's cost of equity capital. Possible explanations for the absence of an associated impact include the lack of important information delivered to the market via an SEC investigation, alternative sources of the associated change in riskiness preempting the information to the market, measurement error in the employed variables, and power issues due to the small sample size.

Several questions arise as a result of this study which could provide opportunities for future studies. Civil lawsuits related to a restatement likely provide direct information to the

market regarding the measurable cost of a restatement. An SEC investigation may provide further evidence for the plaintiff in such cases. It would be interesting to repeat the analysis in this paper for the event date surrounding the announcement of a civil lawsuit. The content of the *AAER* could also be relevant, as it is possible that the market evaluates the aggressiveness of the SEC as reflected in the *AAER* and alters expectations about future cash flows based on the probability of the success of associated lawsuits. Future research could focus on this variation in the ‘tone’ of the *AAER* to measure severity.

The insignificant results could also be a result of the measurement tool; the various models employed to capture cost of equity capital. It is possible that the cost of equity capital measures are not capturing the change in a firm’s cost of equity capital, and therefore do not manifest significance when paired with *AAER* variables. If future academic research discovers alternative methods of capturing the cost of equity capital, the impact of the SEC’s investigation could be retested using models developed in this paper coupled with the alternative measures.

The past decade has witnessed a large body of academic research directed at evaluating these implied cost of equity capital measures. The appendix contains a sampling of papers evaluating the measures and criticisms related to the measures. In order to analyze the cost of equity capital measures and recent iterations, ideally one could use an event study with an event in which clear *ex ante* expectations about the change in cost of equity capital are known. If future studies are able to document and establish the impact of new measures for capturing the cost of equity capital, future studies could utilize this event to evaluate the recently suggested modifications to the cost of equity capital measures.

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## Appendix: Studies evaluating the cost of equity capital measures employed in this paper

Two recognized accounting studies evaluate the four measures summarized in Chapter 4. Botosan and Plumlee (2005) (hereafter BP) assess the measures by regressing the measures on proxies for risk that BP expect to be associated with the cost of equity capital. The risk factor proxies include information risk, market beta, leverage, growth, and firm size. Regression results lead BP to conclude that the Target Price Model<sup>28</sup> and the PEG ratio method yield superior measures based on their stronger (compared to the other models) association with all of the tested proxies for risk. However, the results in BP are based on small differences in coefficients and statistical power. For example, the Target Price Model has one of the lowest R<sup>2</sup>s of the five measures, but is chosen because it is correlated with all five risk proxies.

Easton and Monahan (2005) evaluate all but one of the measures<sup>29</sup> from BP using a decomposition of earnings developed by Vuolteenaho (2002). The authors find that the evaluated measures are not reliable measures of *ex post* realized returns. Easton and Monahan's (2005) results hold despite attempts to remove measurement error by utilizing grouping and instrumental variables. In a recent study, by removing the predictable error from analysts' forecasts before calculating the measures, Gode and Mohanram (2008) are able to improve the measures tested in Easton and Monahan's (2005) study as evidenced by an improved association with realized returns.

Many recent papers also suggest several model transformations that attempt to improve (or further discourage the use of) the models of implied cost of equity capital. For example, Easton and Sommers (2007) suggest that removal of analyst optimism in the forecasts input into the models removes the equity premium (cost of equity capital as measured by the models less

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<sup>28</sup> The Target Price Method is not included in this study.

<sup>29</sup> The Target Price Method (Botosan & Plumlee 2004) is excluded from Easton and Monahan's (2005) analysis.

the risk free rate). Gode and Mohanram (2008) document an improvement in the models association with realized returns when the models are adjusted by removing predictable analyst forecast errors.