NORTHWESTERN UNIVERSITY

Measuring Audit Impact: Implications for Going Concern Opinions and Board Governance

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

for the degree

DOCTOR OF PHILOSOPHY

Field of Accounting Information and Management

By

Blake Davis Bowler

EVANSTON, ILLINOIS

June 2016

ABSTRACT

Measuring Audit Impact: Implications for Going Concern Opinions and Board Governance

Blake Bowler

This dissertation studies the auditing process and audit quality. The first essay examines current empirical measures and introduces a new measure, *audit impact*. The second essay uses this measure to reexamine the use of going concern (GC) opinions as an indicator of audit quality. The third essay discusses how the auditing process impacts quality and examines where research can be extended to better understand the role outside factors have in moderating the effects of the auditing process.

In the first essay, I compare current measures of audit quality to the literature's definition of audit quality and introduce a new empirical measure called audit impact. Current empirical measures of audit quality share a common weakness, a limited conceptual connection with the literature's definition of audit quality. I develop a measure, audit impact, using Benford's Law to compare the quality of unaudited quarterly statements to the quality of audited annual statements. I exploit the fact that Benford's Law can assess the quality of financial statements without being contaminated by business and economic risks, which are of particular concern when GC opinions are being considered (Amiram et al. 2015). This measure provides a new avenue for researchers to gain insights into the auditing process.

In the second essay, I reexamine the use of GC opinions as an indicator of audit quality. The issuance of GC opinions by auditors has been accepted, *a priori*, as a measure of auditor

independence and quality throughout the literature (DeFond and Zhang 2014). Recent findings suggest researchers should reconsider the validity of this measure. The issuance of GC opinions has been shown to reduce expected litigation costs to auditors (Kaplan and Williams 2012) and GC opinions have been shown to be associated with deficient audits (Aobdia 2015). These studies, however, are unable to explain changes in audit behavior surrounding the issuance of GC opinions. My findings suggest that more impactful auditors are *less* likely to issue GC opinions, and their GC opinions are *more* predictive of bankruptcies; in addition, I find the quality of financial statements to be *lower* when GC opinions are issued. This decline is associated with a reduction in the auditor's impact from the previous year. These findings challenge the use of GC opinions as a measure of audit quality and give insight into the auditing behavior that surrounds this decision.

In the third essay, I further examine areas where audit impact can provide insight into the workings of the auditing operations. I examine how independent directors and expert directors are associated with reporting quality. While a positive association has been documented in the past, it remains unclear what drives the increase in reporting quality. It could be that companies that have more independent and expert directors have internal processes in place that ensure higher quality financial reporting. Alternatively, it could be that independent and expert directors empower their auditors to complete more rigorous audits. My results suggest that, while both possibilities may coexist, improvements in the quality of the financial reporting process appear to be more influential. The third chapter also discusses and explores how audit impact can potentially introduce error into the income statement of the fourth-quarter. These results have significant implications for researchers considering how certain corporate or audit firm attributes can drive financial statement quality and how these effects can vary across the financial statements.

Combined, this dissertation provides a tool for furthering research on the auditor's role in the financial reporting process. By introducing a measure of quality that is conceptually linked to auditing procedures, researchers should be better able to use publicly-available data to research the work auditors perform. This step allows researchers to reexamine what current measures of audit quality, such as GC opinions, are actually capturing within the auditing and reporting process.

ACKNOWLEDGEMENTS

My research would not be possible without the continued advice and guidance of my dissertation committee chair, Robert Magee. I am indebted to Robert Magee and the rest of my dissertation committee: Daniel Aobdia, Matthew Lyle, and Kathleen Hagerty. They have provided a plethora of feedback from which I have benefited immensely.

I am grateful for the invaluable training, help, and knowledge I have received from other faculty members during my time at the Kellogg School of Management at Northwestern University. I would like to thank Craig Chapman, Ronald Dye, Thomas Lys, James Naughton, Tjomme Rusticus, Swaminathan Sridharan, Anup Srivastava, Linda Vincent, Beverly Walther, Clare Wang, Laura Wellman, and Wan Wongsunwai.

My fellow doctoral students have provided generous insights and mentorship. I would like to thank Riddha Basu, Davide Cianciaruso, Gary Chen, Pedro Gomez, Rita Gunn, Mark Kim, Kari Lee, Brandon Lock, Rahul Menon, Spencer Pierce, Christopher Rigsby, Kirti Sinha, Andy Stephan, Ira Yeung, and Jie Zhou.

I would like to express my gratitude for the generous financial and administrative support provided by the Kellogg School of Management. Lorraine Cassis, Mariela Flores, Susan Jackman, and Joan Palmer have supported me through the doctoral process. I am especially appreciative of the help provided by Mariela Flores, the Accounting Information and Management Department Manager.

The support from my family and friends has been immense. My parents have provided unwavering encouragement and have sacrificed to support me to pursue my dreams. In addition to her continued support, Hilary, my sister, has always been a role model for me in terms of both academic achievement and personal character. Winnie Ennenga, my aunt, has provided experience, empathy, and assistance that helped me pass the finish line. Last but not least, Erin Bowler, my wife, has provided and continues to give the endless support and love that allows me to succeed both professionally and personally. Thank you.

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INTRODUCTION

This dissertation examines the impact of the auditing process on the quality of financial statements. I review existing measures of audit quality (AQ) and introduce a measure I call *audit impact*. I revaluate an existing measure of AQ, going concern (GC) opinions, and find evidence that GC opinions are not necessarily representative of AQ. Additionally, I demonstrate how the concept of audit impact allows for a richer exploration of attributes associated with reporting quality.

In Chapter 1, I conceptually explore the auditing process and existing measures of AQ. I develop a measure I call *audit impact*. Audit impact measures the change in financial report quality that results from the auditing process. This measure should be divorced from mechanical relationships with client risks, attributes, and business cycles. Audit impact is distinct from many existing measures of AQ that measure the quality of the audited financial statements. Because the audited financial statements are a joint function of the work of both the company and the auditor, my measure of audit impact measures changes in quality resulting from auditing procedures.

I measure the impact of an auditor by comparing the quality of unaudited interim balance sheets with the quality of the audited year-end balance sheet. This measure compares the frequency of first digits in the financial statements to the theoretical distribution posited by Benford's Law. It is easily calculable by researchers from public data. The statements are expected to conform to this distribution regardless of any changes across time, industry, or business cycle.

In Chapter 2, I examine the use of one conventional measure of AQ, GC opinions. I exploit the attribute of audit impact being likely divorced from risk in this setting where traditional measures are likely to incidentally capture corporate risks and characteristics beyond reporting quality.

I find that impactful auditors are less likely to issue GC opinions, and I find that engagements which receive a GC opinion are associated with a reduction in audit impact. These results are consistent with recent findings suggesting that the reduction in expected litigation costs resulting from issuing GC opinions may result in an association of GC opinions with lower-quality audits (Aobdia 2015; Kaplan and Williams 2012). I find less impactful auditors overissue GC opinions and commit more Type I errors. My research indicates that an auditor's propensity to issue GC opinions is not positively associated with all dimensions of quality. My research also indicates that external factors, such as litigation risk, may influence the auditor's decision to issue a GC opinion.

In Chapter 3, I examine the association certain company attributes have with the auditing process. Specifically, I examine the role of the board of directors in determining financial reporting quality. Boards with more independent and expert directors have been shown to have higher reporting quality, but it is not clear if the higher quality is a result of higher corporate standards or additional auditor empowerment. The results in Chapter 3 suggest increased corporate standards are more responsible for the higher level of reporting quality.

Chapter 3 also examines how the auditing process may impact aspects of the financial statements besides the balance sheet. Specifically, data indicate that initially, an auditor's impact is responsible for increasing the quality of the fourth-quarter income statement. This suggests that audit impact is preventing the inclusion of errors in the income statement. The relation between audit impact and the fourth-quarter income statement, however, is non monotonic. For statements with high levels of audit impact, there are indications that an auditor's impact may be responsible for introducing error into the fourth-quarter income statement. This is consistent with auditor correcting errors committed in prior periods and running reversals of these errors through the fourth-quarter income statement.

Combined, these three chapters study the existing measures and concepts of AQ and propose a measure, audit impact, which is informative about how the auditing process affects the quality of the financial statements. The results show a need to reconsider the appropriateness of current measures of AQ and an opportunity to research the factors associated with reporting quality at a richer level.

CHAPTER ONE

Discussion of Audit Quality and Using Benford's Law to Capture Audit Impact

1.1 Introduction to Chapter One

Regulators and researchers are both interested in the quality of work performed by financial statement auditors. The first step in conducting studies on the quality of the work is to define and empirically measure quality. Both of these tasks have proven to be challenging. Chapter one contributes to the literature on this front.

Regulators and researchers have taken different perspectives on how to address the challenge of defining audit quality (AQ). The Public Company Accounting Oversights Board (PCAOB) has abstained from defining AQ although they are seeking empirical indicators and measures of AQ (PCAOB Release No. 2015-005, July 1, 2015). Perhaps the greatest challenge to defining AQ is that AQ can mean different things to different stakeholders (Christensen et al. 2015). The majority of academic research on the topic has defined AQ as "the market-assessed joint probability that a given auditor will both detect a breach in the client's accounting system, and report the breach" (DeAngelo 1981).

Because the auditing process is generally opaque to outsiders, it is difficult to observe AQ. A variety of empirical measures have emerged as proxies of AQ in the literature (DeFond and Zhang 2014). When considering the strengths and weaknesses of these measures, it is important to consider the link between the measure and the dimension of quality being examined. As discussed in this chapter, I find in many applications, the empirical measures of AQ are not theoretically consistent with the aspect of AQ being examined.

In this chapter, I examine a recently published measure that proxies for the level of error contained in financial statements. The unique attribute of this measure stems from its application of Benford's Law (Amiram et al. 2015). Benford's Law posits the distribution of first digits that naturally occurring datasets follow. Research shows the level of conformity of financial statements to Benford's Law can be used as a measure of the quality of financial statements. One of the benefits of this measure is that the attributes and economics of the company generating the financial statements do not affect the expected conformity to Benford's Law except to the extent they may influence reporting quality. I build upon this measure to create a separate measure that conceptually captures the impact the auditing process has on the quality of the issued financial statements. I call this measure *audit impact*.

The measure of audit impact developed in this chapter exploits the strengths of Benford's Law. I compare the conformity of unaudited interim financial statements to audited annual financial statements. Because the application of Benford's Law is conceptually divorced from business risks or cycles, it is an ideal measuring stick for comparing the quality of interim (unaudited) and annual (audited) financial statements. The structure of this measure is conceptually linked, or theoretically consistent, with the literature's definition of AQ.

In this chapter, I detail the construction of this measure of audit impact. I empirically demonstrate the ability of Benford's Law to capture the quality and informativeness of the financial statements and examine what impact the auditing process has on the fourth-quarter financial statements. This work contributes to the literature by identifying the weak conceptual link many empirical measures of AQ have with AQ as defined and by introducing a new measure that overcomes this common shortcoming. The remainder of this chapter proceeds as follows. Section 1.2 discusses quality associated with the auditing process and introduces a new measure called audit impact. Section 1.3 details the construction of the audit impact variable. An empirical examination of the measure is conducted in section 1.4, and section 1.5 presents the results. Section 1.6 concludes.

1.2 Discussion of Quality Associated with Auditing

1.2.1 Defining Auditing Related Quality

Due of the opaqueness of auditing procedures to outsiders, it is challenging to empirically measure the quality of the audit process. The audit process includes the assessments made by auditors and the procedures performed by auditors during the course of the audit. Practitioners, regulators and academics have all been unable to clearly and comprehensively define and empirically measure audit quality (AQ). One of the challenges is that different stakeholders have different perspectives for what constitutes AQ (Christensen et al. 2015). Even after a particular dimension of quality has been identified, there are still challenges in measurement due to data constraints. The sensitive nature of much of the financial information and auditing work papers do not provide transparent ways for researchers to capture the auditing process.

A synthesis of the literature pertaining to AQ has suggested that it "is in the eye of the beholder" and that there are multiple aspects and perspectives to consider when broadly referring to AQ (Knechel et al. 2013). This study focuses on the academic literature's perception and measurement of AQ. Most academic studies define AQ as "the market-assessed joint probability that a given auditor will both detect a breach in the client's accounting system, and report the breach" (DeAngelo 1981; DeFond Zhang 2014). DeFond and Zhang suggest an updated definition of AQ as "a greater assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics" (2014). Researchers adopting this definition must carefully consider how to interpret "faithfully reflect the firm's underlying economics."[1] The common thread in these definitions is that financial statements receiving a high-quality audit will have fewer errors, and more reliability than the statements had before the audit.

These definitions of AQ condition on the quality of the financial statements before they are received by the auditor. I refer to the quality of the financial statements when they are first submitted to the auditor as their ex-ante quality. In DeAngelo's definition, the measure of AQ is implicitly conditioned on the existence of a particular breach in the accounting system; in DeFond and Zhang's definition, AQ is explicitly conditioned upon ex-ante accounting quality. In either case, the change in quality from the ex-ante financial statements to the ex-post audited financial statements is attributed to AQ.

As DeFond and Zhang explain, many measures of AQ used in the literature are actually measures of financial reporting quality (FRQ). FRQ is the quality of the audited financial statements that are distributed to investors and is a joint function of the company's accounting quality and the AQ (DeFond and Zhang 2014). The difference between ex-ante quality and FRQ

[1] For example, financial statements that deviate from Generally Accepted Accounting Principles (GAAP) have been found to be more economically informative than their GAAP compliant restated counterparts in some instances (Badertscher et al. 2012).

is a result of the auditing process, but the empirical measures used in the auditing literature often attribute FRQ entirely to AQ. This implicitly assumes all unaudited reports have identical quality. For instance, when using the frequency of restatements as a measure of AQ, auditors who sign off on statements that do not have errors are said to have high AQ. Measures that strictly use the quality of audited financial statements have the drawback of not capturing ex-ante quality. If the quality of unaudited reports vary, then it is difficult to truly capture AQ with these measures. Financial statements that are clean of errors are not necessarily the result of high AQ. A low-quality auditor could receive statements with high ex-ante quality from their clients and issue statements with high FRQ. Conversely, a high-quality auditor with a high error detection rate could still be associated with low FRQ statements. If a high-quality auditor receives ex-ante statements with a substantial number of errors, a few errors may go uncorrected and persist in the final audited financial statements.

The trade-off between the ex-ante quality and auditor effort is examined in the prior literature. Auditors respond to ex-ante risks not just through their effort selection, but also by managing their client portfolio (Johnstone and Bedard 2003). Auditors will respond to client upward earnings management first through fees, which can proxy effort, and then ultimately through resignation (Krishnan et al. 2012). Evidence suggests auditors also consider the risk associated with a client's poor corporate governance when managing their overall client portfolio (Cassell et al. 2012). The fact that risky clients have a harder time finding auditors (Khalil et al. 2011) is also consistent with auditors being reluctant to accept risky clients. Auditors deliberately manage the ex-ante quality of the statements they audit through their client acceptance and retention decisions. Auditors are able to govern the level of AQ required to maintain acceptable levels of FRQ.

While an auditor's ex-ante risk management is not AQ as academically defined, I do not rule out the fact that such behavior may still create value in the auditing process. For instance, an auditor with low AQ but highly managed ex-ante risk may still provide a reputable certification of financial statements with high FRQ. It is then evident that auditors may substitute ex-ante risk management of their client portfolio for AQ. Investors will perceive auditors that sign off on high FRQ statements to be of high quality, regardless if the FRQ is due to risk management or AQ. In fact, investors' reliance on financial reports can be impacted by their perceptions about the auditor, even if FRQ appears to be uncorrelated with these perceptions (Baber et al. 2014).

Audit impact is the difference in quality between the ex-ante quality of statements that management does not expect to be audited and the quality of audited financial statements. Because an auditor's client may endogenously improve the quality of their financial statements when they know they are being audited, I combine this endogenous improvement with AQ and refer to it as audit impact. Because the client's choice to improve the ex-ante reporting quality of statements to be audited is driven by the client's perception of the auditor, I believe it is still reasonable to attribute this endogenous improvement to the impact of the auditor.

1.2.2 Existing Measures of Quality Associated with Auditors

There are a variety of measures of quality associated with auditors in the literature. Common examples include subsequent restatements, accruals, conservatism, and market reactions. The problem with these measures is that they only capture attributes of the audited financial statements. If the ex-ante quality of the statements varies, then these measures will be unable to identify the portion of the quality attributable to the auditor. Other empirical measures of AQ are derived from audit inputs, audit adjustments, or experimental work. While these measures may conceptually capture the work of the auditor, they face measurement issues, and without conditioning on ex-ante quality, these measures still don't capture the adequacy of the auditor's response.

When FRQ measures, such as restatements, are used to capture AQ, the researcher is implicitly asserting that the accuracy and quality of the audited financial statements are the ultimate responsibility of the auditor and, thus, reflect the quality of the audit process. As such, it is expected that a high-quality auditor will detect and correct errors (Chan and Wong 2002; Gul et al. 2002; Behn et al. 2008; Chang et al. 2009). The need for a restatement, however, is a function of both the ex-ante quality of the statements and AQ. For this reason, correlating restatements with an audit firm without conditioning on ex-ante quality does not accurately capture an auditor's AQ. Additionally, because restatements are correlated with factors outside of the auditing process, their use as a measure of AQ may contain bias. For instance, firms that go bankrupt and are dissolved are unlikely to ever have the ability to restate their final year's financial statements. Additionally, since many restatements are instigated by external sources, company characteristics that attract the attention of external sources could be inadvertently captured by measures using restatements. For example, the U.S. Securities and Exchange Commission (SEC) is constrained in its resources and, therefore, is apparently more likely to investigate the questionable accounting of companies located relatively close to their offices

(Kedia and Rajgopal 2011; DeFond et al. 2015). Internally and externally initiated restatements also have significantly different impacts and represent different breaches of FRQ (Palmrose et al. 2004). The relatively infrequent and discrete nature of restatements also presents an empirical challenge to their use in many settings.

Other FRQ measures, such as accrual quality, conservatism, and market reactions, also need to be conditioned upon ex-ante quality in order to measure AQ. In some research settings, researchers may be interested in the joint function of auditor's risk management and AQ. For instance, when seeking to determine whether non-audit fees compromise the quality of statements issued by a specialist auditor, Lim and Tan (2008) used FRQ measures such as propensity to meet earnings forecasts and earnings response coefficients. Their research conclusions do not explicitly inform about AQ, but do inform about the quality of the resulting financial statements. In such settings, if the researcher is asking how the quality of issued financial statements is impacted by a particular variable, such as non-audit fees, then these measures of FRQ are appropriate. When a researcher is interested in studying AQ and the behavior of an auditor during the course of an audit, then it is not sufficient for the researcher to strictly use FRQ measures.

Some alternative AQ measures capture audit inputs such as audit hours and audit fees. An auditor who spends more time or assigns more skilled staff to an audit will improve their ability to provide more assurance, *ceteris paribus*. Since audit fees are represented as auditor effort when billed to clients, research has pointed towards using audit fees as a measure of AQ (Blankley et al. 2012; Eshleman and Guo 2014; Lobo and Zhao 2013). An auditor's work-level decision, however, is not made in a vacuum. Because auditors respond to the risks they face, some audit inputs have actually been correlated with higher risk and lower FRQ (Seetharaman et al. 2002; Kinney Jr. et al. 2004; Bell et al. 2008; Hribar et al. 2014). Audit fees can signify either increased effort or risk, and in some circumstances, they can result in reduced auditor independence due to economic bonding (Stanley and DeZoort 2007; Choi et al. 2010). The skill of the auditor must also be considered when using input measures. Audit efficiency can vary not only from auditor to auditor but also from client to client (Knechel et al. 2009, Knechel and Sharma 2012). The fact that auditors select their effort in response to client risks underscores the need to condition auditor efforts on ex-ante quality.

Alternatively, some studies use proprietary data sets of audit adjustments to capture AQ (Lennox et al. 2014). While such measures are perhaps the most direct measure of the increase in FRQ due to auditor effort, the number of potential auditor adjustments must be considered when measuring AQ as traditionally defined in the literature (DeFond Zhang 2014). Data from the Public Company Accounting Oversight Board (PCAOB) allows researchers to identify deficiencies in the auditing process, but access to such data is limited (Aobdia 2015). Because the ex-ante quality is not directly observable to outsiders, the use of experimental methods has certain benefits. Experimental work has been able to measure auditor error detection rates in a manner theoretically consistent with the literature's definition of AQ (Owhoso et al. 2002). In empirical archival work, the inability to know how many errors remain undetected makes conditioning on ex-ante quality a challenging task. Additionally, databases of audit hours and audit adjustments are generally limited and not widely available to researchers. Despite the challenges of these measures, they provide invaluable insights in researching auditor behavior where archival data is unavailable.

By studying audit impact rather than AQ, researchers can answer interesting questions surrounding the overall impact an auditor has on FRQ. Although audit impact does not distinguish whether changes in quality are due to auditors correcting errors or due to clients endogenously changing the ex-ante quality of their financial statements, it does capture quality attributable to the auditing process. While measures of FRQ capture the ultimate reporting quality which is a joint function of client and auditor behavior, the interdependencies of these behaviors often make more targeted conclusions difficult. Using audit impact allows the researcher to disentangle certain aspects of the auditing process.

Because direct measures of ex-ante quality and AQ are generally not publicly available, researchers often resort to measures of FRQ to proxy for measures of AQ. Ex-ante quality confounds the relationship between AQ and FRQ because an auditor's work is a function of the ex-ante quality they perceive. If researchers were able to measure both ex-ante reporting quality and FRQ, they would be able to deduce audit impact as the difference. Unfortunately, researchers have been limited in their ability to measure both ex-ante quality and auditor behavior, so they have often been forced to settle for using FRQ measures in studies of AQ.

1.2.3 The Application of Benford's Law in Capturing and Measuring Quality

A new measure of FRQ has been introduced that may also provide a means to better capture audit impact (Amiram et al. 2015). Amiram, Bozanic, and Rouen (ABR) show that financial statements that diverge from the theoretical distribution posited by Benford's Law exhibit lower FRQ. The divergence from Benford's Law is positively associated with accrual-based earnings management proxies. ABR also demonstrate that firms with earnings just above the zero benchmark, which is a sample often associated with having reduced FRQ, have significantly higher deviations from Benford's Law. Additionally, ABR's work indicates that restated financial statements exhibit less divergence than their erroneous predecessors. ABR document that, consistent with being a measure of FRQ, divergence from Benford's Law is associated with decreased abnormal returns around earnings release dates. As ABR point out, this measure has many distinct advantages. The measure "does not require time series or cross-sectional data to estimate, does not require forward-looking information, does not require returns or price information and, by construction, is not likely to be correlated with firm-level characteristics or firms' business models ex-ante."

Benford's Law posits the frequency distribution of digits one through nine as the first digit in certain number sets. The distribution is a result of the base ten logarithms of these numbers being uniformly distributed. Unconstrained naturally occurring numbers tend to comply with Benford's Law. For example, the Fibonacci sequence perfectly conforms to Benford's Law (Washington 1981). In his statistical derivation of Benford's Law, Hill discusses how accounting numbers lend themselves to be used in Benford's Law analysis (1995). The distributions of the first digits of accounting numbers, which are generated through transactions that combine other numbers, conform to Benford's Law (Durtschi et al. 2004). Benford's Law is used in several practical applications including tax compliance, auditing, and fraud detection.[2] In prior literature, research designs have been used that capture digit distributions indicating unscrupulous

[2] Applications of Benford's Law in auditing are done at the account detail and transaction level. Auditors do not apply Benford's Law to numbers on the face of the financial statements in typical audit procedures. For discussion on the use of Benford's Law in these settings, see Nigrini 1996; Watrin et al. 2008; Nigrini and Mittermaier 1997; Durtschi et al. 2004.

rounding.[3] The use of Benford's extends this idea by detecting anomalies even if they are not specifically motivated by the rounding of numbers. ABR construct their measure of conformity to Benford's Law by comparing the frequency of each digit to the frequency expected from the theoretical distribution. The absolute value of each of these differences in frequency is averaged for the digits and is reported as the mean absolute deviation (MAD), or referred to as the financial statement divergence (FSD) score by ABR.[4]

MAD is easily calculable and lacks heavy data requirements. Where other measures may require several years of data for time-series analysis, applying Benford's Law in this fashion requires just one year of the statutory filings of a company. Because there are fewer data restrictions, researchers can generate larger samples in their studies and use samples that more closely resemble the broader population. Studies examining accruals at the quarterly level should recognize that differences between interim and year-end periods may simply be a result of accruals being inherently different across these periods (Durtschi and Easton 2009). While these inherent differences impact accrual measurements, there is no theory to suggest interim reports should have a mechanically different conformity to Benford's Law. This allows us to attribute the changes in the measure to changes in reporting quality rather than differences in business cycles.

The fact that conformity with Benford's Law is not mechanically correlated with a firm's business model or its firm-level characteristics gives this measure a distinct advantage over traditional measures of auditor-related quality. Measures such as accruals can be inherently tied to risk (Fama and French 2008; Khan 2008; Wu et al. 2010). A company with a large amount of

[3] See Carslaw 1988 and Thomas 1989 for early examples.
[4] The mathematical equation for the calculation of MAD is later presented as equation (1).

accruals, even if occurring through the natural course of business, is more risky than an otherwise comparable company with relatively few accruals. As ABR explain, the variety of distributions that generate the true value of each financial statement item is the driving force behind the financial statements conforming to Benford's Law. The variety of the distributions will persist across accounts regardless of the business risks of the company. A change in a company's profitability or riskiness does not have a theoretical mechanical relationship with the conformity of that company's financial statements with Benford's Law. Conversely, a firm experiencing loss or contraction may experience a mechanical decline in accruals (Butler et al. 2004). If business and economic risks are responsible for changes in measures of quality that researchers do not capture in their models, then these measures may be more indicative of these underlying risks than the quality of the financial statements.

I adapt ABR's measure in order to capture the effect audits have in improving the quality of issued financial statements. I utilize the fact that quarterly financial statements are reviewed, but not audited. Prior research has exploited this fact before and suggests that restatements of quarterly statements should not be attributed to auditors (Lobo and Zhao 2013). If the quality of interim financial statements is not to be attributed to the auditor, then it is reasonable to attribute the changes in quality from the interim to the fourth quarter to the auditing process (Brown and Pinello 2007). Unlike other financial-statement-based measures, annual business cycles are not captured and do not influence conformity with Benford's Law. This means interim financial statements can be a good setting to measure the quality of unaudited financial statements.

If attempting to measure AQ as traditionally defined, a researcher would ideally measure the quality of the fourth-quarter financial statements as initially submitted to the auditor as well as the quality of the statements issued subsequent to the audit. Given data constraints, the researcher is unable to observe the ex-ante financial statements. Because of this limitation, I focus my research on audit impact as a proxy for AQ. I use interim unaudited financial statements as a benchmark for a company's quality of unaudited statements. I attribute the change in quality from the unaudited interim statements to the audited annual statements to audit impact. Because a company knows that the year-end statements will be audited, the company may make endogenous choices relating the quality of the ex-ante financial statements that are submitted to the company's auditor. The endogenous nature of these choices is likely dependent on the company's perception of its auditor. While this change in quality is not considered an aspect of AQ, the endogenous change in quality is aggregated with AQ to form the empirical measure of audit impact.

Having a measure of audit impact enables researchers to bring new insights to old and new questions. In studying situations where auditors contemplate giving GC opinions, it is imperative for researchers to use a measure that is not mechanically impacted by the business and financial changes resulting from a company's declining performance or receipt of a GC opinion. Having a metric that can be applied to measure both ending and interim quality in a consistent fashion allows for an examination of the impact of the auditor in these settings.

ABR's measure tests the conformity of all financial statement numbers to Benford's Law on an annual basis. Some modification is required before applying that measure to quarterly statements. If interim financial statements contain more errors than the audited statements, then the reversal of these errors in the fourth quarter are likely to flow through the quarterly income statement and statement of cash flows (SCF).[5] For example, if a company erroneously underestimates the allowance for uncollectible accounts in interim periods, then additional bad debt expense will be incurred in the fourth quarter if the auditor corrects the error. Such a correction would impact the balance sheet, income statement, and SCF. The correction will cause the income statement and SCF to deviate from the actual economics of the quarter while the balance sheet will become more accurate. While the annual income statement and SCF are audited, their fourth-quarter counterparts are not. For this reason, I only measure conformity for balance sheet items. This maintains comparability of the measure across the quarters and avoids capturing the reversal of errors. Being able to measure the quality of unaudited financial statements relative to audited statements without capturing the noise of annual business and economic cycles allows researchers a relatively clean measure of the impact of the auditing process on the quality of the financial statements. I describe the calculation of the measure more thoroughly in Section 1.3.2.

The reduction in data requirements allows researchers to use this measure on broad samples. I compare conformity to unaudited statements to determine a baseline for measuring audit impact. Prior studies of accruals in interim periods recognize that differences between interim and year-end periods mean accruals may be inherently different across these periods. The theory that supports the use of Benford's Law to assess the quality of financial statements applies to both interim and annual financial reporting. The comparability of the measure quarters allows the changes in quality measured to be better attributed to the auditing process rather than differences in business cycles and risks.

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[5] This assumes the use of the indirect method for calculating the statement of cash flows. I maintain this assumption when referring to the statement of cash flows throughout the paper unless specifically stated otherwise.

This measure allows researchers both to better answer old questions and answer new ones. Having a metric that can be applied to measure both audit impact and FRQ allows us to identify auditor characteristics associated with quality. This gives us the additional opportunity to explore exactly what it is about certain auditor attributes that investors associate with quality. For example, characteristics believed to be associated with auditors having higher AQ may actually be associated with auditors having more stringent client screening processes.

1.3 Calculation of Measures and Sample Selection

1.3.1 Sample Selection and Variable Construction

The sample period is for fiscal years 2000-2014. I limit the calculation of my measures of Benford conformity to Compustat balance sheet variables in order to avoid capturing corrections and reversals flowing through the SCF and the income statement. See Appendix A for the listing of data fields used. Missing variables or variables with a value of 0 are ignored in the measurement of conformity to Benford's Law. The first non-zero digit is used in testing Benford conformity. I follow ABR in my treatment of negative numbers by taking their absolute value. For example, if a variable had a value of -3,427.8, then 3 would be identified as its first digit. I require at least 20 numbers to be present on each balance sheet and total assets (ATQ) to be non-negative. To keep the AUD_IMPACT measure consistent across firms, I require each firm-year included to have all four quarters of data. I require each observation to be able to be matched to the Audit Analytics database. The sample consists of 79,291 (317,164) company years (quarters) gathered from 10,974 unique companies collected from Compustat quarterly data.

I calculate control variables as described in Appendix C. Financial measures are calculated using data from Compustat, and market measures are obtained using The Center for Research in Security Prices (CRSP). Audit variables are obtained from the Audit Analytics database.[6] I identify companies going bankrupt using a variety of databases.[7] Table 1.1, Panels C, D, E, F and G describe the sample population before winsorization.

1.3.2 Construction of Standardized Mean Absolute Deviation and Audit Impact

The deviation from Benford's Law used to calculate audit impact differs from ABR's measure of deviation in three distinct ways. The deviations calculated in this study use quarterly data, use only balance sheet items, and are standardized for the sample size. Quarterly data are used to allow for comparison of unaudited and audited financial statements. So as not to capture the reversal of errors in the income statement and SCF, balance sheet financial items listed in the Financial Statement Balancing Model provided by Compustat are used to calculate the level of conformity to Benford's Law for each company-quarter.

[6] I make use of various WRDS Research Macros when joining databases and processing data. WRDS Research Macros, 2010, Wharton Research Data Services, The Wharton School, University of Pennsylvania, https://wrds.wharton.upenn.edu.

[7] I collect bankruptcies and liquidations reported on SDC platinum, CRSP, Compustat, and UCLA's LoPucki Bankruptcy Research Database (BRD). Bankruptcies on SDC platinum are retrieved through June, 2015. CRSP awards company liquidations with a delisting code in the 400's in their delisting database. Liquidations reported through September 2015 were collected from CRSP. Compustat tracks companies dropped due to bankruptcy or liquidation in their "Company" database. Companies with relevant Compustat delisting codes were collected through September 2015. Additionally, I include bankruptcies reported in the UCLA's BRD with bankruptcy filing dates up to and including September 9, 2015. The combined bankruptcy dataset has 1,201 bankruptcies of which 296 are able to be matched with the sample.

The calculation of MAD for firm j in quarter q is made as follows:

$$MAD_{j,q} = \left(\sum_{i=1}^{9} \left|AD_{i,q} - ED_{i,q}\right|\right)/9 \tag{1}$$

Where AD_i is the actual proportion of variables that begin with digit i and ED_i is the proportion of variables expected to begin with digit i according to Benford's Law. ED_i is calculated for each digit, 1-9 as follows:

$$ED_i = log_{10}\left(1 + \frac{1}{i}\right) \tag{2}$$

The expected frequency of each digit appearing as the first digit using equation 2 is presented in Figure 1.1. Because MAD measures mean absolute deviation, higher MAD scores represent lower conformity with Benford's Law and lower FRQ.

Although the MAD score, which is used by ABR, is theoretically insensitive to the size of the pool of the first digits used in its calculation, there are continuity frictions in it when using smaller pools of digits. Concerns about this issue are being voiced in concurrent literature (Barney and Schulzke 2015). For example, according to Benford's Law, approximately 4.6% of the numbers should begin with a nine. For a company with fifty numbers in Compustat relating to the balance sheet, 2.3 numbers are predicted to begin with a nine. Even if the numbers were being drawn from a perfect Benford distribution, there would be mechanical deviations from Benford's Law due to discreteness. Additionally, while the MAD statistic is generally comparable across sample sizes, smaller samples are more at risk of sampling error where the sample is not representative of the underlying population. The relationship between average MAD and sample size in Figure 1.2 demonstrates the need to standardize MAD by the sample size.

I calculate standardized MAD (SMAD) scores based on the sample size of numbers used to generate the score. This adjusts for the effect sample size has on the divergence from Benford's Law due to continuity issues and the variance of the divergence. The standardization process compares a company's MAD to a MAD score that would be expected if such a sample size was drawn from a Benford distribution. That difference is then divided by the standard deviation of the MAD score that is expected. The benchmark MAD and variance are calculated by drawing 10,000 samples of each sample size from the theoretical Benford distribution. The mean and standard deviation of MAD across the 10,000 samples is calculated for each sample size and used as the benchmark. [8]

The standardization process turns the MAD score firm j in quarter q into a SMAD score using the following calculation:

$$SMAD_{j,q} = \frac{(MAD_{j,q} - BM\_MAD_n)}{BM\_MAD\_SD_n} \tag{3}$$

BM_MAD_n is the benchmark MAD score for sample size n, where n is the number of digits used to calculate $MAD_{j,q}$. Similarly, $BM\_MAD\_SD_n$ is the benchmark standard deviation for a sample size n. Using this approach, larger values of SMAD still represent larger deviations from Benford's Law, but the measurement of this deviation is transformed in a way that makes it more comparable across firms and time when the number of numbers used to calculate MAD varies. The average SMAD for each fiscal quarter is charted in Figure 1.3.

As discussed earlier, I attribute the change of quality from the interim quarters to the fourth quarter to the auditor's impact, since the fourth quarter is the only quarter that is actually

[8] See Appendix B for table of standardization values and detailed descriptive on their generation process.

audited. This difference is measured as the difference between a company's average interim SMAD score and their fourth-quarter SMAD score as follows:

$$AUD\_IMPACT_j = Std\_Int\_MAD - SMAD_{j,4} \tag{4}$$

Where

$$Std\_Int\_MAD = \frac{\sum_{q=1}^{3}(SMAD_{j,q})}{3} \tag{5}$$

Remembering that SMAD scores represent deviation from Benford's Law, the calculation of AUD_IMPACT is such that greater numbers represent greater auditor impact. This measure of audit impact is a novel application of Benford's Law that allows researchers to identify changes in quality without capturing changes in business and economic risks.

1.4 Empirical Examination of Audit Impact

1.4.1 Conformity with Benford's Law and the Market's Response

Because the SMAD variable differs from ABR's measure in that SMAD examines the conformity of only balance sheet variables and has gone through a standardization process, I test to confirm that the measure continues to capture FRQ. This test examines the relationship between the market's response to earnings announcements and SMAD. Consistent with ABR's results and SMAD being a measure of FRQ, I predict investors will react more strongly to firms with better (lower) SMAD scores.

The absolute standardized unexpected earnings (SUE) are calculated by taking the absolute value of the difference between actual reported earnings and median analyst estimates and standardizing by share price. Firms are placed in portfolios by ranking firms into terciles based on their absolute SUE and then each of these terciles is ranked into quintiles based on the SMAD scores.[9] This generates a total of fifteen portfolios. The absolute abnormal returns are calculated using a window of three trading days surrounding the earnings announcement date. The analyst estimates used are collected in Thomson Reuters' I/B/E/S database. Compustat's RDQ variable, the report date of quarterly earnings, is used as the earnings announcement date. If RDQ is missing, then Compustat's PDATEQ or I/B/E/S's ANNDATES are used if available. Absolute abnormal returns are calculated as adjusted using size decile returns. Returns are winsorized at the 1st and 99th percentiles.

For each absolute SUE tercile, t-tests are conducted comparing the portfolio with the lowest SMAD to the portfolio with the highest SMAD. Because higher SMAD scores indicate lower FRQ, absolute returns are expected to be decreasing in SMAD for each portfolio of absolute SUE.

In addition, a multivariate analysis is conducted on the impact SMAD has on absolute market responses during earnings announcements. Both 3-day and 5-day windows centered on the earnings announcement date are used in a multivariate analysis using the following specification:[10]

[9] Results are substantively equivalent when portioning more or less coarsely.
[10] In unreported specifications with equivalent results, ABS_SUE is interacted with control variables.

$$ABS\_CAR_{i,t} = \alpha + \beta_1 ABS\_SUE_{i,t} + \beta_2 SMAD_{i,t} + \beta_3 ABS\_SUE_{i,t} * SMAD_{i,t} + \beta_4 LOSS_{i,t} + \beta_5 LEV_{i,t} + \beta_6 BTM_{i,t} + \beta_7 LN\_ASSET_{i,t} + [Year\ Controls] + [FFI48\ Industry\ Controls] + \varepsilon_{i,t} \quad (6)$$

Because investors respond to absolute earnings surprises, a positive relationship between absolute SUE and absolute abnormal returns is expected. Therefore, β_1 is expected to have a positive significant coefficient indicating this relationship. If deviations from Benford's Law indicate lower FRQ, then deviations would be expected to be associated with an attenuation of investor's response to absolute earnings surprises and β_2 to be significantly negative. Because quality is an important factor for investor's reliance on any disclosure, investor's response to information disclosed simultaneously other than absolute earnings surprise may also be attenuated. This response from investors would be indicated by β_3 being significantly negative. The specifications include controls for various firm attributes that can influence returns surrounding announcement periods.[11]

1.4.2 Examination of Fourth-Quarter Audit Impact

Companies file financial reports quarterly. While annual reports in the fourth quarter are audited, interim reports are only reviewed by auditors. For this reason, interim statements are a benchmark of ex-ante financial reporting quality (FRQ) because they are unaudited. Prior research has argued that auditor quality should be judged using audited annual statements and

[11] My controls are consistent with other announcement studies. For example, see Aobdia et al. 2015.

not interim quarterly statements because the interim quarterly statements are not audited (Lobo and Zhao 2013).

I measure average standardized mean absolute deviations (SMAD) from Benford's Law by quarter across all firms in my sample. Because the audit process is expected to improve FRQ, the fourth quarter is expected to have significantly lower values of SMAD. T-tests are conducted comparing the fourth quarter and each individual interim quarter. Additionally, a t-test examines the significance of the difference between the average interim SMAD to the fourth quarter. This difference is calculated at the firm-year level and signifies the audit impact. It is represented with the variable name AUD_IMPACT.

1.4.3 Examination of Quality Measures and Earnings Management

In their study, ABR regress their FSD score, a measure of FRQ, on various measures of earnings management. Their findings suggest accrual-based earnings manipulation is associated with Benford's Law measures, but real earnings management is not. I test my adapted standardized measure of conformity to Benford's Law in a similar manner. Additionally, I examine the measure of audit impact in this setting.

I follow ABR's specification and regress my measures of quality on measures of accrual based earnings management and real earning management using the following model:

$$
\begin{aligned}
Quality\ Measure_{i,t} \\
&= \alpha + \beta_1 ABS\_JONES\_RESID_{i,t} + \beta_2 STD\_DD\_RESID_{i,t} \\
&+ \beta_3 MANIPULATOR_{i,t} + \beta_4 R\_CFO_{i,t} + \beta_5 R\_PROD_{i,t} + \beta_6 R\_DISX_{i,t} \\
&+ \varepsilon_{i,t}
\end{aligned} \tag{7}
$$

To maintain comparability with ABR's analysis, I use only fourth-quarter data when examining the relationship of SMAD and earnings management. Consistent with ABR, I use the Dechow-Dichev measure, the modified Jones model measure, and Beneish's M score as measures of fraudulent accounting and accruals based earnings management. The Dechow-Dichev measure (STD_DD_RESID) is calculated as the five-year moving standard deviation of the Dechow-Dichev residual (Dechow and Dichev 2002). The modified Jones measure (ABS_JONES_RESID) uses the absolute value of the accruals quality residual from the modified Jones model (Jones 1991). The adaptation of Beneish's M score (MANIPULATOR) is a dummy variable equal to 1 if the M Score indicates possible earnings manipulation with a score greater than -1.78 (Beneish 1999).

I remain consistent with ABR and use the same variables to proxy for real earnings management. The developed measures capture real earnings management through abnormal levels of cash flow (Roychowdhury 2006; Cohen et al. 2008). Specifically, real earnings management is measured using abnormal levels of cash flow from operations (R_CFO), abnormal levels of production costs (R_PROD), and abnormal levels of discretionary expenses (R_DISX).

I expect my measure of SMAD, a measure of FRQ, to behave similarly to ABR's FSD Score measure and have a significant relationship with the proxies for accrual-based earnings management. If low balance sheet SMAD scores indicate higher FRQ, then SMAD should be negatively associated with measures of accrual and paper earnings management. Audit impact would also be expected to have negative implications for paper earnings management. While high audit impact may prevent accrual-based earnings management, it should not have a mechanical relationship with measures of real earnings management. Research suggests, however, that companies which experience high auditor scrutiny often substitute real earnings management for accrual earnings management (Chi et al. 2011; Burnett et al. 2012). If this is the case, AUD_IMPACT may be positively associated with increased levels of real earnings management.

1.5 Results of Empirical Examination

1.5.1 Results from Conformity with Benford's Law and the Market's Response

SMAD's relationship with the market's response to absolute earnings surprise is examined conditioned upon the level of absolute SUE. Figure 1.4 charts returns for each tercile of absolute SUE. In all three terciles, the investor response is stronger for the firms with the most conformity to Benford's Law (lowest SMAD). This suggests that the investors are reacting more strongly because the information is of higher quality. The strength of investor response to absolute SUE decreases, almost monotonically, as the increasing SMAD quintiles are plotted. In the fifth quintile of SMAD scores (highest divergence from Benford's Law), investors reaction to absolute SUE is weakest. In Panel A of Table 1.2, t-tests are conducted comparing the highest and lowest SMAD quintile of each absolute SUE tercile. The results in Panel A of Table 1.2 are robust across various specifications of time windows and coarseness of partitioning.[12]

The multivariate analysis in Panel B of Table 1.2 exhibits strong support for the use of SMAD as a measure of reporting quality. In all specifications, divergence from Benford's Law is associated with reduced response during the announcement period. In particular, the negative significance of β_3, the interaction of ABS_SUE and SMAD, indicates that SMAD is associated with reduced investor reliance on reported earnings.

These results demonstrate the ability of SMAD to capture FRQ. SMAD is an alteration of ABR's FSD score that is altered to inspect the quality of the balance sheet and is standardized. The market reactions to SMAD are consistent with the measure capturing financial reporting quality (FRQ), and investors reacting more strongly to news released by companies with higher FRQ.

1.5.2 Results from Fourth-Quarter Audit Impact

Panel B of Table 1.1 presents the average standardized mean absolute deviation (SMAD) scores for each quarter which signifies each quarter's average divergence from Benford's Law. The fourth quarter has a lower mean SMAD than each of the other quarters with high significance. This trend can also be identified in Figure 1.3. This is consistent with the financial statements being of higher quality in the fourth quarter as a result of the audit. The difference between each firm's mean interim SMAD and the fourth-quarter SMAD is the firm's

[12] The results are also robust to interacting ABS_SUE with control variables.

AUD_IMPACT value for that year. The audit impact appears to increase the conformity of the financial statements to Benford's Law by about 6%.[13]

1.5.3 Results from the Examination of Quality Measures and Earnings Management

Results from the examination of quality measures and earnings management are presented in Table 1.3. Similar to the results of ABR, specifications 1 and 2 show the SMAD variable has positive significant relationships with the measures of accrual based earnings management, ABS_JONES_RESID, STD_DD_RESID, and MANIPULATOR. Consistent with SMAD capturing FRQ, statements with signs of accrual based earnings management are associated with significantly higher SMAD. Unlike ABR, I find a negative relationship with two of the measures of real earnings management, R_CFO and R_PROD. This negative relationship may signify the trade-off between real and accrual earnings management. Companies that appear to engage in real earnings management are associated higher levels of conformity to Benford's Law, suggesting their financial statements are less likely to contain error. Next, I examine the relationship of AUD_IMPACT with these earnings management measures. Without conditioning on interim SMAD, I find AUD_IMPACT to be significantly negatively correlated with all three measures of accrual based manipulation. This is consistent with high AUD_IMPACT capturing the work of auditors combatting these accounting manipulations. Additionally, I find AUD_IMPACT to be significantly positively correlated with real earnings management. This is consistent with firms substituting real earnings management for accrual based earnings management when auditor scrutiny is high (Chi et al. 2011; Burnett et al. 2012).

[13] The average audit impact is 0.05 and the average interim SMAD is 0.83. (0.05/0.83=6%)

1.6 Conclusions of Chapter One

Despite the strong interest of researchers and regulators in studying the quality surrounding the auditing process, there are currently deficiencies in the conceptual link between the empirical measures of audit quality (AQ) and the definition. This disconnect makes the results of empirical studies challenging to interpret. Despite the wide array of existing measures of AQ, they often share the same weakness in their conceptual link to AQ.

Traditional measures of AQ measure input and outputs of the audit function, but only a limited few directly capture auditing behavior or its impact. Datasets that do provide insight on auditing behavior and impact are generally private and limited. Many of these special datasets are specific to a particular subset of the population and the results may be difficult to generalize. Other measures of AQ can be highly correlated with other factors.

I apply Benford's Law to identify the impact auditors have in improving the quality of financial statements. I capture the impact of the auditor by comparing the quality of unaudited quarterly financial statements to audited annual financial statements. Because this measure employs the use of the known Benford distribution, it has a theoretical foundation for assessing quality. The distribution of first-digits predicted by Benford's Law is unlikely to be tied to company attributes or business risks. Therefore, I am able to capture financial statement quality when other measures would be affected by additional factors.

This chapter contributes to the literature by identifying weaknesses in the links between the definition and empirical measures of AQ. The chapter presents an alternative measure that captures a dimension of AQ that overcomes this challenge. The implications of these findings have significant implications for the auditing literature and how AQ is measured and discussed.

CHAPTER TWO

Going Concern Opinions and Audit Impact

2.1 Introduction to Chapter Two

Financial statements are generally constructed with the assumption that a company will remain a going concern, meaning that it will continue business for the foreseeable future. Assets and liabilities are valued under the assumption that they will be utilized and satisfied in a manner consistent with an ongoing business. These values can change drastically should the company be required to liquidate. It is an auditor's responsibility to include an explanatory paragraph in the audit opinion when there is substantial doubt about the client's ability to continue as a going concern for a reasonable period of time, not to exceed one year beyond the date of the financial statements being audited (PCAOB, AU Section 341). Companies that receive this explanatory paragraph in their audit opinions are said to have received a going concern (GC) opinion.

Researchers have focused considerable attention on the issuance of GC opinions by auditors. While some of this research is specific to understanding the incentives and consequences of issuing GC opinions, much of the research uses the issuance of GC opinions to answer broader questions about auditor quality and independence. The underlying assumption in most of these studies is that the auditor's propensity to issue GC opinions is positively associated with auditor independence and audit quality (AQ). The auditor's decision to issue a GC opinion is often regarded as the outcome of the tension between auditor independence and client resistance. In truth, the decision is impacted by several additional factors and is not so straightforward. I examine how an auditor's impactfulness is associated with GC opinions.

Auditor independence is a necessary condition for auditing to have value (Watts and Zimmerman 1981), but it should be noted that auditor independence is not – by itself – a sufficient condition for quality. The Financial Accounting Standards Board's (FASB) Statement of Financial Accounting Concepts No. 1 (as amended) recognizes that independent auditors "(enhance) the reliability or credibility of the (financial statements)." An auditor's level of independence is often considered to be an exogenous auditor attribute, but some studies do acknowledge that this "independence" may simply be the result of compensating market-based incentives such as reputation, litigation, or regulatory scrutiny (DeFond et al. 2002). Despite the wide use of GC opinions as a measure of AQ, there are a limited number of studies that speak to the reasonableness of this measure or the possible changes in behavior auditors may have subsequent to issuing GC opinions. Alarmingly, some studies suggest that GC opinions may have no association or even a negative association with measures of AQ and underscore the need to reevaluate the use of this measure (Czerney et al. 2014; Aobdia 2015; Kaplan and Williams 2012). Researchers must better link GC opinions with the quality of the auditors that issue them and the quality of the engagements that receive them.

When companies receive GC opinions, several traditional measures of quality are likely to be inaccurate. For example, financial based measures of quality are more likely to reflect the economics of a distressed company than its reporting quality. Distressed firms that receive GC opinions tend to have negative accruals and are less profitable (Butler et al. 2004). The mechanical relationship of the company's financial condition and financial based metrics prohibits the use of these metrics as measures of AQ. Measures using accruals or earnings are mechanically prone to indicate higher AQ due to the declining company's financials. Furthermore, because 60 to 70 percent of firms receiving GC opinions go bankrupt, become privatized, or are acquired, other measures that subsequently become available, such as restatements (Nogler 1995) have a survivorship bias. Unfortunately, measures of AQ using inputs such as staff hours or audit fees are difficult to analyze because the level of audit inputs used can itself fluctuate with the risks perceived by the auditor and their decision to issue a GC opinion.

This chapter contributes to the literature by examining quality surrounding the issuance of GC opinions. Using a measure that captures the change in quality attributable to the auditing process, this chapter examines the association between the quality of audit offices and their propensity to issue GC opinions. The results from this chapter suggest researchers should reconsider the use of the issuance of GC opinions as an indicator of AQ.

The remainder of this chapter proceeds as follows. Section 2.2 discusses related literature. Section 2.3 develops and motivates the hypotheses. Section 2.4 contains the sample section and empirical examination. Section 2.5 contains the results and section 2.6 concludes

2.2 Literature Review

The measurement of audit quality (AQ) has been an ongoing challenge for researchers, regulators, and practitioners. The Public Company Accounting Oversight Board (PCAOB) issued a concept release seeking the profession's input on assessing AQ (PCAOB Release No. 2015-

005, July 1, 2015). In the concept release, the lack of publicly observable AQ indicators is discussed. As Lewis Ferguson, PCAOB board member, discussed the matter, he explained that defining AQ in a clear fashion is a difficult task in itself (2015). The PCAOB's concept release bypasses this problem by not directly defining AQ. As Ferguson explained, while defining AQ is a challenge, "I know it when I see it." Given the difficulty in defining AQ, it is perhaps no surprise that it is challenging to measure.

Many definitions of AQ are subjective and difficult to measure empirically. A synthesis of the literature pertaining to AQ has suggested that it "is in the eye of the beholder" and that there are multiple aspects and perspectives to consider when broadly referring to AQ (Knechel et al. 2013). Most academic studies define AQ as "the market-assessed joint probability that a given auditor will both detect a breach in the client's accounting system, and report the breach" (DeAngelo 1981; DeFond Zhang 2014). DeFond and Zhang suggest an updated definition of AQ as "a greater assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics (2014)." Researchers adopting this definition must carefully consider how to interpret "faithfully reflect the firm's underlying economics."[14] The common thread in these definitions is that financial statements receiving a high-quality audit will have higher financial reporting quality (FRQ), fewer errors, and more reliability than the statements had before the audit.

By taking a different approach and focusing on audit impact, I am able to measure the effect of an audit with greater specificity. I define audit impact as the difference in FRQ between unaudited and audited issued financial statements. In addition to the work of the auditor, this

[14] For example, financial statements that deviate from Generally Accepted Accounting Principles (GAAP) have been found to be more economically informative than their GAAP compliant restated counterparts in some instances (Badertscher et al. 2012).

allows audit impact to capture endogenous changes in quality made by the company in anticipation of the audit. By capturing both the auditor's work and the endogenous corporate changes, this measure captures more comprehensively the ultimate impact the auditing process has in improving the quality of the financial statements issued. I consider an auditor's impactfulness to be one aspect of their overall quality.

2.3 Hypothesis Development

The issuance of a going concern (GC) opinion has been considered an indicator of AQ. Academic literature is in practical consensus that GC opinions generate weakly negative consequences for the company receiving the opinion. Negative market returns surround the announcement of GC opinions, but evidence is mixed as to whether this is the result of the GC opinion or other information that may be released around the same time (Dopuch et al. 1986; Keller and Davidson 1983; Menon and Williams 2010; Myers et al. 2015). Perhaps the reason for this mixed evidence is that there are some indications that the market reactions to GC opinions may not fully value the information. Prior literature documents a negative drift in the year following a GC opinion (Kausar et al. 2009). Overall, the literature indicates that receiving a GC opinion increases companies' cost of capital (Amin et al. 2014). In addition to these market reactions, there are indications that GC opinions have a "self-fulfilling prophecy" whereby companies receiving these opinions are more likely to fail than if they had not received a GC opinion.[15] For these reasons, there is not much dispute that companies have significant reasons to avoid receiving a GC opinion when possible.

Because of the negative consequences, companies have reason to attempt to influence the auditor's decision to issue a GC opinion. Prior research investigates the mechanisms that may impair the independence of auditors with clients at risk of receiving a GC opinion. These channels are essential in arguing that issuing a GC opinion is representative of heightened auditor independence. Research convincingly shows that clients are more likely to switch auditors subsequent to receiving a GC opinion; however, it is unclear if the clients are able to avoid receiving GC opinions by doing so.[16] The possible "self-fulfilling prophecy" of GC opinions also results in a loss for the auditor. The expected reduction in audit fees from potential client switching and client bankruptcy may discourage auditors from issuing GC opinions. As auditors succumb to this pressure, their propensity to issue GC opinions will decline. As a result, these auditors will under-issue GC opinions and commit more Type II errors. Because of this, prior literature has commonly considered the issuance of GC opinions as an indicator of an auditor's ability to rise above client influences and maintain auditor independence.

The propensity of an auditor to issue GC opinions has been used extensively in research regarding auditor independence. Many studies seek to answer how different relationships or characteristics may impact auditor behavior. These studies associate the issuance of GC opinions with strictly more independent and higher-quality auditors. GC opinions have been used to study auditor independence with respect to client size, audit fees, tax service fees, non-audit fees, total

[15] The "self-fulfilling prophecy" suggests that the issuance of a GC opinion causes an increase in the probability of client bankruptcy. For evidence supporting the "self-fulfilling prophecy," see Garsombke and Choi 1992; Vanstraelen 2003. For evidence opposing it, see Geiger et al. 1998b.

[16] For auditor switching with unsuccessful opinion shopping, see Chow and Rice 1982; Krishnan 1994; Krishnan and Stephens 1995. For auditor switching with successful opinion shopping, see Lennox 2000; Chan et al. 2006.

client fees, future fee receipts, and audit partner compensation.[17] Studies around the GC opinion decision are not limited to audit fees, however. The roles of auditor size and specialization in the issuance of GC opinions have also been investigated.[18]

Proponents of using GC opinions as a measure of auditor independence sometimes consider this independence to be a unique dimension of auditor characteristics. They assume the auditor's ability to overcome client pressures is an innate characteristic of the auditor. Others recognize this independence may be achieved through market-based incentives such as loss of reputation, litigation costs, or regulatory scrutiny (DeFond et al. 2002). If there are market-based costs imposed for not issuing a GC opinion when one is warranted (Type II error), then these costs may very well compensate for the disincentives to issuing a GC opinion. Research does support this and demonstrates that the issuance of a GC opinion reduces the risk of auditor litigation and settlement amounts when an auditor is listed in litigation (Mutchler 1984; Carcello and Palmrose 1994; Kaplan and Williams 2012). If these incentives are strong enough to make an auditor issue a GC opinion when one is warranted, then it is reasonably possible that they could overcompensate. These incentives could possibly encourage auditors to issue GC opinions even if they may not be warranted.

H1: *The impactfulness of an auditor is not associated with the auditor's propensity to issue going concern opinions.*

---

[17] For examples, see Reynolds and Francis 2000; Li 2009; Ettredge et al. 2011; DeFond et al. 2002; Geiger and Rama 2003; Blay and Geiger 2013; Hope and Langli 2010; Lennox 1999; Craswell et al. 2002; Firth 2002; Basioudis et al. 2008; Sharma and Sidhu 2001; Basioudis et al. 2009; Ye et al. 2011; Craswell et al. 2002; Callaghan et al. 2009; Robinson 2008; Carcello et al. 2000.
[18] For examples, see Mutchler et al. 1997; Reichelt and Wang 2010; Defond and Lennox 2011; Francis and Yu 2009; Lim and Tan 2008.

H1 is stated in the null form. If the propensity to issue GC opinions is positively associated with auditor independence and quality as conventional research assumes, then an auditor's impactfulness is positively associated with its propensity to issue GC opinions. If, however, the propensity to issue GC opinions is not positively associated with auditor independence and quality, then the association between an auditor's impactfulness and its propensity to issue GC opinions will be negative or nonexistent. If this is the case, researchers should reconsider their application and use of GC opinions as a positive measure of quality.

H1 does not inform whether auditors with a higher propensity to issue GC opinions are over-issuing the opinions or if auditors with a lower propensity to issue GC opinions are under-issuing them. Auditors must trade off the costs of Type I and Type II errors in their decision to issue GC opinions (Carson et al. 2012). Figure 2.1 identifies potential factors that could explain different associations. If auditors are reluctant to issue GC opinions due to client imposed pressures, then lower-quality auditors who are more susceptible to client pressures will have a decreased propensity to issue GC opinions, leading to an under-issuance of GC opinions. If issuing GC opinions generates positive externalities for auditors, then it is likely that lower-quality auditors, who are more susceptible to being influenced by the positive externalities, will have an increased propensity to issue GC opinions and over-issue GC opinions. If higher-quality auditors are overly conservative, they may have an increased propensity to issue GC opinions and over-issue them. Examining the accuracy and informativeness of an auditor's GC opinions in addition to their propensity to issue GC opinions can help triangulate the extraneous factors that may be influencing their decisions regarding the issuance of GC opinions.

Research on Type I errors that result from the over-issuance of GC opinions is relatively scant, but the data suggest that the error rate is quite high. Early research suggests 80 to 90 percent of companies receiving a GC opinion survive the subsequent year, but that rate drops to 30 to 40 percent if acquisitions and privatizations are considered a substitute for bankruptcy.[19] Such error rates are still substantial and surprising if auditors bear significant costs and client resistance when issuing these GC opinions. Evidence suggests high-quality auditors are able to reduce both Type I and Type II errors (Geiger and Rama 2006). Because of the infrequent nature of bankruptcies, this reduction in Type I and Type II errors would reduce the overall number of GC opinions issued by high-quality auditors even though they are issuing GC opinions that are more informative of client bankruptcies.

H2*: The impact of an auditor is not associated with the accuracy of its going concern opinions.*

H2 is stated in the null form. A positive association will be present if more impactful auditors are better at assessing client solvency and less influenced by external pressures. A negative association will be present if less impactful auditors are better at assessing client solvency and more impactful auditors demonstrate excess conservatism. The results of H2 paired with H1 can provide more information on the auditor decision process for issuing GC opinions. For instance, if the auditors that have a higher propensity to issue GC opinions have less accurate GC opinions and commit more Type I errors, then it indicates that these auditors are over-issuing GC opinions.

[19] For research on overall survivorship in the year after a GC opinion, see Mutchler and Williams 1990; Garsombke and Choi 1992; Geiger et al. 1998a; Geiger and Rama 2006. For analysis considering acquisitions and privatizations, see Nogler 1995.

Applications of GC opinions by researchers typically ignore error rates and simply assume an auditor with a higher propensity to issue GC opinions is an auditor with more independence and quality. This is despite the fact recent research indicates that auditors with higher propensities to issue GC opinions have higher Type I errors (false positives) and comparable Type II errors (Fogel-Yaari and Zhang 2013). Although investors and auditors both believe Type I errors indicate higher AQ (Christensen et al. 2015), because Type I errors signify the imposition of negative externalities needlessly on clients, it seems flawed to associate this behavior with increased auditor quality.

Once an auditor decides to issue a GC opinion, the incentives surrounding the audit could change. That is, if expected litigation risks are reduced as a result of GC opinions, as recent literature suggests (Kaplan and Williams 2012), then the issuance of a GC opinion may be associated with a reduction in the auditor's level of effort. Litigation risk has been thought of as an incentive for auditors to engage in costly effort (Dye 1993). Consistent with GC opinions decreasing the incentives for auditors, ongoing work using PCAOB findings shows a positive association between audit deficiencies and GC opinions (Aobdia 2015). If, however, auditors who have a higher propensity to issue GC opinions are more independent and quality driven, then their work on these audits may remain level or even intensify. If an auditor has a negative outlook for their client's business and its shareholders, the auditor may exert additional effort due to an anticipation of scrutiny following the expected shareholder losses.

H3*: Audits which result in GC opinions are conducted with equal levels of audit impact and result in equivalent levels of financial reporting quality as audits which do not result in GC opinions.*

H3 is stated in the null form. If there is no change in incentives for auditors or if auditors perceive higher risks when GC opinions are issued, then the audit impact will remain level or increase when a GC opinions is issued. If however, auditors perceive a reduction in risk or incentives when a GC opinion is issued, then the audit impact would decline when GC opinions are issued. There is limited research on auditor behavior and incentives subsequent to their decision to issue a GC opinion. Understanding the changes in auditor behavior surrounding their decision to issue a GC opinion is essential for researchers who assume these audits are of higher quality. For example, Kausar and Lennox (2012) approach the difference between liquidation values and book values as a potential motivator for GC opinions. If this is the case, AQ may be of relatively less importance for firms with GC opinions, since the audited book values are not representative of liquidation values that would be realized should the company declare bankruptcy. There are, however, indications that the usefulness of the financial statements to investors shifts from the income statement to the balance sheet once GC opinions have been issued (Blay et al. 2011). Since firm valuations, in this case, would be less dependent on assumptions about future revenue streams and more dependent on the value of the assets and liabilities on hand, such a shift could indicate greater value relevance and investor reliance on the financial statements. Because investors take AQ into account when valuing a company, it is essential to understand potential changes in quality when studying changes in investor behavior surrounding these events (Baber et al. 2014).

2.4 Sample Selection and Empirical Tests

2.4.1 Sample Selection

The sample period is for fiscal years 2000-2014. I limit the calculation of my measures of Benford conformity to Compustat balance sheet variables in order to avoid capturing corrections and reversals flowing through the SCF and the income statement. See Appendix A for listing of data fields used. Missing variables or variables with a value of 0 are ignored in the measurement of conformity to Benford's Law. The first non-zero digit is used in testing Benford conformity. I follow ABR in my treatment of negative numbers by taking their absolute value. For example, if a variable had a value of -3,427.8, then 3 would be identified as its first digit. I require at least 20 numbers to be present on each balance sheet and total assets (ATQ) to be non-negative. To keep the AUD_IMPACT measure consistent across firms, I require each firm-year included to have all four quarters of data. I require each observation to be able to be matched to the Audit Analytics database. The sample consists of 79,291 (317,164) company years (quarters) gathered from 10,974 unique companies collected from Compustat quarterly data.

I calculate control variables as described in Appendix C. Financial measures are calculated using data from Compustat, and market measures are obtained using The Center for Research in Security Prices (CRSP). Audit variables are obtained from the Audit Analytics database.[20] I identify companies going bankrupt using a variety of databases.[21] Table 1.1, Panels

[20] I make use of various WRDS Research Macros when joining databases and processing data. WRDS Research Macros, 2010, Wharton Research Data Services, The Wharton School, University of Pennsylvania, https://wrds.wharton.upenn.edu.

[21] I collect bankruptcies and liquidations reported on SDC platinum, CRSP, Compustat, and UCLA's LoPucki Bankruptcy Research Database (BRD). Bankruptcies on SDC platinum are retrieved through June, 2015. CRSP awards company liquidations with a delisting code in the 400's in their delisting database. Liquidations reported through September 2015 were collected from CRSP. Compustat tracks companies dropped due to bankruptcy or

C, D, E, F and G describe the sample population before winsorization. Panels A and B of Table 2.1 describe the population partitioning upon receiving a GC opinion.

2.4.2 Propensity to Issue Going Concern Opinions – Multivariate Logistic Approach

I test H1 by looking for a relationship between the impactfulness of an audit office and its propensity to issue GC opinions. I predict the occurrence of a GC opinion by conducting multivariate logistic regressions. I test for a relationship between audit office impactfulness with the likelihood of a GC opinion being issued while controlling for financial measures using the following model:

$$
\begin{aligned}
LOGIT[GC\_OPIN = 1] \\
&= \alpha + \beta_1 AVG\_AUD\_IMPACT_{i,t} + \beta_2 AVG\_INT\_SMAD_{i,t} \\
&+ \beta_3 INT\_SMAD_{i,t} + \beta_4 BIGN_{i,t} + \beta_5 ZSCORE_{i,t} + \beta_6 LN\_ASSET_{i,t} \\
&+ \beta_7 LEV_{i,t} + \beta_8 CLEV_{i,t} + \beta_9 LLOSS_{i,t} + \beta_9 OCF_{i,t} + \beta_{10} INVM_{i,t} \\
&+ \beta_{11} REPLAG_{i,t} + \beta_{12} LN\_AGE_{i,t} + \beta_{13} BETA_{i,t} + \beta_{14} RETURN_{i,t} \\
&+ \beta_{15} LN\_SEGMENTS_{i,t} + \beta_{16} LN\_AUD\_TENURE_{i,t} \\
&+ \beta_{17} AUD\_SPECIALIST_{i,t} + [Year\ Controls] \\
&+ [FFI48\ Industry\ Controls] + \varepsilon_{i,t}
\end{aligned}
\tag{8}
$$

liquidation in their "Company" database. Companies with relevant Compustat delisting codes were collected through September 2015. Additionally, I include bankruptcies reported in the UCLA's BRD with bankruptcy filing dates up to and including September 9, 2015. The combined bankruptcy dataset has 1,201 bankruptcies of which 296 are able to be matched with the sample.

I control for various measures of company risk and economic condition using measures that are consistently used across the auditing literature.[22] Given the nature of the sample period, and to be consistent with prior research (Lim and Tan 2008), I include year controls. I control for industry using the Fama and French (1997) industry groupings.[23] Standard errors are clustered at the audit office level. If an audit office's impactfulness is not associated with its propensity to issue GC opinions, as hypothesized in H1, I expect β_1 not to be statistically significant.

I use AVG_AUD_IMPACT, the average audit impact an office has in the previous year as my measure of an office's impactfulness.[24] Because auditors receive signals about the risk and quality of their clients before they decide their level of effort, I include AVG_INT_SMAD, the average interim SMAD of the auditor's clients in the prior year, as a control.

2.4.3 Impactfulness of Audit Offices and the Informativeness of their Going Concern Opinions

If an auditor's decision to issue GC opinions is influenced by factors such as those in Figure 1, then the accuracy and informativeness of those opinions will decline. I test H2 by seeing whether auditor impactfulness moderates GC opinions' ability to predict bankruptcy. I conduct a logit analysis and predict the occurrence of bankruptcy[25] based on whether a GC opinion was issued and the impactfulness of the auditor issuing it using the following specification:

---

[22] My financial controls of GC predictors are calculated consistent with prior literature (Blay and Geiger 2013; Kaplan and Williams 2012; Lim and Tan 2008; Defond et al. 2002).
[23] In unreported tests, I exclude observations from the Finance, Insurance, and Banking FFI48 industries. Identical conclusions can be drawn.
[24] In unreported tests, a lagged 3 year rolling average of the auditor's impact is used and yields similar conclusions.
[25] In reported regressions, bankruptcy is defined as bankruptcy within one year from the date of the auditor's report. In unreported tests, bankruptcy time horizons up to 5 years were used with equivalent results. Additionally, the

$$LOGIT[BANKRUPT = 1] = \alpha + \beta_1 GC\_OPIN_{i,t} + \beta_2 AVG\_AUD\_IMPACT_{i,t} + \beta_3 GC\_OPIN_{i,t} * AVG\_AUD\_IMPACT_{i,t} + \beta_4 AVG\_INT\_SMAD_{i,t} + \beta_5 GC\_OPIN_{i,t} * AVG\_INT\_SMAD_{i,t} + [CONTROLS] + \varepsilon_{i,t} \quad (9)$$

The extent to which an auditor's impactfulness is associated informativeness of GC opinions will be reflected by β_3. Because the decision to issue a GC opinion is essentially assessing the probability of bankruptcy, similar controls are used. Standard errors are clustered at the audit office level.

The informativeness of GC opinions will decline when they are either over- or under-issued by auditors. In either case, GC opinions will be less accurate. While specification (8) provides insight on the overall informativeness of the GC opinions issued by auditors, it is not informative about Type I and Type II errors. To aid in identifying the causes of inaccuracy, I run ex-post logits predicting the issuance of GC opinions conditioning on whether or not the company goes bankrupt using the following specification:

$$LOGIT[GC\_OPIN = 1|BANKRUPT] = \alpha + \beta_1 AVG\_AUD\_IMPACT_{i,t} + \beta_2 AVG\_INT\_SMAD_{i,t} + [CONTROLS] + \varepsilon_{i,t} \quad (10)$$

In specification (9), β_1 indicates if auditors' impactfulness can be linked to Type I and/or Type II errors. If an auditor is more likely to commit Type I errors, then they are more likely to erroneously issue a GC opinion; the relationship will be revealed by β_1 when conditioning on the fact that a bankruptcy does not occur. If an auditor is more likely to commit a Type II error, then the auditor is less likely to issue a GC opinion when one is required; that fact will be indicated by β_1 when conditioning on the fact that a bankruptcy does occur.

results show equivalent significant relationships when excluding Finance, Insurance, and Banking FFI48 industries or when using a moving average of the past 3 years of the audit office's impact.

2.4.4 Test of Relationship of Going Concern Opinion and Audit Impact – Auto Control

It is unclear how an auditor's behavior may change once the decision to issue a going concern (GC) opinion has been made. Regarding H3, conventional wisdom suggests these audits would be expected to be of greater quality and experience a relatively high level of audit impact, but recent research challenges this conventional wisdom. If GC opinions actually decrease expected auditor litigation risk (Kaplan and Williams 2012), and are positively associated with PCAOB Part I audit deficiency findings (Aobdia 2015), then auditors may be reducing their effort when they issue a GC opinion and these audits may experience a lower audit impact.

To shed light on this question, I examine the change in audit impact when companies receive GC opinions. I identify companies that receive a GC opinion in one year and do not in the immediately preceding year. I require these companies to have the same auditor in both years. Using the prior year, when a GC opinion is not issued, as a control, I compare the change in AUD_IMPACT across the two periods. If audits with GC opinions are of higher quality, I expect audit impact to increase in the year of the GC. Conversely, if auditors react to the potential reduction in litigation risk when a GC opinion is issued, then I would expect audit impact to decline in the year of the GC opinion. I extend the comparison by examining instances when these companies receive a second consecutive GC opinion from the same auditor. If the results are driven by the issuance of a GC opinion, I would expect the same results and conclusions to hold.

2.4.5 Test of Relationship of Going Concern Opinion and Audit Impact – Propensity Matching

I further investigate changes in audit impact resulting from GC opinions by using propensity score matching within audit firms. I use the logit specification in column 3 from Table 2.2 and calculate GC_PROB, the predicted probability of receiving a GC opinion for each firm year. I match companies with the same audit firm and fiscal year using an algorithm that maximizes the number of potential matched pairs.[26] I match without replacement; a control firm used in one match cannot be used again in another match. I require companies to have GC_PROB values within 0.005 of each other. My treatment firms are firms which receive a GC opinion in year *t* and do not receive a GC opinion in year *t*-1. My control firms do not receive a GC opinion in either year. I conduct a multivariate OLS predicting audit impact using the following specification:

$$AUD\_IMPACT = \alpha + \beta_1 GC\_YEAR_{i,t} + \beta_2 GC\_FIRM_{i,t} + \beta_3 GC\_YEAR_{i,t} * GC\_FIRM_{i,t} + [CONTROLS] + \varepsilon_{i,t} \quad (11)$$

The specification in equation (10) includes, GC_FIRM, a dummy variable that indicates treatment firms, both in the year of the GC opinion and the year immediately preceding. GC_YEAR is a dummy variable that indicates the period GC opinions are issued. In the year of the GC opinion issuance, GC_YEAR takes a value of one for both firms receiving a GC opinion

[26] I adapt an algorithm used for matching patients in medical studies (Fraeman 2010).

and their matched control observations. The interaction of these two dummies isolates the change in audit impact for the firms receiving GC opinions at the time they receive them. If H2 holds and there is no change in auditor behavior when a GC opinion is issued, then I expect β_3, the coefficient of the interaction term, not to be statistically significant. If auditors increase or decrease their level of impact when a GC opinion is issued, then I expect β_3 to indicate the change in behavior. Standard errors are clustered at the audit firm level.

2.5 Results

2.5.1 Results from Auditor's Propensity to Issue Going Concern Opinions– Multivariate Logistic

Table 2.2 presents the results of the multivariate logistic analysis relating an office's impactfulness and its propensity to issue GC opinions. The financial control variables are consistent across specifications and are in agreement with expectations developed from the prior literature. The Pseudo R^2 values average around 40%, consistent with the predictive power observed in the prior literature.

In all specifications, β_1 is significantly negative. This refutes H1, and suggests that auditors in more impactful offices are less likely to issue GC opinions.[27] These results are contrary to conventional use of GC opinions as a measure of higher-quality auditors. This suggests that other

[27] Equivalent results hold using the average SMAD of the auditor's client's in the previous year, or rolling averages of the previous 3 years of either measure, suggesting that auditors associated with higher-quality financial statements are less likely to issue GC opinions. The results are also robust to excluding observations from the banking, insurance and finance industries.

factors, such as those in Figure 2.1, play an important role in determining a firm's propensity to issue GC opinions. While these results associate auditors with higher (lower) impact with a lower (higher) likelihood to issue GC opinions, they do not capture all factors that may affect this relationship. It could be that high-impact auditors are worse at detecting the need to issue a GC opinion or that they are somehow more susceptible to client pressures. The results are also consistent with low impact auditors over-issuing GC opinions due to conservatism, increased fear of legal action, or poor ability in assessing client solvency. The accuracy of GC opinions must be examined to distinguish the difference.

2.5.2 Results from Impactfulness of Audit Offices and the Informativeness of their Going Concern Opinions

Table 2.3 presents logistic regressions that test for an auditor's impactfulness having a moderating effect in the power of GC opinions to predict bankruptcies. In the first two specifications, which lack financial controls, β_3 is significantly positive. This indicates that as an auditor's average impactfulness increases, their GC opinions are more likely to be predictive of client bankruptcy. In the third and fourth regressions, however, the significance is removed once financial controls are included. This is consistent with impactful auditors issuing GC opinions as warranted by their client's financial performance.[28]

Table 2.4 presents logits that predict the issuance of GC opinions conditioning on whether or not the company goes bankrupt. Panel A has limited observations due to the fact it is conditioned on the fact that a bankruptcy does occur in the year after the date of the auditor's report. In these

[28] Consistent results hold when calculating auditor impactfulness with a rolling average of the prior 3 years. Results hold when observations from the banking, insurance and finance FFI48 industries are excluded.

specifications, β_1 is positive at insignificant levels. Auditor impactfulness is not associated with the probability of committing a Type II error in a statistically significant way. Panel B is conditioned on the fact that a bankruptcy does not occur in the year following the auditor's report. In all three specifications, β_1 is negative with statistical significance. This indicates that when a company does not go bankrupt, impactful auditors are less likely to issue GC opinions and are thus less likely to commit Type I errors.[29] Combined, this answers H2 by showing that more impactful auditors issue more accurate GC opinions and that the increased propensity of less impactful auditors to issue GC opinions results in additional Type I errors. These results are consistent with prior work finding an auditor's propensity to issue GC opinions is positively associated with Type I error rates while not necessarily being associated with Type II error rates (Fogel-Yaari and Zhang 2013).

2.5.3 Results from Testing Relationship of Going Concern Opinion and Audit Impact – Auto Control

I identify 959 instances of companies being audited by the same audit office in two consecutive years where the company does not receive a going concern (GC) opinion in the first year and does in the second year. Panel A of Table 2.5 compares INT_SMAD, AUD_IMPACT, and year-end SMAD for these companies across the two years. I find that interim SMAD is not statistically different across the two years. This indicates that the company's financial reporting systems are comparable across the two years and that differences in annual FRQ are more likely

[29] Consistent results hold when calculating auditor impactfulness with a rolling average of the prior 3 years. Results hold when observations from the banking, insurance and finance FFI48 industries are excluded. Bankruptcy horizons of up to 5 years were also examined with supporting conclusions.

attributable to the auditing process. The data show that auditors have a significantly higher impact in the year prior to issuing the GC opinion than in the year of the GC opinion. These results are consistent with suggestions in the literature that GC opinions decrease expected auditor litigation and that audits with GC opinions are associated with deficient audits (Kaplan and Williams 2012; Aobdia 2015).

Panel B of Table 2.5 then extends the comparison to a subsample of 274 of the 959 companies. This subsample of companies received a second consecutive GC opinion from the same auditor. The results suggest that as GC opinions persist across time, so may changes in auditor behavior. INT_SMAD remains statistically unchanged from the last year prior to the first GC opinion. AUD_IMPACT is once again registered at significantly lower levels.

While the results in Table 2.5 provide evidence on H3 suggesting audits receiving GC opinions have reduced audit impact, it must be acknowledged that this is a univariate comparison and companies are serving as their own control. These results may be influenced by the changes in firms' financial position in the year the GC opinions are received.

2.5.4 Results Testing Relationship of Going Concern Opinion and Audit Impact – Propensity Matching

Table 2.6 shows results of an OLS analysis on a sample matched on its likelihood of receiving a GC opinion. Each matched pair is from the same year and audited by the same accounting firm. The pairs have predicted probabilities of GC opinions within 0.005 of each other based on the third specification of Table 2.2. There are a total of 246 matched firms represented by 984 company-years.[30]

In the regressions, β_3, the coefficient on the interaction of GC_FIRM and GC_YEAR, signifies the change in audit impact specific to the firm receiving the GC opinion in the year of the GC opinion. In all specifications, the interaction is negative with statistical significance. This result allows us to reject H3 and conclude that auditors appear to have a reduced impact in years they issue GC opinions. This result is consistent with concurrent research using PCAOB data (Aobdia 2015). The PCAOB data indicate audits with GC opinions appear to be of lower quality, and my results suggest that this is a result of changes in auditor behavior in the year GC opinions are issued. This change in auditor behavior is consistent with factors from Figure 2.1 such as shareholder litigation risk and cost of audit production impacting auditor behavior. Figure 2.2 charts the difference in SMAD by quarter between the pre GC opinion year and the GC opinion year. The figure shows the quality of the interim quarters are comparable between the years, but that the fourth quarter has a significantly higher SMAD in the year of the GC opinion.

2.6 Conclusion of Chapter 2

Numerous measures have been used to proxy for audit quality (AQ), but most of these constructs lack a conceptual link to audit quality. I use a measure developed in Chapter 1, audit impact, to reexamine one traditional measure of AQ, going concern (GC) opinions. Because audit impact employs the use of the known Benford distribution, it has a theoretical foundation for assessing quality. The distribution of first-digits predicted by Benford's Law is unlikely to be

[30] 246 matches x 2 companies (treatment and non-treatment) *2 periods (pre and post)=984 company-years

tied to company attributes or business risks. Therefore, I am able to capture financial statement quality when other measures would be affected by additional factors.

I apply this advantage in examining a uniquely risky setting that disqualifies the use of extant measures. I find that auditors associated with having a lower impact are more likely to issue GC opinions and GC opinions from more impactful auditors are more predictive of bankruptcy. An analysis of Type I and Type II errors indicates that the increased propensity of less impactful auditors to issue GC opinions results in an over issuance of GC opinions. Additionally, GC opinions are associated with a reduction in audit impact. This reduction in audit impact indicates a potential incentive for auditors to over issue GC opinions. The result is consistent with and expands upon other recent results that challenge long held assumptions about GC opinions.

This chapter discusses the weaknesses of many measures of AQ and empirically examines quality surrounding the issuance of GC opinions. This work demonstrates the ability of the audit impact measure to capture the change in quality attributable to the auditing process. The immediate conclusions from this chapter suggest researchers should reconsider their use of the issuance of GC opinions as an indicator of AQ. The broader implications of this work suggest when researchers study factors associated with AQ, they should further analyze how these attributes are conceptually associated with AQ. Researchers must strive to go beyond associations and understand the role factors play in the auditing process.

CHAPTER THREE

Insights on the Auditing Process Using Benford's Law

3.1 Introduction to Chapter Three

The auditing process is inherently opaque due to the confidentiality of audit work. This fact has been a limiting factor for much of the research in auditing. There have been calls to find "creative settings and research designs … to peek into the black box" of auditing (DeFond and Zhang 2013). The measure of audit impact developed in Chapter 1 provides an opportunity to respond to this call. This chapter highlights two areas where progress can be made in furthering the literature's understanding of the audit process and discusses several others.

In Chapter 3, I take a company attribute that has been previously shown to be positively associated with reporting quality and investigate at what stage in the reporting process is the relationship is strongest. Specifically, I examine the role of the board of directors in determining financial reporting quality. Companies with more independent and expert directors have been shown to have higher reporting quality, but it is not clear if the higher quality is a result of higher corporate standards or additional auditor empowerment. The results in Chapter 3 suggest increased corporate standards are more responsible for the higher level of reporting quality.

Additionally, this chapter further examines how the auditing process may impact the financial statements beyond the balance sheet. Audit impact appears to have a non-linear relationship with the quality of the fourth-quarter income statement. Specifically, data indicate that for lower levels of audit impact, the impact is positively associated with the conformity of the fourth-quarter's income statement to Benford's Law. This suggests that an auditor's impact lowers the likelihood of errors being contained in the fourth-quarter's income statement. For statements with high levels of audit impact, however, there is a negative association between audit impact and the conformity of the fourth-quarter's income statement to Benford's Law. This suggests that an auditor's impact increases the likelihood of errors being contained in the fourth-quarter's income statement. This is consistent with more impactful auditors identifying errors committed in prior periods and correcting them with adjustments that run through the income statement.

This chapter demonstrates the ability of audit impact to address open questions in the literature where previous measures of AQ experienced difficulty in disentangling the quality of the audit from the quality of the financial statements. This research provides insights into how the composition of the board of directors impacts the auditing process and how the income statement is impacted by the auditing process. These results aid practitioners seeking best practices and researchers seeking to better understanding the role the auditing process has in determining the quality of the financial statements.

3.2 Literature Review and Hypothesis Development

3.2.1 Audit Impact and the Board of Directors

There has been much interest in the relationship between companies' board of directors and their financial reporting quality. Because financial reporting quality appears to generate more efficient real investment decisions (Biddle et al. 2009), the market and regulators have plenty of interest in financial reporting quality. Although the relationship between board characteristics and reporting quality has seen much attention from researchers, less is known about the mechanism of this relationship.

Boards of directors play a significant role in monitoring and overseeing their companies. The board members fulfill their duties as they make hiring and compensation decisions for executives, approve annual budgets, and hire an auditor to examine the financial statements. Much effort has been spent studying what outcomes are associated with various board characteristics. To the extent these characteristics measure the board members' ability to fulfill their responsibilities; these characteristics have been predictive of various positive outcomes.

Board member independence and financial expertise have attracted a significant amount of researcher interest. Independent financial experts on the audit committee have been shown to improve accrual quality (Dhaliwal et al. 2010). Klein (2002) demonstrates how independence of both the board at large and the audit committee is associated with lower abnormal accruals. Researchers have made several ties between the quality of the board of directors and fraud (Fich and Shivdasani 2007; Zhao and Chen 2008; Beasley et al. 2010).

Researchers have identified the implications of board characteristics beyond just independence and financial expertise. The social status of the board has explanatory power in addition to the board's financial expertise in reducing accounting irregularities and abnormal accruals (Badolato et al. 2014). Industry experience, when paired with financial expertise, reduces financial restatements and discretionary accruals (Cohen et al. 2010; Cohen et al. 2014). Having legal expertise on the board appears to improve financial reporting quality measured by accrual quality and discretionary accruals (Krishnan et al. 2011). Studies show having executives on the board can have mixed results. For instance, having the company's CFO on the board results in having more effective internal controls, higher accrual quality and lower likelihood of restatements (Bedard et al. 2014). Carcello et al. (2011b) find that when the CEO is involved in the director selection process, there are no significant associations between restatements and the independence and financial expertise of the audit committee.

In their survey paper, Carcello et al. (2011a) summarize that the bulk of the research performed demonstrates that "good" boards result in "good" accounting and auditing. Both the result and the continued interest in it should not be surprising. Because of the broad effects financial reporting quality has, the impact that the board of directors has on reporting quality will naturally attract broad interest. My first hypothesis examines the implications of the board's independence and financial expertise on financial reporting quality.

H1: *Boards of directors with more independence and more financial expertise are not associated with the quality of their audited annual financial statements.*

While H1 is stated in the null form, given the results of prior research, I expect independence and financial expertise to be positively associated with financial statement quality. While H1 appears trivial given the prior research, I maintain it to compare my research approach with prior findings and to contribute another "brick in the wall" of the studies documenting this relationship. Carcello et al. (2011a) point out that although this relationship has been well documented, a gap exists in the literature on understanding the process by which these characteristics improve reporting quality. They call for approaching this research with more diverse theories and methods.

To shed light on the mechanism by which the board improves reporting quality, I bifurcate the impact the board has into two broad categories: impacts through internal and external channels. Board impact through internal channels changes the firm from the inside. As the board directly monitors and oversees the company's policies, practices, and major business decisions, board impacts are made throughout the company. Improvements in reporting quality made through internal channels are likely to stem from policies that influence financial reporting anywhere from the initial recording of transactions through their aggregation into financial reports. Improvements in reporting quality made through external channels are likely made through the board's selection and interaction with the external auditor. If the board of directors select a more effective auditor or enable the selected auditor to be more effective in improving financial reporting quality, then, while the company's reporting process may not necessarily change, the quality of the audited statements will improve.

While bifurcating the impact of the directors into internal and external mechanisms leaves work to be done in continuing to understand and detail these mechanisms, it does shed substantial light on the subject and would still contribute significantly. Parties seeking to improve reporting quality can narrow down where there are potential gains to be made. If the improvements are primarily internal, then focus should be made on better understanding the relationship between directors and internal controls and corporate policies. If improvements are primarily external, then there are benefits to studying how the directors interact with auditors.

Directors play a critical role in many dimensions of a company's corporate governance (Fracassi and Tate 2012; Masulis et al. 2012). For instance, audit committee independence and financial expertise has been found to be associated with improved internal controls (Krishnan 2005). Companies that are judged to have a control deficiency remediate their deficiency faster when they also improve their board structure (Johnstone et al. 2011). Additionally, board expertise has been shown to improve interim disclosures and interim earnings management in some small sample studies (Mangena and Pike 2005; Yang and Krishnan 2005). The results of these internal mechanisms are consistent with directors improving financial reporting quality in both interim and year-end reporting. Given this distinction, the following hypothesis is generated to capture the board's impact through internal mechanism.

H2: *Boards of directors with more independence and more financial expertise are not associated with higher interim financial statement quality.*

H2 is stated in the null form; however, if the independence and financial expertise of board members improves financial reporting through internal mechanisms, then they should improve reporting quality in interim quarters, even though they are unaudited.

Directors may also improve reporting quality through external mechanisms of oversight. One significant responsibility of the board of directors is to appoint an external auditor through their audit committee. Better audit committees have been shown to result in fewer auditor resignations and a selection of higher quality auditors (Lee et al. 2004). The attraction between "good" boards and "good" auditors appears to go in both directions. Auditors appear to consider the board of directors and value higher quality boards (Cassell et al. 2012). Research shows the composition of the board can have significant impact on the auditor's expected liability (Phillips and Jollineau 2015). These relationships suggest strong incentives for "good" boards to match with "good" auditors.

The literature has explored several avenues by which the work of auditors influences financial reporting quality. The board of directors has great potential to indirectly influence this as they both select and oversee the auditor. Oftentimes, management and auditors disagree on how to apply accounting standards to their reporting. If the board is weak, the auditor may be easily pressured or overruled by management. If the board appropriately respects the auditor, then the auditor will feel more comfortable in raising accounting concerns and disagreements. Research has shown how board attributes can directly impact the resolution of such accounting disagreements (Bierstaker et al, 2012). Auditors are more likely to issue going concern opinions and less likely to be subsequently dismissed when there is an independent audit committee (Bronson et al 2009; Carcello and Neal 2003). This suggests that independent directors are better able to shield the auditor from management influence. These findings are consistent with the board of directors empowering the auditors to have a larger impact in improving the quality of the financial statements.

If the board of directors is able to shield the auditor from the management in instances of disagreement, then the auditors are more empowered to adjust the financial statements to improve the quality.

H3: *Boards of directors with more independence and more financial expertise are not associated with the impact of their auditor.*

H3 is stated in the null form; however, if the independence and financial expertise of board members improves the effectiveness of their external audit, then their auditor will have a larger impact.

Despite the attention director independence and financial expertise has attracted, it still remains unclear exactly through what mechanisms they improve financial reporting. There are some indications that corporate governance may reduce real earnings management (Cheng et al., forthcoming), but it may not reduce restatements (Larcker et al. 2007). This suggests that the impact that corporate governance can have on financial reporting quality may have some important limitations. In some firms, the advising role of directors is more important than the monitoring role (Field et al. 2013), suggesting these firms may have weaker links with reporting quality. While "good" boards may attract "good" auditors, they may actually diminish the incentives for these auditors to perform as well. Auditors' control risk assessments and audit planning decisions are affected by the board's role (Cohen et al. 2007). When an auditor's client has strong corporate governance, there is a greater likelihood of client acceptance, lower assessments of control environment risk, and greater reliance on client controls which results in reduced substantive testing (Sharma et al. 2008). Strong corporate governance could actually cause auditors to reduce their effort and impact.

3.2.2 Audit Impact and the Income Statement

A major goal of researchers studying the auditing process is to understand the effect the auditing process has on the quality of financial statements. While research using the audit impact measure uses the balance sheet, the income statement information is not used. As a measure of stocks rather than flows, the balance sheet describes a company's financial position at one particular moment in time. For this reason, the balance sheet provides a less ambiguous benchmark to use in comparing the quality of the financial statements across periods. In an effort to understand the role the auditing process has on the income statement, the relationship between audit impact and the conformity of the income statement to Benford's Law must be more closely examined.

It is not immediately clear how marginal audit impact will be associated with the income statement's conformity to Benford's Law.

H4: *Audit impact has no relationship with the fourth-quarter income statement's conformity to Benford's Law.*

H4 is stated in the null form. If auditors prevent the introduction of errors into the financial statements, then there may be an expectation that audit impact is associated with fewer errors being contained in the fourth-quarter income statement. When financial statements contain errors they are less likely to conform to Benford's Law (Amiram et al. 2015). Therefore, audit impact may be associated with fourth-quarter income statements conforming more to Benford's Law. However, the income statement for one period may contain the reversal of errors that occurred in a prior period. If audit impact indicates the reversal of errors originally recorded in prior periods, then audit impact may be associated with the introduction of error into the fourth-quarter income statement. If this is the case, audit impact will be negatively associated with the conformity of the fourth-quarter income statements to Benford's Law. Studying the association between audit impact and the quality of the income statement will provide insight into how the auditing process impacts aspects of the financial statements other than the balance sheet. These findings have implications beyond the auditing literature. Researchers using quarterly income statements in their studies may be served to consider how the quality of the financial reports they are using may vary across quarters.

3.3 Sample Selection and Empirical Tests

3.3.1 Sample Selection

The sample period is for fiscal years 2000-2014. I limit the calculation of audit impact to Compustat balance sheet variables in order to avoid capturing corrections and reversals flowing through the SCF and the income statement. See Appendix A for listing of data fields used. Similarly, I capture the quality of the quarterly income statement using data fields in Compustat that relate to the income statement. The data requirements and procedure for calculating AUD_IMPACT are identical to those in Chapter 1. The sample consists of 79,291 (317,164) company years (quarters) gathered from 10,974 unique companies collected from Compustat quarterly data.

I calculate control variables as described in Appendix C. Financial measures are calculated using data from Compustat, and market measures are obtained using The Center for Research in Security Prices (CRSP). Audit variables are obtained from the Audit Analytics database.[31] Data regarding the Board of Directors are obtained from BoardEx.[32] I identify companies going bankrupt using a variety of databases.[33] Table 1.1, Panels C, D, E, F and G describe the sample population before winsorization.

3.3.2 Quality and the Board of Directors

To examine how directors are associated with quality, the relationship between quality and directors is studied through different stages of the reporting process. First, an investigation is conducted on H1. The deviation from Benford's Law of the fourth-quarter balance sheet is regressed on the number of independent and expert directors using the following regression:

$$SMAD_{i,t} = \beta_1 LAG\_IND\_DIR_{i,t} + \beta_2 LAG\_EXP\_DIR_{i,t} + [CONTROLS] + \varepsilon_{i,t} \qquad (12)$$

If independent directors are associated with higher quality annual reporting, then the annual statements will have less deviation from Benford's Law and the negative association will be indicated by β_1 being significantly negative. If independent directors are not associated with the quality of audited financial reports, then β_1 will not indicate a significant association. Similarly, if expert directors are associated with higher quality annual reporting, then the annual statements will have less deviation from Benford's Law and the negative association will be

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[31] I make use of various WRDS Research Macros when joining databases and processing data. WRDS Research Macros, 2010, Wharton Research Data Services (WRDS), The Wharton School, University of Pennsylvania, https://wrds.wharton.upenn.edu.

[32] BoardEx data is accessed through Institutional Shareholder Services, formerly RiskMetrics on WRDS.

[33] I collect bankruptcies and liquidations reported on SDC platinum, CRSP, Compustat, and UCLA's LoPucki Bankruptcy Research Database (BRD). Bankruptcies on SDC platinum are retrieved through June, 2015. CRSP awards company liquidations with a delisting code in the 400's in their delisting database. Liquidations reported through September 2015 were collected from CRSP. Compustat tracks companies dropped due to bankruptcy or liquidation in their "Company" database. Companies with relevant Compustat delisting codes were collected through September 2015. Additionally, I include bankruptcies reported in the UCLA's BRD with bankruptcy filing dates up to and including September 9, 2015. The combined bankruptcy dataset has 1,201 bankruptcies of which 296 are able to be matched with the sample.

indicated by β_2 being significantly negative. If expert directors are not associated with the quality of audited financial reports, then β_2 will not show a significant association. A Wald test is also performed in order to determine the probability that neither β_1 nor β_2 are statistically different than zero.

Independent and expert directors have been shown to be associated with higher quality of financial statements in the past, but it is unclear if this relationship is driven through the internal reporting process or through auditor empowerment. In order to examine how the board of directors is associated with quality throughout the financial reporting process, the association between the quality of unaudited interim financial statements and the board of directors is examined. This examination of H2 uses the following specification:

$$INT\_SMAD_{i,t} = \beta_1 LAG\_IND\_DIR_{i,t} + \beta_2 LAG\_EXP\_DIR_{i,t} + [CONTROLS] + \varepsilon_{i,t} \quad (13)$$

The lagged numbers of independent and expert directors are used to ensure the interim quality is being regressed on the directors that are in place at the beginning of the year. If independent directors are associated with higher quality interim financial statements, then they are associated with a lower level of interim divergence from Benford's Law and β_1 will be significantly negative. If independent directors are not associated with the quality of the interim financial statements then β_1 will not show a significant association. Similarly, if expert directors are associated with higher quality interim financial statements, then they are associated with a lower level of interim divergence from Benford's Law and β_2 will be significantly negative. If independent directors are not associated with the quality of the interim financial statements then β_2 will not show a significant association. A Wald test is also performed in order to determine the probability that neither β_1 nor β_2 are statistically different than zero.

Finally, the association between audit impact and directors is examined to investigate H3. Audit impact is regressed on the number of independent and expert directors using the following regression:

$$AUD\_IMPACT_{i,t} = \beta_1 INT\_SMAD_{i,t} + \beta_2 LAG\_IND\_DIR_{i,t} + \beta_3 LAG\_EXP\_DIR_{i,t} + [CONTROLS] + \varepsilon_{i,t} \quad (14)$$

If independent directors are associated with more auditor empowerment and higher audit impact, then the positive association will be indicated by β_2 being significantly positive. If independent directors are not associated with the level of audit impact then β_2 will not show a significant association. Similarly, if expert directors are associated with more auditor empowerment and higher audit impact, then the positive association will be indicated by β_3 being significantly positive. If expert directors are not associated with the level of audit impact then β_3 will not show a significant association. The interim quality is controlled for because audit behavior responds to the quality of interim statements. A Wald test is also performed in order to determine the probability that neither β_2 nor β_3 are statistically different than zero.

3.3.3 Audit Impact and the Income Statement

In order to answer H4 and to get a more complete understanding of an auditor's impact on the financial statements, I examine how *IS_SMAD*, the deviation of the fourth-quarter income statements from Benford's Law, is associated with audit impact using the following model:

$$IS\_SMAD_{i,t} = \beta_1 AUD\_IMPACT_{i,t} + \beta_2 INT\_SMAD_{i,t} + [CONTROLS] + \varepsilon_{i,t} \quad (15)$$

This model allows for a monotonic, linear relationship between *IS_SMAD* and audit impact. Because it is possible for the income statement to contain the errors being committed or the errors being reversed, I further my examination to allow for the relationship to change based on the level of audit impact. I do this by repeating the analysis by audit impact tercile.

To determine if marginal audit impact's effect on the quality of the fourth-quarter income statement is dependent on the level of audit impact, additional specifications are conducted contingent on the tercile of audit impact. Audit impact is ranked into terciles by fiscal year. The analysis is repeated for each tercile subsample to examine if the association between IS_SMAD and audit impact is non-monotonic and conditioned on the level of audit impact.

3.4 Results

3.4.1 Quality and the Board of Directors

Table 3.1 presents the results studying the relationship between quality and the board of directors. Panel A examines the relationship between the quality of the audited annual balance sheet and the presence of independent and expert directors. In the first two specifications, both independent and expert directors show indications of being associated with lower deviation from Benford's Law, indicating higher quality year-end financial statements. These results weaken in the second two specifications where additional controls are included. With regard to H1, the results from the Wald test in the first three specifications indicate that combined, independent and expert directors do have a significant association with the quality of the audited financial statements. These results are consistent with past research indicating a positive association between independent and expert directors and the quality of financial statements. This result, however, does not identify whether this relationship is due to an overall increased level of financial reporting quality, or due to an increased level of auditor empowerment.

Panel B shows the relationship between interim financial reporting quality and the presence of independent and expert directors. The first two specifications suggest that both independent and expert directors are associated with lower divergence from Benford's Law for unaudited interim financial statements. In the last two specifications, only independent directors appear to have a significant association. In all specifications, the Wald tests answer H2 in showing that combined, the directors have a significant association with the quality of the unaudited interim financial statements. These results are consistent with these companies having better financial reporting standards in place.

Panel C examines the association between audit impact and the presence of independent and expert directors. The first two specifications indicate there may be a positive association with independent directors and audit impact, but this result weakens with the inclusion of financial controls in the following specifications. The Wald tests reinforce these findings. While independent and expert directors are shown to have a significant association with audit impact in the first two specifications, the Wald tests indicate that the directors have no association with audit impact in the specifications with financial controls. A positive association with audit impact would have suggested that auditors of companies with more independent and expert directors are more empowered during the course of their audits. In answering H3, after accounting for financial attributes, it does not appear that independent and expert directors are associated with the impact auditors have.

Combined, these results are consistent with prior work in suggesting that companies with more independent and expert directors on their boards are associated with higher quality financial reporting. The results go further in suggesting that the relationship is driven by these companies having better financial reporting processes in place. Although these results are not conclusive, they demonstrate the ability of Benford's Law and audit impact to shed additional light into the role auditing has in determining the financial reporting quality.

3.4.2 Audit Impact and the Income Statement

Table 3.2 provides the results of studying the relationship between audit impact and the quality of the fourth-quarter income statement. To ensure comparability of the results across specifications, in all specifications the sample is restricted to data records that contain all the data fields required. This prevents changes in the sample composition having an impact on the associations observed across the specifications. In Panel A, an analysis of the entire sample population is conducted. In all 5 specifications, a negative relationship between audit impact and the conformity of the fourth-quarter income statement to Benford's Law is observed. This suggests that marginal audit impact is associated with reduced divergence from Benford's Law and improved quality of the fourth-quarter income statement.

Because the association between audit impact and the quality of the fourth-quarter income statement may be non-linear, the analysis is expanded by conducting the regressions by tercile of audit impact. Firms are ranked into terciles by fiscal year based on their level of audit impact. In Panel B of Table 3.2, the regression analysis is performed on the subsample of firm-year observations that are in the lowest tercile of audit impact. In this subsample, the significant negative association between audit impact and the fourth-quarter income statements' deviation from Benford's Law remains across all specifications. The coefficients suggest the magnitude of the association is stronger than the full sample analysis suggested. The data suggest that, for observations with relatively low levels of audit impact, marginal audit impact improves the quality of the fourth-quarter income statement and reduces divergence from Benford's Law. This is consistent with audit impact preventing the commission of errors that would have otherwise been committed and included in the income statement.

The results in Panels C and D oppose the results in Panels A and B. In Panel C of Table 3.2 observations from the middle tercile of audit impact indicate no significant association exists between audit impact and the conformity of the fourth-quarter income statements to Benford's Law. In Panel D, the results suggest a significantly positive association between audit impact and fourth-quarter income statement deviation may exist. This positive association would suggest that marginal audit impact is associated with additional errors being contained in the fourth-quarter income statement. This is consistent with highly impactful audits reversing past errors. As the past errors are corrected, the reversals may be included in the income statement.

These results reinforce the decision to omit income statement variables from the construction of audit impact. Conceptually, the auditing process should monotonically improve the quality of the balance sheet. If an auditor detects an error in the balance sheet, it will be corrected by an independent auditor. Unless the error is serious enough to warrant a restatement of prior financial statements, to the extent the error impacted the income statement, the correction will have the opposite impact on the income statement. With regard to H4, the results suggest that marginal audit impact does have a relationship with the quality of the fourth-quarter income statement. An impactful auditor that corrects errors committed in previous periods could be reintroducing those errors into the income statement as they are reversed. These results suggest the importance of excluding income statement items from the construction of the audit impact measure.

3.5 Implications for Future Research

There are additional opportunities for researchers to apply Benford's Law and audit impact to gain additional insights on existing measures of quality. For example, researchers can use these techniques to explore how Big N auditors, auditor specialists, and auditor tenure are associated with auditing and reporting quality. These associations will not only open the accounting black box to researchers, but the conclusions will also have strong implications for regulators and practitioners. Better identification of the links between these attributes and reporting quality can guide best practices and regulators to improve quality.

The consensus of the literature is that Big N auditors are associated with higher quality, but it is unclear why. In their review, DeFond and Zhang encourage future research to explore the mechanism generating this association (2014). Approaching the puzzle by asking if Big N auditors have a distinct audit impact will indicate the possible mechanism by which Big N firms distinguish their quality. If Big N's quality is mostly attributable to low risk client selection, I would expect Big N firms to be associated with lower audit impact. If, however, Big N firms *improve* the quality, then that would be reflected in my measure of audit impact.

The use of Big N as a control variable appears in many studies and is adopted as a measure of AQ both inside and outside the auditing literature.[34] Determining if this is controlling for company characteristics or the auditing process has broad implications and interest. This distinction is particularly important for studies using quarterly data because firm characteristics continue to be present in interim periods whereas audit impact does not.

Research has indicated that auditor specialization at a national or local level results in higher AQ (Balsam, Krishnan, and Yang 2003; Krishnan 2003; Reichelt and Wang 2010), but emerging research has been critical of the auditor specialist designation. Minutti-Meza finds no effect in fees or quality for audit specialists after controlling for client characteristics (2013). Other research examines the wide range of calculations used to empirically capture auditor specialization in the literature and finds a lack of internal and external validity in the measures that challenges prior findings (Audousset-Coulier et al. 2015). The literature is still at odds over whether effects of auditor specialists are due to auditors performing higher-quality audits, auditors attracting and screening clients of higher quality, or measures generating noise leading to false results.

Using the audit impact measure would answer where the influence and behavior of auditor specialization or tenure can be captured more directly. Such results would be of broad interest to both regulators and researchers. Because client retention is a general prerequisite for the growth in auditor market share required to become an auditor specialist, regulators should

[34] Examples: Mitton 2002; Smart and Zutter 2003; Gul et al. 2009.

consider both auditor tenure and specialization when considering mandatory auditor rotation. Researchers interested in capital markets and disclosure quality should be interested in controlling for auditor driven changes in quality.

Auditors are in the business of assessing and managing risk. Because financial statements cannot be audited to certainty due to economic and inherent constraints, there will always be the risk of material misstatements (audit risk). An auditor's response to increased risk will be to increase audit effort to mitigate the risk, increase the risk premium charged to the client, or a combination of the two. Audit fees have been separately associated with each of these responses (Lobo and Zhao 2013; Hribar et al. 2014). In these studies, audit characteristics are controlled for and abnormal fees attributed to one of the two responses. The studies use measures of financial reporting quality, primarily observed restatements, to capture risk or effort. The use of these infrequent, discrete measures of ending quality may allow for conclusions to be drawn at a population level, but make firm-level estimation relatively sticky and unresponsive to incremental changes. By bifurcating audit fees using my continuous measure of audit impact, I can build on prior models by simultaneously allowing incremental audit fees to be attributed to either increased auditor effort or risk premium.

3.6 Conclusion of Chapter 3

The audit impact measure presented in this paper provides an avenue to address many open questions in the literature. Because previous measures of audit quality (AQ) inadequately disentangle the quality of the audit from the quality of the financial statements, the findings in many cases are difficult to interpret. This should signal to researchers the need to approach these problems with unique and alternative approaches. Audit impact provides new information by capturing quality while remaining orthogonal to non-accounting risks.

Audit impact and Benford's Law can be applied to gain additional insights into why and how certain company and auditor attributes are associated with higher financial reporting quality. This chapter demonstrated how these general associations can be enriched. In the past, the quality of a company's board of directors has been shown to be associated with the quality of its financial reporting. To date, researchers have been unable to satisfactorily identify and document the potential mechanisms driving this relationship. The results in this chapter suggest that this relationship may be primarily driven by improved quality of the company's financial reporting system rather than auditor empowerment. These results may point researchers towards identifying the internal controls, policies, and attributes that are the drivers of reporting quality.

This chapter also provides insight into the effects the auditing process has on the financial statements. While auditors can prevent the commission of errors and improve the quality of the income statement, they can also correct and adjust for past errors and introduce error reversals into the income statement. These results attest to the idea of how the balance sheet approach to auditing can reduce the informativeness of the income statement. These results are of interest to researchers of reporting quality, suggesting that lower quality income statements may not always be associated with lower quality auditors. It also provides insight into how the quality of the financial statements may vary cyclically throughout the fiscal year.

Summary and Conclusions

This dissertation examines the impact the auditing process has on the quality of financial statements. I propose a new measure, *audit impact*, which captures the change in quality of the financial statements associated with the auditor. This measure offers the ability to capture certain aspects of the auditing process that existing measures have not been able to capture. I demonstrate how this measure provides an opportunity for researchers to build upon and improve existing measures of audit quality and extend the research frontier on deeper questions.

Due to data limitations, existing empirical measures of audit quality are often weakly linked to the theoretical aspect of audit quality being studied. Many measures capture the quality of audited financial statements, which are a joint function of the company and the auditor. Because the quality attributable to the company is not parsed out, the level of quality measured cannot be attributed entirely to the auditor. The advantage of the measure introduced in Chapter 1, audit impact, is that it has a distinct ability to capture the portion of quality of the financial statements associated with the auditing process.

Not only do many measures of audit quality face limitations by only capturing the joint quality of the company and the auditor, some lack theoretical support that they are capturing quality at all. In particular, the issuance of going concern opinions has traditionally been used as an indicator of audit quality. Support for this measure has been offered by logical arguments, but rigorous empirical investigations have been lacking. Results from recent research suggest there may be incentives for lower quality auditors to issue going concern opinions. In Chapter 2, I use the measure of audit impact to examine the appropriateness of the use of going concern opinions as a measure of audit quality. I find results that suggest going concern opinions are not associated with high quality auditors. These results have direct implications for researchers using going concern opinions as an empirical measure, but also demonstrate the larger need for researchers to more carefully consider which conceptual aspects of the auditing process their measures of audit quality may be capturing.

Because of the weaknesses of existing measures of audit quality, the literature has had trouble answering more substantive questions regarding the auditing process. Because audit impact captures how the auditing process impacts the quality of the financial statements, rather than simply measuring the quality of the issued financial statements, audit impact can be used to better understand how outside factors can influence this process. For example, companies with a strong board of directors have been associated with higher quality financial statements, but the pathway responsible for this association has not been identified. Higher quality boards of directors may establish corporate policies that promote higher quality financial reporting, or the quality boards may insulate auditors more from the management and empower them to have a larger impact on the quality of the financial statements. In Chapter 3, I employ the use of audit impact to investigate and find results consistent with the internal financial reporting of the company to be more responsible for the positive association between accounting quality and the quality of the board of directors.

Additionally, Chapter 3 seeks to further understand how the auditing process impacts the financial statements by investigating the income statement. The results are consistent with the work of the auditor initially preventing the commission of errors that would otherwise be contained in the fourth-quarter income statement. As the auditor has a larger impact, however, the results suggest the auditors may be introducing errors into the fourth-quarter income statement by reversing errors previously committed. The results demonstrate the ability of audit impact to further our understanding of how the auditing process impacts the financial statements. The results have implications beyond the field of auditing. Researchers using quarterly income statements to capture quality should consider how the auditing process may be captured in their measure.

Combined, the three chapters in this dissertation identify a weakness shared by many measures of audit quality and propose a novel solution, audit impact. The work demonstrates the ability of the audit impact measure to both improve the quality of research and extend the frontier of research that is possible. Audit impact overcomes the weakness shared by many measures and provides an opportunity to peek into the “black box” of the auditing process from a new angle.

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FIGURES

Figure 1.1: Frequency of First Digits for Populations Conforming to Benford's Law

Figure 1.1 charts the first digit frequency for number sets conforming to Benford's Law. In datasets that conform to Benford's Law, the digits 1, 2, 3, 4, 5, 6, 7, 8, and 9 appear as the first digit 20.1%, 17.6%, 12,5%, 9.7%, 7.9%, 6.7%, 5.8%, 5.1%, and 4.6% of the time, respectively.

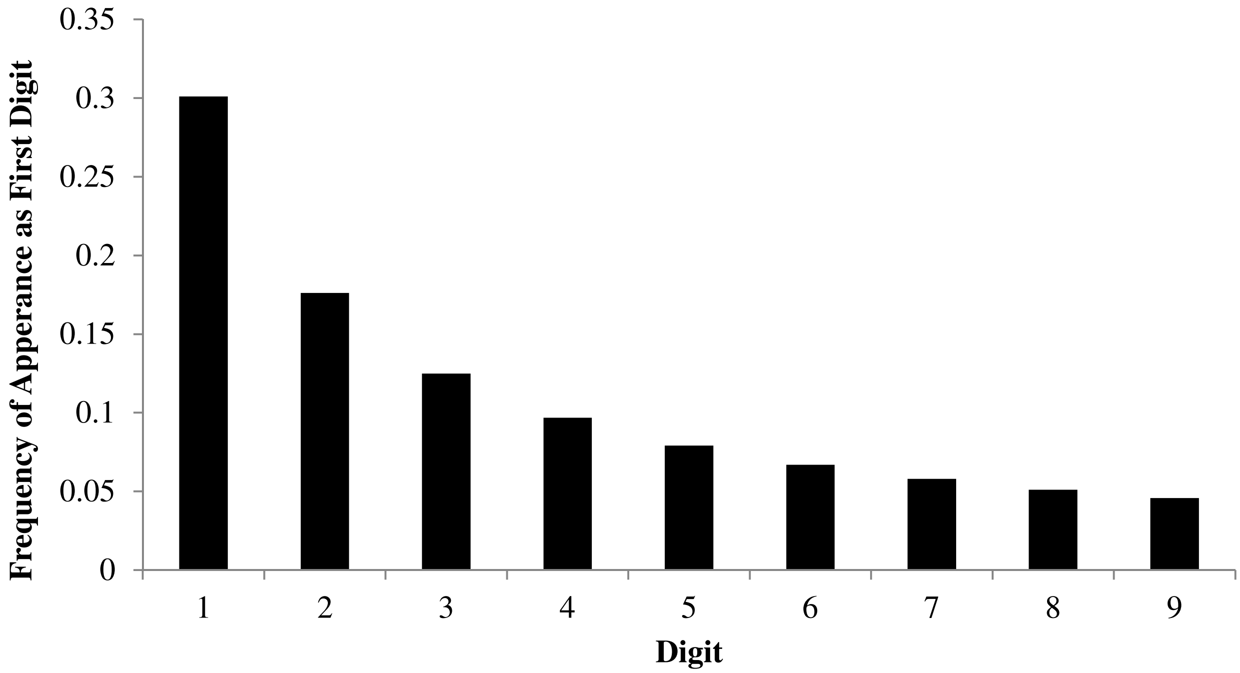


Figure 1.2: Chart of MAD's Average and Standard Deviation by Sample Size

Figure 1.2 charts the average mean absolute deviation (MAD) and the average standard deviation of SMAD for various samples of 10,000 drawn from the Benford Distribution. See Appendix B for additional discussion of samples drawn from the Benford Distribution and table of data contained in Figure 1.2.

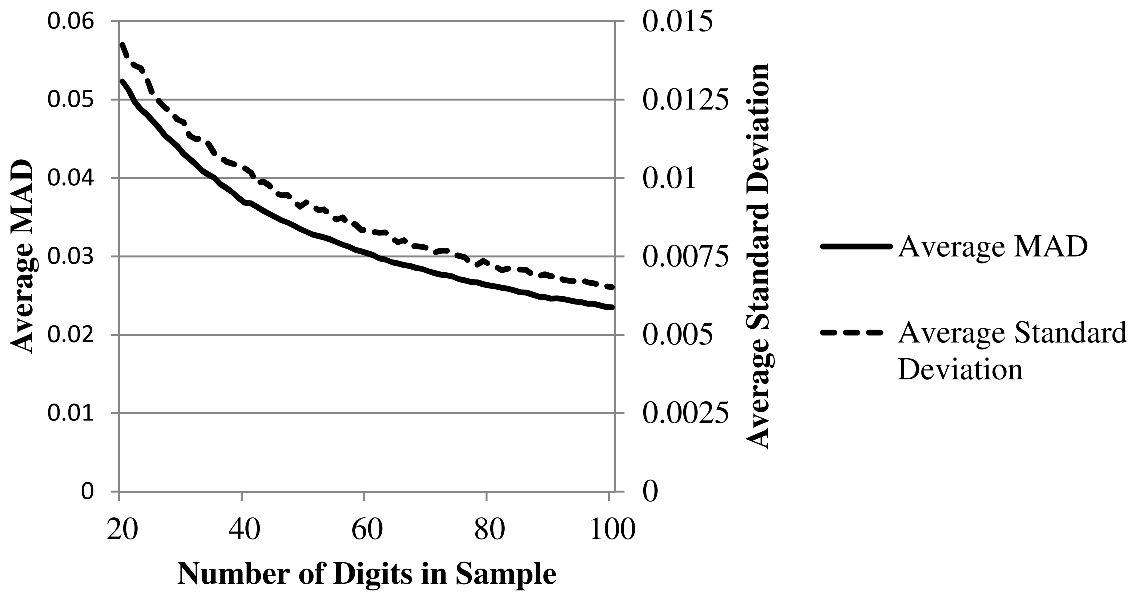


Figure 1.3: Standardized Mean Absolute Deviation by Quarter

Figure 1.3 charts the average standardized mean absolute deviation (SMAD) from Benford's Law for the sample by quarter. See Appendix B for description of the calculation of SMAD. See Table 1.1 Panel B for significance of difference across quarters.

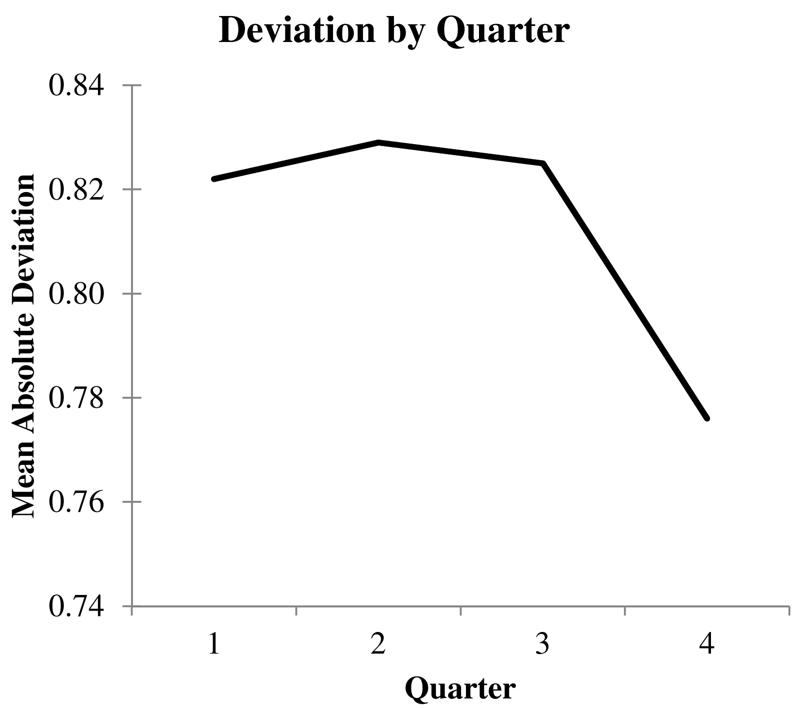


Figure 1.4: SMAD's Relation to the Market's Response to Earnings Surprise

Figure 1.4 is part of an investigation of the role of Standardized MAD in the relationship of market returns and quarterly earnings surprise. Standardized Earnings Surprise (SUE) is calculated as the difference between actual earnings and median analyst estimates obtained from I/B/E/S standardized by share price. Company-quarter observations are ranked into terciles based on the absolute value of their SUEs. Companies in each tercile are then raked on SMAD within that tercile and then placed into quintiles. This creates a total of 15 portfolios. Each portfolio averages 10,360 company-quarters. Decile adjusted abnormal returns are calculated for each portfolio using a three day trading window centered on the announcement date [-1,1]. The announcement date used is variable RDQ as reported in Compustat. If RDQ is missing, then variable pdateq from Compustat, or anndats from I/B/E/S are substituted if available. Continuous variables are winsorized at the 1st and 99th percentiles. Figure 1.4 charts the absolute returns for each of the 15 portfolios against their SMAD portfolio. Trend lines added for each tercile of absolute SUE. See Table 1.2 for additional analysis.

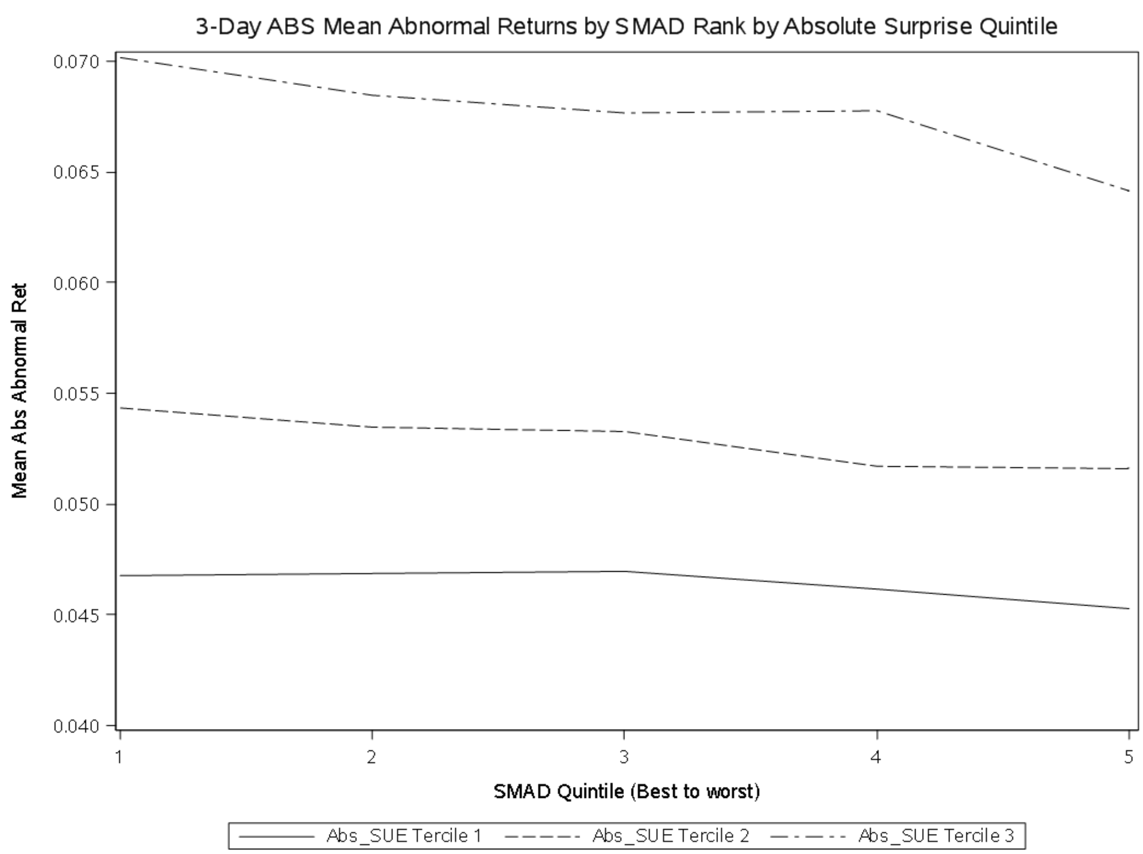


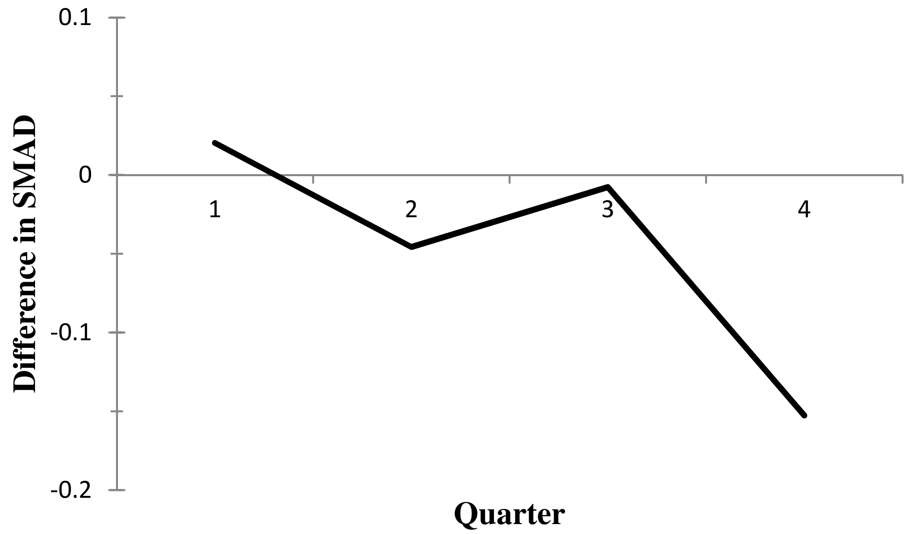
Figure 2.1: Factors Influencing Decision to Issue Going Concern Opinion

Figure 2.1 describes of some of the potential factors that *could* influence an auditor's propensity to issue Going Concern (GC) opinions. While applications of GC opinions as a measure of audit quality rely on client resistance to reduce auditor's propensity to issue GC opinions, there are several factors that could potentially increase their propensity to issue GC opinions.

Factor	Propensity to Issue GC Opinions	Informativeness of GC Opinions	Mechanism / Comments
Client Resistance	Reduced	Reduced	Client can pressure relationship with auditor and threaten to switch auditors
Auditor Conservatism	Increased	Reduced	Intrinsically conservative auditors over issue GC opinions
Shareholder Litigation Risk	Increased	Reduced	Auditors issue GC opinions reduce the expected frequency and severity of shareholder litigation
Cost of Audit Production	Increased	Reduced	Alternative manifestation of reduced litigation risk. The reduction in shareholder litigation risk is offset by a reduction in costly auditor effort (would also exhibit decreased audit scope).
Low Skill in GC Assessment	Ambiguous	Reduced	Relationship with propensity to issue is ambiguous. Additionally, low skill may magnify other factors as the comparative benefit of remaining objective weakens.

Figure 2.2: Difference in Deviation by Quarter for Firms with Going Concern Opinion

Figure 2.2 shows the seasonal difference between standardized mean absolute deviation (SMAD) in the year prior to a going concern (GC) opinion and the year of a GC opinion. Negative numbers represent an increase in SMAD (increased divergence) in the year of the GC opinion.



TABLES

Table 1.1: Sample Descriptive

Panel A describes the number of companies, years, and quarters in the sample. Firm-quarters are required to have at least 20 balance sheet numbers to be included in the sample. Because calculation of AUD_IMPACT requires all four quarters of financial data within the year, there are exactly four quarters per firm-year included in the sample. Panel B compares the standardized mean absolute deviation (SMAD) of the balance sheet for interim quarters with the SMAD of the fourth-quarter balance sheet. Mean Int. SMAD is the average SMAD score of the three interim quarters and is calculated at the firm level. The difference between mean interim SMAD and fourth-quarter SMAD at the company level is AUD_IMPACT. Significance levels are based on two-tailed tests, ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Sample Selection

Number of distinct companies:	10,974
Number of firm-years:	79,291
Number of firm-quarters:	317,164

Panel B: Comparison of Standardized MAD Scores Across Quarters

Comparative Period	Mean SMAD for Comparative Period	Q4 Mean SMAD	Difference
Q1	0.822	0.7763	0.045 (7.26)***
Q2	0.829	0.7763	0.053 (8.44)***
Q3	0.825	0.7763	0.049 (7.77)***
Mean Int. SMAD	0.825	0.7763	0.049 (11.55)***

Table 1.1: Sample Descriptive

Panel C describes presents descriptive statistics of the sample.

Panel C: Data Summary

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	79,291	0.83	-2.20	-1.13	0.11	0.73	1.45	3.56	6.80
AUD_IMP	79,291	0.05	-6.88	-2.86	-0.73	0.07	0.84	2.81	6.41
SMAD	79,291	0.78	-2.83	-1.65	-0.11	0.68	1.55	4.04	9.19
BIGN	79,291	0.64	0	0	0	1	1	1	1
ZSCORE	79,291	1.11	0	0	0	1	2	2	2
LN_ASSET	72,062	5.51	-6.91	-2.00	3.74	5.79	7.41	11.46	15.00
LEV	71,899	2.80	0.00	0.04	0.35	0.59	0.87	15.49	25,969
CLEV	62,822	0.72	-3,575	-2.89	-0.03	0.00	0.05	5.65	25,955
LLOSS	79,291	0.50	0	0	0	1	1	1	1
OCF	69,613	-0.29	-2,597	-4.48	-0.03	0.04	0.10	0.37	107
INVM	72,058	0.19	-0.0278	0.00	0.03	0.09	0.28	0.95	1
REPLAG	72,060	81.02	17	41	63	75	90	231	2,508
LN_AGE	71,641	2.45	0.00	0.00	1.95	2.48	3.09	4.09	4.17
BETA	55,947	0.93	-4.41	-0.26	0.44	0.90	1.33	2.70	5.88
RETURN	55,947	0.14	-0.99	-0.89	-0.23	0.06	0.34	2.90	28.58
LN_SEGMENTS	56,882	0.63	0.00	0.00	0.00	0.00	1.39	2.30	3.09
LN_AUD_TENURE	68,932	1.72	0.00	0.00	1.10	1.79	2.40	3.56	3.71
AUD_SPECIALIST	79,291	0.11	0	0	0	0	0	1	1
AVG_AUD_IMPACT	64,136	0.04	-2.41	-1.01	-0.15	0.04	0.24	1.09	2.48
AVG_INT_SMAD	64,136	0.78	-0.79	-0.02	0.56	0.75	0.96	1.91	3.29
BANKRUPT	79,291	0.00	0	0	0	0	0	0	1

Table 1.1: Sample Descriptive

Panel D presents descriptive statistics for segments of the sample with different level of standardized mean absolute deviation (SMAD). For Panel D, only data from the 4th quarter in the lowest SMAD tercile (highest conformity to Benford's Law) is presented.

Panel D: Data Summary by Q4 SMAD Tercile

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	26,432	0.39	-2.20	-1.27	-0.20	0.32	0.90	2.61	4.97
AUD_IMP	26,432	0.91	-2.04	-0.95	0.28	0.85	1.48	3.26	6.41
SMAD	26,432	-0.52	-2.83	-1.97	-0.84	-0.41	-0.11	0.16	0.17
BIGN	26,432	0.70	0	0	0	1	1	1	1
ZSCORE	26,432	1.03	0	0	0	1	2	2	2
LN_ASSET	23,467	5.82	-6.21	-0.59	4.08	5.98	7.59	11.51	14.63
LEV	23,426	0.93	0.00	0.07	0.38	0.59	0.80	4.62	843
CLEV	20,196	-0.01	-2,414	-1.20	-0.04	0.00	0.05	1.55	838
LLOSS	26,432	0.49	0	0	0	0	1	1	1
OCF	22,924	-0.05	-81	-2.12	0.00	0.06	0.11	0.35	2
INVM	23,466	0.17	0.00	0.00	0.03	0.09	0.23	0.84	1
REPLAG	23,466	79.29	21	40	61	75	89	202	2,508
LN_AGE	23,381	2.54	0.00	0.00	1.95	2.56	3.18	4.11	4.16
BETA	19,168	0.95	-2.11	-0.23	0.48	0.93	1.35	2.69	5.88
RETURN	19,168	0.14	-0.99	-0.89	-0.23	0.06	0.35	2.92	28.58
LN_SEGMENTS	19,583	0.72	0.00	0.00	0.00	0.69	1.39	2.30	3.09
LN_AUD_TENURE	22,758	1.77	0.00	0.00	1.10	1.79	2.40	3.58	3.71
AUD_SPECIALIST	26,432	0.12	0	0	0	0	0	1	1
AVG_AUD_IMPACT	21,524	0.05	-2.00	-0.97	-0.14	0.05	0.25	1.09	1.98
AVG_INT_SMAD	21,524	0.73	-0.79	-0.06	0.53	0.72	0.90	1.77	3.13
BANKRUPT	26,432	0.00	0	0	0	0	0	0	1

Table 1.1: Sample Descriptive

Panel E presents descriptive statistics for segments of the sample with different level of standardized mean absolute deviation (SMAD). For Panel E, only data from the 4th quarter in the highest SMAD tercile (lowest conformity to Benford's Law) is presented.

Panel E: Data Summary Q4 Observations in Highest SMAD Tercile

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	26,430	1.34	-1.75	-0.76	0.60	1.27	2.01	4.08	6.80
AUD_IMP	26,430	-0.82	-6.88	-3.42	-1.52	-0.82	-0.11	1.71	4.52
SMAD	26,430	2.16	1.23	1.24	1.55	1.96	2.56	4.78	9.19
BIGN	26,430	0.57	0	0	0	1	1	1	1
ZSCORE	26,430	1.19	0	0	0	2	2	2	2
LN_ASSET	24,617	5.11	-6.91	-3.22	3.23	5.51	7.18	11.36	15.00
LEV	24,553	5.51	0.00	0.02	0.30	0.60	0.90	38.15	25,969
CLEV	21,728	1.71	-3,575	-7.96	-0.03	0.00	0.05	16.59	25,955
LLOSS	26,430	0.52	0	0	0	1	1	1	1
OCF	23,553	-0.63	-2,597	-7.93	-0.10	0.02	0.09	0.41	107
INVM	24,616	0.23	-0.01	0.00	0.03	0.09	0.36	0.98	1
REPLAG	24,617	83.17	17	43	66	76	90	269	2,442
LN_AGE	24,433	2.35	0.00	0.00	1.79	2.40	3.00	4.09	4.16
BETA	17,965	0.89	-2.38	-0.31	0.39	0.86	1.31	2.71	5.12
RETURN	17,965	0.14	-0.99	-0.89	-0.23	0.06	0.33	2.96	25.68
LN_SEGMENTS	18,293	0.52	0.00	0.00	0.00	0.00	1.10	2.20	3.04
LN_AUD_TENURE	23,279	1.66	0.00	0.00	1.10	1.79	2.30	3.53	3.71
AUD_SPECIALIST	26,430	0.09	0	0	0	0	0	1	1
AVG_AUD_IMPACT	21,151	0.04	-2.41	-1.06	-0.17	0.04	0.25	1.12	2.48
AVG_INT_SMAD	21,151	0.85	-0.68	0.01	0.60	0.80	1.04	2.06	3.29
BANKRUPT	26,430	0.00	0	0	0	0	0	0	1

Table 1.1: Sample Descriptive

Panel F presents descriptive statistics for segments of the sample with different level of AUD_IMP. For Panel F, only data from the 4th quarter in the lowest AUD_IMP tercile (lowest audit impact) is presented.

Panel F: Data Summary Q4 Observations in Lowest AUD_IMP Tercile

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	26,430	0.46	-2.20	-1.29	-0.20	0.36	1.01	3.06	6.21
AUD_IMP	26,430	-1.25	-6.88	-3.42	-1.59	-1.08	-0.73	-0.45	-0.44
SMAD	26,430	1.71	-1.37	-0.38	0.93	1.60	2.36	4.74	9.19
BIGN	26,430	0.64	0	0	0	1	1	1	1
ZSCORE	26,430	1.12	0	0	0	1	2	2	2
LN_ASSET	24,059	5.43	-6.91	-2.26	3.62	5.70	7.38	11.40	14.99
LEV	23,996	3.55	0	0.04	0.35	0.59	0.88	17.18	25,969
CLEV	20,988	1.33	-2,953	-3.20	-0.04	0.00	0.05	7.61	25,954
LLOSS	26,430	0.51	0	0	0	1	1	1	1
OCF	23,297	-0.30	-701	-5.16	-0.04	0.04	0.10	0.39	107
INVM	24,059	0.20	-0.01	0.00	0.03	0.09	0.28	0.96	1.00
REPLAG	24,058	81.57	17	42	64	75	90	243	2,317
LN_AGE	23,908	2.45	0.00	0.00	1.95	2.48	3.09	4.09	4.16
BETA	18,438	0.92	-4.41	-0.29	0.44	0.89	1.33	2.70	5.12
RETURN	18,438	0.14	-0.99	-0.90	-0.24	0.06	0.34	2.96	25.68
LN_SEGMENTS	19,065	0.62	0.00	0.00	0.00	0.00	1.39	2.30	3.09
LN_AUD_TENURE	23,094	1.71	0.00	0.00	1.10	1.79	2.30	3.56	3.71
AUD_SPECIALIST	26,430	0.11	0	0	0	0	0	1	1
AVG_AUD_IMPACT	21,428	0.04	-2.41	-0.99	-0.16	0.04	0.24	1.07	2.48
AVG_INT_SMAD	21,428	0.78	-0.79	-0.04	0.55	0.75	0.96	1.91	3.29
BANKRUPT	26,430	0.00	0	0	0	0	0	0	1

Table 1.1: Sample Descriptive

Panel G presents descriptive statistics for segments of the sample with different level of AUD_IMP. For Panel G, only data from the 4th quarter in the highest AUD_IMP tercile (highest audit impact) is presented.

Panel G: Data Summary Q4 Observations in Highest AUD_IMP Tercile

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	26,430	1.27	-1.40	-0.64	0.57	1.18	1.87	3.95	6.80
AUD_IMP	26,430	1.33	0.56	0.57	0.84	1.18	1.66	3.32	6.41
SMAD	26,430	-0.06	-2.83	-1.97	-0.75	-0.14	0.53	2.52	5.13
BIGN	26,430	0.64	0	0	0	1	1	1	1
ZSCORE	26,430	1.11	0	0	0	1	2	2	2
LN_ASSET	24,087	5.49	-6.91	-1.95	3.71	5.76	7.38	11.48	14.63
LEV	24,036	2.34	0	0.04	0.34	0.59	0.87	15.91	5,838
CLEV	21,074	0.45	-3,575	-3.76	-0.03	0.00	0.05	5.01	5,830
LLOSS	26,430	0.51	0	0	0	1	1	1	1
OCF	23,299	-0.27	-851	-4.53	-0.04	0.04	0.10	0.37	53
INVM	24,086	0.20	-0.03	0.00	0.03	0.09	0.29	0.95	1.00
REPLAG	24,087	81.16	20	41	62	75	90	233	2,508
LN_AGE	23,958	2.43	0.00	0.00	1.79	2.48	3.04	4.09	4.17
BETA	18,617	0.94	-2.89	-0.24	0.45	0.91	1.34	2.72	5.88
RETURN	18,617	0.14	-0.99	-0.89	-0.23	0.06	0.33	2.93	29
LN_SEGMENTS	19,009	0.61	0.00	0.00	0.00	0.00	1.39	2.20	3.00
LN_AUD_TENURE	23,075	1.71	0.00	0.00	1.10	1.79	2.40	3.58	3.71
AUD_SPECIALIST	26,430	0.11	0	0	0	0	0	1	1
AVG_AUD_IMPACT	21,404	0.04	-2.41	-1.04	-0.15	0.04	0.25	1.10	1.98
AVG_INT_SMAD	21,404	0.80	-0.68	-0.01	0.58	0.77	0.98	1.91	3.19
BANKRUPT	26,430	0.00	0	0	0	0	0	0	1

Table 1.2: Market Response Moderated by SMAD

Table 1.2 investigates standardized mean absolute deviation's (SMAD) relationship with market returns and quarterly earnings surprise. Standardized Earnings Surprise (SUE) is calculated as the difference between actual earnings and median analyst estimates obtained from I/B/E/S standardized by share price. Company-quarter observations are ranked into terciles based on the absolute value of their SUEs. Companies in each tercile are then raked on SMAD within that tercile and then placed into quintiles. This creates a total of 15 portfolios. Each portfolio averages 10,360 company-quarters. Decile adjusted cumulative returns are calculated for each portfolio using a trading window centered on the announcement date. See Figure 2 for a plot of the 15 portfolios. The announcement date used is variable RDQ as reported in Compustat. If RDQ is missing, Compustat's pdateq or I/B/E/S's anndats is substituted as available. Continuous variables are winsorized at the 1st and 99th percentiles. Panel A tests the difference between returns of the lowest (best) and highest (worst) SMAD quintile within each tercile of absolute SUE. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: SMAD's Relation to the 3-Day Market Response to Earnings Surprise

		SMAD Quintiles		Difference Between SMAD Quintiles	t-statistic
		1	5		
Absolute SUE Tercile	1	4.68%	4.53%	0.15%**	(2.24)
	2	5.43%	5.16%	0.27%***	(3.77)
	3	7.02%	6.41%	0.61%***	(6.81)

*** p<0.01, ** p<0.05, * p<0.1

Table 1.2: Market Response Moderated by SMAD

Panel B of Table 1.2 regresses absolute abnormal returns on absolute standardized unexpected earnings (ABS_SUE) interacted with standardized mean absolute deviation (SMAD). The results are robust to ABS_SUE being interacted with all the control variables. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the firm level (GVKEY).

Panel B: Multivariate Analysis of SMAD and Market Response to Earnings

$$\boldsymbol{ABS\_CAR_{i,t} = \alpha + \beta_1 ABS\_SUE_{i,t} + \beta_2 SMAD_{i,t} + \beta_3 ABS\_SUE_{i,t} * SMAD_{i,t} + \beta_4 LOSS_{i,t} + \beta_5 LEV_{i,t} + \beta_6 BTM_{i,t} + \beta_7 LN\_ASSET_{i,t} + [Year\ Controls] + [FFI48\ Industry\ Controls] + \varepsilon_{i,t}}$$

VARIABLE	(1) ABS_CAR (-1,+1)	(2) ABS_CAR (-1,+1)	(3) ABS_CAR (-2,+2)	(4) ABS_CAR (-2,+2)
ABS_SUE	0.805***	0.675***	0.986***	0.762***
	(34.46)	(27.15)	(38.18)	(27.80)
SMAD	-0.001***	0.000	-0.000	0.000
	(-3.65)	(0.31)	(-1.39)	(1.59)
SUE*SMAD	-0.067***	-0.066***	-0.080***	-0.078***
	(-4.72)	(-4.57)	(-4.93)	(-4.71)
LOSS		0.002***		0.005***
		(4.40)		(8.13)
LEV		-0.001		0.000
		(-1.00)		(0.23)
BTM		0.005***		0.007***
		(6.29)		(9.25)
LN_ASSET		-0.003***		-0.004***
		(-18.59)		(-24.32)
Year Controls	Yes	Yes	Yes	Yes
FFI48 Controls	No	Yes	No	Yes
Observations	155,686	133,085	155,686	133,085
R-squared	0.048	0.124	0.060	0.132

Table 1.3: Measures of Quality and Earnings Management

Table 1.3 examines the relation between standardized mean absolute deviation (SMAD) and audit impact and measures of earnings management using OLS regressions. Each observation represents one company-year. The sample covers the period 2000 – 2013. See Appendix B for the construction of SMAD. See Appendix C for variable definitions and additional information on variable construction. Continuous measures are winsorized at the 1st and 99th percentiles. Annual fixed effects are included in each regression. Intercepts are omitted for presentation purposes. Significance levels are based on two-tailed tests, ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the firm level (GVKEY).

$$\begin{aligned} \boldsymbol{Quality\ Measure_{i,t}} &= \alpha + \beta_1 \boldsymbol{ABS\_JONES\_RESID_{i,t}} + \beta_2 \boldsymbol{STD\_DD\_RESID_{i,t}} \\ &+ \beta_3 \boldsymbol{MANIPULATOR_{i,t}} + \beta_4 \boldsymbol{R\_CFO_{i,t}} + \beta_5 \boldsymbol{R\_PROD_{i,t}} \\ &+ \beta_6 \boldsymbol{R\_DISX_{i,t}} + \varepsilon_{i,t} \end{aligned}$$

	(1)	(2)	(3)	(4)
VARIABLES	SMAD	SMAD	AUD_IMPACT	AUD_IMPACT
ABS_JONES_RESID	0.003**	0.003**	-0.003*	-0.003**
	(2.13)	(2.10)	(-1.69)	(-2.15)
STD_DD_RESID	0.042***	0.018***	0.006	-0.017***
	(4.92)	(2.60)	(0.85)	(-2.61)
MANIPULATOR	0.058***	0.031**	-0.006	-0.031**
	(3.41)	(2.04)	(-0.36)	(-2.04)
R_CFO	-0.328***	-0.209***	0.095*	0.209***
	(-5.84)	(-4.28)	(1.86)	(4.34)
R_PROD	-0.083*	-0.087**	0.088**	0.085**
	(-1.73)	(-2.13)	(2.09)	(2.11)
R_DISX	0.036	-0.025	0.081***	0.023
	(1.14)	(-0.92)	(2.92)	(0.88)
INT_SMAD control	No	Yes	No	Yes
Year Controls	Yes	Yes	Yes	Yes
Observations	45,988	45,988	45,988	45,988
R-squared	0.011	0.172	0.001	0.153

Table 2.1: Sample Descriptive

Panel A presents descriptive statistics for segments of the sample that do not receive a going concern opinion on their financial statement audit. For Panel A, only data from the 4th quarter is presented.

Panel A: Data Summary Q4 Observations Not Receiving a Going Concern Opinion

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	70,905	0.78	-2.20	-1.14	0.08	0.70	1.40	3.44	6.80
AUD_IMP	70,905	0.05	-5.86	-2.79	-0.71	0.07	0.83	2.77	6.41
SMAD	70,905	0.73	-2.83	-1.67	-0.13	0.64	1.50	3.92	7.85
BIGN	70,905	0.69	0	0	0	1	1	1	1
ZSCORE	70,905	1.03	0	0	0	1	2	2	2
LN_ASSET	63,876	6.04	-6.91	0.76	4.42	6.12	7.60	11.60	15.00
LEV	63,719	0.62	0.00	0.04	0.33	0.57	0.81	1.61	1,679
CLEV	56,002	-0.07	-2,260	-0.67	-0.03	0.00	0.03	0.51	92
LLOSS	70,905	0.45	0	0	0	0	1	1	1
OCF	61,438	0.01	-219	-0.90	0.00	0.05	0.11	0.36	4
INVM	63,873	0.19	-0.02	0.00	0.03	0.09	0.27	0.94	1
REPLAG	63,874	76.95	17	41	61	75	88	163	1,536
LN_AGE	63,577	2.50	0.00	0.00	1.95	2.48	3.14	4.09	4.17
BETA	53,958	0.93	-4.41	-0.24	0.45	0.90	1.33	2.69	5.88
RETURN	53,958	0.16	-0.99	-0.87	-0.20	0.07	0.35	2.88	28.58
LN_SEGMENTS	49,779	0.68	0.00	0.00	0.00	0.00	1.39	2.30	3.09
LN_AUD_TENURE	60,763	1.75	0.00	0.00	1.10	1.79	2.40	3.58	3.71
AUD_SPECIALIST	70,905	0.12	0	0	0	0	0	1	1
AVG_AUD_IMPACT	58,707	0.05	-2.41	-0.97	-0.15	0.05	0.24	1.03	2.01
AVG_INT_SMAD	58,707	0.76	-0.79	-0.03	0.55	0.74	0.94	1.83	3.29
BANKRUPT	70,905	0.00	0	0	0	0	0	0	1

Table 2.1: Sample Descriptive

Panel B presents descriptive statistics for segments of the sample that receive a going concern opinion on their financial statement audit. For Panel B, only data from the 4th quarter is presented.

Panel B: Data Summary Q4 Observations Receiving a Going Concern Opinion

Variable	N	MEAN	MIN	P1	P25	P50	P75	P99	MAX
INT_SMAD	8,386	1.17	-1.81	-0.87	0.39	1.06	1.84	4.18	6.43
AUD_IMP	8,386	0.00	-6.88	-3.25	-0.89	0.03	0.90	3.12	5.21
SMAD	8,386	1.17	-2.48	-1.50	0.19	1.07	2.01	4.85	9.19
BIGN	8,386	0.20	0	0	0	0	0	1	1
ZSCORE	8,386	1.81	0	0	2	2	2	2	2
LN_ASSET	8,186	1.42	-6.91	-5.12	-0.23	1.39	2.89	8.60	11.42
LEV	8,180	19.77	0.00	0.03	0.60	1.14	3.12	296.56	25,969
CLEV	6,820	7.18	-3,575	-76.73	-0.08	0.15	0.82	128.33	25,955
LLOSS	8,386	0.92	0	0	1	1	1	1	1
OCF	8,175	-2.54	-2,597	-30.52	-1.39	-0.44	-0.06	0.49	107
INVM	8,185	0.23	-0.03	0.00	0.02	0.10	0.34	0.99	1
REPLAG	8,186	112.80	20	55	90	92	106	472	2,508
LN_AGE	8,064	2.01	0.00	0.00	1.39	2.08	2.71	3.91	4.14
BETA	1,989	0.76	-1.69	-0.72	0.25	0.65	1.19	2.75	4.03
RETURN	1,989	-0.31	-0.99	-0.98	-0.76	-0.51	-0.14	3.44	9.00
LN_SEGMENTS	7,103	0.25	0.00	0.00	0.00	0.00	0.00	1.79	2.64
LN_AUD_TENURE	8,169	1.47	0.00	0.00	0.69	1.61	2.08	3.18	3.69
AUD_SPECIALIST	8,386	0.03	0	0	0	0	0	1	1
AVG_AUD_IMPACT	5,429	0.03	-2.41	-1.26	-0.24	0.02	0.30	1.39	2.48
AVG_INT_SMAD	5,429	1.00	-0.50	0.00	0.65	0.95	1.31	2.48	3.29
BANKRUPT	8,386	0.01	0	0	0	0	0	1	1

Table 2.2: Predicting the Likelihood of Receiving a Going Concern Opinion

Table 2.2 examines the probability of receiving a GC opinion by controlling for financial measures using logistic regressions. Each observation represents one company-year. The sample covers the period 2000 – 2014. AVG_AUD_IMPACT captures the audit office's average impactfulness. AVG_INT_SMAD is a measure of the average client risk an auditor assumes. INT_SMAD is the average SMAD for each record at the company-year level. See Appendix B and B for further discussion on the calculation of variables. Continuous measures are winsorized at the 1st and 99th percentiles. . ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the audit office level.

$$\boldsymbol{LOGIT}[\boldsymbol{GC\_OPIN} = \mathbf{1}] = \boldsymbol{\alpha} + \boldsymbol{\beta_1 AVG\_AUD\_IMPACT_{i,t}} + \boldsymbol{\beta_2 AVG\_INT\_SMAD_{i,t}} + [\boldsymbol{CONTROLS}] + \boldsymbol{\varepsilon_{i,t}}$$

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GC_OPIN	GC_OPIN	GC_OPIN	GC_OPIN	GC_OPIN
AVG_AUD_IMPACT	-0.678***	-0.183*	-0.206*	-0.268**	-0.275**
	(-7.72)	(-1.84)	(-1.93)	(-2.43)	(-2.38)
AVG_INT_SMAD	1.787***	0.082	0.134	0.169	0.163
	(12.02)	(0.55)	(0.87)	(0.99)	(0.96)
INT_SMAD	0.239***	0.099**	0.116**	0.108**	0.116**
	(12.70)	(2.30)	(2.53)	(2.35)	(2.45)
BIGN		0.123	0.113	0.036	0.095
		(1.06)	(0.92)	(0.26)	(0.67)
ZSCORE		0.665***	0.871***	0.741***	0.941***
		(9.38)	(11.12)	(10.04)	(11.62)
LN_ASSET		-0.475***	-0.470***	-0.453***	-0.467***
		(-12.97)	(-11.48)	(-11.20)	(-11.02)
LEV		1.030***	1.114***	1.021***	1.091***
		(8.20)	(8.15)	(7.74)	(7.97)
CLEV		-0.383***	-0.457***	-0.329**	-0.385**
		(-2.86)	(-3.24)	(-2.28)	(-2.57)
LLOSS		1.394***	1.278***	1.099***	1.058***
		(11.93)	(10.11)	(9.00)	(8.37)
OCF		-1.603***	-1.614***	-1.706***	-1.723***
		(-10.02)	(-9.58)	(-10.08)	(-9.78)
INVM		-2.082***	-2.128***	-2.162***	-2.262***
		(-8.25)	(-8.64)	(-7.95)	(-8.73)
REPLAG		0.018***	0.019***	0.017***	0.018***
		(13.79)	(13.22)	(12.36)	(11.93)
LN_AGE		0.032	0.038	-0.000	0.034
		(0.41)	(0.54)	(-0.00)	(0.45)
BETA		0.113	0.105	0.067	0.088
		(1.56)	(1.49)	(0.84)	(1.18)

Table 2.2: Predicting the Likelihood of Receiving a Going Concern Opinion (Continued)

RETURN		-0.781***	-0.764***	-0.641***	-0.618***
		(-7.53)	(-7.15)	(-6.23)	(-5.80)
LN_SEGMENTS				-0.029	-0.066
				(-0.43)	(-0.90)
LN_AUD_TENURE				0.066	0.077
				(1.05)	(1.22)
AUD_SPECIALIST				0.149	0.092
				(0.82)	(0.47)
Year Controls	Yes	Yes	Yes	Yes	Yes
FFI48 Controls	No	No	Yes	No	Yes
Number of GC Observations	5,429	1,383	1,346	1,240	1,213
Total Observations	64,136	43,152	42,349	34,692	34,277
Pseudo R-squared	0.0703	0.423	0.452	0.427	0.457

Table 2.3: Auditor Impactfulness and Going Concern Accuracy
Table 2.3 models the probability of companies going bankrupt in the year subsequent to the release date of their annual financial statements. Annual company and auditor measures are used to predict the probability of the incidence of bankruptcy. Bankruptcy data is aggregated from SDC Platinum, CRSP, Compustat, and UCLA's LoPucki Bankruptcy Research Database (BRD). Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the audit office level.

$$LOGIT[BANKRUPT = 1] = \alpha + \beta_1[GOING\_CONCERN]_{i,t} + \beta_2[AVG\_AUD\_IMPACT]_{i,t} + \beta_3[GC\_OPIN * AVG\_AUD\_IMPACT]_{i,t} + [CONTROLS] + \varepsilon_{i,t}$$

VARIABLES	(1) BANKRUPT	(2) BANKRUPT	(3) BANKRUPT	(4) BANKRUPT
GC_OPIN	3.190***	3.094***	3.283***	2.715***
	(10.23)	(8.51)	(5.79)	(5.16)
AVG_AUD_IMPACT	-0.053	-0.074	-0.241	-0.328
	(-0.17)	(-0.28)	(-0.71)	(-0.95)
GC_OPIN *AVG_AUD_IMPACT	0.884**	0.791**	0.731	0.751
	(2.43)	(2.40)	(1.57)	(1.51)
AVG_INT_SMAD	0.010	0.243	0.760*	1.003**
	(0.04)	(0.75)	(1.85)	(2.54)
GC_OPIN*AVG_INT_SMAD	-1.335***	-1.397***	-0.847	-1.034*
	(-3.85)	(-3.40)	(-1.56)	(-1.90)
INT_SMAD	0.121	-0.024	0.124	0.097
	(1.28)	(-0.27)	(1.32)	(0.93)
BIGN			-0.366	0.063
			(-1.19)	(0.21)
ZSCORE			0.400***	0.768***
			(2.68)	(3.69)
LN_ASSET			0.346***	0.217***
			(4.75)	(3.22)
LEV			-0.053	0.034
			(-0.37)	(0.23)
CLEV			0.580**	0.406
			(2.17)	(1.46)
LLOSS			0.881***	1.126***
			(2.70)	(3.67)
OCF			0.429	0.154
			(1.61)	(0.64)

Table 2.3: Auditor Impactfulness and Going Concern Accuracy (Continued)

INVM			0.800	0.011
			(1.18)	(0.02)
REPLAG			-0.001	0.000
			(-0.28)	(0.14)
LN_AGE			-0.171	0.092
			(-1.10)	(0.70)
BETA			0.039	0.112
			(0.24)	(0.68)
RETURN			-1.057***	-1.171***
			(-3.63)	(-3.91)
LN_SEGMENTS			-0.329**	-0.343**
			(-2.25)	(-2.24)
LN_AUD_TENURE			-0.096	-0.051
			(-0.70)	(-0.35)
AUD_SPECIALIST			0.126	0.004
			(0.47)	(0.02)
Year Controls	Yes	Yes	Yes	Yes
FFI48 Controls	No	Yes	No	Yes
BANKRUPT Count	185	138	127	117
Observations	61,683	47,102	34,587	30,086
Pseudo R-squared	0.0982	0.114	0.216	0.251

Table 2.4: Going concern reporting ex-post analysis

Table 2.4 models the probability of receiving a going concern opinion conditioned on whether or not the firm goes bankrupt within 1 year of the issue date of the annual financial statements. Bankruptcy data is aggregated from SDC Platinum, CRSP, Compustat, and UCLA's LoPucki Bankruptcy Research Database (BRD). Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the audit office level.

Panel A: Ex-Post Analysis of Firms that go Bankrupt in 1 Year

	$LOGIT[GC\_OPIN = 1 \mid BANKRUPT = 1]$	
	(1)	(2)
VARIABLES	GC_OPIN	GC_OPIN
AVG_AUD_IMPACT	1.060	0.653
	(1.61)	(0.84)
AVG_INT_SMAD	0.252	-0.664
	-0.41	(-0.72)
INT_SMAD	0.15	0.524**
	-0.75	-1.98
BIGN		0.561
		(0.94)
ZSCORE		0.503
		(1.05)
LN_ASSET		-0.432**
		(-2.23)
LEV		0.450
		(0.61)
CLEV		1.305
		(0.81)
LLOSS		-0.268
		(-0.45)
OCF		0.306
		(0.49)
INVM		-0.931
		(-0.57)
REPLAG		0.028*
		(1.86)
LN_AGE		0.141
		(0.41)
BETA		0.651
		(1.53)
RETURN		-2.093***
		(-2.73)

Table 2.4: Going concern reporting ex-post analysis
Panel A: Ex-Post Analysis of Firms that go Bankrupt in 1 Year (Continued)

Year controls	Yes	No
FFI48 Controls	No	No
GC_OPIN Count	81	49
Observations	178	117
Pseudo R-squared	0.076	0.238

Table 2.4: Going concern reporting ex-post analysis

Panel B: Ex-Post Analysis of Firms that do not go Bankrupt in 1 Year

	$LOGIT[GC\_OPIN = 1 \mid NO\ BANKRUPT = 0]$		
	(1)	(2)	(3)
VARIABLES	GC_OPIN	GC_OPIN	GC_OPIN
AVG_AUD_IMPACT	-0.702***	-0.256**	-0.285**
	(-7.62)	(-2.45)	(-2.38)
AVG_INT_SMAD	1.768***	0.134	0.164
	-11.77	-0.86	-0.94
INT_SMAD	0.231***	0.069	0.097**
	-11.93	-1.52	-1.99
BIGN		0.164	0.102
		(1.39)	(0.70)
ZSCORE		0.687***	0.930***
		(9.38)	(10.90)
LN_ASSET		-0.492***	-0.486***
		(-13.20)	(-11.22)
LEV		1.031***	1.061***
		(7.91)	(7.76)
CLEV		-0.392***	-0.424***
		(-2.73)	(-2.79)
LLOSS		1.436***	1.060***
		(11.61)	(7.90)
OCF		-1.744***	-1.734***
		(-10.51)	(-9.72)
INVM		-2.269***	-2.271***
		(-9.23)	(-8.50)
REPLAG		0.018***	0.018***
		(13.32)	(11.83)
LN_AGE		0.091	0.028
		(1.18)	(0.35)
BETA		0.095	0.073
		(1.31)	(0.98)
RETURN		-0.732***	-0.565***
		(-6.89)	(-5.33)
LN_SEGMENTS			-0.056
			(-0.72)
LN_AUD_TENURE			0.084
			(1.29)
AUD_SPECIALIST			0.048
			(0.24)

Table 2.4: Going concern reporting ex-post analysis

Panel B: Ex-Post Analysis of Firms that do not go Bankrupt in 1 Year (continued)

Year controls	Yes	Yes	Yes
FFI48 Controls	No	No	Yes
GC_OPIN Count	5,180	1,290	1,164
Observations	61,498	41,230	34,160
Pseudo R-squared	0.068	0.435	0.461

Table 2.5: Impact of GC Opinion on Quality Measures

Table 2.5 Panel A tests the impact of receiving a GC opinion on measures of quality. I identify instances of a company being issued a GC opinion when one was not issued in the previous year and the same audit office was retained for both periods. I compare the measures of quality for the year prior to the GC opinion (Pre GC Year) and in the year of the GC opinion (Year of 1st GC). In Panel B, a subset of firms is identified which receive a second sequential GC opinion from the same audit office. I compare the measures of quality from the year prior to the first GC opinion to the year of the second GC opinion. The measures are winsorized at the 1st and 99th percentiles. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Impact of Going Concern Opinion on Quality Measures - Pre/Post Univariate Comparison

Measure	Pre GC Year	Year of 1st GC	1st GC Year - Pre GC Year
Int_SMAD	0.799	0.805	0.007
			(0.20)
AUD_IMPACT	0.082	-0.060	-0.142**
			(-2.43)
Q4 SMAD	0.717	0.869	0.153***
			(3.03)
N	959	959	

Panel B: Impact of Going Concern Opinion on Quality Measures – Pre/Post Univariate Comparison of Firms with Consecutive GC Opinions

Measure	Pre GC Year	Year of 1st GC	1st GC Year - Pre GC Year	Year of 2nd GC	2nd GC Year - Pre GC Year
Int_SMAD	0.862	0.852	-0.010	0.945	0.083
			(-0.15)		(1.21)
AUD_IMPACT	0.171	-0.089	-0.260**	-0.062	0.233**
			(-2.44)		(-2.35)
Q4 SMAD	0.690	0.948	0.258***	1.010	0.319***
			(2.69)		(3.39)
N	274	274		274	

Table 2.6: Impact of GC Opinion on Audit Impact

Table 2.6 tests the impact of receiving a GC opinion on audit impact for a propensity matched sample. The probability of each company receiving a GC opinion is calculated using specification 3 from Table 2.2. Companies that receive a GC opinion and do not have a GC opinion in the immediately preceding year are matched to companies that do not receive a GC opinion in either year. Matched pairs have the same audit firm and fiscal years. Matches are required to be within 0.005 of probability. Matches are made using an algorithm that maximizes the number of matches. GC_Year is a dummy variable coded as 1 for both firms in a matched pair the year of the GC opinion and 0 otherwise. GC_FIRM is coded as 1 for the firm that receives the GC opinion, regardless of the period. See Appendix C for variable definitions. Continuous variables are winsorized at 1% and 99%. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors clustered by audit firm.

$$\boldsymbol{OLS}: \boldsymbol{AUD\_IMPACT} = \boldsymbol{\alpha + \beta_1 GC\_YEAR_{i,t} + \beta_2 GC\_FIRM_{i,t} + \beta_3 GC\_YEAR_{i,t} * GC\_FIRM_{i,t} + [CONTROLS] + \varepsilon_{i,t}}$$

VARIABLES	(1) AUD_IMPACT	(2) AUD_IMPACT	(3) AUD_IMPACT	(4) AUD_IMPACT
GC_YEAR	0.169	0.167	0.178	0.157
	(1.71)	(1.36)	(1.20)	(0.88)
GC_FIRM	0.140**	0.111**	0.140	0.151
	(2.56)	(2.12)	(1.42)	(1.47)
GC_YEAR *GC_FIRM	-0.345***	-0.357***	-0.369**	-0.402**
	(-3.99)	(-3.78)	(-2.60)	(-2.55)
INT_SMAD	0.563***	0.589***	0.612***	0.648***
	(16.54)	(17.39)	(18.44)	(17.74)
BIGN			0.001	-0.068
			(0.01)	(-0.57)
ZSCORE			0.105	0.134
			(1.60)	(1.55)
LN_ASSET			0.069	0.114***
			(1.68)	(3.70)
LEV			0.049	0.057
			(0.57)	(0.37)
CLEV			-0.034	-0.022
			(-0.12)	(-0.07)
LLOSS			-0.044	-0.089
			(-0.44)	(-0.98)
OCF			0.076	0.056
			(0.76)	(0.37)
INVM			0.003	-0.034
			(0.02)	(-0.21)

Table 2.6: Impact of GC Opinion on Audit Impact (Continued)

REPLAG			-0.001	-0.000
			(-0.38)	(-0.04)
LN_AGE			0.026	0.020
			(0.60)	(0.54)
BETA			-0.053	-0.098
			(-0.66)	(-1.14)
RETURN			0.099	0.095
			(1.42)	(1.27)
LN_SEGMENTS			0.014	-0.012
			(0.17)	(-0.14)
LN_AUD_TENURE			-0.073	-0.074
			(-1.41)	(-1.40)
AUD_SPECIALIST			-0.065	-0.050
			(-1.27)	(-1.08)
Year Controls	Yes	Yes	Yes	Yes
FFI48 Controls	No	Yes	No	Yes
Observations	984	959	794	785
R-squared	0.215	0.247	0.239	0.284

Table 3.1: Quality and the Board of Directors

Table 3.1 investigates the association between the quality of the financial statements and the composition of the board of directors. Quality is examined by looking at the fourth-quarter audited statements' deviation from Benford's Law in Panel A, audit impact in Panel B, and interim statements' deviation from Benford's Law in Panel C. Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the company level (GVKEY).

Panel A: Audited Financial Statement Quality and the Board of Directors

Panel A investigates the association between the quality of the audited annual financial statements, measured by SMAD, and the number of independent and expert directors. Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the company level (GVKEY).

VARIABLES	(1) SMAD	(2) SMAD	(3) SMAD	(4) SMAD
LAG_IND_DIR	-0.025***	-0.032***	-0.010	-0.009
	(-4.95)	(-6.19)	(-1.62)	(-1.58)
LAG_EXP_DIR	-0.011	-0.021**	-0.010	-0.008
	(-1.16)	(-2.31)	(-1.05)	(-0.90)
BIGN			-0.033	-0.024
			(-1.08)	(-0.75)
ZSCORE			0.028	0.027
			(1.54)	(1.52)
LN_ASSET			-0.014	-0.008
			(-1.63)	(-0.94)
LEV			-0.177**	-0.177**
			(-2.32)	(-2.31)
CLEV			-0.050	-0.051
			(-0.94)	(-0.96)
LLOSS			0.003	0.004
			(0.13)	(0.17)
OCF			-0.208***	-0.216***
			(-4.09)	(-4.22)
INVM			0.609***	0.596***
			(9.43)	(9.20)

Table 3.1: Quality and the Board of Directors

Panel A: Audited Financial Statement Quality and the Board of Directors (Continued)

REPLAG			0.000	0.000
			(0.25)	(0.37)
LN_AGE			-0.014	-0.005
			(-0.92)	(-0.34)
BETA			-0.048***	-0.050***
			(-2.60)	(-2.70)
RETURN			-0.020	-0.020
			(-1.42)	(-1.38)
LN_SEGMENTS				-0.041**
				(-2.56)
LN_AUD_TENURE				-0.005
				(-0.43)
AUD_SPECIALIST				-0.055*
				(-1.81)
Year Controls	No	Yes	Yes	Yes
FFI48 Controls	No	Yes	Yes	Yes
Observations	22,281	22,281	22,281	22,281
R-squared	0.003	0.034	0.052	0.052
P(LAG_IND_DIR = LAG_EXP_DIR =0)	0.0000	0.0000	0.0922	0.125

Table 3.1: Quality and the Board of Directors

Panel B: Interim Quality and the Board of Directors

Panel B examines the association between the quality of unaudited interim financial statements and the number of independent and expert directors. Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the company level (GVKEY).

	(1)	(2)	(3)	(4)
VARIABLES	INT_SMAD	INT_SMAD	INT_SMAD	INT_SMAD
LAG_IND_DIR	-0.021***	-0.030***	-0.010*	-0.010*
	(-4.52)	(-6.28)	(-1.84)	(-1.79)
LAG_EXP_DIR	-0.009	-0.022***	-0.012	-0.010
	(-0.96)	(-2.58)	(-1.36)	(-1.18)
BIGN			-0.034	-0.031
			(-1.21)	(-1.06)
ZSCORE			0.027*	0.026*
			(1.77)	(1.74)
LN_ASSET			-0.008	-0.001
			(-1.03)	(-0.13)
LEV			-0.169***	-0.168***
			(-2.76)	(-2.78)
CLEV			0.066	0.065
			(1.47)	(1.45)
LLOSS			0.023	0.024
			(1.17)	(1.25)
OCF			-0.292***	-0.301***
			(-7.35)	(-7.53)
INVM			0.599***	0.582***
			(10.14)	(9.75)
REPLAG			-0.001	-0.000
			(-1.08)	(-0.90)
LN_AGE			-0.024*	-0.015
			(-1.73)	(-0.99)
BETA			-0.046***	-0.048***
			(-2.87)	(-3.01)

Table 3.1: Quality and the Board of Directors

Panel B: Interim Quality and the Board of Directors (Continued)

RETURN			-0.018*	-0.018
			(-1.66)	(-1.60)
LN_SEGMENTS				-0.055***
				(-3.86)
LN_AUD_TENURE				-0.002
				(-0.17)
AUD_SPECIALIST				-0.021
				(-0.74)
Year Controls	No	Yes	Yes	Yes
FFI48 Controls	No	Yes	Yes	Yes
Observations	22,281	22,281	22,281	22,281
R-squared	0.003	0.060	0.088	0.090
P(LAG_IND_DIR = LAG_EXP_DIR =0)	0.0000	0.0000	0.0336	0.0533

Table 3.1: Quality and the Board of Directors

Panel C: Audit Impact and the Board of Directors

Panel C examines the association between audit impact and the number of independent and expert directors. Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the company level (GVKEY).

	(1)	(2)	(3)	(4)
VARIABLES	AUD_IMPACT	AUD_IMPACT	AUD_IMPACT	AUD_IMPACT
INT_SMAD	0.496***	0.518***	0.532***	0.533***
	(55.97)	(56.59)	(57.52)	(57.61)
LAG_IND_DIR	0.014***	0.017***	0.005	0.004
	(3.88)	(4.48)	(0.99)	(0.96)
LAG_EXP_DIR	0.006	0.010	0.004	0.003
	(0.87)	(1.38)	(0.50)	(0.40)
BIGN			0.019	0.011
			(0.79)	(0.45)
ZSCORE			-0.014	-0.013
			(-0.98)	(-0.97)
LN_ASSET			0.010	0.008
			(1.58)	(1.15)
LEV			0.095*	0.095*
			(1.86)	(1.85)
CLEV			0.090*	0.090*
			(1.77)	(1.77)
LLOSS			0.005	0.004
			(0.22)	(0.21)
OCF			0.069	0.073
			(1.52)	(1.60)
INVM			-0.327***	-0.322***
			(-6.47)	(-6.35)
REPLAG			-0.000	-0.000
			(-0.78)	(-0.82)
LN_AGE			0.004	-0.001
			(0.31)	(-0.05)
BETA			0.027*	0.028*
			(1.75)	(1.81)

Table 3.1: Quality and the Board of Directors

Panel C: Audit Impact and the Board of Directors (Continued)

RETURN			0.012	0.012
			(0.85)	(0.83)
LN_SEGMENTS				0.016
				(1.28)
LN_AUD_TENURE				0.005
				(0.45)
AUD_SPECIALIST				0.045*
				(1.81)
Year Controls	No	Yes	Yes	Yes
FFI48 Controls	No	Yes	Yes	Yes
Observations	22,281	22,281	22,281	22,281
R-squared	0.156	0.165	0.170	0.170
P(LAG_IND_DIR = LAG_EXP_DIR =0)	0.0000	0.0000	0.463	0.512

Table 3.2: Audit Impact and Income Statement Quality

Table 3.2 investigates the association of audit impact and the quality of the fourth-quarter income statement. Panel A examines the association using full sample regressions. Panels B, C, and D perform the analysis on various subsamples of the population. The sample is ranked into terciles of audit impact in each fiscal year. The analysis of observations belonging to the low, middle, and high terciles are presented in Panels B, C, and D respectively. Variables are defined in Appendix C and continuous variables are winsorized at the 1% and 99% levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Standard errors are clustered at the company level (GVKEY).

Table 3.2: Audit Impact and Income Statement Quality
Panel A: AI Impact on IS SMAD – Entire Sample

VARIABLES	(1) IS_SMAD	(2) IS_SMAD	(3) IS_SMAD	(4) IS_SMAD	(5) IS_SMAD
AUD_IMPACT	-0.066***	-0.019***	-0.014***	-0.022***	-0.014**
	(-13.78)	(-3.74)	(-2.90)	(-4.01)	(-2.49)
INT_SMAD	0.223***	0.065***	0.045***	0.079***	0.048***
	(26.24)	(8.80)	(6.40)	(9.74)	(6.02)
BIGN		0.054***	0.043**	-0.076***	0.017
		(3.06)	(2.33)	(-3.61)	(0.79)
ZSCORE		0.030***	0.021**	0.064***	0.021**
		(3.09)	(2.11)	(6.63)	(2.00)
LN_ASSET		-0.053***	-0.062***	-0.029***	-0.053***
		(-10.04)	(-11.15)	(-5.09)	(-9.00)
LEV		-0.173***	-0.101***	-0.080***	-0.095***
		(-5.68)	(-3.78)	(-3.09)	(-3.55)
CLEV		-0.052	-0.069**	-0.109***	-0.058*
		(-1.63)	(-2.22)	(-3.27)	(-1.78)
LLOSS		0.214***	0.183***	0.163***	0.189***
		(14.04)	(12.14)	(9.93)	(11.64)
OCF		-0.746***	-0.621***	-0.723***	-0.617***
		(-20.48)	(-17.21)	(-19.15)	(-16.57)
INVM		0.791***	0.712***	0.731***	0.649***
		(18.50)	(16.16)	(16.74)	(14.30)
REPLAG		-0.003***	-0.000	-0.003***	-0.001**
		(-8.75)	(-1.43)	(-7.20)	(-2.02)
LN_AGE		-0.012	-0.046***	-0.032***	-0.039***
		(-1.33)	(-4.78)	(-2.97)	(-3.54)
BETA		0.028**	0.015	0.006	0.004
		(2.43)	(1.25)	(0.49)	(0.30)
RETURN		0.019**	-0.010	0.031***	0.002
		(2.12)	(-0.97)	(3.15)	(0.15)
LN_SEGMENTS				-0.076***	-0.064***
				(-7.10)	(-5.98)
LN_AUD_TENURE				0.024***	0.002
				(2.62)	(0.23)
AUD_SPECIALIST				0.057**	0.030
				(2.51)	(1.33)
Year Controls	No	No	Yes	No	Yes
FFI48 Controls	No	No	Yes	No	Yes
Observations	79,261	54,985	54,095	44,432	44,018
R-squared	0.022	0.112	0.146	0.109	0.134

Table 3.2: Audit Impact and Income Statement Quality
Panel B: AI Impact on IS SMAD – Low Audit Impact Tercile

VARIABLES	(1) IS_SMAD	(2) IS_SMAD	(3) IS_SMAD	(4) IS_SMAD	(5) IS_SMAD
AUD_IMPACT	-0.162***	-0.047***	-0.031**	-0.043***	-0.030*
	(-12.44)	(-3.29)	(-2.22)	(-2.74)	(-1.94)
INT_SMAD	0.251***	0.082***	0.058***	0.095***	0.057***
	(21.02)	(7.09)	(5.00)	(7.35)	(4.42)
BIGN		0.019	0.014	-0.076**	0.015
		(0.73)	(0.50)	(-2.40)	(0.46)
ZSCORE		0.011	0.004	0.045***	0.004
		(0.77)	(0.28)	(3.09)	(0.26)
LN_ASSET		-0.058***	-0.068***	-0.030***	-0.057***
		(-7.71)	(-8.44)	(-3.60)	(-6.45)
LEV		-0.146***	-0.093***	-0.080***	-0.091***
		(-4.43)	(-3.11)	(-2.83)	(-3.08)
CLEV		-0.100*	-0.116**	-0.176***	-0.131**
		(-1.81)	(-2.16)	(-3.19)	(-2.33)
LLOSS		0.207***	0.175***	0.165***	0.186***
		(8.50)	(7.09)	(6.15)	(6.93)
OCF		-0.779***	-0.656***	-0.790***	-0.673***
		(-12.97)	(-10.84)	(-12.34)	(-10.34)
INVM		0.696***	0.589***	0.605***	0.522***
		(11.66)	(9.29)	(9.75)	(7.86)
REPLAG		-0.003***	-0.001	-0.003***	-0.001*
		(-6.16)	(-1.50)	(-4.82)	(-1.79)
LN_AGE		-0.012	-0.041***	-0.025	-0.030*
		(-0.86)	(-2.91)	(-1.56)	(-1.86)
BETA		0.035*	0.030	0.012	0.015
		(1.94)	(1.63)	(0.62)	(0.74)
RETURN		0.007	-0.013	0.025	0.005
		(0.44)	(-0.74)	(1.45)	(0.27)
LN_SEGMENTS				-0.093***	-0.076***
				(-5.62)	(-4.52)
LN_AUD_TENURE				0.001	-0.018
				(0.10)	(-1.30)
AUD_SPECIALIST				0.020	-0.003
				(0.59)	(-0.10)
Year Controls	No	No	Yes	No	Yes
FFI48 Controls	No	No	Yes	No	Yes
Observations	26,415	18,161	17,869	14,707	14,580
R-squared	0.030	0.113	0.150	0.111	0.139

Table 3.2: Audit Impact and Income Statement Quality
Panel C: AI Impact on IS SMAD – Middle Audit Impact Tercile

VARIABLES	(1) IS_SMAD	(2) IS_SMAD	(3) IS_SMAD	(4) IS_SMAD	(5) IS_SMAD
AUD_IMPACT	-0.043	-0.022	-0.017	-0.023	-0.014
	(-1.50)	(-0.70)	(-0.53)	(-0.66)	(-0.40)
INT_SMAD	0.183***	0.052***	0.039***	0.074***	0.049***
	(16.27)	(4.55)	(3.53)	(5.81)	(3.88)
BIGN		0.087***	0.079***	-0.057*	0.031
		(3.39)	(2.89)	(-1.84)	(0.97)
ZSCORE		0.029*	0.020	0.061***	0.020
		(1.92)	(1.27)	(4.04)	(1.21)
LN_ASSET		-0.045***	-0.051***	-0.025***	-0.046***
		(-6.16)	(-6.67)	(-3.14)	(-5.46)
LEV		-0.181***	-0.100*	-0.066	-0.085
		(-3.35)	(-1.94)	(-1.27)	(-1.62)
CLEV		0.039	-0.001	-0.020	0.035
		(0.60)	(-0.02)	(-0.31)	(0.53)
LLOSS		0.226***	0.195***	0.176***	0.197***
		(9.32)	(7.93)	(6.64)	(7.39)
OCF		-0.697***	-0.586***	-0.640***	-0.552***
		(-11.44)	(-9.56)	(-10.16)	(-8.70)
INVM		0.826***	0.780***	0.781***	0.730***
		(13.33)	(11.95)	(12.09)	(10.66)
REPLAG		-0.003***	-0.000	-0.002***	-0.001
		(-4.63)	(-0.28)	(-3.64)	(-0.84)
LN_AGE		-0.015	-0.046***	-0.042***	-0.045***
		(-1.07)	(-3.21)	(-2.65)	(-2.73)
BETA		0.019	-0.008	0.004	-0.009
		(1.08)	(-0.41)	(0.22)	(-0.46)
RETURN		0.025	-0.010	0.027	-0.007
		(1.50)	(-0.57)	(1.52)	(-0.35)
LN_SEGMENTS				-0.076***	-0.062***
				(-4.63)	(-3.73)
LN_AUD_TENURE				0.035***	0.013
				(2.61)	(0.98)
AUD_SPECIALIST				0.084**	0.056*
				(2.55)	(1.66)
Year Controls	No	No	Yes	No	Yes
FFI48 Controls	No	No	Yes	No	Yes
Observations	26,424	18,462	18,162	14,950	14,795
R-squared	0.015	0.101	0.135	0.098	0.122

Table 3.2: Audit Impact and Income Statement Quality
Panel D: AI Impact on IS SMAD – Highest Audit Impact Tercile

VARIABLES	(1) IS_SMAD	(2) IS_SMAD	(3) IS_SMAD	(4) IS_SMAD	(5) IS_SMAD
AUD_IMPACT	0.049***	0.029*	0.024	0.008	0.013
	(3.23)	(1.87)	(1.54)	(0.43)	(0.74)
INT_SMAD	0.210***	0.055***	0.034***	0.064***	0.033**
	(17.55)	(4.68)	(2.98)	(4.85)	(2.51)
BIGN		0.055**	0.037	-0.090***	0.007
		(2.10)	(1.34)	(-2.81)	(0.21)
ZSCORE		0.055***	0.042***	0.088***	0.042**
		(3.82)	(2.64)	(5.72)	(2.52)
LN_ASSET		-0.054***	-0.065***	-0.032***	-0.057***
		(-6.90)	(-7.97)	(-3.64)	(-6.36)
LEV		-0.222***	-0.126***	-0.105**	-0.122***
		(-4.81)	(-2.78)	(-2.21)	(-2.59)
CLEV		-0.081	-0.080	-0.112*	-0.062
		(-1.52)	(-1.54)	(-1.91)	(-1.09)
LLOSS		0.205***	0.177***	0.149***	0.180***
		(8.26)	(7.03)	(5.47)	(6.60)
OCF		-0.751***	-0.609***	-0.726***	-0.613***
		(-14.14)	(-11.85)	(-13.25)	(-11.59)
INVM		0.837***	0.765***	0.801***	0.697***
		(13.57)	(11.73)	(12.49)	(10.26)
REPLAG		-0.003***	-0.001	-0.003***	-0.001
		(-5.34)	(-0.88)	(-4.59)	(-1.06)
LN_AGE		-0.010	-0.050***	-0.027*	-0.039**
		(-0.76)	(-3.48)	(-1.68)	(-2.33)
BETA		0.029	0.020	0.002	0.006
		(1.61)	(1.12)	(0.09)	(0.30)
RETURN		0.027*	-0.006	0.040**	0.006
		(1.71)	(-0.33)	(2.32)	(0.32)
LN_SEGMENTS				-0.059***	-0.057***
				(-3.56)	(-3.39)
LN_AUD_TENURE				0.034**	0.009
				(2.40)	(0.66)
AUD_SPECIALIST				0.062*	0.041
				(1.80)	(1.18)
Year Controls	No	No	Yes	No	Yes
FFI48 Controls	No	No	Yes	No	Yes
Observations	26,422	18,362	18,064	14,775	14,643
R-squared	0.023	0.124	0.160	0.119	0.149

APPENDIX A: Data Used to Calculate Mean Absolute Deviation

Data Fields Used to Calculate Mean Absolute Deviation (MAD)

The calculation of audit impact is based on the conformity of balance sheet accounts to the distribution posited by Benford's Law. Appendix A lists the Compustat quarterly accounts that are used in this calculation.

Data Item	Description
ACOMINCQ	Accumulated Other Comprehensive Income (Loss)
ACOQ	Current Assets - Other - Total
ACTQ	Current Assets - Total
AOCIDERGLQ	Accum Other Comp Inc - Derivatives Unrealized Gain/Loss
AOCIOTHERQ	Accum Other Comp Inc - Other Adjustments
AOCIPENQ	Accum Other Comp Inc - Min Pension Liab Adj
AOCISECGLQ	Accum Other Comp Inc - Unreal G/L Ret Int in Sec Assets
AOQ	Assets - Other - Total
APQ	Accounts Payable/Creditors - Trade
ATQ	Assets - Total
CAPSQ	Capital Surplus/Share Premium Reserve
CEQQ	Common/Ordinary Equity - Total
CHEQ	Cash and Short-Term Investments
CHQ	Cash
CSTKCVQ	Carrying Value
CSTKQ	Common/Ordinary Stock (Capital)
DCOMQ	Deferred Compensation
DD1Q	Debt Due in 1 Year
DLCQ	Debt in Current Liabilities
DLTTQ	Long-Term Debt - Total
DPACREQ	Accumulated Depreciation of Real Estate Property
DPACTQ	Depreciation, Depletion and Amortization (Accumulated)
DRCQ	Deferred Revenue - Current
DRLTQ	Deferred Revenue - Long Term

Appendix A (Continued)

Data Item	Description
ESOPCTQ	Common ESOP Obligation - Total
ESOPNRQ	Preferred ESOP Obligation - Non-Redeemable
ESOPRQ	Preferred ESOP Obligation - Redeemable
ESOPTQ	Preferred ESOP Obligation - Total
GDWLQ	Goodwill
ICAPTQ	Invested Capital - Total
INTANOQ	Other Intangibles
INTANQ	Intangible Assets - Total
INVFGQ	Inventory - Finished Goods
INVOQ	Inventory - Other
INVRMQ	Inventory - Raw Materials
INVTQ	Inventories - Total
INVWIPQ	Inventory - Work in Process
IVAEQQ	Investment and Advances - Equity
IVAOQ	Investment and Advances - Other
IVSTQ	Short-Term Investments- Total
LCOQ	Current Liabilities - Other
LCTQ	Current Liabilities - Total
LOQ	Liabilities - Other
LOXDRQ	Liabilities - Other - Excluding Deferred Revenue
LSEQ	Liabilities and Stockholders' Equity - Total
LTQ	Liabilities - Total
MIBQ	Noncontrolling Interest - Redeemable - Balance Sheet
MSAQ	Accum Other Comp Inc - Marketable Security Adjustments
NPATQ	Nonperforming Assets - Total
NPQ	Notes Payable Current
PPEGTQ	Property Plant and Equipment - Total (Gross)
PPENTQ	Property Plant and Equipment - Total (Net)
PSTKNQ	Preferred/Preference Stock - Nonredeemable
PSTKQ	Preferred/Preference Stock (Capital) - Total
PSTKRQ	Preferred/Preference Stock - Redeemable
RECDQ	Receivables - Estimated Doubtful
RECTAQ	Accum Other Comp Inc - Cumulative Translation Adjustments
RECTQ	Receivables - Total

Appendix A (Continued)

Data Item	Description
REUNAQ	Unadjusted Retained Earnings
RLLQ	Reserve for Loan/Asset Losses
SEQOQ	Stockholders' Equity Adjustments - Other
SEQQ	Stockholders Equity - Parent - Total
TSTKQ	Treasury Stock - Total (All Capital)
TXDBAQ	Deferred Tax Asset - Long Term
TXDBCAQ	Current Deferred Tax Asset
TXDBCLQ	Current Deferred Tax Liability
TXDBQ	Deferred Taxes - Balance Sheet
TXDITCQ	Deferred Taxes and Investment Tax Credit
TXPQ	Income Taxes Payable
UAPTQ	Accounts Payable - Utility
UCAPSQ	Paid In Capital - Other - Utility
UCCONSQ	Contributions In Aid Of Construction
UCEQQ	Common Equity - Total - Utility
UDDQ	Debt (Debentures) - Utility
UDMBQ	Debt (Mortgage Bonds)
UDOLTQ	Debt (Other Long-Term)
UDPCOQ	Debt (Pollution Control Obligations)
ULCOQ	Current Liabilities - Other
UPMCSTKQ	Premium On Common Stock - Utility
UPMPFQ	Premium On Preferred Stock - Utility
UPMPFSQ	Premium On Preference Stock - Utility
UPMSUBPQ	Premium On Subsidiary Preferred Stock - Utility
UPSTKCQ	Preference Stock At Carrying Value - Utility
UPSTKQ	Preferred Stock At Carrying Value - Utility
URECTQ	Receivables (Net) - Utility
WCAPQ	Working Capital (Balance Sheet)
XACCQ	Accrued Expenses
ALTOQ	Long-Term Assets - Other
IVLTQ	Long-Term Investments - Total
MIBNQ	Noncontrolling Interest - Nonredeemable - Balance Sheet
MIBTQ	Noncontrolling Interest - Total - Balance Sheet
NCOQ	Net Charge-Offs

Appendix A (Continued)

Data Item	Description
RECTOQ	Receivables - Current Other incl Tax Refunds
TEQQ	Stockholders Equity - Total

APPENDIX B: The Standardization Process for Mean Absolute Differences

The Need for Standardization

The theoretical calculation of expected digit frequencies according to Benford's Law is calculated in a continuous fashion. While comparisons of mean absolute deviation (MAD) across sample sizes are theoretically reasonable, there is slippage in these comparisons due to differential continuity impacts and sampling risk. The relationship between average MAD and sample size in Figure 1.2 demonstrates the need to standardize by the sample size.

The Standardization Process

I calculate standardized MAD (SMAD) as the signed number of standard deviations the MAD score deviates from a benchmark MAD score for a sample of size *n*. The benchmark MAD and benchmark standard deviation is notated as BM_MAD_n and $BM\_MAD\_SD_n$, respectively. SMAD can therefore be calculated as follows:

$$SMAD = \frac{(MAD - BM\_MAD_n)}{BM\_MAD\_SD_n}$$

Calculations of Benchmark Variables

To calculate BM_MAD_n, I draw 10,000 samples of sample size *n* from a known Benford distribution and calculate the average MAD of the 10,000 samples. I calculate $BM\_MAD\_SD_n$ as the standard deviation of the sampled MAD scores. As one would expect, BM_MAD_n and $BM\_MAD\_SD_n$ decrease as the sample size increases.

Using the fact that the mantissas of a Benford distribution are uniformly distributed, the sample numbers are calculated as 10^x, where *x* is drawn using a random number generator across the uniform distribution (0,1).

APPENDIX B (continued)

Sample Benchmark Values

Sample Size	BM_MAD_n	$BM\_MAD\_SD_n$	Sample Size	BM_MAD_n	$BM\_MAD\_SD_n$
20	0.0523	0.0142	55	0.0318	0.0087
21	0.0513	0.0137	56	0.0315	0.0087
22	0.0498	0.0136	57	0.0312	0.0085
23	0.0488	0.0135	58	0.0309	0.0085
24	0.0481	0.0132	59	0.0307	0.0083
25	0.0473	0.0127	60	0.0304	0.0083
26	0.0464	0.0124	61	0.0302	0.0083
27	0.0454	0.0122	62	0.0297	0.0082
28	0.0447	0.0121	63	0.0296	0.0083
29	0.0440	0.0119	64	0.0293	0.0081
30	0.0431	0.0118	65	0.0291	0.0079
31	0.0424	0.0113	66	0.0289	0.0080
32	0.0418	0.0112	67	0.0288	0.0078
33	0.0409	0.0113	68	0.0285	0.0078
34	0.0405	0.0111	69	0.0284	0.0078
35	0.0400	0.0108	70	0.0281	0.0078
36	0.0392	0.0107	71	0.0279	0.0076
37	0.0387	0.0105	72	0.0277	0.0077
38	0.0382	0.0105	73	0.0276	0.0077
39	0.0375	0.0104	74	0.0274	0.0076
40	0.0369	0.0103	75	0.0271	0.0075
41	0.0368	0.0102	76	0.0269	0.0075
42	0.0363	0.0098	77	0.0267	0.0073
43	0.0358	0.0099	78	0.0267	0.0072
44	0.0354	0.0098	79	0.0265	0.0074
45	0.0350	0.0095	80	0.0263	0.0072
46	0.0346	0.0095	81	0.0262	0.0072
47	0.0343	0.0095	82	0.0260	0.0071
48	0.0340	0.0093	83	0.0259	0.0071
49	0.0335	0.0091	84	0.0257	0.0071
50	0.0332	0.0092	85	0.0254	0.0071
51	0.0328	0.0091	86	0.0254	0.0071
52	0.0326	0.0090	87	0.0251	0.0069
53	0.0324	0.0090	88	0.0249	0.0069
54	0.0322	0.0088	89	0.0248	0.0069

APPENDIX B (continued)

***Sample Benchmark Values* (continued)**

Sample Size	BM_MAD_n	BM_MAD_SD_n
90	0.0246	0.0069
91	0.0246	0.0069
92	0.0246	0.0068
93	0.0244	0.0067
94	0.0243	0.0067
95	0.0242	0.0067
96	0.0240	0.0067
97	0.0240	0.0066
98	0.0237	0.0066
99	0.0236	0.0066
100	0.0235	0.0065
101	0.0234	0.0064
102	0.0232	0.0064
103	0.0231	0.0065
104	0.0229	0.0063
105	0.0229	0.0064
106	0.0228	0.0063
107	0.0228	0.0063
108	0.0226	0.0062
109	0.0226	0.0062
110	0.0224	0.0063

APPENDIX C: Variable Definitions

Variable	Description	Definition
Variables Derived from Benford's Law		
MAD	Mean Absolute Deviation	MAD captures the deviation of the balance sheet from Benford's Law. See Appendix B for more detail.
SMAD	Standardized MAD measure	SMAD is the MAD statistic after standardizing for the number of numbers in the balance sheet. See Appendix B for more detail.
INT_SMAD	Average SMAD during the interim periods	INT_SMAD is calculated at the firm-year level. It is the average SMAD for quarters 1, 2, and 3.
AUD_IMPACT	Audit impact, the improvement in quality from interim quarters to the audited fourth-quarter attributed to the fact that the fourth-quarter is audited	AUD_IMPACT is calculated as average interim SMAD less fourth-quarter SMAD. AUD_IMPACT is calculated at the company-year level and requires four quarters of financial data.
Company Market and Financial Measures		
ABS_CAR	Absolute cumulative abnormal returns	ABS_CAR is calculated as the absolute value of the cumulative decile adjusted returns for a period.

APPENDIX C: Variable Definitions (Continued)

Variable	Description	Definition
Company Market and Financial Measures (Continued)		
ABS_JONES_RESID	Absolute value of the residual from the modified Jones model, following ABR's application of Kothari et al (2005)	The following regression is estimated for each industry year: tca = Δsales + net PPE + ROA, where tca = (Δcurrent assets - Δcash - Δcurrent liabilities + Δ debt in current liabilities – depreciation and amortization), ROA is defined as below, and all variables are scaled by beginning-of-period total assets.
AUD_SPECIALIST	Dummy variable that indicates being audited by an industry specialist	Audit firms are considered specialists when they have the most market share by at least 10% within a two-digit SIC industry.
BANKRUPT	Dummy variable used to indicate bankruptcy within one year of the auditor's issuance of the financial statements	BANKRUPT is calculated using bankruptcies and liquidations data that are aggregated from CRSP, Compustat, SDC Platinum, and UCLA's LoPucki Bankruptcy Research Database.
BETA	Beta of stock returns	BETA measures systematic risk over the past fiscal year.
BTM	Book to market ratio	BTM is measured at the firm quarter level. It is measured using Compustat variables as (TEQQ/MKVALTQ).
CLEV	Change in leverage	CLEV is the change in leverage and is calculated as the current year's LEV less LEV in the prior year.

APPENDIX C: Variable Definitions (Continued)

Variable	Description	Definition
Company Market and Financial Measures (Continued)		
GC_FIRM	Dummy variable used to indicate treatment firms in propensity matched testing	Takes a value of one in both the year of the GC opinion and the year immediately preceding the GC opinion for firms that receive a GC opinion
GC_OPIN	Going Concern Opinion Dummy	GC_OPIN is a dummy variable that takes the value of 1 when a GC opinion is issued and 0 otherwise.
GC_PROB	Probability of a firm year receiving a GC opinion	GC_PROB is the predicted probability of a firm year receiving a GC opinion according to the specified logistic regression.
GC_YEAR	Dummy variable used to indicate treatment period in propensity matched testing	Takes a value of one for both the firm receiving a GC opinion and its matched pair in the year of the GC opinion
INVM	Liquid investments	INVM is calculated as the company's liquid cash scaled by assets (CHE/AT).
IS_SMAD	Income Statement SMAD (4^{th} Quarter)	IS_SMAD is calculated by standardizing the deviation of the fourth-quarter income statement from Benford's Law.
LAG_EXP_DIR	Expert Directors	Lagged number of expert directors obtained from BoardEx.
LAG_IND_DIR	Independent Directors	Lagged number of independent directors obtained from BoardEx.

APPENDIX C: Variable Definitions (Continued)

Variable	Description	Definition
Company Market and Financial Measures (Continued)		
LEV	Leverage	LEV is calculated using Compustat variables as (LT/AT).
LLOSS	Lag loss	LLOSS is a dummy variable with value of 1 if prior year net income (NI) is negative and 0 otherwise.
LN_AGE	Log age	LN_AGE is the log of the age of company on Compustat.
LN_ASSET	Log assets	LN_ASSET is the natural log of total assets at fiscal year-end (log(AT)).
LN_SEGMENTS	Log business segments	LN_SEGMENTS is the log of the number of business segments reported in Compustat
LN_AUD_TENURE	Log auditor tenure	LN_AUD_TENURE is the log of the number of consecutive years the same audit office has performed a firm's audit
MANIPULATOR	Following ABR as an indicator variable equal to 1 if the M Score is greater than -1.78	M Score is calculated following Beneish (1999).
OCF	Operating cash flows	OCF is operating cash flows scaled by assets. It is calculated as OANCF/AT.
R_CFO	Level of abnormal cash flows from operations	Abnormal operating cash flows are measured following Cohen et al. (2008). Following ABR in use and application of variable.

APPENDIX C: Variable Definitions (Continued)

Variable	Description	Definition
Company Market and Financial Measures (Continued)		
R_DISX	Level of abnormal discretionary expenses	Abnormal discretionary expenses are measured following Cohen et al. (2008). Following ABR in use and application of variable.
R_PROD	Level of abnormal production costs	Abnormal production costs are measured following Cohen et al. (2008). Following ABR in use and application of variable.
REPLAG	Reporting lag	REPLAG is calculated as the number of days between the fiscal year-end and the earnings announcement date (file_date - datadate).
RETURN	Stock return	Return measures the company's stock return over the past fiscal year.
STD_DD_RESID	Five-year moving standard deviation of the Dechow-Dichev residual, following ABR's application of Francis et al.(2005)	The following regression is estimated for each industry year: tca = cfot-1 + cfo + cfot+1, where tca is defined as above, and cfo = (interest before extraordinary items - (wcacc - depreciation and amortization)). All variables are scaled by average total assets. The five-year rolling standard deviations of the residuals are then calculated.

APPENDIX C: Variable Definitions (Continued)

Variable	Description	Definition
Company Market and Financial Measures (Continued)		
SUE	Standardized unexpected earnings	Calculated as the standardized difference between actual earnings and median analyst expectations. Calculated with Compustat and I/B/E/S data as (act/medest)/prccq.
ZSCORE	Indicator of bankruptcy risk	ZSCORE is a measure increasing in bankruptcy risk based on Altman's Z-Score (1968). Variable is coded as 0 if the score is more than 3, 1 if the score is between 1.81 and 3, or 2 if the score is less than 1.81.
Audit Firm Measures		
AVG_AUD_IMPACT	Audit office's average impactfulness	AVG_AUD_IMPACT is the average AUD_IMPACT for an audit office across all audit engagements for the previous year.
AVG_INT_SMAD	Average quality of the unaudited interim financial statements for an audit office's clients	AVG_INT_SMAD is the average INT_SMAD for an audit office across all audit clients for the previous year. Higher values indicate lower-quality interim financial statements of audit clients.
BIGN	Indicator of auditor's status as a Big N auditor.	BIGN is dummy variable with a value of 1 when an audit firm is identified as being a Big N auditor and 0 otherwise.