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**Abstract:**

We document 45 specific allegations related to audit deficiencies based on GAAS, as detailed in 141 AAERs and 153 securities class action lawsuits over the violation years 1978–2016. Next, we use these allegations to validate popular proxies of audit quality. Of all the audit quality proxies, we find that restatements consistently predict all of the top six most cited audit deficiencies. The ratio of audit fees to total fees and the presence of a city specialist auditor predict five of the most cited deficiencies. Overall, our results suggest that the predictive power of audit quality proxies depends on (i) the settings that researchers are interested in and (ii) the specific audit deficiencies hypothesized to matter in the investigated setting. For instance, future studies related to auditor independence might consider using restatements and the ratio of audit fees to total fees as proxies of audit quality.

Keywords: Audit Quality; Audit Deficiency; AAER; Securities Class Action Lawsuits; Enforcement.

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## 1. Introduction

A large body of research investigates the antecedents and consequences of poor audit quality. Much of this research, as summarized by DeFond and Zhang (2014), relies on cross-sectional or time-series variation of the following three types of proxies to measure audit quality: (i) output-based audit quality measures (e.g., restatements), (ii) input-based audit quality measures (e.g., audit fees), and (iii) other metrics. These measures are relatively easy to compute from machine-readable databases. However, there is little evidence to support their construct validity.

In this paper, we have two objectives. First, we provide detailed descriptive analyses of how poor audits are perceived in both public and private litigation settings. Second, we evaluate how well existing audit quality proxies predict detailed allegations related to how auditors actually performed in specific engagements. These allegations are hand-collected from the SEC's Accounting and Auditing Enforcement Releases (AAERs) and nondismissed securities class action lawsuits filed against auditors (both audit firms and individual audit partners).

Any discussion of the proxies for audit quality must grapple with the difficulty of defining audit quality. The two most cited definitions have been provided by (i) DeAngelo (1981), who defines audit quality as the joint probability that auditors both "discover a breach in the client's accounting system and report the breach," and by (ii) DeFond and Zhang (2014), who define higher audit quality as "greater assurance of high financial reporting quality." Survey evidence by Christensen, Glover, Omer, and Shelley (2016) suggests that individual investors value auditor competence as indicative of high audit quality, whereas audit professionals view compliance with auditing standards as a sign of high audit quality. Thus DeAngelo (1981) seems to focus on the auditor's input into detection of errors, whereas practitioners are concerned about compliance

(Christensen et al. 2016). DeFond and Zhang's (2014) definition arguably incorporates both the auditor's detection of errors and compliance with auditing standards.

We believe that audit deficiencies in specific engagements alleged by the SEC or private law firms are consistent with all three definitions of audit quality in that (i) lawyers claim that auditors did not discover or report breaches in the client's accounting system (the DeAngelo definition), (ii) such alleged defects are bound to affect overall financial reporting quality (the DeFond and Zhang definition), and, (iii) as a practical matter, allegations against auditors are framed by both the SEC and the class action lawyers in terms of violations of Generally Accepted Auditing Standards (GAAS), consistent with practitioners' definition of audit quality (Christensen et al. 2016). Our attempt to compile fine-grained data on audit quality allows us to incorporate "the institutional features of the audit process into the definition of audit quality," as described by Donovan, Frankel, Lee, Martin, and Seo (2014).

In the first part of the paper, we describe alleged deficiencies in audits of (i) 141 companies identified by the SEC over the years 1985–2016 and (ii) 153 companies identified as deficient in securities class action lawsuits over the years 1996–2016. To eliminate frivolous allegations, we focus only on lawsuits that were not dismissed. Because the rest of the lawsuits are invariably settled, we cannot ascertain whether the alleged deficiencies held up in a court of law. Moreover, we cannot compare allegations in cases won or lost by the plaintiff, given that all lawsuits are settled. Of course, the sample of the SEC's AAERs is less likely to suffer from this limitation. Our sample is further subject to selection issues if the SEC is less likely to pursue Big N auditors, relative to the class action lawyers, who focus almost exclusively on the Big N. Notwithstanding these limitations, we believe our evidence provides the first granular perspective into audit quality deficiencies at the engagement level based on what the SEC and plaintiff lawyers actually do.

Using the GAAS framework for general, fieldwork, and reporting standards, we classify audit deficiencies into seven broad categories: (1) bogus audit; (2) issues with engagement acceptance; (3) violation of general standards; (4) three specific violations of GAAS standards on fieldwork, including (a) deficiencies in audit planning, (b) insufficient competent evidence, and (c) understanding of internal controls; and (5) a violation of the GAAS standard on reporting. Across these broad categories, we identify 45 sub-categories of specific violations. A framework based on violations of GAAS standards facilitates cross-sectional comparison of deficiencies across audit engagements.

An AAER or a lawsuit usually contains allegations of multiple deficiencies. The six most commonly cited violations of GAAS standards, at the sub-category level, for AAERs and lawsuits combined, relate to (i) failure to gather sufficient competent audit evidence (200 cases), (ii) failure to exercise due professional care (177 cases), (iii) failure to express an appropriate audit opinion (156 cases), (iv) inadequate planning and supervision (126 cases), (v) lack of independence from client (122 cases), and (vi) failure to obtain an understanding of internal control (106 cases).[1]

After documenting the nature of the audit quality weaknesses in detail, we assess, in the second part of the paper, how well the extant proxies of audit quality predict the top six violations individually. The focus on AAERs and class action lawsuits against auditors to discriminate among various audit quality proxies is subject to the caveat that we only analyze a sample of nonrandom weak audits. To mitigate this concern, our control sample consists of firm-years with class action lawsuits or AAERs against management, as opposed to auditors. The number of observations in our control sample ranges from 2,552 to 4,599 firm-year observations, consistent with that of Karpoff, Koester, Lee, and Martin (2017). Given that audit quality is unobservable, we believe our

[1] See Appendix B for the most frequently cited audit deficiencies.

control sample serves as a reasonable counterfactual, because the control sample experienced poor financial quality but not necessarily negligent audit quality.

We focus on 14 frequently used audit quality proxies. They are organized as (1) output-based and (2) input-based and other proxies. Output-based proxies include total accruals (*Total Accruals*), restatements (*Rstmt*), small profits (*SmlProfit* and *SmlBeat*), and going concern opinions (*GC*). Input-based and other proxies include big N auditors (*BigN*), the audit-fees-to-total-fees ratio (*Audit Fee Ratio*), client importance (*Audit Fee City Ratio*), auditor tenure (*Tenure*), new client (*New Client*), client location (*Top 20 City*), auditor-client location mismatch (*Auditor Firm Diff*), city specialist auditors (*City Specialist*), and industry specialist auditors (*Industry Specialist*). We find that restatements and total accruals consistently and positively predict each of the six alleged audit deficiencies and hence represent the best proxy for poor audit quality. Two input-based measures also seem to fare well. The presence of a city specialist auditor negatively predicts five out of the top six deficiencies, suggesting that city-specific industry specialists provide higher audit quality. The ratio of audit fees to total fees also negatively predicts five out of the top six deficiencies. This finding indicates that a ratio of higher audit fees to total fees signals higher audit quality.

Lastly, we include all audit quality measures in a single regression to predict each of the top six audit deficiencies in AAERs and lawsuits. We find that restatements continue to consistently predict all of the top six most cited audit deficiencies. On the other hand, total accruals predict only one out of six allegations. These findings suggest that total accruals do not add any predictive power of audit deficiency allegations when all audit quality measures are present. The ratio of audit fees to total fees is negatively associated with five audit violations. The relation between audit fees and audit deficiencies is bi-directional. On the one hand, if higher audit fees

reflect greater audit effort, we would expect a negative association between audit fees and alleged audit violations. On the other hand, greater audit fees could proxy for a self-insurance cover for litigation, due to risky clients or even lack of independence, suggesting a positive association between audit fees and audit deficiencies. The bi-directional nature of this proxy makes interpretation of empirical associations difficult. Results suggest that audit fees are more likely to proxy for auditor effort in our settings. Additionally, a city specialist auditor is negatively associated with five allegations, implying that a city-specific specialist provides higher audit quality. Contrary to our predictions, firms with small profits are less likely to commit all of the top six alleged audit violations.

Taken together, our results can be summarized as follows. First, subject to the limitations of the research design discussed later, restatements emerge as the best audit quality proxy, because they consistently predict all of the top six most cited audit deficiencies. Second, the predictive power of audit quality proxies is specific to the investigated setting. For example, if a researcher is interested in predicting the "evidence violation" by auditors, that person should consider using restatements, the presence of a Big N auditor, the ratio of audit fees to total fees, the presence of a new client, or city specialist auditor as audit quality proxies. If predicting the "independence violation" matters, researchers should consider using restatement or audit fees to total fees ratio as audit quality proxies.

Our paper follows a long tradition of work that aims to test the construct validity of machine-readable measures of earnings management (Dechow, Sloan, and Sweeney 1995; Dechow, Ge, Larson, and Sloan 2011) or litigation risk (Kim and Skinner 2012). Our paper contributes to the literature in two important ways. First, we provide comprehensive evidence on how poor audit quality is actually perceived at the field level. Identifying a sample of bad audits

is itself a nontrivial endeavor. One of the key objectives of the paper is to determine what went wrong with low-quality audits of specific clients. It is worth noting that the public aspect of the PCAOB's inspections is limited to informing academics and practitioners about what went wrong with each low-quality instance (Part I Findings) without linking these audit deficiencies to specific clients.[2]

Second, unlike other attempts at cataloging audit deficiencies, such as the work of Beasley et al. (1999 and 2013), we evaluate which aspect of low quality (as seen by regulators and attorneys) is captured by which audit quality proxy. This is important, given the ubiquity of the standard proxies of audit quality in the literature. In a recent paper, Aobdia (2019) conducts a similar validation of audit quality proxies benchmarked against a proprietary list of poor- and high-quality audits identified by PCAOB inspections. Our work differs from his in that (i) we rely on a publicly available, albeit smaller, dataset of alleged audit deficiencies covering a longer period; (ii) we document associations between audit quality proxies and detailed allegations related to how the audit was potentially deficient; and (iii) we focus on validating audit quality proxies in litigation settings, covering both public and private lawsuits against auditors. [3]

Our paper is subject to some limitations. First, the regression models implemented here are only suggestive of which types of audit deficiencies identified by attorneys are associated with or

[2] St. Pierre and Anderson (1984) describe audit deficiencies found in 129 lawsuits against accountants in the 1960s and '70s, but this classification predates much of GAAS. Beasley, Carcello, and Hermanson (1999) and Beasley, Carcello, Hermanson, and Neal (2013), in separate reports commissioned by the American Institute of CPAs (AICPA) and the Center for Audit Quality (CAQ), respectively, also report descriptive data on audit deficiencies identified by the SEC for 56 and 81 AAERs for the periods 1987–1997 and 1998–2010. Our sample is more comprehensive in that we also cover 153 nondismissed lawsuits against auditors over the period 1996–2016. Moreover, there are substantial differences in the nature of deficiencies identified by the SEC when compared with the class action lawyers, as detailed later in the paper.

[3] We focus on convergent validity, which we test empirically as the association between each audit quality proxy and audit deficiencies raised in AAERs and lawsuits. These deficiencies provide us with unique information about process-level audit failures, which ideally should have predictable associations with widely used proxies for audit quality.

captured by which audit-quality proxies. Unfortunately, we cannot rank the severity of these allegations. Second, we acknowledge that there are inherent limitations to what we can learn from a small sample of bad audits drawn from 141 AAERs and 153 securities class action lawsuits. Bad audits are likely a rare event. Hence finding a convincing counterfactual sample of good audits is difficult. We have relied on enforcements against managers, as opposed to auditors, to provide such a counterfactual, as we do not have access to a sample of certifiably clean audits. Finally, our paper is the first to undertake the task of modeling audit deficiencies alleged by the SEC and lawyers. Theoretical guidance on why plaintiffs' lawyers and the SEC cite specific violations of GAAS is not available. Hence a skeptic might argue that our approach of investigating the reliability of audit quality proxies does not constitute a validity test per se. The exercise could also be interpreted as a concordance analysis of the (possibly divergent) views of audit quality between academics and practitioners.

The remainder of the paper is as follows. Section 2 discusses the merits and costs of relying on the SEC's AAERs and lawsuits to identify audit quality deficiencies. Section 3 presents our data. Section 4 discusses research on audit quality proxies and the research design used here. Section 5 reports the results, and section 6 concludes.

## 2. Our setting

We focus on SEC AAERs and class action lawsuits against auditors to collect detailed data on deficiencies in the audit of client firms. As discussed by St. Pierre and Anderson (1984), both the SEC and class action lawyers come across signals or characteristics related to specific firms that alert them to search for material errors in the financial statements of that firm and the auditor's role in failing to discover or report these errors to investors. Our setting, comprising AAERs and auditor lawsuits, has advantages and disadvantages. The SEC can demand disclosure of nonpublic

data from both auditors and companies via its enquiry process (SEC 2016). Because the SEC is also concerned about losing support from the investing public and its political constituents (e.g., Bealing 1994; Zheng 2020), it is less likely to allege audit inadequacies, unless it can establish guilt with a high degree of assurance. In the United States, public enforcement of audits is supplemented by the possibility of private class action litigation against auditors. That is, investors can sue to protect their rights and hold auditors accountable for violations of securities laws resulting from negligent audits. However, in litigation, the plaintiff bears the burden of establishing the defendant's scienter (e.g., Alexander 1991). Hence some lawsuits against auditors are potentially frivolous. We minimize that possibility by deleting lawsuits that were eventually dismissed. In general, the AAER sample, and to some extent the lawsuit sample, is less likely to suffer from Type I errors, because the SEC and plaintiffs' lawyers are more likely to have identified wrongdoing when it actually occurred.

The other consideration that deserves discussion is the period over which lawsuit data have been gathered: 1996–2016. This period starts after the passage of the Private Securities Litigation Reform Act (PSLRA).[4] Coffee (2002), in particular, has argued that PSLRA inhibited plaintiffs from suing public companies for accounting abuses. Moreover, the Securities Litigation Uniform Standards Act (1998) abolished state court class-actions alleging securities fraud, increasing plaintiffs' difficulty in suing public companies. Difficulty in suing public companies for accounting violations also raises the bar for litigation against audit firms, which are a step removed from management, which presumably orchestrates frauds. Therefore the allegations documented

[4] Moorthy and Sarath (2017) examine the likelihood of auditor lawsuits and settlement in securities class action lawsuits. They find that auditors are more likely to be sued and settle the suit in lawsuits involving alleged earnings manipulation and GAAP violations. They, however, do not include AAER samples nor examine the validity of audit quality proxies.

in the class action suits against auditors arguably represent (i) a lower bound on such cases and (ii) more egregious instances of auditor laxity while conducting audits.

However, our setting suffers from some disadvantages as well. First, there could be selection bias in cases identified by the SEC, but SEC criteria for investigation are not visible to a researcher. Empirically, though, the SEC is, if anything, less likely to pursue Big N audit firms (Kedia, Khan, and Rajgopal 2017). Moreover, most of the allegations leveled by the SEC are usually neither contested nor accepted by the audit firms, because the cases are settled, not necessarily won, by the SEC. Thus we cannot assert that the SEC's allegations are truly violations.

Class action lawsuits are *less* likely to be filed against Big N auditors. However, lawsuits against Big N auditors are more likely to result in larger monetary penalties, because they have deep pockets (e.g., Arthur Andersen et al. 1992; Lennox and Li 2019). Although we delete dismissed cases, the remaining cases against auditors almost never go to trial, as they are settled. Hence we can never observe whether the plaintiffs' allegations would have withstood scrutiny during a trial. Of course, one can argue that the auditors are not entirely blameless, as they seek settlement, rather than risk scrutiny of their audit procedures in a trial.

Despite these limitations, we believe that audit deficiencies identified by the SEC and the class action lawyers provide an under-discussed perspective on deficiencies in audit quality at the engagement level. Hence these deserve to be documented and analyzed. We now turn to that task.

## 3. Data and sample selection

Our sample is drawn from two sources: SEC's AAERs and nondismissed securities litigation against auditors. We identify all enforcement actions against auditors filed between 1985 and 2016, using the AAER dataset discussed in Dechow et al. (2011). As reported in Panel A of Table 1, we started with a total of 107 AAERs from this dataset, which we supplement with 114

AAERs based on our own search of the SEC's database. We end up with 141 usable observations after eliminating (i) 38 AAERs that pertain to the auditor's lack of registration with the PCAOB, (ii) 21 cases that were miscoded in the original dataset as cases against auditors[5], (iii) 10 missing AAER files from the SEC's website, (iv) 10 redundant cases, and (v) one AAER with insufficient details to enable coding of audit deficiencies. We download these 141 AAERs against auditors from the SEC's website (http://www.sec.gov/divisions/enforce/friactions.shtml).

As reported in Table 1, we obtained 293 nondismissed lawsuits against auditors filed between 1996 and 2016 from the ISS securities class action database. We collected the lawsuit filings for all these cases to verify that the auditor was listed as a defendant. To optimally allocate our effort related to data gathering and coding, we eliminated (i) 53 cases where the auditors were not listed as a defendant[6], (ii) 33 cases where the lawsuit complaint could not be found, (iii) 25 cases where the allegations were too vague to code[7], (iv) 14 cases for which records could not be found on CRSP and Compustat, (v) nine cases with the same issues as AAERs, and (vi) six cases involving privately traded firms. This left us with 153 usable lawsuits.

We read each complaint in detail and manually coded every listed allegation against the auditor under seven broad categories of alleged deficiencies. To define these categories, we rely on the GAAS framework for general, fieldwork, and reporting standards. Reliance on GAAS facilitates cross-audit comparison of deficiencies and enables us to report comparable descriptive

[5] Some of these cases related to the company's audit report, but the SEC did not pursue the auditor directly. For example, in AAER 3063 (SEC vs. China Holdings, Inc. and its CEO), the CEO forged the audit report and the auditor resigned. The SEC sued the company and its CEO, but it did not sue its auditor.

[6] This could mean that either (i) there could be data errors in the ISS database or (ii) the auditor was dismissed while other defendant(s) remained in the lawsuit. Regardless, we exclude cases where auditor's name does not appear on the complaint.

[7] When coding the audit deficiencies in lawsuits, we look for sections where the complaint lists all the audit standard violations for defendants. Usually this section is named as "Defendant Auditor's Violation of Auditing Standards" or something similar. If this section is missing, we go through the entire document to look for alleged audit deficiencies. Specifically, we look for terms such as "the auditor violated a certain GAAS standard." We exclude cases where no concrete violations of auditing standards are alleged.

data for the sample. More important, accusations related to the violation of GAAS are leveled by both the SEC and the plaintiff lawyers against the auditors.

A brief description of these standards follows. The general standards require that (i) the audit be performed by a person or persons with adequate technical training and proficiency as an auditor; (ii) in all matters relating to the assignment, an independence in mental attitude is to be maintained by the auditor or auditors; and (iii) due professional care be exercised in the performance of the audit and the preparation of the report. The standards of field work require that (i) the work be adequately planned and any assistants properly supervised; (ii) a sufficient understanding of internal control be obtained to plan the audit and determine the nature, timing, and extent of tests to be performed; and (iii) sufficient competent evidential matter be obtained through inspection, observation, inquiries, and confirmations to afford a reasonable basis for an opinion regarding the financial statements under audit.

The standards of reporting mandate that (i) the report shall state whether the financial statements are presented in accordance with GAAP, (ii) the report shall identify those circumstances in which such principles have not been consistently observed in the current period in relation to the preceding period, (iii) informative disclosures in the financial statements are to be regarded as reasonably adequate unless otherwise stated in the report, and (iv) the report shall contain either an expression of opinion regarding the financial statements, taken as a whole, or an assertion to the effect that an opinion cannot be expressed. When an overall opinion cannot be expressed, the reasons therefor should be stated. In all cases where an auditor's name is associated with financial statements, the report should indicate the character of the auditor's work, if any, and the degree of responsibility the auditor is taking.

We classify audit deficiencies into seven categories: (1) bogus audit; (2) issues with engagement acceptance; (3) violation of GAAS; (4) three specific violations of GAAS standard on fieldwork including (a) deficiencies in audit planning, (b) insufficient competent evidence, and (c) understanding of internal controls; and (5) a violation of the GAAS standard on reporting. These seven categories are catalogued as Panels A–G in Table 2. We identify 45 sub-categories of fine-grained deficiencies across these seven broad categories. It is hard for us to comment on which of these violations is considered most severe. We suspect that the importance of specific violations is closely tied to the context and is unobservable to an empiricist from case documents.

The data reveal substantial differences in the frequency with which the class action lawyers and the SEC cite violations of specific GAAS standards. As indicated in Panel H of Table 2, on average, plaintiff lawyers refer to the violation of about 14.6 GAAS standards and sub-standards per case relative to 4.8 violations cited by the SEC. The difference in the average number of cites of auditing standards between AAERs and lawsuits is statistically significant. Panel I suggests that the lawyers are also more likely to cite other standards, such as GAAP (two violations on average, relative to one by the SEC). The SEC found three bogus audits, but the lawyers found none, as per Panel A. This is not surprising, considering that the SEC tends to investigate audits by smaller accounting firms, unlike securities lawyers. The lawyers are more likely to cite violations of sub-standards, relative to the SEC. However, the SEC and the lawyers are equally likely to cite insufficient levels of professional skepticism (C4) and inadequate evaluation of an entity's going concern status (G1). Because these data have not received a lot of academic attention, we include detailed discussions of the more frequently cited 11 audit deficiencies in Appendix C.

In the following sections, we evaluate whether the proxies for audit quality widely used in the literature reflect the economic content of these allegations.

## 4. Audit quality proxies

*4.1 Previous work on audit quality proxies*

A large body of accounting research investigates the determinants and consequences of audit quality. The commonly used proxies for audit quality can be categorized into output-based proxies and input-based proxies (DeFond and Zhang 2014). Output-based measures typically cover (1) material restatements, preferably initiated by the auditor, and SEC AAERs; (2) going concern opinions; (3) financial reporting characteristics, such as the use of total accruals or the firm's tendency to meet or beat quarterly analyst consensus estimates of earnings; and (4) perception-based measures, such as the earnings response coefficient, stock price reactions to auditor-related events, and cost of capital measures.

Input-based proxies refer to auditor-specific characteristics and auditor fees. The most popular measure for auditor-specific characteristics is auditor size—in particular, whether the company is audited by a Big N auditor. The intuition is that Big N auditors provide higher-quality audits, given their scale and access to resources related to technology, training, and facilities (e.g., Francis, Maydew, and Sparks 1999; Khurana and Raman 2004). Big N auditors are thought to be more independent than smaller audit firms, because (1) they suffer greater reputational risk should they be negligent, (2) they rely less on any single client's revenues and are hence less likely to be swayed by an individual client, and (3) their larger revenue base exposes them to higher litigation risk (e.g., Palmrose 1988; Bonner, Palmrose, and Young 1998; Skinner and Srinivasan 2012). However, the Big N variable is an indicator variable that lacks nuance, because it is not an engagement-specific measure.

Audit fees can proxy for the level of auditor effort. Fees capture both demand and supply factors associated with audits (e.g., Simunic 1980). Some researchers have also used the proportion

of audit fees to non-audit fees as a proxy for auditor independence (Frankel, Johnson, and Nelson 2002). However, audit fees are likely tainted by efficiency improvements, which may not directly capture audit quality improvements. Moreover, oligopolistic premiums charged by the Big N may not directly translate to higher audit quality. Audit fees can also serve as price protection for expected litigation risk (e.g., Seetharaman, Gul, and Lynn 2002) or even proxy for lack of independence (e.g., Kinney, Palmrose, and Scholz 2004).

DeFond and Zhang (2014) summarize the pros and cons of each of these measures. One of the significant challenges with these measures is the difficulty in disentangling audit quality from the innate characteristics of the firm and its reporting quality (Dichev, Graham, Harvey, and Rajgopal 2013). Material restatements and AAERs are great proxies, because they directly speak to the quality of the audit process, but these observations, while capturing egregious conduct, are (almost by definition) rare and do not account for "within GAAP" manipulations of financial statements. Moreover, the absence of an AAER or a material restatement does not automatically imply higher audit quality, as even the most carefully executed audit cannot guarantee detection of fraud. Further, managerial and auditor incentives can lead to nondisclosure of identified misstatements (Srinivasan, Wahid, and Yu 2015). Going concern opinions are also direct measures of the auditor's opinion about the financial statements, but these are issued only in exceptional cases. Financial reporting characteristics are easy to compute and capture an element of audit quality, because financial reporting and audit quality are inextricably intertwined. However, reporting characteristics are rife with measurement error and bias (e.g., Kothari, Leone, and Wasley 2005; Ball, Kothari, and Nikolaev 2012). Perception-based measures, such as the earnings response coefficients, can capture audit quality in more comprehensive and less error-prone ways than financial reporting measures, but they are indirect measures.

We focus on validating three sets of commonly used audit quality proxies: output-based proxies, input-based proxies, and other proxies. We describe each of the proxies in detail next.

*4.2 Research design*

We use the following logistic regression to estimate whether an audit quality measure is associated with any specific audit deficiency violation:

*Prob* (audit violation) = *f* (audit quality measure, controls), (1)

where the dependent variable equals 1 if an auditor allegedly violates one of the top six most frequently cited audit violations in AAERs or lawsuits and zero otherwise. This regression is estimated for each of the audit violations at the violation firm-year level. The top six most frequently cited audit deficiencies are presented in Appendix B: (1) failure to gather sufficient audit evidence, (3) failure to exercise due professional care, (3) failure to express an appropriate audit opinion, (4) inadequate planning and supervision, (5) lack of independence from the client, and (6) failure to obtain an understanding of internal control. We estimate model (1) using a treatment and control sample. Sample size for each variation of Model (1) varies due to data availability. For example, regressions validating variables related to audit fees have a smaller sample size, because information on audit fees became publicly available after 2002. For brevity, we describe the sample composition for Model (1) in Tables 4 to 9 in Panel B of Table 1. We construct our treatment sample as 344 firm-years with securities class action lawsuits or AAERs against auditors. Of the 344 firm-years, 44 are from AAERs, and 300 are from class action lawsuits.[8] We define our control sample as 3,935 firm-years with class action lawsuits or AAERs,

[8] A skeptic might worry that AAERs and lawsuits have different objectives and that it is unclear whether these cases can be pooled. We pooled both the public and private lawsuits for analyses, because they conceptually set precedents for future lawsuits against auditors. As a robustness check, in untabulated work, we re-estimated Tables 4–10 after including the lawsuit indicator as an independent variable. The findings are similar to the main results reported in the paper, where we excluded the lawsuit indicator variable.

but these lawsuits or AAERs are not against auditors. We begin with 1,449 AAER firm-years and 3,965 class action lawsuits' firm-years that are not against auditors and have identifiers in CRSP and Compustat. Then we delete observations with missing values for variables that are necessary for running regressions. In the end, we have 940 firm-years from AAERs and 2,995 firm-years from class action lawsuits in our control sample. We believe that our control sample provides a good counterfactual with financial misconduct unrelated to deficient audits.

We validate 14 commonly used audit quality measures. Following DeFond and Zhang (2014), we categorize them into two groups: (1) output-based measures of audit quality and (2) input-based and other measures. The former include *Total Accrual*s, *Rstmt*, *SmlProfit*, *SmlBeat*, and *GC*.[9] Total accruals, *Total Accrual*s, is calculated as earnings before extraordinary items minus net cash flow from operations excluding extraordinary items and discontinued operations. Consistent with findings from the literature that total accruals are negatively associated with audit quality (e.g., Becker, DeFond, Jiambalvo, and Subramanyam 1998; Francis, Maydew, and Sparks 1999), we expect that firms with higher *Total Accrual*s are more likely to receive audit deficiency violations.

*Rstmt* is an indicator variable that equals 1 if the financial statements for the year are restated. We expect that auditors are more likely to violate auditing standards if their clients restate the financial statement (i.e., a positive coefficient on *Rstmt*). We obtain restatement data prior to 2002 from the GAO restatement database. We retrieve restatements during and after 2002 from

[9] We also validate discretionary accruals, *DA*, and absolute value of discretionary accruals, *AbsDA*. However, we only report results of *Total Accrual*s for brevity, since it is well known that these variables are highly correlated. We estimate *DA* using the cross-sectional modified Jones model, following the literature (e.g., Jones 1991; Kothari et al. 2005; DeFond and Zhang 2014). We subtract the derived nondiscretionary accruals from accruals to obtain signed discretionary accruals. *AbsDA* is the absolute value of *DA*. In untabulated results, we find that *DA* and *AbsDA* are not associated with any individual allegations. Additionally, both variables do not load in combined regressions if we use either to replace Total Accruals

Audit Analytics. We exclude all restatements caused by clerical errors. *SmlProfit* is an indicator variable if the ROA (income before extraordinary items deflated by beginning assets) is less than 3%. *SmlBeat* is an indicator variable that equals 1 if the year-over-year change in ROA is less than 1%. Following the literature on the propensity to meet/beat earnings target as a measure of audit quality (e.g., Francis and Yu 2009), we expect that *SmlProfit* and *SmlBeat* positively predict the alleged audit deficiencies. Going concern opinion, *GC*, equals 1 if the auditor issued a going concern opinion, as per Audit Analytics. Because going concern opinions signal low audit quality, we anticipate a positive coefficient for *GC.*

Our input-based and other measures of audit quality are *BigN*, *Audit Fee Ratio*, *Audit Fee City Ratio*, *Tenure*, *New Client*, *Top 20 City*, *Auditor Firm Diff*, *City Specialist*, and *Industry Specialist*. The most popular measure for auditor-specific characteristics is auditor size—in particular, whether the company is audited by a Big N auditor (DeFond, Erkens, and Zhang 2016). The intuition is that Big N auditors provide higher-quality audits. Given their scale, these auditors have better access to technology, training, and facilities (e.g., Khurana and Raman 2004). Big N auditors are thought to be more independent than smaller audit firms, because they (1) suffer greater reputational risk should they be negligent, (2) rely less on an individual client's revenues and are hence less likely to be swayed by any one individual client, and (3) their larger revenue base exposes them to higher litigation risk (e.g., Palmrose 1988). However, Big N is not an engagement-specific measure and therefore not nuanced. Based on the literature, we expect Big N auditors to be less likely to experience audit deficiency allegations (i.e., a negative coefficient on *BigN*).

Papers use proxies related to audit fees to measure the auditor–client relation and auditor's litigation risk (e.g., Chaney, Jeter, and Shivakumar 2004; Dao, Raghunandan, and Rama 2012).

*Audit Fee Ratio* is audit fees divided by the sum of audit fees and non-audit fees for a given firm-year. Some papers view the ratio of audit fees to total fees as a proxy for auditor independence; the larger the ratio, the more independent the auditor (e.g., Frankel et al. 2002; Reynolds, Deis Jr., and Francis 2004). On the other hand, some studies find no relation between audit fees ratio and reporting quality (e.g., Ashbaugh, LaFond, and Mayhew 2003; DeFond, Raghunandan, and Subramanyam 2002). Therefore we make no directional prediction on *Audit Fee Ratio.*

*Audit Fee City Ratio* is measured as a firm's audit fees divided by the aggregated amount of audit fees charged by the firm's auditor in the firm's headquarters city. Essentially *Audit Fee City Ratio* measures the importance of a client for an audit firm in a city. As suggested by the theory of auditor independence (DeAngelo 1981), we expect that auditors have higher incentives to compromise their independence and acquiesce to clients when conducting audits for their more important clients (i.e., a positive coefficient on *Audit Fee City Ratio*).

We use two input-based measures to capture auditor-client relationships, *Tenure* and *New Client*. *Tenure* is the time in years of the auditor-firm relation. Research is inconclusive on the relation between auditor tenure and audit quality. Some research shows that auditor tenure is associated with higher audit quality (e.g., Geiger and Raghunandan 2002; Johnson, Khurana, and Reynolds 2002; Myers, Myers, and Omer 2003). On the other hand, Davis, Soo, and Trompeter (2009) find that longer auditor tenure can be associated with worse audit quality. Consistent with findings that longer auditor-client relations can reduce auditor independence from the client (e.g., Davis et al. 2009), we anticipate that *Tenure* will be positively associated with audit deficiencies.

*New Client* is an indicator variable that signals if the auditor-client relationship is in its first year. Papers suggest that longer auditor tenure improves audit and financial reporting quality (e.g., Geiger and Raghunandan 2002; Johnson et al. 2002; Myers et al. 2003). Hence we expect that the

newly established auditor-client relationship will lead to weaker audit quality, as it takes time for the auditor to learn about its client's operations. Alternatively, a firm's new auditor may exert more audit effort to avoid potential litigation, as shown by Cahan and Zhang (2006). Given the conflicting arguments on the first-year auditor-client relationship, we make no directional prediction on *New Client.*

Motivated by recent papers focusing on the city-level characteristics of auditors (e.g., Ferguson, Francis, and Stokes 2003; Francis, Reichelt, and Wang 2005), we create the following three city-level measures. *Top 20 City* is an indicator variable that equals 1 if the firm's headquarters city is one of the largest 20 cities in the United States. If the firm's headquarters is in the same city as its auditor's office, then the indicator variable, *Auditor Firm Diff*, takes the value of 1. *City Specialist* measures the auditor's office size in a city (Francis and Yu 2009) and equals 1 if a firm's auditor has the largest market share in terms of aggregated audit fees in an industry within that city in a given year. Because larger offices can provide better audits, we expect *City Specialist* to be negatively associated with audit deficiencies. Lastly, indicator variable *Industry Specialist* equals 1 if the auditor satisfies one of the two following definitions (following Reichelt and Wang 2010): (1) an auditor is a city industry specialist if it has the largest annual market share in an industry, based on the two-digit SIC code, and if its annual market share is at least 10 percentage points greater than its closest competitor in a city audit market; or (2) if it has an annual market share greater than 50% in an industry, based on the two-digit SIC code in the city audit market.[10]

Similar to the literature (e.g., DeFond and Zhang 2014), we control for size (*LogAT*), leverage (*Leverage*), loss (*Loss*), asset turnover (*AssetTurnover*), book-to-market ratio (*B2M*),

[10] We define a city as a Metropolitan Statistical Area (MSA) for all variables at the city level, consistent with Reichelt and Wang (2010).

return on assets (*ROA*), growth (*SalesGrow*), the firm's age (*Age*), and December fiscal year-end (*December*). *LogAT* is the natural log of the firm's total assets. *Leverage* is total liability divided by total assets. Indicator variable, *Loss*, measures negative income. *AssetTurnover* is measured as sales divided by total assets. *B2M* is a firm's book-to-market ratio at fiscal year-end. Return on assets, *ROA*, is net income before taxes and extraordinary items divided by total assets. *SalesGrow* is the year-on-year sales growth of the firm. *Age* measures the length of data history for a firm in the Compustat annual file. We also include an indicator variable, *December*, which equals 1 if the firm's fiscal year ends in December.

## 5. Results

### *5.1 Descriptive statistics*

Table 3 provides descriptive statistics on the variables used in the regressions in Table 4. All continuous variables are winsorized at 1% and 99% levels. Due to data availability, sample size varies across regressions. For example, there are 344 treatment observations and 3,935 control observations in the accrual quality-related regression (i.e., regression (1) in Panel A of Table 4). The sample size drops to 246 treatment observations and 2,552 control observations for audit fees-related regressions (i.e., regressions (7) and (8) in Panel B of Table 4), because most audit fees-related variables in Audit Analytics are available only after 2002.[11]

In Panel A of Table 3, we report descriptive statistics for all audit quality measures used in all regressions in Panels A and B of Table 4.[12] Results show that the treatment sample has higher total accruals (*Total Accruals*) and higher restatement rates (*Rstmt*). Auditors in the treatment

[11] There are costs and benefits associated with using constant versus varying sample. We allow the sample size to vary for each regression model because of data availability and our attempt to best preserve the power of our tests, consistent with research design choices in the literature (e.g., Aobdia 2019). We also use a constant sample to re-estimate models in Tables 4 to 9. The untabulated results remain similar.

[12] For completeness, we report correlation matrix in Appendix D.

sample are less likely to be a Big N firm (*BigN*) and industry specialist (*Industry Specialist*), relative to auditors in the control sample. Interestingly, only about 3% of the treatment sample received a going concern opinion, which is lower than the percentage of firms in the control sample (5%). In Panel B of Table 3, we show descriptive statistics for control variables used in Model (1) of Table 4. Results show that the treatment sample has fewer loss firms (*Loss*), higher market-to-book ratio (*M2B)*, and higher growth rate (*SalesGrow)*.

*5.2 Predicting the allegation of failure to gather sufficient competent audit evidence*

Table 4 presents the results of predicting the allegation of sufficient competent audit evidence. In addition to logit coefficient estimates, we report areas under the curve (AUC) statistics with and without an audit quality measure. We use the chi-squared test to compare AUC with and without an audit quality measure for each model and report the *p*-value of the chi-squared test. These comparisons help us gauge the relative predictive power of each audit quality proxy within a model. Out of the five output-based audit quality measures in Panel A, *Total Accruals* and *Rstmt* load positively and significantly. These findings suggest that firm-years with higher accruals and restatements are more likely to be associated with alleged evidence violation. In Model (1), the AUC statistic without *Total Accruals* is 0.613, and the AUC statistic increases to 0.631 when including *Total Accruals*. The *p*-value of the chi-squared test ($p = 0.052$) comparing the equality of these two statistics suggests that *Total Accruals* significantly improves the predictability of an allegation of insufficient competent audit evidence. Similarly, we reach the same conclusions for *Rstmt*.

Panel B presents the results for input-based and other measures of audit quality. The coefficient of *BigN* is negative and significant (-0.858), which implies that Big N auditors are less likely to experience the audit-evidence allegation, consistent with research that Big N auditors

provide better audit quality than non-Big N auditors. *BigN* also increases the predictability of the model, as suggested by the *p*-value of the chi-squared test ($p = 0.001$). *Audit Fee City Ratio* acquires a positive and significant coefficient (1.020), consistent with our expectations. Auditors are more likely to experience an evidence allegation when conducting audits of more important clients. Lastly, the negative and significant coefficient of *City Specialist* (-0.452) in Panel B indicates that, if the auditor is the city-level industry specialist, that auditor is less likely to experience an evidence violation, consistent with the findings of Francis and Yu (2009), who show that larger audit offices are associated with higher audit quality. However, the *p*-values of the chi-squared test are 0.127 and 0.171 in Models (8) and (13). This suggests that *Audit Fee City Ratio* and *City Specialist* do not significantly improve the predictability of both models, although both variables load significantly.

In Panel C, we compare the AUCs with audit quality measures *across* selected models in Panels A and B and report the *p*-values of chi-squared tests. We choose to compare AUCs for seven audit quality measures that predict at least the top three audit deficiencies in Table 10. They are Models (1) *Total Accruals*, (2) *Rstmt*, (6) *Big N*, (8) *Audit Fee City Ratio*, (10) *New Client*, (13) *City Specialist*, and (14) *Industry Specialist*. The AUC with *Total Accruals* in Model (1) of Panel A is 0.631, and the AUC with *Rstmt* in Model (2) of Panel A is 0.676. We use a chi-squared test to compare the two AUCs. The *p*-value of the chi-squared test reported in Panel C is 0.027. This suggests that *Rstmt* is relatively more predictive of the allegation of insufficient competent audit evidence in comparison to *Total Accruals*.

*5.3 Predicting the allegation of failure to exercise due professional care*

Table 5 reports the results of predicting the due-professional-care allegation. *Total Accruals* and *Rstmt* are positively associated with the due-professional-care allegation, per Panel

A of Table 5. Consistent with our expectations, *BigN* in Model (6) of Panel B is negatively and significantly associated with the due-professional-care allegation. Big N auditors are associated with lower likelihood of this violation, consistent with prior observations that Big N auditors provide higher audit quality (e.g., Lawrence, Minutti-Meza, and Zhang 2011; DeFond et al. 2016). The negative and significant coefficient on *City Specialist* (-0.735) indicates that auditors with the largest market share in an industry in a city are less likely to violate the due-professional-care standard. Perhaps these auditors care more about their reputation and provide better audit quality. All four variables—*Total Accruals, Rstmt, BigN,* and *City Specialist*—increase the predictability of their respective models predicting a due-professional-care allegation, as evidenced by the *p*-value of the chi-squared test. According to Panel C, *Rstmt* has more predictive power for the due-professional-care allegation in comparison to *Total Accruals* and *BigN*.

*5.4 Predicting the allegation of failure to express an appropriate audit opinion*

Consistent with our expectation that higher accruals signal lower audit quality, *Total Accruals* in Panel A of Table 6 is positively and significantly associated with the allegation that the auditor failed to express an appropriate audit opinion (coefficient of 1.742, Model (1)). The positive and significant coefficient on *Rstmt* (1.100) suggests that firm-years with restatements are more likely to be associated with this violation of appropriate audit opinion.

Turning to Panel B of Table 6, *Audit Fee Ratio* has a negative and marginally significant coefficient of -0.703. This implies that a higher ratio of audit fees to total fees is correlated with a lower likelihood of the appropriate-audit-opinion violation. The *p*-value of the chi-squared test ($p = 0.458$) suggests that *Audit Fee Ratio* does not appear to increase the predictability of the allegation of appropriate audit opinion. The negative and significant coefficient for *City Specialist*

(-0.757) suggests that city-specific industry specialists are less likely to experience an appropriate-audit-opinion violation.

*5.5 Predicting the allegation of inadequate planning and supervision*

Table 7 reports the results predicting occurrence of the allegation of inadequate planning and supervision. In Panel A, *Total Accruals'* coefficient (1.498) suggests that firm-years with higher total accruals are associated with higher likelihood of the allegation of inadequate planning and supervision. *Rstmt* loads positively and significantly, implying that firms with restated financial statements are more likely to experience such a violation. Both *Total Accrual* and *Rstmt* seem to increase the predictability of an allegation of inadequate planning and supervision, suggested by the *p*-values of the chi-squared test.

*Big N* acquires a negative and significant coefficient (-1.110) in Panel B, suggesting that Big N auditors are less likely to experience an inadequate planning and supervision violation. The negative and marginally significant coefficient on *Audit Fee Ratio* (-0.774) suggests that higher audit-fees ratio is associated with lower likelihood of the auditor experiencing an allegation of inadequate planning and supervision. This is consistent with papers concluding that lower audit-fees ratio is associated with impaired auditor independence (e.g., Frankel et al. 2002; Reynolds et al. 2004).

*Audit Fee City Ratio* acquires a statistically significant coefficient of 1.391. Auditors are more likely to experience an inadequate planning and supervision violation for more important clients. The coefficient for *City Specialist* (-0.621) in Column (13) of Panel B implies that city-level industry specialists are associated with a lower likelihood of receiving an inadequate planning and supervision violation. Lastly, the positive and marginally significant coefficient of *Top 20 City*

suggests that firms in the Top 20 largest U.S. cities are more likely to experience problems with inadequate planning and supervision.

Turning to *p*-values of chi-squared tests of equality of AUC with and without an AQ measure, *BigN*, *Audit Fee City Ratio*, and *Top 20 City* have low *p*-values of <0.001, 0.024 and 0.09. These findings suggest that *BigN*, *Audit Fee City Ratio*, and *Top 20 City* have statistically significant predictive power for the allegation of inadequate planning and supervision. On the other hand, *Audit Fee Ratio* and *City Specialist* have *p*-values of 0.454 and 0.139, suggesting that these proxies have little incremental predictive power.

*5.6 Predicting the allegation of lack of independence from client*

Table 8 includes the results predicting the alleged independence violation. In Panel A, *Total Accruals*' positive and significant coefficient of 1.645 suggests that higher total accruals are associated with higher likelihood of an independence allegation. *Rstmt* assumes a positive and significant coefficient of 0.770, implying that firm-years with restatements are more likely to be associated with the independence violation. In Panel B, *Audit Fee Ratio* has a negative and significant ratio of -1.312, indicating that a higher audit-fees ratio is associated with a lower likelihood of independence violation, consistent with prior findings that a ratio of higher audit fees to total fees indicates higher audit quality (e.g., Frankel et al. 2002; Reynolds et al. 2004). *Total Accruals* and *Rstmt* predict the independence allegation, as implied by the low *p*-value of the chi-squared test in Models (1) and (2). *Audit Fee Ratio,* on the other hand, does not seem to add any statistically significant predictive power to Model (7).

*5.7 Predicting the allegation of inadequate understanding of internal control*

Results in Panel A of Table 9 suggest that *Total Accruals* and *Rstmt* predict the internal-control allegation positively. The negative and significant coefficient of *Audit Fee Ratio* in Column

(7) of Panel B suggests that a higher fees ratio is correlated with lower likelihood of internal-control violation. *City Specialist* in Column (13) of Panel B has a negative and significant coefficient (-0.550), indicating that city-level industry specialists are less likely to experience the internal control allegation.

*5.8 Combined regressions*

Panel A of Table 10 presents the results from the combined regression analyses, where we include all the audit quality measures on the right-hand side in equation (1) with all the control variables. Of all the audit quality proxies, *Rstmt* is positively and significantly associated with all six audit deficiencies, suggesting that the presence of a restatement is a reasonably powerful measure of poor audit quality.[13] *SmlProfit* loads negatively and significantly in all six regressions, implying that less profitable firms are less likely to violate these auditing standards. This result, however, contradicts our expectation based on the literature. Perhaps auditors of the less profitable firms are more aware of the potential litigation risks. Therefore auditors put more effort into the audit of such firms to reduce their exposure to litigation.

The *Audit Fee Ratio* negatively predicts five violations, suggesting that a lower ratio of audit fees to total fees is associated with higher likelihood of these five audit deficiencies. The

[13] Lennox and Li (2019) and Moorthy and Sarath (2017) examine the determinants of an auditor involved in a class action lawsuit. Lennox and Li (2019) find no association between restatements and the likelihood of an auditor being sued. But Moorthy and Sarath (2017) find that auditors are more likely to be involved in lawsuits involving restatements of earnings. The different conclusions are likely due to research design choices (i.e., different sample periods and control variables). Our study has different research objectives and finds that restatements are associated with several types of alleged audit deficiencies found in lawsuits against auditors. Note that the work of Lennox and Li (2019) and ours differ in sample composition, unit of analysis in regressions, sample period, and control variables. First, Lennox and Li (2019) consider class action lawsuits and material federal civil lawsuits identified in the litigation database in Audit Analytics. We study AAERs and class action lawsuits. That is, their sample does not include all the AAERs. Our sample does not include civil lawsuits other than class action lawsuits. Second, their sample period covers 2000 to 2015. Our violation years span 1978 to 2016. Moreover, their sample includes both dismissed and contested lawsuits. However, we only include nondismissed class action lawsuits to eliminate frivolous allegations. Third, the unit of analysis differs. Lennox and Li (2019) analyze at the lawsuit level. We analyze at the violation firm-year level, because each AAER and nondismissed lawsuit may involve multiple violation years.

literature on this measure is mixed. Frankel et al. (2002) find that non-audit fees are positively associated with small earnings surprises and the magnitude of discretionary accruals, whereas Ashbaugh et al. (2003) and Chung and Kallapur (2003) report that non-audit fees are not associated with the incidence of higher discretionary accruals. Our results indicate that a ratio of greater audit fees to total fees proxies for higher audit quality. Additionally, *City Specialist* is negatively and significantly associated with five violations, which implies that city-specific industry specialists provide higher audit quality (e.g., Reichelt and Wang 2010).[14]

*BigN* is negatively correlated with *Evidence*, *DueCare*, and *Plan*, implying that Big N auditors are less likely to experience those violations. These results are consistent with evidence that Big N auditors provide higher audit quality (e.g., Lawrence et al. 2011; DeFond et al. 2016). *New Client* negatively predicts three out of six audit violations. In the first year of the engagement, the auditor is less likely to experience violations of *Evidence*, *DueCare*, and *Plan*. New auditors likely exert more effort in the first year to reduce the potential litigation risk associated with the audit, consistent with the findings of Cahan and Zhang (2006). *Industry Specialist* is marginally and positively associated with *Evidence*, *Opinion*, and *IntControl* violations. Moreover, *Audit Fee City Ratio* positively predicts *Plan* violation, *Tenure* negatively predicts *Plan* violation, and *Top 20 City* positively predicts *Plan* violation. Auditors are more likely to experience *Evidence*, *Opinion*, or *Plan* allegations when conducting audits of more important clients, relative to other clients in the city, as measured by *Audit Fee City Ratio*.

[14] According to the literature, the city-level industry specialization measure (*City Specialist*) suffers from a few limitations. First, *City Specialist* could proxy for city-level industry specialization or client characteristics (e.g., Minutti-Meza 2014). Second, the literature has various proxies for auditor industry specialization. These in general exhibit low internal and external construct validity, according to Audousset-Coulier, Jeny, and Jiang (2016). We therefore suggest that readers exercise caution when interpreting our results of *City Specialist*.

We report the area under the curve (AUC) as a measure of goodness of fit and of the predictive power of our models in Panel B of Table 10. AUC usually ranges between 0.5 and 1, where these two ends represent variation between random models and perfectly predictive models. We first estimate the combined regressions with control variables only and report the resulting AUCs in row (1) in Panel B. Then we calculate and report the AUCs for regressions with all the audit quality measures in row (2) in Panel B. We also calculate chi-squared statistics in row (3) that compare AUCs in rows (1) and (2). As suggested by the chi-squared statistics, the inclusion of audit quality measures statistically increases the AUC. In particular, the increases in explanatory power contributed by the audit quality measures range from 27.6% to 55.8% (reported in row (5)), a magnitude that is statistically significant and arguably economically significant.

For example, the *IntControl* regression in Panel A of Table 10 includes all audit quality proxies and control variables and has an AUC of 0.805. We exclude audit quality proxies and use only the control variables to re-run regression (6). In Panel B, we find that the AUC is 0.631. Including audit quality measures increases the AUC from 0.631 to 0.805. This change of 0.174 is significantly different from zero at the 1% level, according to the chi-squared test.

*5.9 Robustness check: Seemingly unrelated regressions*

Another potential concern of our research design is that individual allegations may not be independent from one other. Therefore predicting individual allegations in separate logistic regressions may not account for the correlations among the allegations. To address this issue, we predict the top six most cited allegations jointly using seemingly unrelated regressions (SURs). SURs account for the correlations among individual allegations by assuming that the error terms in each regression are correlated (Zellner 1962). To ensure the SURs are run efficiently, we randomly drop one control variable for each regression. Table 11 presents the results using

seemingly unrelated regressions. Results in Table 11 are consistent with our main results in Table 10.

## 6. Conclusion

We provide a descriptive analysis of audits identified by SEC AAERs and class action lawsuits as potentially deficient and a preliminary validity test of the various audit quality proxies used in the literature. Our first objective is valuable, as it documents what went wrong with low-quality audits from a public data source of AAERs and lawsuits. The best alternative on this point comes from deficient audits flagged by the PCAOB's inspection process (Aobdia 2019). However, client names are not publicly released by the PCAOB.

In particular, we identify specific complaints related to the audits identified in 141 SEC AAERs and 153 securities class action lawsuits filed against auditors over the violation years 1978–2016. Assuming that these complaints capture fine-grained data on deficiencies in audits, we examine the associations between audit quality proxies and the top six most cited audit deficiencies in AAERs and lawsuits. The counterfactual used for this exercise relies on AAERs and lawsuits filed against managers, as opposed to auditors.

We find that out of the 14 audit quality proxies validated in this study, restatement (*Rstmt*) is the only one that consistently predicts all of the top six most cited audit violations. Additionally, the ratio of audit fees to total fees (*Audit Fee Ratio*) and city specialist (*City Specialist*) are predictive of five out of the top six audit violations. These results are consistent with research suggesting that a ratio of higher audit fees to total fees indicates higher audit quality (e.g., Frankel et al. 2002; Reynolds et al. 2004), and that city-specific industry specialists provide higher audit quality (e.g., Reichelt and Wang 2010). Big N auditor (*BigN*) and auditor–firm relationship (*New Client*) predict half of the top six violations.

Collectively, our findings imply that the use of audit quality proxies is specific to the alleged violation and the research setting. We suggest that researchers choose audit quality proxies based on the specific violations they want to investigate. For example, for auditor independence-related studies, we recommend using the ratio of audit fees to total fees (*Audit Fee Ratio*) and restatement (*Rstmt*) as proxies of audit quality. For internal control-related studies, we recommend restatement (*Rstmt*), ratio of audit fees to total fees (*Audit Fee Ratio*), and city-specific industry specialists (*City Specialist*) as proxies of audit quality.

Our work is subject to caveats. First, the regression models implemented here are only suggestive of which types of audit issues are associated or captured by which audit quality proxies. In particular, we are not aware of a reasonable way to rank the severity of these allegations. Second, we acknowledge that there are limits to what scholars can learn from a small sample of publicly known bad audits, represented by AAERs and lawsuits. We hope that the regulators will work toward releasing more public data on bad audits to relax this constraint in the near future. Third, our results hold for a sample of extreme accounting irregularities and may not be generalizable to other settings.

We hope future work will focus its energy on refining these audit quality proxies and persuading the audit industry or the PCAOB to allow access to finer data, such as anonymized work papers in an audit, to further understanding of what drives audit quality.

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**Appendix A: Variable Definitions**

| Variable | Definition |
|---|---|
| **Test Variables (Audit Quality Measures):** | |
| Total Accruals | Absolute value of total accruals deflated by beginning assets. Total accruals are defined as income before extraordinary items less cash flow from operations, excluding extraordinary items, and discontinued operations. |
| Rstmt | An indicator variable that equals 1 if the financial statement for the alleged audit-deficient firm-year was restated and zero otherwise. |
| SmlProfit | An indicator variable that equals 1 if the ROA (income before extraordinary items deflated by beginning assets) is less than 3%. |
| SmlBeat | An indicator variable that equals 1 if the year-on-year change in ROA (income before extraordinary items deflated by beginning assets) is less than 1%. |
| GC | An indicator variable that equals 1 if the auditor issued a going concern opinion. |
| BigN | An indicator variable that equals 1 if the audit firm is a Big 4/6/8 firm and zero otherwise. |
| Audit Fee Ratio | Audit fee ratio is audit fees divided by the sum of audit fees and non-audit fees for a given firm-year. |
| Audit Fee City Ratio | Audit fee city ratio is a firm's audit fees divided by the aggregated amount of audit fees charged by the firm's auditor in the firm's headquarters city. |
| Tenure | The length in years of the auditor-firm relationship. |
| New Client | An indicator variable that equals 1 if the auditor-firm relationship is in its first year and zero otherwise. |
| Top 20 City | An indicator variable that equals 1 if the firm's headquarters city is one of the largest 20 cities in the U.S. |
| Auditor Firm Diff | An indicator variable that equals 1 if the firm's headquarters city is the same city as its auditor's office and zero otherwise. |
| City Specialist | An indicator variable that equals 1 if the auditor satisfies one of the two following definitions. Definition 1: An auditor is a city-level industry specialist if it has the largest annual market share in an industry in a city, based on the two-digit SIC code, and if its annual market share is at least 10 percentage points greater than its closest competitor in a city audit market. Definition 2: An auditor is a city-level industry specialist if it has an annual market share greater than 50% in an industry, based on the two-digit SIC code in the city audit market. We define a city as a Metropolitan Statistical Area (MSA). Our definition of City Specialist is consistent with Reichelt and Wang (2010). |
| Industry Specialist | An indicator variable that equals 1 if the auditor satisfies one of the two following definitions. Definition 1: An auditor is a national industry specialist if it has the largest annual market share in an industry, based on the two-digit SIC code, and if its annual market share is at least 10 percentage points greater than its closest competitor in a national audit market. Definition 2: An auditor is a national industry specialist if it has an annual market share greater than 30% in an industry, based on the two-digit SIC code in the national audit market. Our definition of "industry specialist" is consistent with Reichelt and Wang (2010). |

**Control Variables:**

| | |
|---|---|
| LogAT | Natural log of the firm's total assets. |
| Leverage | Total liabilities divided by total assets. |
| Loss | An indicator variable that equals 1 if a firm's net income is negative and zero otherwise. |
| AssetTurnover | Sales divided by total assets, from Compustat. |
| B2M | Book-to-market ratio. |
| ROA | Return on assets is calculated as net income before taxes and extraordinary items divided by total assets. |
| SalesGrow | Year-on-year sales growth of the firm. |
| Age | Firm age is measured as the length of data history in the Compustat annual file. |
| December | An indicator variable that equals 1 if the firm's fiscal year ends in December and zero otherwise. |
| Segments | Number of nonmissing segments from Compustat segment dataset. |

**Dependent Variables:**

| | |
|---|---|
| Evidence | An indicator variable that equals 1 if an auditor experienced the allegation of "failure to gather sufficient competent audit evidence" and zero otherwise. |
| DueCare | An indicator variable that equals 1 if an auditor experienced the allegation of "failure to exercise due professional care" and zero otherwise. |
| Opinion | An indicator variable that equals 1 if an auditor experienced the allegation of "failure to express an appropriate audit opinion" and zero otherwise. |
| Plan | An indicator variable that equals 1 if an auditor experienced the allegation of "inadequate planning and supervision" and zero otherwise. |
| Indep | An indicator variable that equals 1 if an auditor experienced the allegation of "lack of independence from client" and zero otherwise. |
| IntControl | An indicator variable that equals 1 if an auditor experienced the allegation of "failure to gather sufficient competent audit evidence" and zero otherwise. |

**Appendix B: Top 10 Cited Audit Deficiencies**

| Rank | Frequency | Allegations |
|---|---|---|
| 1 | 200 | Failure to gather sufficient competent audit evidence |
| 2 | 177 | Failure to exercise due professional care |
| 3 | 156 | Failure to express an appropriate audit opinion |
| 4 | 126 | Inadequate planning and supervision |
| 5 | 122 | Lack of independence from client |
| 6 | 106 | Failure to obtain an understanding of internal control or over-reliance on internal controls (over-relying/failing to react to known control weaknesses) |
| 7 | 93 | Insufficient level of professional skepticism |
| 8 | 91 | Failure to faithfully state whether the financial statements are presented in accordance with GAAP |
| 9 | 70 | Failure to evaluate adequacy of disclosure |
| 10 | 67 | Inadequate consideration of fraud risks |

## Appendix C: Detailed Examples of Specific Audit Deficiency Allegations

### *App C1: Most frequently cited deficiencies*

In this section, we briefly discuss the 10 most frequent categories of audit deficiencies: (1) 200 instances of failure to gather sufficient competent audit evidence (violation of the fieldwork standard, row E2 in Table 2); (2) 177 cases of failure to exercise due professional care (violation of the general GAAS standard, row C3); (3) 156 instances of failure to express an appropriate audit opinion (violation of the reporting standard, row G5); (4) 126 instances of inadequate planning and supervision (violation of the audit planning standard, row D1); (5) 122 cases of lack of independence from the client (violation of the general GAAS standards, row C2); (6) 106 instances of failure to obtain an understanding of internal control (violation of the fieldwork standard, row F2); (7) 93 cases of insufficient level of professional skepticism (violation of general GAAS standard, row C4); (8) 91 cases of failure to faithfully state whether the financial statements are presented in accordance with GAAP (violation of the reporting standard, row G3); (9) 70 cases of failure to evaluate the adequacy of disclosure (violation of the reporting standard, row G6); and (10) 67 cases of inadequate consideration of fraud risks (violation of the audit planning standard, row D3). These instances are reviewed in detail in the following subsections.

### *App C2: Failure to gather sufficient competent audit evidence*

Several cases in this category accuse the auditor of relying on management representations without verifying the underlying evidence, or it is claimed that the auditor did not even obtain management representation before signing off on the audit report. An example is the lawsuit filed by lawyers of Worldcom's shareholders against Arthur Andersen, which states: "Andersen failed to obtain sufficient evidence in connection with WorldCom's elimination or reduction of expenses through write-offs of reserves. Instead, Andersen relied largely on management's representations. As a result, during 1999 and 2000, approximately $1.2 billion of those reserves were written off directly to income without any conceptual basis under GAAP. Andersen failed to discover that the adjustments were unsupported by documentation. In particular, Andersen failed to determine whether nonreporting-system journal entries (i.e., those entries that come from sources other than WorldCom's revenue, expense, cash receipts, cash disbursement and payroll accounting and reporting systems) were valid. Either Andersen failed to review WorldCom's general ledgers or failed to ask to see any post-closing journal entries, or recklessly disregarded such journal entries made without support. For example, while discussing management's aggressive accounting practices, Andersen documented the following note in its work papers: 'Manual Journal Entries How deep are we going? Surprise w[ith] look [at] journal entries.' Andersen failed to examine the nature of these manual journal entries." (In *re Worldcom, Inc. Securities Litigation*, U.S. District Court, Southern District of New York, Dec. 2, 2003, p. 224.)

### *App C3: Failure to exercise due professional care*

Most of the allegations in this category are about inadequate audit procedures, despite knowledge of potential risks associated with the client. For example, the SEC states: "PwC and Hirsch (the audit partner) identified a number of risk factors associated with the preparation of SmarTalk's financial statements. Despite PwC's and Hirsch's awareness of numerous risks and other information that could materially impact the financial statements, PwC and Hirsch failed to perform sufficient audit procedures to assess properly whether SmarTalk's accounting for and charges against its restructuring reserves was in conformity with GAAP. As a result, SmarTalk

improperly established a non-GAAP restructuring reserve and, as described above, misused it to materially inflate earnings before one-time charges at year-end 1997" (AAER 1787, 2003).

The SEC alleges in relation to Gemstar's audit: "KPMG did not have in place a policy that required consultation with the Department of Professional Practice regarding all significant issues that had come to the attention of the engagement." The agency goes on to assert: "With respect to the AOL revenue, Wong, Palbaum, Hori, (the partners) and KPMG unreasonably failed to exercise professional care and skepticism in reviewing the AOL IPG agreement and in testing Gemstar's representations regarding the purpose of the upfront nonrefundable fee" (AAER 2125, 2004).

***App C4: Failure to express an appropriate audit opinion***

Allegations in this category mainly relate to the auditor issuing an unqualified opinion, despite alleged knowledge of the fraudulent accounting policies or schemes used. For instance, the lawsuit against Seitel Securities (In *re Seitel, Inc. Securities Litigation*, U.S. District Court, Southern District of Texas, Dec. 6, 2002, p. 58) states: "E&Y's published audit opinion, which represented that Seitel's 2000 financial statements were presented in conformity with GAAP, was materially false and misleading because E&Y knew or was reckless in not knowing that Seitel's 2000 financial statements violated the principles of fair reporting and GAAP." Similarly, in the case against Andersen related to Global Crossing (In *re Global Crossing LTD. Securities Litigation*, Second Amended Complaint, U.S. District Court, Southern District of New York, March 22, 2004, p. 331), the lawyers point to "Andersen's failure to qualify, modify or disclaim issuing its audit opinions on Global Crossing's 1998, 1999, and 2000 financial statements, or Asia Global Crossing's 2000 financial statements, when it knew or deliberately turned a blind eye to numerous facts that showed that those financial statements were materially false and misleading."

***App C5: Inadequate planning and supervision***

As the title suggests, this category relates to deficient audit plans. In its AAER no. 1452, the SEC alleges: "For the fiscal 1994 and 1995 audits conducted by Wilkinson, there is a complete lack of documentation of any planning and no written audit programs. For the fiscal 1996 to 1998 audits conducted by Boettger and reviewed by Wilkinson (partner), audit planning documents and checklists were often incomplete, undated and unsigned. Supervision of the audits was inadequate and included little partner involvement. For the fiscal 1998 audit, a staff accountant conducted the audit at Madera's Miami headquarters while his supervisor, an audit manager, remained at Harlan & Boettger's San Diego office. Boettger permitted the audit manager to supervise the audit by telephone" (AAER 1452, 2001).

In the case against Nicor, the lawyers allege: "Nicor's switch to the PBR plan was a new audit area that presented Andersen with a high degree of audit risk and it needed to focus on this area with an audit strategy characterized by, among other things, heightened professional skepticism and expanded audit procedures designed to obtain more persuasive evidence that Nicor's financial statements were not materially misstated. Such procedures would include careful investigation of the third-party contracts Nicor was relying upon to justify the LIFO decrements, the substantial December 1999 'sales' which inflated earnings in 2000, and the impossibly high volume of infield transfers in 2000" (In *re Nicor, Inc. Securities Litigation*, U.S. District Court, Northern District of Illinois, February 14, 2003, p. 80).

***App C6: Lack of independence***

These allegations relate to the absence of an independent attitude of the auditor in dealing with the client. For instance in the Global Crossing case, the lawyers allege: "because of significant

non-audit related fees paid by Global Crossing and the hiring of Andersen's former senior partner in charge of the Telecommunications Practice in the Firm and lead partner on the Global Crossing engagement as the Senior Vice President of Finance at Global Crossing in May 2000, Andersen lacked the requisite independence when Andersen audited the Company's financial statements" (In *re Global Crossing LTD. Securities Litigation*, Second Amended Complaint, U.S. District Court, Southern District of New York, March 22, 2004, p. 331). Similarly in the matter of AaiPharma, the lawyers allege: "E&Y participated in the wrongdoing alleged herein in order to retain AaiPharma as a client and to protect the fees it received from AaiPharma. E&Y enjoyed a lucrative, long-standing business relationship with AaiPharma's senior management for which it received $4.7 million dollars in fees for auditing, consulting, tax and due diligence services for 2002–2003. These fees were particularly important to the partners in E&Y's Raleigh office as their incomes were dependent on the continued business from AaiPharma" (In *re AaiPharma Inc. Securities Litigation*, U.S. District Court, Eastern District of North Carolina, February 11, 2005, p. 101).

***App C7: Failure to obtain an understanding of internal control***

These allegations typically deal with the auditor's negligence in appreciating the deficient internal control systems of the firm, which potentially led to the alleged accounting fraud. For instance, the lawsuit against Cellstar states: "Although KPMG Peat Marwick was retained by the Company to address deficient internal control problems at the same time that it was auditing the Company's financial statements for the year ended November 30, 1995, KPMG Peat Marwick recklessly failed to enhance the scope of its audit so as to uncover Defendants' fraudulent scheme" (*State of Wisconsin Investment Board, et al. v. Goldfield, et al*., U.S. District Court, Northern District of Texas, p. 23). Similarly, in the matter of Informix, the lawyers allege: "Informix had weak internal controls. E&Y knew that Informix's tiny internal audit department performed no procedures to ensure revenue was recognized properly but primarily audited customer accounts as to license use. Informix's weak internal controls made it possible for the defendants to recognize revenue on shipments made after quarter end" (In *re Informix, Corp. Securities Litigation*, U.S. District Court, Northern District of California, April 6, 1998, p. 42).

***App C8: Insufficient level of professional skepticism***

Exercise of professional skepticism requires auditors to demonstrate a questioning mind and to critically assess audit evidence. In the Worldcom case, the lawyers allege: "Specific examples of failing to exercise due professional skepticism include: (i) given the poor state of the telecommunications industry in 2000 and 2001, Andersen failed to use professional skepticism in evaluating WorldCom's ability to continue to meet aggressive revenue growth targets and maintain a 42% line cost expense-to-revenue ratio; and (ii) during 2000, WorldCom employees reported to Andersen audit team that WorldCom's European operation reversed $33.6M in line costs accruals after the close of the first quarter of 2000 and as a result they were under-accrued. This top-side entry was directed by WorldCom's U.S. management, and the U.K. employees did not have supporting documentation for it. Andersen failed to request and receive supporting documentation for this reduction and failed to exercise due professional care in evaluating the accrual" (In *re Worldcom, Inc. Securities Litigation*, U.S. District Court, Southern District of New York, December 2, 2003, p. 224).

A lawsuit against Hollinger Inc. likewise alleges: "KPMG was required to exercise professional skepticism, an attitude that includes a questioning mind, including an increased recognition of the need to corroborate management representations and explanations concerning

mutual matters. Here, KPMG completely failed in its duties by issuing 'clean' or unqualified opinions in connection with its deficient audits and reviews of Hollinger's financial statements" (In *re Hollinger International, Inc, Securities Litigation*, U.S. District Court, Northern District of Illinois, p. 151).

***App C9: Failure to faithfully state whether financial statements are in accordance with GAAP***

In a lawsuit against Microstrategy, the lawyers allege: "PWC violated GAAS Standard of Reporting No. 1 which requires the audit report to state whether the financial statements are presented in accordance with GAAP. PWC's audit reports falsely represented that MicroStrategy's fiscal 1997, 1998 and 1999 financial statements were presented in accordance with GAAP when they were not for the reasons stated herein" (In *re MicroStrategy Inc. Securities Litigation,* U.S. District Court, Eastern District of Virginia, p. 33). In AAER no. 2238, the SEC alleges: "the respondents did not heed sufficiently indications that Just for Feet may have been improperly recognizing income through the acquisition of vendor display booths and failed to consider that this would mean that the financial statements did not conform to GAAP" (AAER 2238, 2005).

***App C10: Failure to evaluate the adequacy of disclosure***

GAAS requires the auditor to determine whether informative disclosures are reasonably adequate, and if not, the auditor must state so in their report (PCAOB AU 431.01). Allegations in this category pertain to the auditor's failure to assess whether the client should have disclosed material information in its financial statements. For instance, in the case of KPMG and Xerox, the SEC in its AAER no. 2234 stated: "KPMG also failed to assess adequately (or require Xerox to assess) the need to disclose in the MD&A or financial statements the nature of and the impacts from these accounting actions, which materially deviated from the company's historical accounting and financial reporting and accelerated $2.8 billion of equipment revenues and $659 million in pre-tax earnings that otherwise would not have been recorded under GAAP" (AAER 2234, 2005).

In the case of PWC and Arthrocare, the class action lawyers allege: "ArthroCare's financial statement disclosures were inadequate and, therefore, PwC violated GAAS by not modifying its previously issued unqualified audit opinions for the inadequacy of the information disclosed. The inadequate disclosures involved basic fundamental concepts such as revenue recognition, acquisition accounting and impairment analysis" (In *re Arthrocare Corp. Securities Litigation*, U.S. District Court, Western District of Texas, December 18, 2009, p. 275).

***App C11: Inadequate consideration of fraud risks***

In the matter of Hanover, lawyers allege: "under AU §316, consideration of fraud in a financial statement audit, PWC was required to consider and plan for factors that indicated Hanover may be dealing with entities that were not independent. The risk factors under AU §316.17 included: (i) significant, unusual, or highly complex transactions, especially those close to year end, that pose difficult 'substance over form' questions; (ii) overly complex organizational structure involving numerous or unusual legal entities, managerial lines of authority, or contractual arrangements without apparent business purpose; (iii) difficulty in determining the organization or individual(s) that control(s) the entity; and (iv) unusually rapid growth or profitability, especially compared with that of other companies in the same industry" (*Pirelli Armstrong Tire Corporation Retiree Medical Benefits Trust, et al. v. Hanover Compressor Company, et al*., U.S. District Court, Southern District of Texas, October 4, 2004, p. 37).

Similarly, in SEC's AAER 2815, the SEC alleges: "Putnam received indications of possible fraud at Ebix including earnings management, high involvement in accounting decisions by non-financial management, commitments made to analysts, the expectation of possible equity funding, the desire to maintain a high stock price, Ebix's very aggressive accounting policies, and possible opinion shopping by Ebix among accounting firms, among others. In particular, Putnam became aware that Ebix's management had taken an extremely aggressive approach to recognizing revenue from the company's software sales" (AAER 2815, 2008).

Appendix D: Correlation Matrix

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Evidence | 1 | | | | | | | | | | | | | | | | | | |
| (2) DueCare | 0.870*** | 1 | | | | | | | | | | | | | | | | | |
| (3) Opinion | 0.774*** | 0.764*** | 1 | | | | | | | | | | | | | | | | |
| (4) Plan | 0.844*** | 0.837*** | 0.679*** | 1*** | | | | | | | | | | | | | | | |
| (5) Indep | 0.497*** | 0.590*** | 0.555*** | 0.536*** | 1*** | | | | | | | | | | | | | | |
| (6) IntControl | 0.721*** | 0.729*** | 0.747*** | 0.651*** | 0.654*** | 1 | | | | | | | | | | | | | |
| (7) Total Accruals | 0.069*** | 0.063** | 0.080*** | 0.066** | 0.035 | 0.011 | 1 | | | | | | | | | | | | |
| (8) Rstmt | 0.123*** | 0.134*** | 0.143*** | 0.088*** | 0.113*** | 0.138*** | 0.046* | 1 | | | | | | | | | | | |
| (9) SmlProfit | -0.023 | -0.025 | -0.016 | -0.046* | -0.025 | -0.014 | -0.097** | 0.099*** | 1 | | | | | | | | | | |
| (10) SmlBeat | -0.008 | -0.010 | -0.007 | -0.011 | -0.011 | -0.006 | -0.058** | -0.002 | 0.060** | 1 | | | | | | | | | |
| (11) GC | -0.028 | -0.016 | -0.011 | -0.019 | -0.038 | -0.032 | 0.161*** | -0.026 | -0.060** | 0.046* | 1 | | | | | | | | |
| (12) BigN | -0.155*** | -0.138*** | -0.041* | -0.159*** | -0.017 | -0.014 | -0.208*** | 0.034 | 0.069*** | 0.049* | -0.138*** | 1 | | | | | | | |
| (13) Audit Fee Ratio | -0.017 | -0.018 | -0.034 | -0.032 | -0.079** | -0.083** | -0.024 | -0.040 | -0.013 | -0.093** | 0.067** | -0.260*** | 1 | | | | | | |
| (14) Audit Fee City Ratio | 0.096*** | 0.072*** | 0.067** | 0.130*** | 0.044* | 0.021 | 0.072*** | -0.024 | 0.009 | 0.008 | 0.074*** | -0.278*** | 0.052* | 1 | | | | | |
| (15) Tenure | -0.020 | -0.037 | 0.003 | -0.064** | 0.016 | 0.018 | -0.138*** | -0.008 | 0.049* | 0.034 | -0.035 | 0.217*** | -0.111*** | -0.029 | 1 | | | | |
| (16) New Client | -0.039 | -0.027 | -0.019 | -0.029 | -0.033 | -0.030 | 0.034 | 0.025 | -0.024 | 0.006 | -0.019 | -0.173*** | 0.077*** | 0.084*** | -0.344*** | 1 | | | |
| (17) Top 20 City | 0.023 | 0.028 | 0.021 | 0.050* | 0.000 | 0.008 | -0.015 | 0.053** | 0.011 | 0.014 | -0.009 | 0.092*** | -0.019 | -0.069** | 0.070*** | -0.007 | 1 | | |
| (18) Auditor Firm Diff | 0.006 | 0.015 | 0.036 | 0.020 | 0.021 | 0.034 | -0.026 | 0.018 | 0.053** | 0.038 | -0.026 | 0.115*** | -0.066** | -0.060** | 0.0737*** | -0.028 | 0.533*** | 1 | |
| (19) Industry Specialist | 0.036 | 0.033 | 0.029 | 0.037 | 0.038 | 0.032 | -0.021 | 0.005 | 0.014 | 0.034 | 0.030 | -0.024 | 0.0559** | 0.017 | -0.055** | -0.054** | -0.103*** | -0.076** | 1 |
| (20) City Specialist | -0.078*** | -0.084*** | -0.100*** | -0.082** | -0.042* | -0.060** | -0.064** | -0.007 | 0.070*** | 0.042* | 0.008 | 0.121*** | -0.043* | 0.055** | 0.085*** | -0.039 | -0.189*** | -0.153*** | 0.079*** |

## Table 1: Sample Description

**Panel A: Distinct AAERs and Securities Class Action Lawsuits Coded**

| *AAERs* | | *Securities Class Action Lawsuits* | |
|---|---|---|---|
| AAERs against auditors from Berkeley Database | 107 | # of class action lawsuits against auditors identified in the ISS database | 293 |
| Additional hand-collected AAERs against auditors | 114 | Subtract: | |
| Subtract: | | Allegations are too vague to code | (25) |
| Missing AAER files | (10) | Incomplete complaints or no complaints | (33) |
| PCAOB registration matters | (38) | Auditors not included in complaints | (53) |
| Not against auditors | (21) | Privately traded firms | (6) |
| Allegations are too vague to code | (1) | No records in CRSP and/or Compustat | (14) |
| Redundant issues | (10) | Same cases as AAERs | (9) |
| ***# of unique AAERs coded*** | ***141*** | ***# of unique Lawsuits coded*** | ***153*** |

**Panel B: Sample Composition for Model (1) in Table 4**

| | Treatment Sample (against auditors) | Control Sample (not against auditors) |
|---|---|---|
| *AAER (firm-years)* | | |
| AAERs with CRSP or Compustat identifiers | 149 | 1,449 |
| AAERs with missing values in CRSP, Compustat, or Audit Analytics | (105) | (348) |
| *AAER firm-years in Model (1) in Table 4* | *44* | *940* |
| | | |
| *Securities Class Action Lawsuits (firm-years)* | | |
| Class Action Lawsuits with CRSP or Compustat identifiers | 390 | 3,965 |
| Class Action Lawsuits with missing values in CRSP, Compustat, or Audit Analytics | (90) | (970) |
| *Class Action Lawsuit firm-years in Model (1) in Table 4* | *300* | *2,995* |

**Table 2: Descriptive Statistics for Audit Deficiencies Allegations**

| | Allegations | AAER (N=141) | Lawsuits (N=153) | Significance Level |
|---|---|---|---|---|
| **Panel A: Bogus Audit** | | 3 | 0 | * |
| **Panel B: Engagement Acceptance** | | | | |
| B1 | Failure to conduct adequate predecessor/successor communications | 6 | 1 | ** |
| B2 | Inadequate assessment/consideration of management's integrity | 1 | 2 | |
| **Panel C: General GAAS Standards** | | | | |
| C1 | Inadequate training and proficiency to conduct engagement | 11 | 37 | *** |
| C2 | Lack of independence from client | 46 | 76 | *** |
| C3 | Failure to exercise due professional care | 63 | 114 | *** |
| C4 | Insufficient level of professional skepticism | 42 | 51 | |
| C5 | Former audit employee serves in client management role (CEO/CFO) | 1 | 2 | |
| **Panel D: Audit Planning—Fieldwork GAAS Standard** | | | | |
| D1 | Inadequate planning and supervision | 36 | 90 | *** |
| D2 | Failure to adequately address audit risk and materiality | 15 | 32 | ** |
| D3 | Inadequate consideration of fraud risks | 12 | 55 | *** |
| D4 | Failure to address illegal acts by clients | 7 | 10 | |
| D5 | Failure to recognize/ensure disclosure of key related parties | 13 | 23 | |
| D6 | Failure to appropriately design audit programs | 8 | 13 | |
| D7 | Inadequate performance of analytical procedures | 5 | 4 | |
| D8 | Inadequate review of engagement | 9 | 1 | *** |
| **Panel E: Sufficient Competent Evidence—Fieldwork GAAS Standard** | | | | |
| E1 | Failure to adequately perform audit procedures in response to assessed risks | 13 | 12 | . |
| E2 | Failure to gather sufficient competent audit evidence | 75 | 125 | *** |
| E3 | Inadequate performance of substantive analytical procedures | 6 | 15 | * |
| E4 | Inappropriate confirmation procedures | 18 | 20 | |
| E5 | Inadequate observation of inventories | 8 | 11 | |
| E6 | Failure to adequately audit derivative instruments, hedging activities, and investments in securities | 4 | 9 | |
| E7 | Failure to obtain adequate evidence related to management representations | 35 | 30 | |
| E8 | Over-reliance on/failure to obtain work of specialists | 4 | 1 | |
| E9 | Inadequately considering responses from client's legal counsel/ attorney letters | 3 | 3 | * |
| E10 | Inadequate preparation and maintenance of audit documentations | 30 | 2 | *** |
| E11 | Failure to appropriately audit accounting estimates | 8 | 17 | * |
| E12 | Incorrect sampling techniques (failing to project results to population) | 0 | 1 | |
| E13 | Intentional alteration and/or destruction of workpapers | 4 | 1 | |

| | Allegations | AAER (N=141) | Lawsuits (N=153) | Significance Level |
|---|---|---|---|---|
| **Panel F: Understanding Internal Controls—Fieldwork GAAS Standard** | | | | |
| F1 | Failure to obtain an understanding of the entity and its environment | 2 | 19 | *** |
| F2 | Failure to obtain an understanding of internal control | 9 | 97 | *** |
| F3 | Over-reliance on internal controls (over-relying/failing to react to known control weaknesses) | 2 | 8 | * |
| F4 | Failure to consider particular risks related to the control environment | 3 | 21 | *** |
| F5 | Failure to communicate internal control-related matters identified in an audit | 1 | 3 | |
| **Panel G: Reporting GAAS Standards** | | | | |
| G1 | Inadequate evaluation of entity's going concern status | 5 | 10 | |
| G2 | Failure to adequately communicate with the audit committee | 7 | 15 | |
| G3 | Failure to faithfully state whether the financial statements are presented in accordance with GAAP | 5 | 86 | *** |
| G4 | Incorrect/inconsistent interpretation or application of requirements of GAAP | 17 | 36 | ** |
| G5 | Failure to express an appropriate audit opinion | 48 | 108 | *** |
| G6 | Failure to evaluate adequacy of disclosure | 11 | 59 | *** |
| G7 | Failure to appropriately reference the work performed by other auditors | 1 | 0 | |
| G8 | Inappropriate consideration of material subsequent events | 4 | 4 | |
| G9 | Inadequate evaluation of impact of uncertainties | 1 | 5 | |
| G10 | Failure to report changes in accounting principle | 1 | 3 | |
| G11 | Failure to evaluate known audit differences/improperly concluding that passed audit adjustments were immaterial | 2 | 3 | |
| G12 | Inadequate reviews of quarterly/interim financial statement information | 9 | 14 | |
| **Panel H: Average number of cites of auditing standards** | | 4.8 | 14.6 | +++ |
| **Panel I: Average number of cites of non-auditing standards (e.g. GAAP rules)** | | 1.5 | 2.0 | + |

Note: This table presents the distribution of audit deficiency allegations for all AAERs and securities class action lawsuits coded. In Panels A through G, we report the aggregate amount of allegations. For example, for allegation B1, six out of the 141 AAERs and one out of the 153 lawsuits stated a "failure to conduct adequate predecessor/successor communication" allegation against auditors. In Panel H, we report the average number of cites of auditing standards in an AAER or securities class action lawsuit. In Panel I, we report the average number of cites of non-auditing standards (such as GAAP rules). For continuous variables, +, ++, +++ represent *p*-value at the 0.1, 0.05, and 0.01 level for two-sided t-tests. For discrete dichotomous variables, *, **, *** represent *p*-values at the 0.1, 0.05, and 0.01 levels for two-sided chi-squared tests.

**Table 3: Descriptive Statistics**

This table presents descriptive statistics for variables used in Table 4. Sample size varies by regression specification. The treatment sample is defined as firm-years with securities class action lawsuits or AAERs against auditors. The control sample is defined as firm-years with securities class action lawsuits or AAERs, but these lawsuits or AAERs are not against auditors. There are 4,279 observations (344 observations in the treatment sample and 3,935 observations in the control sample) used in regression (1) in Panel A of Table 4, where *Total Accruals* is the variable of interest. The sample size increases to 5,019 in regressions (2), (3), and (4) in Panel A of Table 4 and regressions (6), (9), and (10) in Panel B of Table 4. The sample size decreases to 3,252 for regression (5) in Panel A, 2,798 for regressions (7) and (8) in Panel B of Table 4, and 3,236 for regressions (11) to (14) in Panel B of Table 4, due to data availability for variables related to going concern opinion and audit fees. All continuous variables are winsorized at the 1% and 99% levels. See Appendix A for variable definitions.

**Panel A: Descriptive Statistics for AQ measures**

| | Related Models | Treatment Sample | | | | | | Control Sample | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *AQ Measures* | in Tables 4 to 9 | N | 25%tile | Median | 75%tile | SD | Mean | N | 25%tile | Median | 75%tile | SD | Mean |
| Total Accruals | (1) | 344 | 0.035 | 0.066 | 0.158 | 0.202 | 0.145 | 3,935 | 0.031 | 0.066 | 0.133 | 0.155 | 0.115 |
| Rstmt | (2) | 420 | 0 | 1 | 1 | 0.498 | 0.548 | 4,599 | 0 | 0 | 1 | 0.474 | 0.340 |
| SmlProfit | (3) | 420 | 0 | 0 | 0 | 0.420 | 0.229 | 4,599 | 0 | 0 | 0 | 0.387 | 0.184 |
| SmlBeat | (4) | 420 | 0 | 1 | 1 | 0.468 | 0.679 | 4,599 | 0 | 1 | 1 | 0.462 | 0.692 |
| GC | (5) | 283 | 0 | 0 | 0 | 0.176 | 0.032 | 2,969 | 0 | 0 | 0 | 0.214 | 0.048 |
| BigN | (6) | 420 | 0 | 1 | 1 | 0.438 | 0.743 | 4,599 | 1 | 1 | 1 | 0.344 | 0.863 |
| Audit Fee Ratio | (7) | 246 | 0.480 | 0.698 | 0.886 | 0.255 | 0.662 | 2,552 | 0.461 | 0.699 | 0.882 | 0.254 | 0.659 |
| Audit Fee City Ratio | (8) | 246 | 0.027 | 0.074 | 0.235 | 0.281 | 0.199 | 2,552 | 0.015 | 0.045 | 0.147 | 0.205 | 0.131 |
| Tenure | (9) | 420 | 3 | 6 | 11 | 6.589 | 7.850 | 4,599 | 3 | 5 | 9 | 6.486 | 7.371 |
| New Client | (10) | 420 | 0 | 0 | 0 | 0.310 | 0.107 | 4,599 | 0 | 0 | 0 | 0.312 | 0.110 |
| Top 20 City | (11) | 282 | 0 | 0 | 1 | 0.439 | 0.259 | 2,954 | 0 | 0 | 0 | 0.419 | 0.227 |
| Auditor Firm Diff | (12) | 282 | 0 | 0 | 1 | 0.444 | 0.270 | 2,954 | 0 | 0 | 1 | 0.439 | 0.260 |
| City Specialist | (13) | 282 | 1 | 1 | 1 | 0.326 | 0.879 | 2,954 | 1 | 1 | 1 | 0.348 | 0.859 |
| Industry Specialist | (14) | 282 | 0 | 0 | 1 | 0.463 | 0.309 | 2,954 | 0 | 0 | 1 | 0.494 | 0.421 |

**Panel B: Descriptive Statistics for Control Variables in Column (1) of Table 4**

| | Related Models | Treatment Sample | | | | | | Control Sample | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Control variables* | in Tables 4 to 9 | N | 25%tile | Median | 75%tile | SD | Mean | N | 25%tile | Median | 75%tile | SD | Mean |
| LogAT | (1) | 344 | 4.494 | 6.372 | 7.998 | 2.498 | 6.400 | 3,935 | 4.692 | 6.012 | 7.627 | 2.132 | 6.203 |
| Leverage | (1) | 344 | 0.290 | 0.486 | 0.659 | 0.258 | 0.491 | 3,935 | 0.271 | 0.475 | 0.674 | 0.281 | 0.496 |
| Loss | (1) | 344 | 0 | 0 | 1 | 0.460 | 0.302 | 3,935 | 0 | 0 | 1 | 0.496 | 0.433 |
| AssetTurnover | (1) | 344 | 0.470 | 0.724 | 1.200 | 0.684 | 0.920 | 3,935 | 0.489 | 0.832 | 1.251 | 0.745 | 0.987 |
| M2B | (1) | 344 | 1.613 | 3.073 | 5.661 | 5.760 | 4.727 | 3,935 | 1.344 | 2.554 | 4.703 | 5.784 | 3.930 |
| ROA | (1) | 344 | -0.026 | 0.039 | 0.087 | 0.380 | -0.048 | 3,935 | -0.110 | 0.016 | 0.067 | 0.374 | -0.100 |
| SalesGrow | (1) | 344 | 0.049 | 0.226 | 0.577 | 0.820 | 0.437 | 3,935 | 0.000 | 0.155 | 0.461 | 0.903 | 0.388 |
| Age | (1) | 344 | 11 | 20 | 31 | 17.390 | 23.968 | 3,935 | 12 | 20 | 28 | 16.532 | 24.137 |
| December | (1) | 344 | 0 | 1 | 1 | 0.478 | 0.648 | 3,935 | 0 | 1 | 1 | 0.484 | 0.624 |
| Segments | (1) | 344 | 1 | 1 | 3 | 1.454 | 2.078 | 3,935 | 1 | 1 | 3 | 1.398 | 1.968 |

**Table 4: Allegation of Failure to Gather Sufficient Competent Audit Evidence**

This table presents the results of Model (1). The dependent variable equals 1 if there is an alleged violation of "failure to gather sufficient competent audit evidence" and 0 otherwise. Each column shows the regression results for a different audit quality measure, AQ Measure, shown at the top of each column. Panel A presents the regression results for output-based measures of audit quality. Panel B presents the regression results for input-based and other measures of audit quality. In Panel C, we report the *p*-values of chi-squared tests comparing the AUCs between selected models. AUCs with AQ measure are reported in Panels A and B. Variable definitions are provided in Appendix A. Coefficient estimates are in logit units. Standard errors are clustered at firm level. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Output-based measures of audit quality**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***DV: Evidence*** | ***Total Accruals*** | ***Rstmt*** | ***SmlProfit*** | ***SmlBeat*** | ***GC*** |
| AQ Measure | 1.455*** | 0.963*** | -0.129 | 0.078 | -0.302 |
| | [0.423] | [0.166] | [0.203] | [0.122] | [0.491] |
| LogAT | 0.052 | -0.012 | -0.007 | -0.012 | -0.111 |
| | [0.082] | [0.066] | [0.066] | [0.066] | [0.080] |
| Leverage | 0.24 | 0.737* | 0.673* | 0.627 | 0.820* |
| | [0.403] | [0.403] | [0.389] | [0.395] | [0.465] |
| Loss | -0.768*** | -0.759*** | -0.813*** | -0.767*** | -0.925*** |
| | [0.193] | [0.173] | [0.189] | [0.181] | [0.222] |
| AssetTurnover | -0.175 | -0.251 | -0.211 | -0.199 | -0.440** |
| | [0.154] | [0.154] | [0.147] | [0.146] | [0.171] |
| M2B | 0.022* | 0.027** | 0.021* | 0.022* | 0.006 |
| | [0.012] | [0.011] | [0.011] | [0.011] | [0.016] |
| ROA | 0.167 | 0.277 | 0.184 | 0.224 | 0.354 |
| | [0.312] | [0.323] | [0.321] | [0.334] | [0.437] |
| SalesGrow | -0.103 | 0.068 | 0.047 | 0.050 | 0.114 |
| | [0.080] | [0.065] | [0.064] | [0.065] | [0.081] |
| Age | -0.006 | -0.006 | -0.006 | -0.006 | -0.008 |
| | [0.010] | [0.009] | [0.009] | [0.009] | [0.011] |
| December | -0.088 | -0.058 | -0.124 | -0.119 | -0.219 |
| | [0.221] | [0.210] | [0.206] | [0.207] | [0.238] |
| Segments | 0.017 | 0.044 | 0.061 | 0.058 | 0.015 |
| | [0.074] | [0.066] | [0.063] | [0.063] | [0.080] |
| Constant | -2.719*** | -2.919*** | -2.439*** | -2.489*** | -1.275** |
| | [0.532] | [0.461] | [0.446] | [0.440] | [0.543] |
| Total Observations | 4,279 | 5,019 | 5,019 | 5,019 | 3,252 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.631 | 0.676 | 0.621 | 0.620 | 0.641 |
| AUC without AQ measure | 0.613 | 0.620 | 0.620 | 0.620 | 0.642 |
| *P*-value of Chi-sq test for AUC equality | 0.052 | <0.001 | 0.758 | 0.924 | 0.649 |
| Pseudo $R^2$ | 0.026 | 0.052 | 0.024 | 0.023 | 0.034 |

**Panel B: Input-based and other measures of audit quality**

| | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|
| | | *Audit Fee* | *Audit Fee* | | *New* | *Top 20* | *Auditor* | *City* | *Industry* |
| ***DV: Evidence*** | ***BigN*** | ***Ratio*** | ***City Ratio*** | ***Tenure*** | ***Client*** | ***City*** | ***Firm Diff*** | ***Specialist*** | ***Specialist*** |
| AQ Measure | -0.858*** | -0.441 | 1.020** | 0.011 | -0.091 | 0.218 | 0.077 | -0.452** | -0.087 |
| | [0.260] | [0.373] | [0.495] | [0.018] | [0.210] | [0.282] | [0.285] | [0.206] | [0.206] |
| LogAT | 0.055 | -0.143* | -0.122 | -0.014 | -0.011 | -0.114 | -0.109 | -0.089 | -0.105 |
| | [0.067] | [0.084] | [0.082] | [0.065] | [0.065] | [0.080] | [0.080] | [0.079] | [0.080] |
| Leverage | 0.555 | 0.903* | 0.785 | 0.635 | 0.636 | 0.746 | 0.761* | 0.753* | 0.761* |
| | [0.402] | [0.489] | [0.506] | [0.394] | [0.394] | [0.454] | [0.455] | [0.455] | [0.458] |
| Loss | -0.742*** | -0.878*** | -0.846*** | -0.761*** | -0.760*** | -0.918*** | -0.924*** | -0.932*** | -0.934*** |
| | [0.180] | [0.244] | [0.246] | [0.178] | [0.178] | [0.222] | [0.223] | [0.222] | [0.221] |
| AssetTurnover | -0.174 | -0.477** | -0.496*** | -0.204 | -0.2 | -0.429** | -0.433** | -0.390** | -0.434** |
| | [0.140] | [0.189] | [0.187] | [0.147] | [0.146] | [0.170] | [0.170] | [0.168] | [0.170] |
| M2B | 0.024** | 0.009 | 0.011 | 0.022* | 0.022* | 0.007 | 0.007 | 0.007 | 0.006 |
| | [0.011] | [0.017] | [0.018] | [0.011] | [0.011] | [0.016] | [0.016] | [0.015] | [0.016] |
| ROA | 0.209 | 0.598 | 0.573 | 0.209 | 0.207 | 0.404 | 0.396 | 0.377 | 0.391 |
| | [0.316] | [0.554] | [0.540] | [0.330] | [0.329] | [0.437] | [0.436] | [0.436] | [0.435] |
| SalesGrow | 0.038 | 0.124 | 0.122 | 0.050 | 0.045 | 0.117 | 0.115 | 0.113 | 0.111 |
| | [0.063] | [0.091] | [0.090] | [0.064] | [0.064] | [0.080] | [0.080] | [0.081] | [0.081] |
| Age | -0.006 | -0.016 | -0.015 | -0.008 | -0.006 | -0.008 | -0.008 | -0.008 | -0.008 |
| | [0.009] | [0.012] | [0.012] | [0.010] | [0.009] | [0.011] | [0.011] | [0.011] | [0.011] |
| December | -0.125 | -0.294 | -0.306 | -0.119 | -0.121 | -0.235 | -0.231 | -0.211 | -0.233 |
| | [0.209] | [0.253] | [0.254] | [0.207] | [0.207] | [0.239] | [0.241] | [0.239] | [0.240] |
| Segments | 0.039 | 0.038 | 0.014 | 0.06 | 0.059 | 0.019 | 0.015 | 0.024 | 0.012 |
| | [0.063] | [0.089] | [0.089] | [0.063] | [0.063] | [0.080] | [0.080] | [0.080] | [0.081] |
| Constant | -2.137*** | -0.657 | -1.147** | -2.460*** | -2.438*** | -1.297** | -1.285** | -1.310** | -1.202** |
| | [0.427] | [0.622] | [0.555] | [0.446] | [0.448] | [0.545] | [0.544] | [0.541] | [0.514] |
| Total Observations | 5,019 | 2,798 | 2,798 | 5,019 | 5,019 | 3,236 | 3,236 | 3,236 | 3,236 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.652 | 0.660 | 0.671 | 0.623 | 0.622 | 0.643 | 0.642 | 0.652 | 0.643 |
| AUC without AQ measure | 0.620 | 0.659 | 0.659 | 0.620 | 0.620 | 0.642 | 0.642 | 0.642 | 0.642 |
| *P*-value of Chi-sq test for AUC difference | 0.001 | 0.892 | 0.127 | 0.835 | 0.84 | 0.605 | 0.715 | 0.171 | 0.299 |
| Pseudo $R^2$ | 0.035 | 0.041 | 0.048 | 0.024 | 0.023 | 0.034 | 0.033 | 0.039 | 0.033 |

**Panel C: *P*-values of chi-squared tests comparing AUCs with AQ measure between models in Panels A and B**

| *Models* | (1) Total Accruals | (2) Rstmt | (6) BigN | (8) Audit Fee City Ratio | (10) New Client | (13) City Specialist |
|---|---|---|---|---|---|---|
| **(2) Rstmt** | 0.027 | | | | | |
| **(6) BigN** | 0.178 | 0.116 | | | | |
| **(8) Audit Fee City Ratio** | 0.007 | 0.839 | 0.698 | | | |
| **(10) New Client** | 0.022 | <0.001 | 0.001 | 0.023 | | |
| **(13) City Specialist** | 0.095 | 0.418 | 0.118 | 0.309 | 0.014 | |
| **(14) Industry Specialist** | 0.045 | 0.190 | 0.027 | 0.605 | 0.044 | 0.212 |

**Table 5: Allegation of Failure to Exercise Due Professional Care**

This table presents the results of Model (1). The dependent variable equals 1 if there is an alleged violation of "failure to exercise due professional care" and 0 otherwise. Each column shows the regression results for a different audit quality measure, AQ Measure, shown at the top of each column. Panel A presents the regression results for output-based measures of audit quality. Panel B presents the regression results for input-based and other measures of audit quality. In Panel C, we report the *p*-values of chi-squared tests comparing the AUCs between selected models. AUCs with AQ measure are reported in Panels A and B. Variable definitions are provided in Appendix A. Coefficient estimates are in logit units. Standard errors are clustered at firm level. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Output-based measures of audit quality**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***DV: DueCare*** | ***Total Accruals*** | ***Rstmt*** | ***SmlProfit*** | ***SmlBeat*** | ***GC*** |
| AQ Measure | 1.316*** | 1.014*** | -0.273 | -0.032 | -0.333 |
| | [0.444] | [0.179] | [0.224] | [0.126] | [0.500] |
| LogAT | 0.077 | 0.005 | 0.013 | 0.009 | -0.093 |
| | [0.081] | [0.074] | [0.073] | [0.073] | [0.092] |
| Leverage | 0.275 | 0.654 | 0.626 | 0.545 | 0.853* |
| | [0.395] | [0.408] | [0.396] | [0.398] | [0.475] |
| Loss | -0.786*** | -0.732*** | -0.842*** | -0.736*** | -0.803*** |
| | [0.190] | [0.177] | [0.192] | [0.184] | [0.223] |
| AssetTurnover | -0.118 | -0.146 | -0.119 | -0.096 | -0.327** |
| | [0.149] | [0.149] | [0.144] | [0.142] | [0.165] |
| M2B | 0.026** | 0.032*** | 0.026** | 0.027** | 0.014 |
| | [0.012] | [0.012] | [0.011] | [0.012] | [0.015] |
| ROA | -0.046 | 0.084 | -0.032 | -0.002 | 0.184 |
| | [0.291] | [0.305] | [0.297] | [0.309] | [0.408] |
| SalesGrow | -0.081 | 0.066 | 0.049 | 0.043 | 0.094 |
| | [0.083] | [0.068] | [0.068] | [0.068] | [0.087] |
| Age | -0.007 | -0.010 | -0.010 | -0.010 | -0.013 |
| | [0.010] | [0.010] | [0.010] | [0.010] | [0.012] |
| December | 0.034 | -0.071 | -0.145 | -0.139 | -0.198 |
| | [0.228] | [0.229] | [0.224] | [0.224] | [0.269] |
| Segments | 0.067 | 0.073 | 0.093 | 0.086 | 0.048 |
| | [0.076] | [0.072] | [0.069] | [0.069] | [0.090] |
| Constant | -3.184*** | -3.217*** | -2.691*** | -2.703*** | -1.671*** |
| | [0.540] | [0.476] | [0.455] | [0.447] | [0.549] |
| Observations | 4,279 | 5,019 | 5,019 | 5,019 | 3,252 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.633 | 0.679 | 0.615 | 0.612 | 0.625 |
| AUC without AQ measure | 0.617 | 0.612 | 0.612 | 0.612 | 0.625 |
| *P*-value of Chi-sq test for AUC difference | 0.058 | <0.001 | 0.457 | 0.610 | 0.860 |
| Pseudo $R^2$ | 0.027 | 0.052 | 0.023 | 0.021 | 0.027 |

**Panel B: Input-based and other measures of audit quality**

| | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|
| ***DV: DueCare*** | ***BigN*** | ***Audit Fee Ratio*** | ***Audit Fee City Ratio*** | ***Tenure*** | ***New Client*** | ***Top 20 City*** | ***Auditor Firm Diff*** | ***City Specialist*** | ***Industry Specialist*** |
| AQ Measure | -0.830*** | -0.631 | 0.708 | 0.013 | -0.123 | 0.398 | 0.248 | -0.735*** | -0.093 |
| | [0.275] | [0.407] | [0.443] | [0.019] | [0.229] | [0.278] | [0.288] | [0.230] | [0.220] |
| LogAT | 0.070 | -0.129 | -0.106 | 0.002 | 0.005 | -0.102 | -0.097 | -0.062 | -0.087 |
| | [0.075] | [0.100] | [0.098] | [0.071] | [0.072] | [0.090] | [0.091] | [0.090] | [0.092] |
| Leverage | 0.467 | 0.964* | 0.835 | 0.545 | 0.546 | 0.751 | 0.770* | 0.772* | 0.784* |
| | [0.407] | [0.496] | [0.514] | [0.400] | [0.399] | [0.461] | [0.463] | [0.461] | [0.467] |
| Loss | -0.716*** | -0.737*** | -0.709*** | -0.738*** | -0.737*** | -0.787*** | -0.790*** | -0.815*** | -0.811*** |
| | [0.184] | [0.245] | [0.249] | [0.180] | [0.181] | [0.224] | [0.224] | [0.224] | [0.222] |
| AssetTurnover | -0.076 | -0.362** | -0.371** | -0.101 | -0.096 | -0.313* | -0.319* | -0.259 | -0.320* |
| | [0.136] | [0.184] | [0.183] | [0.142] | [0.142] | [0.164] | [0.164] | [0.158] | [0.165] |
| M2B | 0.028** | 0.019 | 0.020 | 0.027** | 0.027** | 0.014 | 0.014 | 0.015 | 0.014 |
| | [0.011] | [0.016] | [0.017] | [0.011] | [0.012] | [0.015] | [0.015] | [0.015] | [0.015] |
| ROA | 0.017 | 0.403 | 0.371 | 0.006 | 0.004 | 0.245 | 0.235 | 0.197 | 0.224 |
| | [0.300] | [0.497] | [0.497] | [0.308] | [0.308] | [0.406] | [0.407] | [0.405] | [0.405] |
| SalesGrow | 0.037 | 0.084 | 0.089 | 0.051 | 0.045 | 0.100 | 0.099 | 0.092 | 0.092 |
| | [0.067] | [0.099] | [0.095] | [0.068] | [0.068] | [0.086] | [0.086] | [0.087] | [0.087] |
| Age | -0.010 | -0.022 | -0.021 | -0.012 | -0.01 | -0.013 | -0.013 | -0.012 | -0.013 |
| | [0.010] | [0.014] | [0.014] | [0.011] | [0.010] | [0.012] | [0.012] | [0.012] | [0.012] |
| December | -0.145 | -0.277 | -0.292 | -0.136 | -0.139 | -0.215 | -0.200 | -0.179 | -0.211 |
| | [0.226] | [0.289] | [0.293] | [0.224] | [0.225] | [0.268] | [0.268] | [0.267] | [0.271] |
| Segments | 0.066 | 0.078 | 0.061 | 0.088 | 0.087 | 0.058 | 0.052 | 0.063 | 0.045 |
| | [0.070] | [0.100] | [0.100] | [0.070] | [0.070] | [0.089] | [0.089] | [0.089] | [0.090] |
| Constant | -2.403*** | -0.919 | -1.512*** | -2.727*** | -2.697*** | -1.719*** | -1.705*** | -1.727*** | -1.596*** |
| | [0.433] | [0.626] | [0.575] | [0.457] | [0.455] | [0.554] | [0.549] | [0.541] | [0.537] |
| Observations | 5,019 | 2,798 | 2,798 | 5,019 | 5,019 | 3,236 | 3,236 | 3,236 | 3,236 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.641 | 0.646 | 0.654 | 0.610 | 0.611 | 0.633 | 0.627 | 0.656 | 0.626 |
| AUC without AQ measure | 0.612 | 0.643 | 0.643 | 0.612 | 0.612 | 0.625 | 0.625 | 0.625 | 0.625 |
| *P*-value of Chi-sq test for AUC difference | 0.006 | 0.615 | 0.077 | 0.645 | 0.801 | 0.214 | 0.544 | 0.013 | 0.222 |
| Pseudo $R^2$ | 0.032 | 0.036 | 0.037 | 0.022 | 0.022 | 0.030 | 0.028 | 0.040 | 0.026 |

**Panel C: *P*-values of chi-squared tests comparing AUCs with AQ measure between models in panels A and B**

| *Models* | (1) Total Accruals | (2) Rstmt | (6) BigN | (8) Audit Fee City Ratio | (10) New Client | (13) City Specialist |
|---|---|---|---|---|---|---|
| **(2) Rstmt** | 0.030 | | | | | |
| **(6) BigN** | 0.346 | 0.022 | | | | |
| **(8) Audit Fee City Ratio** | 0.116 | 0.230 | 0.806 | | | |
| **(10) New Client** | 0.009 | <0.001 | 0.005 | <0.001 | | |
| **(13) City Specialist** | 0.065 | 0.555 | 0.945 | 0.621 | <0.001 | |
| **(14) Industry Specialist** | 0.864 | 0.035 | 0.080 | 0.087 | 0.020 | 0.016 |

**Table 6: Allegation of Failure to Express an Appropriate Audit Opinion**

This table presents the results of Model (1). The dependent variable equals 1 if there is an alleged violation of "failure to express an appropriate audit opinion" and 0 otherwise. Each column shows the regression results for a different audit quality measure, AQ Measure, shown at the top of each column. Panel A presents the regression results for output-based measures of audit quality. Panel B presents the regression results for input-based and other measures of audit quality. In Panel C, we report the *p*-values of chi-squared tests comparing the AUCs between selected models. AUCs with AQ measure are reported in Panels A and B. Variable definitions are provided in Appendix A. Coefficient estimates are in logit units. Standard errors are clustered at firm level. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Output-based measures of audit quality**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***DV: Opinion*** | ***Total Accruals*** | ***Rstmt*** | ***SmlProfit*** | ***SmlBeat*** | ***GC*** |
| AQ Measure | 1.742*** | 1.100*** | -0.131 | -0.015 | -0.299 |
| | [0.437] | [0.187] | [0.228] | [0.129] | [0.511] |
| LogAT | 0.107 | 0.039 | 0.045 | 0.042 | -0.043 |
| | [0.083] | [0.069] | [0.068] | [0.068] | [0.081] |
| Leverage | 0.543 | 0.723* | 0.631 | 0.59 | 0.716 |
| | [0.405] | [0.422] | [0.396] | [0.405] | [0.493] |
| Loss | -0.767*** | -0.733*** | -0.787*** | -0.734*** | -0.879*** |
| | [0.196] | [0.183] | [0.198] | [0.192] | [0.231] |
| AssetTurnover | -0.254 | -0.282 | -0.23 | -0.217 | -0.537** |
| | [0.172] | [0.177] | [0.165] | [0.165] | [0.211] |
| M2B | 0.024** | 0.033*** | 0.027** | 0.028** | 0.015 |
| | [0.012] | [0.012] | [0.011] | [0.011] | [0.016] |
| ROA | -0.082 | -0.08 | -0.19 | -0.178 | -0.062 |
| | [0.269] | [0.270] | [0.263] | [0.268] | [0.353] |
| SalesGrow | -0.077 | 0.084 | 0.067 | 0.064 | 0.097 |
| | [0.085] | [0.073] | [0.071] | [0.072] | [0.099] |
| Age | -0.006 | -0.003 | -0.003 | -0.003 | -0.005 |
| | [0.010] | [0.010] | [0.010] | [0.009] | [0.012] |
| December | -0.227 | -0.244 | -0.319 | -0.316 | -0.484* |
| | [0.237] | [0.230] | [0.225] | [0.226] | [0.269] |
| Segments | 0.048 | 0.028 | 0.046 | 0.042 | 0.006 |
| | [0.082] | [0.074] | [0.071] | [0.070] | [0.094] |
| Constant | -3.351*** | -3.457*** | -2.892*** | -2.899*** | -1.786*** |
| | [0.565] | [0.505] | [0.482] | [0.475] | [0.592] |
| Observations | 4,279 | 5,019 | 5,019 | 5,019 | 3,252 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.649 | 0.693 | 0.632 | 0.631 | 0.637 |
| AUC without AQ measure | 0.625 | 0.631 | 0.631 | 0.631 | 0.635 |
| *P*-value of Chi-sq test for AUC difference | 0.021 | <0.001 | 0.703 | 0.884 | 0.34 |
| Pseudo $R^2$ | 0.034 | 0.062 | 0.027 | 0.026 | 0.033 |

**Panel B: Input-based and other measures of audit quality**

| | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|
| | | *Audit Fee* | *Audit Fee* | | *New* | *Top 20* | *Auditor Firm* | *City* | *Industry* |
| ***DV: Opinion*** | ***BigN*** | ***Ratio*** | ***City Ratio*** | ***Tenure*** | ***Client*** | ***City*** | ***Diff*** | ***Specialist*** | ***Specialist*** |
| AQ Measure | -0.298 | -0.703* | 0.880 | 0.016 | 0.076 | 0.329 | 0.291 | -0.757*** | -0.197 |
| | [0.304] | [0.420] | [0.624] | [0.019] | [0.207] | [0.304] | [0.308] | [0.240] | [0.221] |
| LogAT | 0.061 | -0.061 | -0.037 | 0.035 | 0.043 | -0.052 | -0.049 | -0.013 | -0.036 |
| | [0.069] | [0.086] | [0.084] | [0.067] | [0.067] | [0.081] | [0.082] | [0.080] | [0.081] |
| Leverage | 0.562 | 0.728 | 0.570 | 0.592 | 0.586 | 0.627 | 0.632 | 0.643 | 0.651 |
| | [0.409] | [0.534] | [0.547] | [0.406] | [0.406] | [0.478] | [0.483] | [0.479] | [0.483] |
| Loss | -0.726*** | -0.893*** | -0.853*** | -0.735*** | -0.736*** | -0.866*** | -0.863*** | -0.884*** | -0.892*** |
| | [0.189] | [0.254] | [0.259] | [0.187] | [0.187] | [0.231] | [0.233] | [0.230] | [0.229] |
| AssetTurnover | -0.208 | -0.567** | -0.583*** | -0.224 | -0.217 | -0.520** | -0.524** | -0.455** | -0.531** |
| | [0.163] | [0.229] | [0.225] | [0.166] | [0.165] | [0.209] | [0.209] | [0.204] | [0.209] |
| M2B | 0.028** | 0.025 | 0.027 | 0.027** | 0.028** | 0.015 | 0.015 | 0.016 | 0.014 |
| | [0.011] | [0.017] | [0.018] | [0.011] | [0.011] | [0.016] | [0.016] | [0.015] | [0.016] |
| ROA | -0.167 | 0.071 | 0.033 | -0.173 | -0.174 | -0.012 | -0.019 | -0.056 | -0.03 |
| | [0.264] | [0.428] | [0.426] | [0.268] | [0.266] | [0.361] | [0.360] | [0.359] | [0.358] |
| SalesGrow | 0.063 | 0.140 | 0.145 | 0.072 | 0.065 | 0.102 | 0.102 | 0.096 | 0.091 |
| | [0.070] | [0.110] | [0.104] | [0.071] | [0.072] | [0.098] | [0.097] | [0.099] | [0.099] |
| Age | -0.003 | -0.013 | -0.012 | -0.006 | -0.003 | -0.005 | -0.005 | -0.004 | -0.005 |
| | [0.009] | [0.014] | [0.013] | [0.011] | [0.009] | [0.012] | [0.012] | [0.012] | [0.012] |
| December | -0.316 | -0.604** | -0.628** | -0.314 | -0.316 | -0.498* | -0.483* | -0.461* | -0.496* |
| | [0.226] | [0.289] | [0.293] | [0.225] | [0.226] | [0.269] | [0.271] | [0.270] | [0.271] |
| Segments | 0.037 | 0.037 | 0.018 | 0.046 | 0.041 | 0.014 | 0.012 | 0.025 | 0.002 |
| | [0.070] | [0.105] | [0.102] | [0.071] | [0.071] | [0.094] | [0.093] | [0.094] | [0.094] |
| Constant | -2.767*** | -1.081 | -1.730*** | -2.915*** | -2.919*** | -1.817*** | -1.823*** | -1.857*** | -1.620*** |
| | [0.488] | [0.693] | [0.605] | [0.484] | [0.484] | [0.595] | [0.592] | [0.590] | [0.563] |
| Observations | 5,019 | 2,798 | 2,798 | 5,019 | 5,019 | 3,236 | 3,236 | 3,236 | 3,236 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.633 | 0.655 | 0.652 | 0.631 | 0.631 | 0.642 | 0.644 | 0.670 | 0.639 |
| AUC without AQ measure | 0.631 | 0.650 | 0.650 | 0.631 | 0.631 | 0.635 | 0.635 | 0.635 | 0.635 |
| *P*-value of Chi-sq test for AUC difference | 0.556 | 0.458 | 0.742 | 0.940 | 0.558 | 0.213 | 0.091 | 0.006 | 0.169 |
| Pseudo $R^2$ | 0.028 | 0.043 | 0.045 | 0.028 | 0.027 | 0.035 | 0.034 | 0.046 | 0.033 |

**Panel C: *P*-values of chi-squared tests comparing AUCs with AQ measure between models in panels A and B**

| *Models* | (1) Total Accruals | (2) Rstmt | (6) BigN | (8) Audit Fee City Ratio | (10) New Client | (13) City Specialist |
|---|---|---|---|---|---|---|
| **(2) Rstmt** | 0.068 | | | | | |
| **(6) BigN** | 0.034 | <0.001 | | | | |
| **(8) Audit Fee City Ratio** | 0.339 | 0.008 | 0.222 | | | |
| **(10) New Client** | 0.021 | <0.001 | 0.680 | 0.097 | | |
| **(13) City Specialist** | 0.046 | 0.273 | 0.013 | 0.134 | 0.002 | |
| **(14) Industry Specialist** | 0.980 | 0.007 | 0.536 | 0.374 | 0.141 | 0.013 |

**Table 7: Allegation of Inadequate Planning and Supervision**

This table presents the results of Model (1). The dependent variable equals 1 if there is an alleged violation of "inadequate planning and supervision" and 0 otherwise. Each column shows the regression results for a different audit quality measure, AQ Measure, shown at the top of each column. Panel A presents the regression results for output-based measures of audit quality. Panel B presents the regression results for input-based and other measures of audit quality. In Panel C, we report the *p*-values of chi-squared tests comparing the AUCs between selected models. AUCs with AQ measure are reported in Panels A and B. Variable definitions are provided in Appendix A. Coefficient estimates are in logit units. Standard errors are clustered at firm level. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Output-based measures of audit quality**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***DV: Plan*** | ***Total Accruals*** | ***Rstmt*** | ***SmlProfit*** | ***SmlBeat*** | ***GC*** |
| AQ Measure | 1.498*** | 0.953*** | -0.093 | 0.082 | -0.680 |
| | [0.469] | [0.187] | [0.249] | [0.139] | [0.680] |
| LogAT | 0.084 | 0.025 | 0.028 | 0.023 | -0.105 |
| | [0.103] | [0.089] | [0.087] | [0.088] | [0.105] |
| Leverage | -0.513 | 0.344 | 0.284 | 0.244 | 0.64 |
| | [0.491] | [0.507] | [0.486] | [0.495] | [0.535] |
| Loss | -0.746*** | -0.810*** | -0.852*** | -0.820*** | -0.926*** |
| | [0.220] | [0.202] | [0.219] | [0.210] | [0.242] |
| AssetTurnover | -0.011 | -0.191 | -0.148 | -0.139 | -0.439** |
| | [0.164] | [0.187] | [0.177] | [0.178] | [0.199] |
| M2B | 0.028* | 0.028* | 0.023 | 0.023 | 0.001 |
| | [0.015] | [0.015] | [0.014] | [0.014] | [0.019] |
| ROA | 0.145 | 0.250 | 0.150 | 0.188 | 0.222 |
| | [0.401] | [0.409] | [0.408] | [0.429] | [0.482] |
| SalesGrow | -0.134 | 0.051 | 0.033 | 0.037 | 0.062 |
| | [0.095] | [0.076] | [0.074] | [0.075] | [0.096] |
| Age | -0.011 | -0.012 | -0.012 | -0.012 | -0.017 |
| | [0.011] | [0.011] | [0.011] | [0.011] | [0.014] |
| December | -0.243 | -0.316 | -0.375 | -0.371 | -0.428 |
| | [0.252] | [0.247] | [0.243] | [0.244] | [0.283] |
| Segments | 0.045 | 0.063 | 0.077 | 0.075 | 0.049 |
| | [0.083] | [0.072] | [0.070] | [0.069] | [0.085] |
| Constant | -2.949*** | -3.060*** | -2.592*** | -2.640*** | -1.200* |
| | [0.637] | [0.555] | [0.537] | [0.528] | [0.616] |
| Observations | 4,279 | 5,019 | 5,019 | 5,019 | 3,252 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.636 | 0.686 | 0.629 | 0.629 | 0.654 |
| AUC without AQ measure | 0.618 | 0.628 | 0.628 | 0.628 | 0.652 |
| *P*-value of Chi-sq test for AUC difference | 0.039 | <0.001 | 0.678 | 0.651 | 0.609 |
| Pseudo $R^2$ | 0.032 | 0.053 | 0.027 | 0.027 | 0.038 |

**Panel B: Input-based and other measures of audit quality**

| | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|
| | | *Audit Fee* | *Audit Fee* | | *New* | *Top 20* | *Auditor* | *City* | *Industry* |
| ***DV: Plan*** | ***BigN*** | ***Ratio*** | ***City Ratio*** | ***Tenure*** | ***Client*** | ***City*** | ***Firm Diff*** | ***Specialist*** | ***Specialist*** |
| AQ Measure | -1.110*** | -0.774* | 1.391*** | -0.007 | -0.175 | 0.558* | 0.196 | -0.621** | -0.006 |
| | [0.294] | [0.424] | [0.495] | [0.019] | [0.251] | [0.287] | [0.308] | [0.244] | [0.238] |
| LogAT | 0.115 | -0.139 | -0.1 | 0.029 | 0.023 | -0.117 | -0.103 | -0.074 | -0.096 |
| | [0.088] | [0.112] | [0.106] | [0.086] | [0.087] | [0.103] | [0.104] | [0.103] | [0.104] |
| Leverage | 0.138 | 0.722 | 0.517 | 0.249 | 0.259 | 0.486 | 0.525 | 0.523 | 0.543 |
| | [0.499] | [0.547] | [0.572] | [0.496] | [0.493] | [0.524] | [0.525] | [0.521] | [0.526] |
| Loss | -0.791*** | -0.926*** | -0.866*** | -0.815*** | -0.813*** | -0.906*** | -0.920*** | -0.935*** | -0.932*** |
| | [0.210] | [0.264] | [0.268] | [0.207] | [0.207] | [0.244] | [0.246] | [0.242] | [0.243] |
| AssetTurnover | -0.107 | -0.463** | -0.488** | -0.137 | -0.14 | -0.417** | -0.429** | -0.372* | -0.431** |
| | [0.167] | [0.210] | [0.209] | [0.177] | [0.178] | [0.197] | [0.198] | [0.192] | [0.199] |
| M2B | 0.026* | 0.004 | 0.007 | 0.023 | 0.023 | 0.001 | 0.001 | 0.002 | 0.001 |
| | [0.014] | [0.021] | [0.022] | [0.014] | [0.014] | [0.019] | [0.019] | [0.019] | [0.019] |
| ROA | 0.159 | 0.333 | 0.292 | 0.168 | 0.168 | 0.333 | 0.314 | 0.288 | 0.307 |
| | [0.393] | [0.531] | [0.529] | [0.419] | [0.421] | [0.489] | [0.489] | [0.487] | [0.487] |
| SalesGrow | 0.020 | 0.090 | 0.088 | 0.029 | 0.032 | 0.071 | 0.065 | 0.060 | 0.061 |
| | [0.074] | [0.102] | [0.102] | [0.076] | [0.075] | [0.094] | [0.095] | [0.096] | [0.095] |
| Age | -0.012 | -0.024 | -0.023 | -0.011 | -0.012 | -0.015 | -0.017 | -0.016 | -0.017 |
| | [0.010] | [0.016] | [0.016] | [0.012] | [0.011] | [0.014] | [0.014] | [0.014] | [0.014] |
| December | -0.385 | -0.494 | -0.518* | -0.374 | -0.373 | -0.448 | -0.436 | -0.418 | -0.448 |
| | [0.247] | [0.301] | [0.305] | [0.244] | [0.244] | [0.280] | [0.282] | [0.282] | [0.285] |
| Segments | 0.049 | 0.091 | 0.052 | 0.073 | 0.077 | 0.063 | 0.052 | 0.062 | 0.047 |
| | [0.070] | [0.093] | [0.091] | [0.071] | [0.070] | [0.085] | [0.085] | [0.085] | [0.085] |
| Constant | -2.230*** | -0.417 | -1.253** | -2.596*** | -2.575*** | -1.287** | -1.239** | -1.264** | -1.213** |
| | [0.498] | [0.674] | [0.623] | [0.539] | [0.540] | [0.623] | [0.618] | [0.611] | [0.609] |
| Observations | 5,019 | 2,798 | 2,798 | 5,019 | 5,019 | 3,236 | 3,236 | 3,236 | 3,236 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.671 | 0.668 | 0.689 | 0.629 | 0.63 | 0.666 | 0.653 | 0.666 | 0.651 |
| AUC without AQ measure | 0.628 | 0.663 | 0.663 | 0.628 | 0.628 | 0.651 | 0.651 | 0.651 | 0.651 |
| *P*-value of Chi-sq test for AUC difference | <0.001 | 0.454 | 0.024 | 0.449 | 0.446 | 0.090 | 0.612 | 0.139 | 0.534 |
| Pseudo $R^2$ | 0.046 | 0.048 | 0.060 | 0.027 | 0.027 | 0.044 | 0.037 | 0.046 | 0.036 |

**Panel C: *P*-values of chi-squared tests comparing AUCs with AQ measure between models in panels A and B**

| *Models* | (1) Total Accruals | (2) Rstmt | (6) BigN | (8) Audit Fee City Ratio | (10) New Client | (13) City Specialist |
|---|---|---|---|---|---|---|
| **(2) Rstmt** | 0.034 | | | | | |
| **(6) BigN** | 0.037 | 0.410 | | | | |
| **(8) Audit Fee City Ratio** | 0.004 | 0.395 | 0.981 | | | |
| **(10) New Client** | 0.111 | <0.001 | <0.001 | <0.001 | | |
| **(13) City Specialist** | 0.085 | 0.843 | 0.336 | 0.420 | 0.005 | |
| **(14) Industry Specialist** | 0.468 | 0.593 | 0.071 | 0.047 | 0.031 | 0.140 |

**Table 8: Allegation of Independence Violation**

This table presents the results of Model (1). The dependent variable equals 1 if there is an alleged violation of "lack of independence from client" and 0 otherwise. Each column shows the regression results for a different audit quality measure, AQ Measure, shown at the top of each column. Panel A presents the regression results for output-based measures of audit quality. Panel B presents the regression results for input-based and other measures of audit quality. In Panel C, we report the *p*-values of chi-squared tests comparing the AUCs between selected models. AUCs with AQ measure are reported in Panels A and B. Variable definitions are provided in Appendix A. Coefficient estimates are in logit units. Standard errors are clustered at firm level. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***DV: Indep*** | ***Total Accruals*** | ***Rstmt*** | ***SmlProfit*** | ***SmlBeat*** | ***GC*** |
| AQ Measure | 1.645*** | 0.770*** | -0.170 | -0.054 | -1.60 |
| | [0.522] | [0.216] | [0.267] | [0.160] | [1.108] |
| LogAT | 0.137 | 0.095 | 0.097 | 0.095 | 0.048 |
| | [0.093] | [0.085] | [0.084] | [0.084] | [0.103] |
| Leverage | 0.045 | 0.31 | 0.318 | 0.258 | 0.537 |
| | [0.447] | [0.486] | [0.477] | [0.477] | [0.562] |
| Loss | -0.433* | -0.523** | -0.599** | -0.525** | -0.715** |
| | [0.238] | [0.221] | [0.247] | [0.230] | [0.291] |
| AssetTurnover | -0.242 | -0.303 | -0.279 | -0.259 | -0.536* |
| | [0.216] | [0.235] | [0.221] | [0.226] | [0.319] |
| M2B | 0.055*** | 0.058*** | 0.052*** | 0.053*** | 0.041*** |
| | [0.012] | [0.012] | [0.012] | [0.012] | [0.016] |
| ROA | 0.245 | 0.140 | 0.032 | 0.050 | -0.154 |
| | [0.441] | [0.395] | [0.392] | [0.409] | [0.523] |
| SalesGrow | -0.192* | -0.023 | -0.027 | -0.034 | -0.01 |
| | [0.104] | [0.084] | [0.083] | [0.084] | [0.116] |
| Age | -0.009 | -0.005 | -0.005 | -0.005 | -0.011 |
| | [0.010] | [0.010] | [0.010] | [0.010] | [0.012] |
| December | 0.009 | -0.183 | -0.237 | -0.234 | -0.226 |
| | [0.305] | [0.293] | [0.289] | [0.289] | [0.367] |
| Segments | 0.158* | 0.113 | 0.121 | 0.118 | 0.160* |
| | [0.087] | [0.076] | [0.074] | [0.074] | [0.092] |
| Constant | -4.236*** | -4.126*** | -3.721*** | -3.719*** | -3.273*** |
| | [0.711] | [0.657] | [0.618] | [0.607] | [0.815] |
| Observations | 4,279 | 5,019 | 5,019 | 5,019 | 3,252 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.679 | 0.684 | 0.667 | 0.665 | 0.692 |
| AUC without AQ measure | 0.659 | 0.665 | 0.665 | 0.665 | 0.685 |
| *P*-value of Chi-sq test for AUC difference | 0.042 | 0.090 | 0.274 | 0.892 | 0.102 |
| Pseudo $R^2$ | 0.046 | 0.057 | 0.041 | 0.041 | 0.053 |

**Panel B: Input-based and other measures of audit quality**

| | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|
| *DV: Indep* | *BigN* | *Audit Fee Ratio* | *Audit Fee City Ratio* | *Tenure* | *New Client* | *Top 20 City* | *Auditor Firm Diff* | *City Specialist* | *Industry Specialist* |
| AQ Measure | -0.585 | -1.312** | 0.577 | 0.020 | -0.148 | 0.370 | 0.362 | -0.392 | 0.016 |
| | [0.387] | [0.572] | [0.586] | [0.020] | [0.235] | [0.336] | [0.331] | [0.279] | [0.288] |
| LogAT | 0.130 | 0.009 | 0.039 | 0.085 | 0.091 | 0.046 | 0.048 | 0.074 | 0.062 |
| | [0.082] | [0.110] | [0.106] | [0.084] | [0.084] | [0.101] | [0.101] | [0.103] | [0.103] |
| Leverage | 0.201 | 0.734 | 0.495 | 0.258 | 0.258 | 0.342 | 0.340 | 0.374 | 0.380 |
| | [0.481] | [0.548] | [0.562] | [0.479] | [0.478] | [0.547] | [0.555] | [0.552] | [0.558] |
| Loss | -0.512** | -0.731** | -0.689** | -0.527** | -0.527** | -0.700** | -0.698** | -0.725** | -0.721** |
| | [0.228] | [0.320] | [0.333] | [0.226] | [0.226] | [0.291] | [0.294] | [0.290] | [0.289] |
| AssetTurnover | -0.241 | -0.499 | -0.492 | -0.271 | -0.259 | -0.513 | -0.515* | -0.485 | -0.525* |
| | [0.215] | [0.333] | [0.325] | [0.227] | [0.226] | [0.313] | [0.311] | [0.311] | [0.317] |
| M2B | 0.054*** | 0.044*** | 0.046*** | 0.052*** | 0.053*** | 0.041*** | 0.041*** | 0.042*** | 0.042*** |
| | [0.012] | [0.017] | [0.016] | [0.012] | [0.012] | [0.015] | [0.015] | [0.015] | [0.016] |
| ROA | 0.082 | 0.069 | -0.011 | 0.065 | 0.062 | -0.014 | -0.029 | -0.055 | -0.032 |
| | [0.398] | [0.564] | [0.575] | [0.409] | [0.408] | [0.532] | [0.533] | [0.530] | [0.534] |
| SalesGrow | -0.032 | 0.042 | 0.076 | -0.020 | -0.030 | -0.002 | 0.002 | -0.008 | -0.006 |
| | [0.082] | [0.128] | [0.116] | [0.082] | [0.083] | [0.111] | [0.111] | [0.114] | [0.114] |
| Age | -0.004 | -0.018 | -0.016 | -0.009 | -0.005 | -0.01 | -0.011 | -0.01 | -0.011 |
| | [0.010] | [0.013] | [0.013] | [0.011] | [0.010] | [0.012] | [0.012] | [0.011] | [0.012] |
| December | -0.236 | -0.381 | -0.403 | -0.231 | -0.233 | -0.236 | -0.22 | -0.225 | -0.249 |
| | [0.290] | [0.378] | [0.384] | [0.288] | [0.290] | [0.364] | [0.361] | [0.366] | [0.369] |
| Segments | 0.107 | 0.178* | 0.168* | 0.122 | 0.119 | 0.176* | 0.171* | 0.173* | 0.159* |
| | [0.074] | [0.104] | [0.100] | [0.075] | [0.074] | [0.094] | [0.093] | [0.094] | [0.093] |
| Constant | -3.474*** | -2.130** | -3.179*** | -3.748*** | -3.718*** | -3.361*** | -3.371*** | -3.347*** | -3.334*** |
| | [0.637] | [0.956] | [0.834] | [0.617] | [0.618] | [0.812] | [0.812] | [0.805] | [0.802] |
| Observations | 5,019 | 2,798 | 2,798 | 5,019 | 5,019 | 3,236 | 3,236 | 3,236 | 3,236 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.676 | 0.696 | 0.687 | 0.667 | 0.666 | 0.681 | 0.684 | 0.69 | 0.683 |
| AUC without AQ measure | 0.665 | 0.680 | 0.68 | 0.665 | 0.665 | 0.683 | 0.683 | 0.683 | 0.683 |
| *P*-value of Chi-sq test for AUC difference | 0.134 | 0.263 | 0.272 | 0.66 | 0.482 | 0.749 | 0.905 | 0.300 | 0.761 |
| Pseudo $R^2$ | 0.044 | 0.058 | 0.048 | 0.042 | 0.041 | 0.051 | 0.051 | 0.052 | 0.048 |

**Panel C: *P*-values of chi-squared tests comparing AUCs with AQ measure between models in panels A and B**

| *Models* | (1) Total Accruals | (2) Rstmt | (6) BigN | (8) Audit Fee City Ratio | (10) New Client | (13) City Specialist |
|---|---|---|---|---|---|---|
| **(2) Rstmt** | 0.738 | | | | | |
| **(6) BigN** | 0.451 | 0.539 | | | | |
| **(8) Audit Fee City Ratio** | 0.487 | 0.100 | 0.541 | | | |
| **(10) New Client** | 0.054 | 0.109 | 0.179 | 0.148 | | |
| **(13) City Specialist** | 0.884 | 0.075 | 0.872 | 0.656 | 0.283 | |
| **(14) Industry Specialist** | 0.713 | 0.016 | 0.674 | 0.142 | 0.522 | 0.310 |

**Table 9: Allegation of Failure to Obtain an Understanding of Internal Control**

This table presents the results of Model (1). The dependent variable equals 1 if there is an alleged violation of "failure to obtain an understanding of internal control" and 0 otherwise. Each column shows the regression results for a different audit quality measure, AQ Measure, shown at the top of each column. Panel A presents the regression results for output-based measures of audit quality. Panel B presents the regression results for input-based and other measures of audit quality. In Panel C, we report the *p*-values of chi-squared tests comparing the AUCs between models. AUCs with AQ measure are reported in Panels A and B. Variable definitions are provided in Appendix A. Coefficient estimates are in logit units. Standard errors are clustered at firm level. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Output-based measures of audit quality**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| ***DV: IntControl*** | ***Total Accruals*** | ***Rstmt*** | ***SmlProfit*** | ***SmlBeat*** | ***GC*** |
| AQ Measure | 1.170** | 1.121*** | -0.175 | -0.013 | -0.526 |
| | [0.530] | [0.202] | [0.242] | [0.161] | [0.563] |
| LogAT | 0.126 | 0.037 | 0.041 | 0.037 | -0.036 |
| | [0.088] | [0.072] | [0.070] | [0.071] | [0.083] |
| Leverage | 0.701* | 1.221*** | 1.124*** | 1.070** | 1.253** |
| | [0.404] | [0.428] | [0.420] | [0.422] | [0.489] |
| Loss | -0.570** | -0.595*** | -0.669*** | -0.591*** | -0.738*** |
| | [0.232] | [0.202] | [0.228] | [0.214] | [0.253] |
| AssetTurnover | -0.386* | -0.492** | -0.437** | -0.416* | -0.811*** |
| | [0.219] | [0.232] | [0.214] | [0.214] | [0.283] |
| M2B | 0.024* | 0.027* | 0.020 | 0.021 | 0.008 |
| | [0.013] | [0.014] | [0.013] | [0.013] | [0.018] |
| ROA | 0.187 | 0.349 | 0.238 | 0.263 | 0.418 |
| | [0.407] | [0.403] | [0.402] | [0.418] | [0.567] |
| SalesGrow | -0.101 | 0.074 | 0.053 | 0.05 | 0.092 |
| | [0.096] | [0.076] | [0.076] | [0.077] | [0.098] |
| Age | -0.009 | -0.006 | -0.006 | -0.006 | -0.007 |
| | [0.011] | [0.010] | [0.009] | [0.009] | [0.011] |
| December | -0.436* | -0.400* | -0.461* | -0.455* | -0.509* |
| | [0.261] | [0.242] | [0.239] | [0.240] | [0.276] |
| Segments | 0.058 | 0.078 | 0.092 | 0.088 | 0.049 |
| | [0.089] | [0.074] | [0.071] | [0.071] | [0.088] |
| Constant | -3.529*** | -3.736*** | -3.131*** | -3.146*** | -2.125*** |
| | [0.623] | [0.542] | [0.536] | [0.529] | [0.660] |
| Observations | 4,279 | 5,019 | 5,019 | 5,019 | 3,252 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.650 | 0.715 | 0.666 | 0.665 | 0.676 |
| AUC without AQ measure | 0.641 | 0.665 | 0.665 | 0.665 | 0.675 |
| *P*-value of Chi-sq test for AUC difference | 0.179 | <0.001 | 0.474 | 0.88 | 0.634 |
| Pseudo $R^2$ | 0.033 | 0.076 | 0.042 | 0.041 | 0.054 |

**Panel B: Input-based and other measures of audit quality**

| *DV: IntControl* | (6) *BigN* | (7) *Audit Fee Ratio* | (8) *Audit Fee City Ratio* | (9) *Tenure* | (10) *New Client* | (11) *Top 20 City* | (12) *Auditor Firm Diff* | (13) *City Specialist* | (14) *Industry Specialist* |
|---|---|---|---|---|---|---|---|---|---|
| AQ Measure | -0.278 | -1.383*** | 0.115 | 0.017 | -0.253 | 0.170 | 0.230 | -0.550** | -0.173 |
| | [0.358] | [0.426] | [0.674] | [0.020] | [0.260] | [0.325] | [0.322] | [0.258] | [0.243] |
| LogAT | 0.053 | -0.092 | -0.063 | 0.029 | 0.032 | -0.037 | -0.039 | -0.012 | -0.028 |
| | [0.070] | [0.089] | [0.090] | [0.069] | [0.070] | [0.083] | [0.084] | [0.082] | [0.083] |
| Leverage | 1.044** | 1.538*** | 1.342** | 1.073** | 1.080** | 1.164** | 1.160** | 1.165** | 1.175** |
| | [0.426] | [0.524] | [0.555] | [0.423] | [0.422] | [0.481] | [0.484] | [0.478] | [0.483] |
| Loss | -0.583*** | -0.692** | -0.650** | -0.591*** | -0.589*** | -0.733*** | -0.726*** | -0.739*** | -0.752*** |
| | [0.211] | [0.282] | [0.289] | [0.209] | [0.209] | [0.254] | [0.257] | [0.253] | [0.252] |
| AssetTurnover | -0.403* | -0.968*** | -0.946*** | -0.425** | -0.417* | -0.800*** | -0.799*** | -0.738*** | -0.807*** |
| | [0.211] | [0.313] | [0.310] | [0.215] | [0.215] | [0.281] | [0.280] | [0.278] | [0.280] |
| M2B | 0.022 | 0.024 | 0.025 | 0.020 | 0.021 | 0.008 | 0.007 | 0.008 | 0.007 |
| | [0.013] | [0.019] | [0.019] | [0.013] | [0.013] | [0.018] | [0.018] | [0.017] | [0.018] |
| ROA | 0.272 | 0.952 | 0.884 | 0.273 | 0.268 | 0.494 | 0.492 | 0.462 | 0.479 |
| | [0.409] | [0.809] | [0.814] | [0.416] | [0.416] | [0.565] | [0.567] | [0.567] | [0.563] |
| SalesGrow | 0.049 | 0.098 | 0.132 | 0.058 | 0.050 | 0.094 | 0.096 | 0.088 | 0.087 |
| | [0.075] | [0.110] | [0.102] | [0.075] | [0.076] | [0.097] | [0.096] | [0.097] | [0.098] |
| Age | -0.006 | -0.012 | -0.01 | -0.009 | -0.006 | -0.006 | -0.007 | -0.006 | -0.006 |
| | [0.009] | [0.013] | [0.012] | [0.011] | [0.009] | [0.011] | [0.011] | [0.011] | [0.011] |
| December | -0.453* | -0.638** | -0.656** | -0.452* | -0.455* | -0.523* | -0.509* | -0.497* | -0.525* |
| | [0.240] | [0.291] | [0.298] | [0.239] | [0.240] | [0.277] | [0.276] | [0.278] | [0.277] |
| Segments | 0.083 | 0.064 | 0.064 | 0.092 | 0.09 | 0.055 | 0.055 | 0.066 | 0.046 |
| | [0.072] | [0.100] | [0.101] | [0.072] | [0.072] | [0.090] | [0.089] | [0.090] | [0.089] |
| Constant | -3.021*** | -0.842 | -1.899*** | -3.161*** | -3.111*** | -2.147*** | -2.159*** | -2.192*** | -1.985*** |
| | [0.555] | [0.755] | [0.710] | [0.534] | [0.539] | [0.665] | [0.661] | [0.660] | [0.626] |
| Observations | 5,019 | 2,798 | 2,798 | 5,019 | 5,019 | 3,236 | 3,236 | 3,236 | 3,236 |
| Cluster by Firm | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC with AQ measure | 0.668 | 0.714 | 0.693 | 0.665 | 0.665 | 0.676 | 0.68 | 0.692 | 0.677 |
| AUC without AQ measure | 0.665 | 0.693 | 0.693 | 0.665 | 0.665 | 0.674 | 0.674 | 0.674 | 0.674 |
| *P*-value of Chi-sq test for AUC difference | 0.366 | 0.0442 | 0.933 | 0.966 | 0.907 | 0.59 | 0.173 | 0.060 | 0.278 |
| Pseudo $R^2$ | 0.042 | 0.075 | 0.061 | 0.042 | 0.042 | 0.053 | 0.053 | 0.059 | 0.052 |

**Panel C: *P*-values of chi-squared tests comparing AUCs with AQ measure between models in panels A and B**

| *Models* | (1) Total Accruals | (2) Rstmt | (6) BigN | (8) Audit Fee City Ratio | (10) New Client | (13) City Specialist |
|---|---|---|---|---|---|---|
| **(2) Rstmt** | 0.022 | | | | | |
| **(6) BigN** | 0.396 | <0.001 | | | | |
| **(8) Audit Fee City Ratio** | 0.198 | 0.007 | 0.203 | | | |
| **(10) New Client** | 0.161 | <0.001 | 0.513 | 0.187 | | |
| **(13) City Specialist** | 0.139 | 0.206 | 0.122 | 0.518 | 0.056 | |
| **(14) Industry Specialist** | 0.735 | 0.030 | 0.801 | 0.049 | 0.481 | 0.099 |

**Table 10: Predicting Top 6 Most Cited Audit Deficiencies Using All AQ Measures**

Panel A of this table presents the results of Model (1) when using combined regressions by including all audit quality measures. Variable definitions are provided in Appendix A. Standard errors are clustered at firm level. Model (5) does not include variables *GC* and *Industry Specialist*. This is because GC=1 and Industry Specialist=1 perfectly predicts independence violation. Consequently, Model (5) has a lower number of observations. Coefficient estimates are in logit units. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively. Panel B of this table reports AUC-related statistics.

**Panel A: Combined Regressions**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| ***DV*** | ***Evidence*** | ***DueCare*** | ***Opinion*** | ***Plan*** | ***Indep*** | ***IntControl*** |
| TotalAccruals | 0.735 | 0.626 | 1.290* | 0.385 | 0.627 | -0.088 |
| | [0.655] | [0.644] | [0.701] | [0.675] | [0.960] | [0.970] |
| Rstmt | 1.247*** | 1.426*** | 1.571*** | 1.003*** | 1.565*** | 1.754*** |
| | [0.285] | [0.302] | [0.362] | [0.300] | [0.446] | [0.406] |
| SmlProfit | -0.693** | -0.785** | -0.808** | -1.156*** | -1.153*** | -0.868** |
| | [0.294] | [0.329] | [0.319] | [0.407] | [0.395] | [0.340] |
| SmlBeat | 0.211 | 0.119 | 0.14 | 0.183 | -0.064 | 0.082 |
| | [0.182] | [0.187] | [0.182] | [0.205] | [0.260] | [0.230] |
| GC | -0.972 | -0.594 | -0.306 | -0.656 | | -1.31 |
| | [0.854] | [0.721] | [0.706] | [0.879] | | [1.160] |
| BigN | -1.566*** | -1.614*** | -0.467 | -1.569*** | -0.810 | -0.771 |
| | [0.438] | [0.447] | [0.493] | [0.490] | [0.661] | [0.563] |
| Audit Fee Ratio | -0.917** | -0.820* | -0.515 | -1.379*** | -1.517** | -1.630*** |
| | [0.415] | [0.454] | [0.476] | [0.473] | [0.674] | [0.541] |
| Audit Fee City Ratio | 1.205 | 0.734 | 1.32 | 1.690** | 0.814 | 0.797 |
| | [0.764] | [0.648] | [0.863] | [0.730] | [0.712] | [0.875] |
| Tenure | 0.002 | -0.023 | 0.015 | -0.056** | 0.022 | 0.017 |
| | [0.027] | [0.025] | [0.030] | [0.027] | [0.032] | [0.028] |
| New Client | -1.090** | -0.961** | -0.438 | -1.252*** | -0.815 | -0.567 |
| | [0.439] | [0.391] | [0.392] | [0.409] | [0.550] | [0.409] |
| Top 20 City | 0.266 | 0.202 | -0.173 | 0.692* | -0.344 | -0.264 |
| | [0.349] | [0.381] | [0.368] | [0.384] | [0.514] | [0.438] |
| Auditor Firm Diff | 0.091 | 0.142 | 0.408 | 0.183 | 0.400 | 0.448 |
| | [0.357] | [0.370] | [0.358] | [0.399] | [0.500] | [0.394] |
| Industry Specialist | 1.322* | 1.165 | 1.231* | 1.627 | | 1.852* |
| | [0.741] | [0.724] | [0.743] | [1.000] | | [1.075] |
| City Specialist | -0.482* | -0.670*** | -0.985*** | -0.503* | -0.535 | -0.577* |
| | [0.248] | [0.258] | [0.286] | [0.278] | [0.365] | [0.320] |
| Constant | -2.055** | -2.795*** | -3.713*** | -1.76 | -2.682** | -3.381*** |
| | [1.027] | [1.011] | [1.052] | [1.215] | [1.182] | [1.263] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 2,389 | 2,389 | 2,389 | 2,389 | 2,202 | 2,389 |
| Cluster by Firm; Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| AUC | 0.799 | 0.787 | 0.794 | 0.826 | 0.786 | 0.805 |
| Pseudo $R^2$ | 0.155 | 0.142 | 0.146 | 0.182 | 0.140 | 0.154 |

**Panel B: AUC Statistics**

| | *Evidence* | *DueCare* | *Opinion* | *Plan* | *Indep* | *IntControl* |
|---|---|---|---|---|---|---|
| (1) AUC - Controls Only | 0.550 | 0.551 | 0.609 | 0.530 | 0.615 | 0.631 |
| (2) AUC - Controls and AQ Measures | 0.799 | 0.787 | 0.794 | 0.826 | 0.786 | 0.805 |
| (3) Chi-squared statistics comparing the equality of (1) and (2) | 80.02 | 58.54 | 31.52 | 91.17 | 15.34 | 15.20 |
| (4) *P*-value of Chi-squared test | <0.001 | <0.001 | <0.001 | <0.001 | 0.007 | <0.001 |
| (5) Incremental Explanatory Power Contributed by AQ Measures | 45.3% | 42.8% | 30.4% | 55.8% | 27.8% | 27.6% |

**Table 11: Seemingly Unrelated Regressions**

This table presents results for seemingly unrelated regressions that use the top six most cited audit violations as dependent variables. The independent variables include all the audit quality measures and control variables. To ensure the regressions are run efficiently, we randomly drop a control variable for each regression. We report one set of results for brevity. The omitted controls are reported at the bottom of the table. Variable definitions are provided in Appendix A. Standard errors are clustered at firm level. Coefficient estimates are in logit units. All continuous variables are winsorized at 1% and 99% levels. Associated *p*-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| ***DV*** | ***Evidence*** | ***DueCare*** | ***Opinion*** | ***Plan*** | ***Indep*** | ***IntControl*** |
| TotalAccruals | 0.724 | 0.612 | 1.193** | 0.245 | 0.680 | -.1650 |
| | [0.628] | [0.610] | [0.601] | [0.643] | [0.868] | [0.891] |
| Rstmt | 1.241*** | 1.430*** | 1.555*** | .948*** | 1.553*** | 1.756*** |
| | [0.200] | [0.219] | [0.243] | [0.213] | [0.302] | [0.282] |
| SmlProfit | -0.692** | -0.735** | -0.394 | -1.020** | -1.200*** | -0.888** |
| | [0.310] | [0.333] | [0.315] | [0.408] | [0.414] | [0.347] |
| SmlBeat | 0.220 | 0.111 | 0.0488 | 0.1856 | -0.088 | 0.051 |
| | [0.192] | [0.194] | [0.200] | [0.220] | [0.246] | [0.229] |
| GC | -1.020 | -0.433 | -0.303 | -0.468 | | -1.490 |
| | [0.694] | [0.582] | [0.573] | [0.657] | | [1.120] |
| BigN | -1.480*** | -1.580*** | -.0480 | -1.490*** | -0.767* | -0.785** |
| | [0.247] | [0.288] | [0.309] | [0.315] | [0.405] | [0.367] |
| Audit Fee Ratio | -0.945*** | -0.784** | -0.548 | -1.411*** | -1.502*** | -1.605*** |
| | [0.361] | [0.367] | [0.376] | [0.385] | [0.476] | [0.437] |
| Audit Fee City Ratio | 1.223*** | 0.7644* | 1.408*** | 1.625*** | 0.8325 | 0.8083 |
| | [0.421] | [0.439] | [0.447] | [0.403] | [0.520] | [0.572] |
| Tenure | 0.003 | -0.023 | 0.0177 | -0.054*** | 0.024 | 0.017 |
| | [0.017] | [0.018] | [0.018] | [0.021] | [0.021] | [0.018] |
| New Client | -1.082*** | -0.922** | -0.413 | -1.217*** | -0.834 | -0.568 |
| | [0.413] | [0.383] | [0.387] | [0.420] | [0.561] | [0.466] |
| Top 20 City | 0.276 | 0.226 | -0.142 | 0.721*** | -0.362 | -0.264 |
| | [0.216] | [0.229] | [0.220] | [0.246] | [0.319] | [0.269] |
| Auditor Firm Diff | 0.092 | 0.142 | 0.400* | 0.086 | 0.418 | 0.453* |
| | [0.218] | [0.225] | [0.212] | [0.247] | [0.300] | [0.238] |
| Industry Specialist | 1.299* | 1.195 | 1.272* | 1.633 | | 1.865* |
| | [0.758] | [0.752] | [0.754] | [1.019] | | [1.081] |
| City Specialist | -0.462** | -0.657*** | -0.966*** | -0.563*** | -0.506** | -0.579** |
| | [0.189] | [0.201] | [0.226] | [0.219] | [0.251] | [0.243] |
| Observations | 2,389 | 2,389 | 2,389 | 2,389 | 2,202 | 2,389 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Control Omitted | LogAT | Leverage | Loss | AssetTurnover | M2B | ROA |