Measuring Audit Quality

Shivaram Rajgopal
Roy Bernard Kester and T.W. Byrnes Professor of
Accounting and Auditing
Columbia Business School
Columbia University
sr3269@columbia.edu

Suraj Srinivasan
Philip J. Stomberg Professor of Business
Administration
Harvard Business School
Harvard University
ssrinivasan@hbs.edu

Xin Zheng
Assistant Professor
Sauder School of Business
University of British Columbia
xin.zheng@sauder.ubc.ca

August 2018

Abstract:

This study first provides detailed descriptive analyses on 45 specific audit deficiency allegations based on GAAS as detailed in AAERs and securities class action lawsuits over the violation years 1978-2015, and then uses these allegations to validate existing popular proxies of audit quality. Of all the audit quality proxies, we find that restatement fares the best as it consistently predicts all the top six most cited audit violations. Additionally, audit fees to total fees ratio and city specialist predict five of the most cited violations. Overall, our results suggest that the predictive power of audit quality proxies depends on the settings that researchers are interested in, and on the specific audit violations hypothesized to matter in the investigated setting. For example, for future studies related to auditor independence, we recommend the use of restatement and audit fees to total fees ratio as proxies of audit quality.

Measuring Audit Quality

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., discretionary accruals), (ii) input-based audit quality measures (e.g., audit fees), and (iii) other audit quality measures. These measures are relatively easy to compute from machine readable databases. However, there is little evidence on the descriptive accuracy of these measures or on the construct validity of these proxies. In this paper, we aim to achieve two objectives. First, we provide detailed descriptive analyses on 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 non-dismissed securities class action lawsuits filed against auditors (both audit firms and individual audit partners).

Any discussion of the proxies of audit quality has to grapple with the difficulty associated with defining audit quality. The two most cited definitions of audit quality 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 et al. (2016) suggests that individual investors value auditor competence as indicative of high audit quality whereas audit professionals view compliance with audit 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 (2014)'s definition arguably incorporates both the auditor's detection of errors and compliance with auditing standards.

We believe that audit defects in specific engagements alleged by the SEC or private law firms are consistent with all the three definitions of audit quality in that (i) lawyers allege that auditors did not discover and/or report breaches in the client's accounting system (the DeAngelo definition); (ii) such alleged defects are bound to affect high 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 is also consistent with calls by Donovan et al. (2014) to incorporate "the institutional features of the audit process into the definition of audit quality."

We provide three sets of empirical analyses to evaluate how well the extant proxies capture actual audit deficiencies. We begin with a detailed description of alleged deficiencies on audits of (i) 141 companies identified by the SEC over the years 1985-2016; and (ii) 153 companies identified as deficient by securities class action lawyers over the years 1996- 2016. To eliminate frivolous allegations, we only focus on lawsuits that were not subsequently dismissed. Because the rest of the lawsuits are invariably settled, we cannot ascertain whether these 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 SEC's AAERs is less likely to suffer from this limitation. Our sample is also subject to selection issues if the SEC is the 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 is interesting because it provides the first granular perspectives into audit quality deficiencies at the audit engagement level based on what the SEC and private lawyers actually do rather than relying on aggregate and arguably indirect measures of audit quality that researchers have been constrained to use to date.

Based on the GAAS framework for general, fieldwork, and reporting standards, we classify audit deficiencies into seven categories: (i) bogus audit; (ii) issues with engagement acceptance, (iii) violation of general standards; (iv) three specific violations of GAAS standards on fieldwork including, (a) deficiencies in audit planning; (b) insufficient competent evidence; and (c) understanding internal controls; and (v) a violation of the GAAS standard on reporting. Within each of 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 allegations in detail, we assess how well the extant proxies of audit quality predict the top six alleged violations individually. The difficulty of such task is to separate audit quality from financial reporting quality. We use litigations against auditors

---

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

as our treatment sample, and litigations against managers and firms but not auditors as our control sample. Given that audit quality is unobservable, we believe our control sample serves as a good counterfactual because the control sample experienced poor financial quality but not audit quality. We find that restatement consistently and positively predicts each of the six alleged audit deficiencies. This finding indicates that restatements are associated with lower audit quality. Two input-based measures seem to also fare well. City specialist negatively predicts five out of the top six deficiencies, suggesting that city-specific industry specialists provide higher audit quality. Audit fees to total fees ratio negatively predict four out of the top six deficiencies. This indicates that higher audit fees ratio signals higher audit quality.

Lastly, we include all audit quality measures in a combined regression to predict each of the top six alleged audit deficiencies in AAERs and lawsuits. We find that restatement consistently predicts all of the top 6 most cited audit deficiencies. Audit fees to total fees ratio is negatively associated with five alleged audit violations. The relation between audit fees and audit deficiencies is bi-directional. On the one hand, if audit fees suggest the need for greater audit effort in the case of risky clients, we would expect a negative association between audit fees and alleged audit violations. One the other hand, more fees could proxy for cover against expected litigation risk 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 and ambiguous. Results in our study suggest that audit fees is more likely to be a proxy for auditor effort in litigation settings. Additionally, city specialist is also negatively associated with five allegations. This suggests that city-specific industry specialists provide higher audit quality. Contrary to our prediction, we observe that firms with small profits are less likely to violate all of the top six alleged audit violations.

Taken together, our results can be summarized as follows. First, restatement seems to be the best audit quality proxy as it consistently predicts all top six most cited audit deficiencies. Second, the predictive power of audit quality proxies is violation and setting specific. For example, if a researcher is interested in predicting evidence violation by auditors, he/she should consider using the discretionary accruals, restatement, Big N auditor, audit fees to total fees ratio, new client, or city specialist as audit quality proxies. If predicting independence violation is of interests, researchers should consider using restatement or audit fees to total fees ratio as audit quality proxies. If a researcher is interested in predicting internal control violation, the researcher should consider using restatement, audit fees to total fees ratio, discretionary accruals, industry specialist, or city specialist as audit quality proxies.

Our paper follows a long tradition of work designed to test the construct validity of machine-readable measures of earnings management (Dechow et al. 1995; Dechow et al. 2011) or of litigation risk (Kim and Skinner 2011). 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. St. Pierre and Anderson (1984) describe audit defects found in 129 lawsuits against accountants in the 60's and 70's but this classification predates much of GAAS. Beasley et al. (1999, 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 period 1987-1997 and 1998-2010. Our sample is more comprehensive in that we also cover 153 non-dismissed 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.

Second, unlike Beasley et al. (1999 and 2013), we evaluate whether widely used models of audit quality predict these detailed deficiencies. This is an important task given the ubiquity of the standard proxies of audit quality in the literature. In a recent paper Aobdia (2017) conducts a similar validation of audit quality proxies benchmarked against a proprietary list of poor quality audits identified by PCAOB inspections. Our paper complements Aobdia's (2017) work in that our findings are equally skeptical of the descriptive validity of audit quality proxies (except perhaps for restatements). We differ from Aobdia (2017) in that (i) we rely on a publicly available, albeit smaller, data set of alleged audit defects covering a longer time 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.

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

2.0 Previous research and our setting

2.1 Previous work on audit quality proxies

A large body of accounting research investigates the drivers and consequences of audit quality. The more commonly used proxies for audit quality can be categorized into input-based proxies and output-based proxies (DeFond and Zhang 2014). Output based measures typically cover (i) material restatements, preferably initiated by the auditor; and SEC AAERs; (ii) going concern opinions; (iii) financial reporting characteristics such as the use of signed or absolute discretionary accruals, the Dechow-Dichev (2002) measure of earnings quality or Basu's timely

loss recognition measure (Basu 1997), or the firm's tendency to meet or beat quarterly analyst consensus estimates of earnings; and finally (iv) 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 or not the company is audited by a Big N auditor (DeFond et al. 2014). The intuition is that Big N auditors provide a higher quality audit. Given their scale, Big N auditors have access to better resources related to technology, training, and facilities (Chaney et al. 2004; Craswell et al. 1995; Francis et al. 1999; Khurana and Raman 2004). Big N auditors are thought to be more independent than smaller audit firms because they (i) suffer greater reputational risk should they be negligent; (ii) rely less on an individual client's revenues and are hence less likely to be swayed by an individual client; and (iii) their larger revenue base exposes them to higher litigation risk (Palmrose 1988; Stice 1991; Bonner et al. 1998; Skinner and Srinivasan 2012; Koh et al. 2013; DeFond and Zhang 2014). However, the Big N variable is an indicator variable that lacks nuance because it is not an engagement specific measure.

Audit fees proxy for the level of effort the auditor puts into scrutinizing a client. Fees capture both demand and supply factors associated with audits. Some researchers have also used the proportion of audit fees to non-audit fees as a proxy for their independence (Frankel et al. 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. Abnormal audit fees can also serve as price protection for expected litigation risk (e.g., Seetharaman et al. 2002) or even proxy for lack of independence (e.g., Kinney et al.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 the firm's reporting quality (Dichev et al. 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 also 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 non-disclosure of identified misstatements (Srinivasan et al. 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 (Kothari, Leone, and Wasley 2005; Dietrich, Muller, and Riedl 2007; Patatoukas and Thomas 2011; Ball, Kothari, and Nikolaev 2013). 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 of audit quality.

We focus on validating three sets of audit quality proxies that are commonly used in the literature: output-based proxies, input-based proxies, and other proxies. We describe each of the proxies in detail in section 4.

2.2 Our setting

We focus on SEC's AAERs and class action lawsuits against auditors to identify detailed data on deficiencies in the audit of particular 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 alerts interested parties to search for material errors in the financial statements of that firm and the auditor's role in either failing to discover or report these errors to investors. Our setting, comprising of AAERs and auditor lawsuits, has a number of advantages and disadvantages. The SEC has the power to demand disclosure of non-public 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., Weick 1969; Bealing 1994; Zheng 2017), it is less likely to allege audit inadequacies unless it can establish guilt with a high degree of assurance. The United States is unique among much of the developed world in that public enforcement of audits is supplemented by the possibility of private class action litigation against auditors. That is, investors can use securities class action lawsuits to protect their rights and hold auditors accounTable 6or violations of securities laws resulting from negligent audits. However, in the litigation process, the plaintiff bears the burden to establish 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 class action lawyers are more likely to have identified wrong-doing when it actually occurred.

The other consideration that deserves discussion is the time period over which lawsuit data has been gathered: 1996 - 2016. This period starts after the passage of the Private Securities Litigation Reform Act (PSLRA). Coffee (2002), in particular, has argued that PSLRA made it

more difficult for class action plaintiffs to sue 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 automatically raises the bar for litigating against audit firms, who are a step removed from management, which presumably orchestrates frauds. Hence, the allegations documented in the class action suits against auditors arguably represent (i) a lower bound on such cases, if these restrictions were not in force; 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 any guidelines that the SEC follows in picking cases and how it implements those guidelines 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 2015). Moreover, most of the allegations leveled by the SEC are usually neither contested nor accepted by the audit firms as the cases are settled, not necessarily won, by the SEC. Hence, we cannot assert that the SEC's allegations are truly violations.

Class action lawsuits are more likely to be filed against Big N auditors because they have deep pockets (e.g., Arthur Andersen et al. 1992). Although we delete dismissed cases, the remaining cases against auditors almost never go to trial as they are settled out of court. 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 a hitherto under-discussed perspective on granular deficiencies in

audit quality at the engagement level. Hence, these deserve to be documented and analyzed. Furthermore, it is useful to ascertain how well the popular measures of audit quality in the literature line up with these granular deficiencies. We now turn to that task.

3.0 Data

3.1 Sample selection

Our sample is drawn from two sources: SEC's AAERs and non-dismissed securities litigation against auditors. We identify enforcement actions against auditors using the AAER dataset discussed in Dechow et al. (2011). As reported in 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; [2] (iii) 10 missing AAER files from the SEC's website; (iv) 10 redundant cases; and (v) one AAER with insufficient details to enable coding audit deficiencies. We download these 141 AAERs against auditors between 1985 and 2016 from the SEC's website (http://www.sec.gov/divisions/enforce/friactions.shtml). Although the detailed descriptive data on the allegations reported in Table 2 are based on these 141 AAERs, only a maximum of 65 AAERs, or the equivalent of 149 firm-years related to the violation period during which the faulty audit was conducted, are available for use in the regressions reported in Tables 2 - 10. The primary culprit is the unavailability of data related to several control variables on CRSP and COMPUSTAT.

---

[2] Some of these cases were 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.

As reported in Table 1, we obtained 293 non-dismissed lawsuits against auditors 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;[3] (ii) 33 cases where the lawsuit complaint could not be found; (iii) 25 cases where the allegations were too vague to code;[4] (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 comprising 390 firm-years representing the class period where faulty audits are alleged by the plaintiffs.

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 data for the sample. More importantly, 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 is to 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; (iii) due professional care is to be exercised in the

---

[3] This could mean one of two things: (i) there could be data errors in the ISS database, or (ii) the lawsuit against the auditor could be filed separately. Regardless, we exclude cases where auditor's name does not appear on the complaint.

[4] 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 certain GAAS standard." We exclude cases where no concrete violations of auditing standards are alleged.

performance of the audit and the preparation of the report. The standards of field work require

that (i) the work is to be adequately planned and assistants, if any, are to be properly supervised;

(ii) a sufficient understanding of internal control is to be obtained to plan the audit and to determine

the nature, timing, and extent of tests to be performed; (iii) sufficient competent evidential matter

is to 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 therefore should be stated. In all cases where an auditor's name is

associated with financial statements, the report should contain a clear-cut indication of 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 by audit area: (i) bogus audit; (ii) issues

with engagement acceptance, (iii) violation of GAAS; (iv) three specific violations of GAAS

standard on fieldwork including (a) deficiencies in audit planning; (b) insufficient competent

evidence; and (c) understanding internal controls; and (v) 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 under each of these broad categories. It is hard for us to

comment on which of these violations is considered more severe. We suspect that the importance

of specific violations is specific 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 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 (2, 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 entity's going concern status (G1). Because these data have not received a lot of academic attention, we turn to a somewhat detailed discussion of the more frequently cited deficiencies.

3.2 Most frequently cited deficiencies

In this section, we briefly discuss the ten most frequently observed categories of deficiencies in our data: (i) 200 instances of failure to gather sufficient competent audit evidence (violation of the fieldwork standard, row E2 in Table 2); (ii) 177 cases of failure to exercise due professional care (violation of the general GAAS standard, row C3); (iii) 156 instances of failure to express an appropriate audit opinion (violation of the reporting standard, row G5); (iv) 126 instances of inadequate planning and supervision (violation of the audit planning standard, row D1); (v) 122 cases of lack of independence from the client (violation of the general GAAS

standards, row C2); (vi) 106 instances of failure to obtain an understanding of internal control (violation of the fieldwork standard, row F2); (vii) 93 cases of insufficient level of professional skepticism (violation of general GAAS standard, row C4); (viii) 91 cases of failure to faithfully state whether the financial statements are presented in accordance with GAAP (violation of the reporting standard, row G3); (ix) 70 cases of failure to evaluate the adequacy of disclosure (violation of the reporting standard, row G6); and (x) 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 sub-sections.

3.3 Failure to gather sufficient competent audit evidence

Several cases in this category accuse the auditor of relying too much on management's representations without verifying the evidence underlying these representations. Some cases allege that the auditor did not even obtain management representation before signing off on the audit report. An illustrative example of the former type of allegation can be found in the lawsuit filed by class action lawyers of Worldcom's shareholders against Arthur Andersen: "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 non-reporting-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.' Anderson 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, December 2, 2003, p. 224)."

3.4 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 the matter related to the Gemstar's audit that "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." They go 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)."

16

3.5 Failure to express an appropriate audit opinion

Most of the allegations in this category relate to the auditor issuing an unqualified opinion on the financial statements despite alleged knowledge of the fraudulent accounting policies or schemes used. For instance, in the lawsuit against Seitel securities (In *re Seitel, Inc. Securities Litigation*, U.S. District Court, Southern District of Texas, December 6, 2002, p. 58), the lawyers allege, "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 Amandede Complaint, U.S. District Court, Southern District of New York, March 22, 2004, p. 331), the lawyers allege, "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."

3.6 Inadequate planning and supervision

As the title suggests, this category relates to deficient audit plans. In the SEC's 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)."

3.7 Lack of independence

These allegations relate to the absence of an independent mental 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 Amandede 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)."

3.8 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 lawyers state the following in the case related to Cellstar: "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 that 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)."

3.9 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 case 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)."

In the matter of Hollinger Inc, the lawyers allege, "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)."

3.10 Failure to faithfully state whether financial statements are in accordance with GAAP

In the class action lawsuit involving 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)."

3.11 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 the auditor's report (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 Arthocare, 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)."

3.12 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. Hangover 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)."

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

4.0 Research design and audit quality proxies

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 run for each of the audit violation. The top six most frequently cited audit deficiencies are presented in Appendix 2: (i) failure to gather sufficient competent audit evidence; (ii) failure to exercise due professional care; (iii) failure to express an appropriate audit opinion; (iv) inadequate planning and supervision; (v) lack of independence from the client; and the (vi) failure to obtain an understanding of internal control.

We run model (1) using a treatment and control sample defined as the following. We construct our treatment sample as firm-years with securities class action lawsuits or AAERs against auditors. We define our control sample as firm-years with class action lawsuits or AAERs, but these lawsuits or AAERs are not against auditors. We believe that our control sample provides a good counterfactual with financial misconducts that were not related to auditors.

We validate 16 commonly-used audit quality measures. Following DeFond and Zhang (2014), we further categorize them into two groups: (1) output-based measures of audit quality, and (2) input-based and other measures of audit quality.

Output-based measures of audit quality include *DA*, *AbsDA*, *Total Accrual*s, *Rstmt*, *SmlProfit*, *SmlBeat*, and *GC*. Discretionary accruals, *DA*, is a commonly used measure of audit quality. We estimate *DA* using the cross-sectional modified Jones model, following prior literature (e.g., Jones 1991; Dechow et al. 1995; Kothari et al. 2005; Reichelt and Wang 2010; DeFond and Zhang 2014). We subtract the derived non-discretionary accruals from accruals to obtain signed

discretionary accruals. *AbsDA* is the absolute value of *DA*. Total accruals, *Total Accrual*s, is calculated as earnings before extraordinary items minus net cash flow from operations excluding extraordinary items and discontinued operations. As suggested by prior literature that discretionary accruals and total accruals are negatively associated with audit quality (e.g., Becker et al., 1998; Francis et al., 1999), we expect that firms with higher *DA*, *AbsDA*, or *Total Accrual*s are more likely to receive audit deficiency violations.

Rstmt is an indicator variable that equals one if the financial statements for the year are restated (e.g., Lobo and Zhao 2013). 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*). *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 one if the year-over-year change in ROA is less than 1%. Following the literature using 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*, is another indicator variable that equals one if the auditor issued a going concern opinion, 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 or not the company is audited by a Big N auditor (DeFond et al. 2014). The intuition is that Big N auditors provide higher quality audit. Given their scale, Big N auditors have access to better resources related to technology, training, and facilities (Chaney et al. 2004;

Craswell et al. 1995; Francis et al. 1999; Khurana and Raman 2004). Big N auditors are thought to be more independent than smaller audit firms because they (i) suffer greater reputational risk should they be negligent; (ii) rely less on an individual client's revenues and are hence less likely to be swayed by an individual client; and (iii) their larger revenue base exposes them to higher litigation risk (Palmrose 1988; Stice 1991; Bonner et al. 1998; Skinner and Srinivasan 2012; Koh et al. 2013; DeFond and Zhang 2014). However, the Big N variable is an indicator variable without much nuance because it is not an engagement specific measure. Based on existing literature, we expect Big N auditors are less likely to experience audit deficiency allegations (i.e., a negative coefficient on *BigN*).

A stream of literature uses audit fees related proxies to measure the auditor-client relation and auditor's litigation risk (e.g., Chaney et al. 2004; Dao et al. 2012; Francis et al. 2005; Fung et al. 2012; Gul and Goodwin 2010; Seetharaman et al. 2002). *Audit Fee Ratio* is audit fees divided by the sum of audit fees and non-audit fees for a given firm-year. Multiple forces can jointly determine audit fees (e.g., Simunic 1980). One stream of auditing literature views the audit fees to total fees ratio as a proxy for auditor's independence. The larger the ratio, the more independent the auditor (e.g., Frankel et al. 2002; Reynolds et al. 2004; Francis and Ke 2006). On the other hand, a few studies found no results using audit fees to total fees ratio as proxy for audit quality (e.g., Ashbaugh et al. 2003; DeFond et al. 2002). Therefore, we also 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 headquartered 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

25

to compromise their independence and conform to client's requests when conducting audits for more important client (i.e., a positive coefficient on *Audit Fee City Ratio*).

We use two input-based measures to capture auditor-client relationships. They are *Tenure* and *New Client*. *Tenure* is the length in year of the auditor-firm relation. Extant research shows conflicting results when investigating the relations between auditor tenure and audit quality. On one hand, some research shows that auditor tenure is associated with higher audit quality (e.g., Geiger and Raghunandan 2002; Johnson et al. 2002; Myers et al. 2003). On the other hand, Davis, Soo, and Trompeter (2009) find that longer auditor tenure can be associated with deteriorated audit quality. Following prior literature suggesting that longer auditor-firm relation can reduce auditor's 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 which signals whether or not the auditor-firm relationship is in its first year. Following the literature suggesting longer auditor tenure improves audit quality and financial reporting quality (e.g., Geiger and Raghunandan 2002; Johnson et al. 2002; Myers et al. 2003), one can expect that the newly establish auditor-client relationship may lead to deteriorated audit quality, as it takes time for the auditor to learn about its client's business operation. Alternatively, a firm's new auditor mays put in more effort into the audit to avoid potential litigation risk in the first year audit of the firm. Given the conflicting arguments on the first-year auditor-client relationship, we make no directional prediction on *New Client*.

Motivated by a recent stream of literature focusing on the city level characteristics of auditors (e.g., Ferguson et al. 2003; Francis et al. 2005), we create the following 3 city level measures. *Top 20 City* is an indicator variable that equals to one if the firm's headquarter city is one of the largest 20 cities in the U.S. If the firm's headquartered city is the same city as its

auditor's office, then the indicator variable, *Auditor Firm Diff*, takes the value of one. We use *City Specialist* to measure the auditor's office size in a city, following Francis and Yu (2009). *City Specialist* equals one 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. Since larger offices provide higher quality audits, we expect *City Specialist* to be negatively associated with audit deficiencies. Lastly, we create an indicator variable, *Industry Specialist*, which equals one if equals to one 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 an auditor has an annual market share greater than 50% in an industry, based on the two-digit SIC code in the city audit market.

Similar to prior literature (e.g., DeFond and Zhang 2014), we control for Big N auditor (*Big4*), size (*LogAT*), leverage (*Leverage*), the presence of a reported loss (*Loss*), the firm's asset turnover (*AssetTurnover*), book-to-market ratio (*B2M*), return on assets (*ROA*), growth (*SalesGrow*), the firm's age (*Age*), and firms with December fiscal year-end (*December*). *Big4* is an indicator variable that equals one if a firm's auditor is one of the big N auditor. *LogAT* is the natural log of the firm's total assets. *Leverage* is total liability divided by total assets. We create an indicator variable, *Loss*, to signal 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 Compustat annual file. We also include an indicator variable, *December*, which equals to one if the firm's fiscal year ends in December.

5.0 Results

5.1 Descriptive statistics

Table 3 provides descriptive statistics on the variables used in the regressions in Table 4. Due to data availability, sample size varies for specific regressions. For example, there are 344 treatment observations and 3935 control observations in accrual quality related regressions (i.e., regressions (1), (2), and (3) in Panel A of Table 4). The sample size drops to 246 treatment observations and 2552 control observations for audit fees related regressions (i.e., regressions (2), and (3) in Panel B of Table 4) because most audit fees related variables in Audit Analytics become available after 2000.

The descriptive statistics presented in Table 3 shows that treatment sample has higher signed and absolute value discretionary accruals (*DA* and *AbsDA*), while total accruals are similar. Additionally, treatment sample has higher restatement rates (*Rstmt*), lower loss number of loss firms (*Loss*), higher market-to-book ratio (*M2B)*, lower ROA (*ROA*), and slower growth rate (*SalesGrow*). The auditors for firms in the treatment sample are less likely to be Big N auditor (*BigN*) and less likely to be industry specialist (*Industry Specialist*) in comparison to auditors for firms in the control sample. Interestingly, only about 3% of the treatment sample received going concern opinion, which is lower than the percentage of firms in the control sample that received going concern opinion (5%). This low rate is consistent with observations in prior literature.

5.2 Predicting sufficient competent audit evidence allegation

Table 4 presents the results of predicting the sufficient competent audit evidence allegation. Out of the seven output-based audit quality measures in Panel A, *DA*, *AbsDA*, and *Rstmt* load positively and significantly. These results suggest that firm years with higher discretionary

accruals (both signed and unsigned) and restatements are more likely to be associated with alleged evidence violation. In Panel B, we present the results for input-based and other measures of audit quality. The coefficient of *BigN* is negative and significant (-0.864), which suggest that Big N auditors are less likely to experience the audit evidence allegation. This is consistent with prior research finding that Big N auditors provide better audit quality in comparison to non-Big N auditors. *Audit Fee City Ratio* has a positive and significant coefficient (1.059), consistent with our expectation. This finding indicates that auditors are more likely to experience evidence allegation and compromise audit quality when conducting audits for more important clients. Perhaps auditor's independence can be compromised when auditing more important clients. Lastly, the negative and significant coefficient of *City Specialist* (-0.463) in Panel B indicates that if the auditor has the largest market share in a city, then its clients are less likely to experience evidence violation. This is consistent with research finding that larger audit offices provide higher audit quality (Francis and Yu, 2009).

5.3 Predicting the due professional care allegation

Table 5 reports the results of predicting due professional care allegation. Similarly, *DA*, *AbsDA*, and *Rstmt* are positively associated with due professional care allegation, per Panel A of Table 5. Consistent with our expectation, *BigN* in Column (1) of Panel B is negatively and significantly associated with due professional care allegation. This result suggests that Big N auditors are associated with lower likelihood of due professional care violation, consistent with prior observations that Big N auditors provide higher audit quality (e.g., Lawrence et al. 2011). The coefficient of *Audit Fee City Ratio* is positive and marginally significant, which suggests that auditors are more likely to experience due professional care when auditing more important clients. The negative and significant coefficient of *City Specialist* (-0.746) indicates that auditors with the

29

largest market share in a city are less likely to violate due professional care standard. Perhaps these auditors care more about their reputation and provide better audit quality.

5.4 Predicting failure to express an appropriate audit opinion allegation

Consistent with our expectation that higher discretionary accruals signal lower audit quality, *DA* and *AbsDA* in Panel A of Table 6 are positively and significantly associated with the allegation that the auditor failed to express an appropriate audit opinion (coefficients of 0.087 and 0.077 in Columns (1) and (2)). The positive and significant coefficient of *Rstmt* (1.064) suggests that firm years with restatements are more likely to be associated with appropriate audit opinion violation.

Turning to Panel B of Table 6, *Audit Fee Ratio* has a negative and marginally significant coefficient of -0.721. This suggests that higher audit fees to total fees ratio is correlated with lower likelihood of appropriate audit opinion violation. The negative and significant coefficient for *City Specialist* implies that city-specific industry specialists are less likely to experience appropriate audit opinion violation, as they provide higher audit quality.

5.5 Predicting inadequate planning and supervision allegation

Table 7 reports the results predicting inadequate planning and supervision allegation. In Panel A, *Rstmt* loads positively and significantly, implying that firms with restated financial statements are more likely to experience inadequate planning and supervision violation.

Big N has a negative and significant coefficient (-1.104) in Panel B. This implies that Big N auditors are less likely to experience inadequate planning and supervision violation. The negative and significant coefficient of *Audit Fee Ratio* (-0.755) suggests that higher audit fees to total fees ratio is associated with lower likelihood that the auditor will experience the inadequate planning and supervision allegation. This is consistent with prior research on audit fees ratio

suggesting that lower audit fees in proportion to total fees is associated with lower audit quality, as auditor's independence may be impaired (e.g., Frankel et al. 2002; Reynolds et al. 2004).

Audit Fee City Ratio has a statistically significant coefficient of 1.456, suggesting that auditors are more likely to have inadequate planning and supervision violation for more important clients. The coefficient for *City Specialist* (-0.624) in Column (8) of Panel B implies that larger auditor offices are associated with lower likelihood of inadequate planning and supervision violation. Lastly, the positive coefficient of *Top 20 City* suggests that firms in the Top 20 largest U.S. cities are more likely to experience inadequate planning and supervision problem.

5.6 Predicting independence allegation

Table 8 includes the results predicting independence violation. In Panel A, *Rstmt* has a positive and significant coefficient of 0.714, suggesting 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 -1.296, indicating that higher audit fees to total fees ratio is associated with lower likelihood of independence violation. This is consistent with prior findings that higher audit fees to total ratios indicate higher audit quality (e.g., Frankel et al. 2002; Reynolds et al. 2004).

5.7 Predicting inadequate understanding of internal control allegation

Results in Panel A of Table 9 suggests that *Rstmt* predicts internal control allegation positively. The negative and significant coefficient of *Audit Fee Ratio* in Column (2) of Panel B suggests that higher audit fees to total fees ratio are correlated with lower likelihood of internal control violation. *City Specialist* in Column (8) of Panel B has a negative and significant coefficient (-0.565). This finding suggest that city-specific industry specialists provide better internal control quality in audits.

5.8 Combined Regressions

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 in place. Out of all the audit quality proxies, *Rstmt* is positively and significantly associated with all six audit deficiencies. This is consistent with our expectation that firms with restatements are associated with lower audit quality. *SmlProfit* loads negatively and significantly in all six regressions, suggesting that less profitable firms are less likely to violate these auditing standards. This result, however, contradicts our expectation based on prior literature. Perhaps auditors for the less profitable firms are more aware of the potential litigation risks. Therefore, the auditors put more effort into the audit to reduce the litigation risks.

Audit Fee Ratio negatively predicts five violations, suggesting that lower audit fees to total fees ratio is associated with higher likelihood of these five audit deficiencies. Existing literature presents mixed results using audit fees to total fees ratio as a proxy for audit quality. For example, 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) find non-audit fees are not associated with the incidence of higher discretionary accruals. Out results contribute to the debate by showing that audit fees to total fees ratio proxies for audit quality in litigation settings. Additionally, *City Specialist* is negatively and significantly associated with five violations, which suggests that city-specific industry specialists provide higher audit quality (e.g., Reichelt and Wang, 2010).

DA has positive and significant coefficients in four out of six regressions. This indicates that firms with higher discretionary accruals are associated with higher likelihood of *Evidence*, *DueCare*, *Opinion*, and *IntControl* violations. *BigN* is negatively correlated with *Evidence*, *DueCare*, and *Plan*, suggesting that Big N auditors are less likely to experience those violations.

These findings are consistent with prior literature finding Big N auditors providing higher audit quality (e.g., Lawrence et al. 2011). *Audit Fee City Ratio* positively predicts *Evidence*, *Opinion*, and *Plan* violations. These findings suggest that auditors are more likely to experience *Evidence*, *Opinion*, or *Plan* allegation when conducting audits for more important clients in relation to other clients in the city. These findings also indicate that auditor's independence can be compromised when auditing more important clients. *New Client* negatively predicts three out of six audit violations. This suggests that if the auditor-client relation is in its first year, the auditor is less likely to experience violations of *Evidence*, *DueCare*, *Plan* and *Indep*. New auditors may be putting more effort into the first-year audit to reduce the potential litigation risk associated with the audit.

Industry Specialist is marginally and positively associated with *Evidence* and *IntControl* violations. These results imply that industry specialists are marginally more likely to violate these two auditing standards. Moreover, *Tenure* negatively predicts *Plan* violation; and *Top 20 City* positively predicts *Plan* violation.

We report area under the curve (AUC) as a measure of goodness of fit and predictive power of our models. AUC usually is between 0.5 and 1, which represents a variation between random models and perfectly predictive models. For example, regression (6) in Table 10 includes all audit quality proxies and control variables, and has an AUC of 0.803. We exclude audit quality proxies and use only control variables to re-run regression (6). In untabulated results, we find the AUC is 0.601. Including audit quality measures increases AUC from 0.601 to 0.803. This change of 0.202 is significant at 1% in an untabulated chi-square test. This also suggests that all audit quality measures have an incremental explanatory power of 40.4%, which is economically considerable.[5]

5.9 Robustness Check: Entropy Balancing

---

[5] Calculation: (0.803-0.601)/(1-0.5)*100%=40.4%.

One concern of our methodology could be covariate imbalance across treatment and control samples (i.e., differences in observables as shown in control variables). To address covariate imbalancing, we adopt the entropy balancing method (Hainmeller 2012). As shown in Panels A and B of Table 11, the means of the observables (i.e., control variables) become statistically indifferent after entropy balancing. This suggest that control variables are well balanced between treatment and control samples. We re-run all the regressions in Table 10 using the entropy balanced sample. Results remain similar. For example, *Rstmt*, *SmlProfit*, and *City Specialist* remain best predictors for all six violations.

5.10 Robustness Check: Seemingly Unrelated Regressions

One concern of our research design is that individual allegations may not be independent from each 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 by including all the audit quality proxies and controls as independent variables. Seemingly unrelated regressions account for the correlations among individual allegations by assuming the error terms in each regression are correlated (Zellner 1962). Table 12 presents results using seemingly unrelated regressions. Results in Table 12 are consistent with our main results in Table 10.

6.0 Conclusions

We provide evidence on the validity of output-based, input-base, and other proxies of audit quality that are commonly used in extant audit research. Our empirical strategy relies on identifying specific complaints related to the audits identified in SEC's AAERs and securities class action lawsuits filed against auditors over the violation years 1978-2015. Assuming these complaints drafted by the SEC and private lawyers capture fine-grained data on deficiencies in the

audit process, we examine the associations between audit quality proxies and the top six most cited audit deficiencies in AAERs and lawsuits.

We find that out of all the audit quality proxies validated in this study, restatement (*Rstmt*) is on the only proxy that consistently predicts all of the top six most cited audit violations. Additionally, audit fees to total fees ratio (*Audit Fee Ratio*) and city specialist (*City Specialist*) performs the second best and are predictive of five out of the top six audit violations. These results are consistent with prior research suggesting that higher audit fees to total fees ratio 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). Discretionary accruals (*DA*) is predictive of four out of the top six violations. Big N auditor (*BigN*), client importance in a city (*Audit Fee City Ratio*) and auditor-firm relationship (*New Client*) are predictive of three out of the top six violations. Auditor's industry specialty (*Industry Specialist*) is predictive of two violations. Auditor tenure (*Tenure*) and top cities (*Top 20 City*) are predictive of one violation.

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

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

References

Alexander, J. C. (1991). Do the merits matter? A study of settlements in securities class actions. *Stanford Law Review*, 497-598.

Aobdia, D. (2017). The validity of publicly available measures of audit quality: Evidence from the PCAOB inspection data. Available at SSRN: http://ssrn.com/abstract=2629305 or http://dx.doi.org/10.2139/ssrn.2629305

Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG Peat Marwick, and Price Waterhouse. 1992. The liability crisis in the United States: Impact on the accounting profession. *Journal of Accountancy* (November): 19–23.

Ashbaugh, H., LaFond, R., and Mayhew, B. W. (2003). Do nonaudit services compromise auditor independence? Further evidence. *The Accounting Review* 78(3), 611-639.

Ball, R., Kothari, S. P., and Nikolaev, V. V. (2012). On estimating conditional conservatism. *The Accounting Review* 88(3), 755-787.

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24(1): 3-37.

Bealing, W. E. (1994). Actions speak louder than words: An institutional perspective on the Securities and Exchange Commission. *Accounting, Organizations and Society*, 19– (7), 555–567.

Beasley, M. S., Carcello, J. V., and Hermanson, D. R. (1999). Fraudulent financial reporting: 1987-1997 an analysis of US public companies. *The Auditor's Report* 22(3), 15-17.

Beasley, M. S., Carcello, J. V., Hermanson, D. R., and Neal, T. L. (2013). An analysis of alleged auditor deficiencies in SEC fraud investigations: 1998–2010. Center for Audit Quality. Retrieved from www. theca. org resources pdfs CA deficienciesMay2013. pdf.

Becker, C. L., DeFond, M. L., Jiambalvo, J., and Subramanyam, K. R. (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research* 15(1), 1-24.

Bonner, S. E., Palmrose, Z. V., and Young, S. M. (1998). Fraud type and auditor litigation: An analysis of SEC accounting and auditing enforcement releases. *The Accounting Review*, 503-532.

Chaney, P. K., Jeter, D. C., and Shivakumar, L. (2004). Self-selection of auditors and audit pricing in private firms. *The Accounting Review* 79(1), 51-72.

Christensen, B. E., Glover, S. M., Omer, T. C., & Shelley, M. K. (2016). Understanding audit quality: Insights from audit professionals and investors. *Contemporary Accounting Research*, *33*(4), 1648-1684.

Chung, H., & Kallapur, S. (2003). Client importance, nonaudit services, and abnormal accruals. *The Accounting Review*, *78*(4), 931-955.

Coffee, J.C. (2002). Understanding Enron: 'It's about the Gatekeepers, Stupid,' *Business Lawyer* 57: 1403.

Craswell, A. T., Francis, J. R., and Taylor, S. L. (1995). Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20(3), 297-322.

Davis, L. R., Soo, B. S., & Trompeter, G. M. (2009). Auditor tenure and the ability to meet or beat earnings forecasts. *Contemporary Accounting Research*, 26(2), 517-548.

Dao, M., Raghunandan, K., and Rama, D. V. (2012). Shareholder voting on auditor selection, audit fees, and audit quality. *The Accounting Review* 87(1), 149-171.

DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics* 3(3): 183-199.

Dechow, P. M. and I. D. Dichev (2002). The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review 77(s-1): 35-59.

Dechow, P. M., Ge, W., Larson, C. R., and Sloan, R. G. (2011). Predicting material accounting misstatements. *Contemporary Accounting Research* 28(1), 17-82.

Dechow, P. M., Sloan, R. G., and Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review* 193-225.

DeFond, M., Erkens, D. H., and Zhang, J. (2014). Do client characteristics really drive Big N quality differentiation. Working paper.

DeFond, M. and J. Zhang (2014). A review of archival auditing research. *Journal of Accounting and Economics* 58(2): 275-326.

DeFond, M. L., Raghunandan, K., and Subramanyam, K. R. (2002). Do non-audit service fees impair auditor independence? Evidence from going concern audit opinions. *Journal of Accounting Research* 40 (4), 1247-1274.

Dichev, I. D., Graham, J. R., Harvey, C. R., and Rajgopal, S. (2013). Earnings quality: Evidence from the field. *Journal of Accounting and Economics* 56(2), 1-33.

Dietrich, J. R., Muller III, K. A., and Riedl, E. J. (2007). Asymmetric timeliness tests of accounting conservatism. *Review of Accounting Studies* 12(1), 95-124.

Donovan, J., Frankel, R., Lee, J., Martin, X., and Seo, H. (2014). Issues raised by studying DeFond and Zhang: What should audit researchers do?. *Journal of Accounting and Economics* 58(2), 327-338.

Ferguson, A., Francis, J. R., & Stokes, D. J. (2003). The effects of firm-wide and office-level industry expertise on audit pricing. *The Accounting Review*, 78(2), 429-448.

Francis J. R. and Ke., B. (2006). Disclosure of fees paid to auditors and the market valuation of earnings surprises. *Review of Accounting Studies* 11, 495-523.

Francis, J. R., Maydew, E. L., and Sparks, H. C. (1999). The role of Big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice & Theory* 18(2), 17-34.

Francis, J. R., Reichelt, K., & Wang, D. (2005). The pricing of national and city-specific reputations for industry expertise in the US audit market. *The Accounting Review* 80(1), 113-136.

Francis, J. R. and Yu, M. D. (2009). Big 4 office size and audit quality. *The Accounting Review* 84(5): 1521-1552.

Frankel, R. M., Johnson, M. F., and Nelson, K. K. (2002). The relation between auditors' fees for nonaudit services and earnings management. *The Accounting Review* 77(s-1), 71-105.

Fung, S. Y. K., Gul, F. A., and Krishnan, J. (2012). City-level auditor industry specialization, economies of scale, and audit pricing. *The Accounting Review* 87(4), 1281-1307.

Geiger, M. A., & Raghunandan, K. (2002). Auditor tenure and audit reporting failures. *Auditing: A Journal of Practice & Theory*, 21(1), 67-78.

Gul, F. A. and Goodwin, J. (2010). Short-term debt maturity structures, credit ratings, and the pricing of audit services. The Accounting Review 85(3): 877-909.

Hainmueller, Jens. 2012. "Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies." *Political Analysis* 20 (1): 25–46.

Johnson, V. E., I. K. Khurana, and J. K. Reynolds. 2002. Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research* 19 (3): 637–60.

Jones, J. J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research*: 193-228.

Kedia, S., Khan, U. and Rajgopal, S. (2015). The SEC's enforcement record against auditors. Working Paper.

Khurana, I. K. and Raman, K. (2004). Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries. *The Accounting Review* 79(2): 473-495.

Kim, I. and Skinner, D. J. (2012). Measuring securities litigation risk. *Journal of Accounting and Economics* 53(1): 290-310.

Kinney, W. R., Palmrose, Z. V., and Scholz, S. (2004). Auditor independence, non-audit services, and restatements: Was the US Government right?. *Journal of Accounting Research* 42(3), 561-588.

Koh, K., Rajgopal, S., and Srinivasan, S. (2013). Non-audit services and financial reporting quality: evidence from 1978 to 1980. *Review of Accounting Studies* 18(1), 1-33.

Kothari, S. P., Leone, A. J., and Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39(1), 163-197.

Lawrence, A., Minutti-Meza, M., & Zhang, P. (2011). Can Big 4 versus non-Big 4 differences in audit-quality proxies be attributed to client characteristics?. *The Accounting Review*, *86*(1), 259-286.

Lobo, G. J., & Zhao, Y. (2013). Relation between audit effort and financial report misstatements: Evidence from quarterly and annual restatements. *The Accounting Review*, *88*(4), 1385-1412.

Minutti-Meza, Miguel. (2013). Does auditor industry specialization improve audit quality?. *Journal of Accounting Research*, *51*(4), 779-817.

Myers, J. N.*, L. A. Myers, and* T. C. Omer. 2003. Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation. *The Accounting Review* , *78*(3), 779-799.

Palmrose, Z.-V. (1988). An analysis of auditor litigation and audit service quality. *The Accounting Review* 63(1): 55-73.

Patatoukas, P. N. and Thomas, J. K. (2011). More evidence of bias in the differential timeliness measure of conditional conservatism. *The Accounting Review* 86(5), 1765-1793.

PCAOB. Adequacy of Disclosure in Financial Statements. In AU Section 431.

Reichelt, K. J., & Wang, D. (2010). National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research*, *48*(3), 647-686.

Reynolds, J. K., Deis Jr, D. R., & Francis, J. R. (2004). Professional service fees and auditor objectivity. *Auditing: A Journal of Practice & Theory*, *23*(1), 29-52.

Securities and Exchange Commission. (2016). Enforcement Manual. Office of the Chief Counsel.

Securities Litigation Uniform Standards Act 1998, 15 U.S.C.

Seetharaman, A., Gul, F. A., & Lynn, S. G. (2002). Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets. *Journal of Accounting and Economics* 33(1), 91-115.

Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research*, 161-190.

Skinner, D. J., and Srinivasan, S. (2012). Audit quality and auditor reputation: Evidence from Japan. *The Accounting Review* 87(5) 1737–1765.

Srinivasan, S., Wahid, A., and Yu, G. (2015). Admitting mistakes: Home country effect on the reliability of restatement reporting. *The Accounting Review*, *90*(3), 1201-1240..

St.Pierre, K. and Anderson, J. A. (1984). An Analysis of the factors associated with lawsuits against public accountants. *The Accounting Review* 59(2): 242-263.

Stice, J. D. (1991). Using financial and market information to identify pre-engagement factors associated with lawsuits against auditors. *The Accounting Review*: 516-533.

U.S. Securities and Exchange Commission. 2001. Accounting and Auditing Enforcement Release No. 1452.

U.S. Securities and Exchange Commission. 2003. Accounting and Auditing Enforcement Release No. 1787.

U.S. Securities and Exchange Commission. 2004. Accounting and Auditing Enforcement Release No. 2125.

U.S. Securities and Exchange Commission. 2005. Accounting and Auditing Enforcement Release No. 2234.

U.S. Securities and Exchange Commission. 2005. Accounting and Auditing Enforcement Release No. 2238.

U.S. Securities and Exchange Commission. 2008. Accounting and Auditing Enforcement Release No. 2815.

Weick, K. E. (1969). The social psychology of organizing (No. 04; HM131, W3.).

Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American statistical Association*, *57*(298), 348-368.

Zheng, X. (2017). A Tale of Two Courts: Determinants and Consequences of the SEC's Choice of Enforcement Venue After the Dodd-Frank Act. Working Paper.

Appendix A: Variable Definitions

Variable	Definition
Test Variables (Audit Quality Measures):	
DA	Discretionary accruals are estimated using modified Jones model with intercept.
AbsDA	The absolute value of DA.
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 to one if the financial statements for the alleged audit-deficient firm-year was restated, and zero otherwise.
SmlProfit	An indicator variable that equals to one if the ROA (income before extraordinary items deflated by beginning assets) is less than 3%.
SmlBeat	An indicator variable that equals to one 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 to one if the auditor issued a going concern opinion.
BigN	An indicator variable that equals to one 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 headquarter city.
Tenure	The length in year of the auditor-firm relationship.
New Client	An indicator variable that equals to one if the auditor-firm relationship is in its first year, and zero otherwise.
Top 20 City	An indicator variable that equals to one if the firm's headquarter city is one of the largest 20 cities in the U.S.
Auditor Firm Diff	An indicator variable that equals to one if the firm's headquarter city is the same city as its auditor's office, and zero otherwise.
City Specialist	An indicator variable that equals to one if an office is the number one auditor in terms of aggregated client audit fees in an industry within that city in a given year, and zero otherwise.
Industry Specialist	An indicator variable that equals to one if the auditor satisfies one of the two following definitions. Definition 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. Definition 2: An auditor is a city 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.

Control Variables:

Variable	Definition
LogAT	Natural log of the firm's total assets.

Leverage	Total liabilities divided by total assets.
Loss	An indicator variable that equals to one 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 Compustat annual file
December	An indicator variable that equals to one if the firm's fiscal year ends in December, and zero otherwise
Segments	Number of non-missing segments from COMPUSTAT segment data set.

Dependent Variables:

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

Table 1: Sample Description

AAERs		*Class Action Securities Litigations*	
AAERs against auditors from Berkeley Data Set	107	# of litigations against auditors 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 are not included in the 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 AAERs coded	**141**	**# of Lawsuits coded**	**153**
Subtract:		Translates to:	
No records in CRSP and/or Compustat	(52)	**# of firm-years identified in CRSP and Compustat**	**390**
Bogus Audit	(3)		
No issuer information	(21)		
# of distinct AAERs in final sample	**65**		
Translates to:			
# of firm-years identified in CRSP and Compustat	**149**		

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 clients 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 Fail 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 the AAERs and securities class action lawsuits coded. In Panels A through G, we report the aggregate amount of allegations. For example, for allegation B1, 6 out of the 141 AAERs and 1 out of the 153 lawsuits stated "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 0.1, 0.05, and 0.01 level for two-sided t-tests. For discrete dichotomous variables, *, **, *** represent p-value at 0.1, 0.05, and 0.01 level for two-sided chi-square tests.

Table 3: Descriptive Statistics

This table presents descriptive statistics for variables used in Table 4. Sample size varies by regression specification. Treatment sample is defined as firm-years with securities class action lawsuits or AAERs against auditors. 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 4279 observations (344 observations in the treatment sample and 3935 observations in the control sample) used in regressions (1), (2), and (3) in Panel A of Table 4, where accrual-based audit quality measures are variables of interest. The sample size increases to 5019 in regressions (4), (5), and (6) in Panel A of Table 4, and regressions (1), (4), (5) and (9) in Panel B of Table 4. The sample size decreases to 3252 for regression (7) in Panel A and 3236 for regressions (6), (7), and (8) in Panel B of Table 4 due to data availability for variables going concern and auditor city. The same size further reduces to 2798 in regressions (2) and (3) in Panel B of Table 4 due to availability of audit fees related variables. See Appendix A for variable definitions.

AQ Measures	Treatment Sample						Control Sample					
	N	Min	Median	Max	SD	Mean	N	Min	Median	Max	SD	Mean
DA	344	-2.923	0.019	58.997	3.217	0.249	3935	-21.305	0.010	13.774	0.895	0.046
AbsDA	344	0.001	0.114	58.997	3.198	0.427	3935	0.000	0.104	21.305	0.851	0.280
Total Accruals	344	0.000	0.066	5.168	0.363	0.165	3935	0.000	0.066	147.708	2.368	0.164
Rstmt	420	0	1	1	0.497	0.564	4599	0	0	1	0.480	0.359
SmlProfit	420	0	0	1	0.356	0.148	4599	0	0	1	0.347	0.140
SmlBeat	420	0	1	1	0.483	0.631	4599	0	1	1	0.469	0.672
GC	283	0	0	1	0.174	0.031	2969	0	0	1	0.217	0.050
BigN	420	0	1	1	0.452	0.715	4599	0	1	1	0.346	0.861
Audit Fee Ratio	246	0.086	0.705	1	0.272	0.663	2552	0.021	0.692	1	0.257	0.654
Audit Fee City Ratio	246	0.001	0.078	1	0.300	0.214	2552	0	0.043	1	0.195	0.122
Tenure	420	1	6	32	6.595	7.573	4599	1	5	39	6.597	7.347
New Client	420	0	0	1	0.310	0.108	4599	0	0	1	0.314	0.111
Top 20 City	282	0	0	1	0.405	0.206	2954	0	0	1	0.407	0.210
Auditor Firm Diff	282	0	0	1	0.419	0.226	2954	0	0	1	0.429	0.242
City Specialist	282	0	0	1	0.453	0.288	2954	0	0	1	0.493	0.422
Industry Specialist	420	0	0	1	0.495	0.573	4599	0	0	1	0.497	0.550
Control Variables												
LogAT	344	-1.238	6.372	12.248	2.521	6.391	3935	-1.245	6.012	12.460	2.146	6.197
Leverage	344	0.026	0.486	3.870	0.327	0.501	3935	0.013	0.475	28.870	0.673	0.518
Loss	344	0	0	1	0.460	0.302	3935	0	0	1	0.496	0.433
AssetTurnover	344	0.014	0.724	3.859	0.684	0.920	3935	0.000	0.832	15.961	0.833	1.001
M2B	344	-10.131	3.073	80.699	7.179	4.922	3935	-876.945	2.554	1174.300	37.046	4.302
ROA	344	-61.197	0.039	0.503	3.334	-0.235	3935	-53.572	0.016	0.695	1.079	-0.138
SalesGrow	344	-0.896	0.226	31.779	1.935	0.530	3935	-1.000	0.155	1062.448	17.782	0.864
Age	344	3	20	68	17.407	23.953	3935	2	20	68	16.537	24.133
December	344	0	1	1	0.478	0.648	3935	0	1	1	0.484	0.624
Segments	344	1	1	8	1.475	2.084	3935	1	1	10	1.447	1.979

Table 4: Sufficient Competent Audit Evidence Allegation

This table presents the results of Model (1). The dependent variable equals one if there is an alleged violation of "failure to gather sufficient competent audit evidence." 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. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. 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

DV: Sufficient competent audit evidence allegation	(1) DA	(2) AbsDA	(3) Total Accruals	(4) Rstmt	(5) SmlProfit	(6) SmlBeat	(7) GC
AQ Measure	0.073***	0.066***	0.001	0.928***	-0.074	0.051	-0.309
	[0.023]	[0.023]	[0.008]	[0.166]	[0.206]	[0.122]	[0.518]
LogAT	0.049	0.05	0.047	0.03	0.03	0.026	-0.053
	[0.079]	[0.079]	[0.079]	[0.057]	[0.057]	[0.057]	[0.069]
Leverage	-0.094	-0.097	-0.097	-0.024	-0.028	-0.032	-0.051
	[0.086]	[0.084]	[0.086]	[0.074]	[0.076]	[0.077]	[0.075]
Loss	-0.771***	-0.780***	-0.783***	-0.801***	-0.809***	-0.795***	-0.968***
	[0.185]	[0.185]	[0.185]	[0.166]	[0.181]	[0.177]	[0.216]
AssetTurnover	-0.144	-0.147	-0.133	-0.2	-0.166	-0.161	-0.358**
	[0.136]	[0.135]	[0.133]	[0.143]	[0.132]	[0.132]	[0.159]
M2B	0.001	0.001	0.001	0	0	0	0.001
	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]
ROA	-0.081***	-0.080***	-0.081***	-0.067**	-0.063**	-0.062**	-0.058*
	[0.028]	[0.028]	[0.028]	[0.030]	[0.029]	[0.029]	[0.030]
SalesGrow	-0.02	-0.018	-0.004	-0.001	-0.003	-0.003	-0.001
	[0.018]	[0.016]	[0.010]	[0.003]	[0.006]	[0.005]	[0.002]
Age	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.009
	[0.010]	[0.010]	[0.010]	[0.009]	[0.009]	[0.009]	[0.011]
December	-0.073	-0.077	-0.067	-0.018	-0.086	-0.084	-0.151
	[0.221]	[0.221]	[0.221]	[0.211]	[0.207]	[0.207]	[0.240]
Segments	0.004	0.002	0.003	0.032	0.046	0.044	0.019
	[0.068]	[0.068]	[0.068]	[0.061]	[0.058]	[0.058]	[0.075]
Constant	-2.329***	-2.340***	-2.328***	-2.699***	-2.275***	-2.303***	-1.270**
	[0.483]	[0.484]	[0.480]	[0.428]	[0.411]	[0.405]	[0.518]
Total Observations	4279	4279	4279	5019	5019	5019	3252
# of Treatment Obs.	344	344	344	420	420	420	283
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.609	0.607	0.607	0.673	0.614	0.614	0.633
Pseudo R2	0.021	0.021	0.019	0.047	0.020	0.020	0.030

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

DV: Sufficient competent audit evidence allegation	(1) BigN	(2) Audit Fee Ratio	(3) Audit Fee City Ratio	(4) Tenure	(5) New Client	(6) Top 20 City	(7) Auditor Firm Diff	(8) City Specialist	(9) Industry Specialist
AQ Measure	-0.864***	-0.425	1.059**	0.009	-0.086	0.237	0.088	-0.463**	-0.15
	[0.258]	[0.367]	[0.486]	[0.017]	[0.213]	[0.284]	[0.286]	[0.208]	[0.203]
LogAT	0.088	-0.111	-0.096	0.024	0.027	-0.059	-0.054	-0.035	-0.049
	[0.056]	[0.078]	[0.074]	[0.056]	[0.056]	[0.068]	[0.069]	[0.068]	[0.069]
Leverage	-0.045	0.378	0.327	-0.032	-0.033	-0.062	-0.059	-0.047	-0.06
	[0.077]	[0.259]	[0.264]	[0.077]	[0.078]	[0.075]	[0.075]	[0.074]	[0.075]
Loss	-0.771***	-0.922***	-0.886***	-0.787***	-0.786***	-0.986***	-0.987***	-0.991***	-0.999***
	[0.171]	[0.221]	[0.223]	[0.169]	[0.169]	[0.214]	[0.215]	[0.214]	[0.214]
AssetTurnover	-0.141	-0.441**	-0.463**	-0.164	-0.16	-0.344**	-0.350**	-0.310**	-0.351**
	[0.125]	[0.179]	[0.180]	[0.133]	[0.132]	[0.155]	[0.156]	[0.152]	[0.156]
M2B	0	0	0	0	0	0.001	0.001	0.001	0
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
ROA	-0.061**	0.244	0.241	-0.063**	-0.064**	-0.054*	-0.054*	-0.055**	-0.055*
	[0.028]	[0.173]	[0.180]	[0.029]	[0.029]	[0.028]	[0.029]	[0.028]	[0.029]
SalesGrow	-0.005	0.033	0.021	-0.003	-0.003	-0.001	-0.001	-0.001	-0.001
	[0.009]	[0.036]	[0.043]	[0.005]	[0.006]	[0.002]	[0.002]	[0.002]	[0.002]
Age	-0.005	-0.015	-0.015	-0.007	-0.006	-0.009	-0.009	-0.009	-0.009
	[0.008]	[0.012]	[0.012]	[0.010]	[0.009]	[0.011]	[0.011]	[0.011]	[0.011]
December	-0.091	-0.254	-0.27	-0.083	-0.085	-0.169	-0.165	-0.145	-0.165
	[0.209]	[0.254]	[0.255]	[0.207]	[0.207]	[0.241]	[0.242]	[0.241]	[0.241]
Segments	0.025	0.035	0.009	0.046	0.045	0.022	0.019	0.027	0.015
	[0.058]	[0.083]	[0.084]	[0.058]	[0.058]	[0.075]	[0.075]	[0.076]	[0.075]
Constant	-1.953***	-0.609	-1.062**	-2.287***	-2.269***	-1.297**	-1.281**	-1.300**	-1.148**
	[0.396]	[0.612]	[0.536]	[0.411]	[0.414]	[0.520]	[0.518]	[0.514]	[0.488]
Total Observations	5019	2798	2798	5019	5019	3236	3236	3236	3236
# of Treatment Obs.	420	246	246	420	420	282	282	282	282
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.649	0.654	0.662	0.616	0.614	0.634	0.632	0.645	0.634
Pseudo R2	0.031	0.036	0.044	0.020	0.020	0.031	0.030	0.035	0.030

Table 5: Due Professional Care Allegation

This table presents the results of Model (1). The dependent variable equals one if there is an alleged violation of "failure to exercise due professional care." 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. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. 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

DV: Due professional care allegation	(1) DA	(2) AbsDA	(3) Total Accruals	(4) Rstmt	(5) SmlProfit	(6) SmlBeat	(7) GC
AQ Measure	0.072***	0.060**	0.001	0.979***	-0.208	-0.05	-0.278
	[0.023]	[0.024]	[0.008]	[0.179]	[0.224]	[0.126]	[0.519]
LogAT	0.075	0.075	0.073	0.038	0.043	0.038	-0.037
	[0.080]	[0.079]	[0.079]	[0.067]	[0.066]	[0.065]	[0.085]
Leverage	-0.095	-0.098	-0.099	-0.04	-0.04	-0.048	-0.054
	[0.084]	[0.083]	[0.084]	[0.072]	[0.075]	[0.076]	[0.074]
Loss	-0.710***	-0.719***	-0.723***	-0.720***	-0.767***	-0.698***	-0.789***
	[0.178]	[0.178]	[0.178]	[0.166]	[0.177]	[0.176]	[0.213]
AssetTurnover	-0.094	-0.096	-0.085	-0.108	-0.087	-0.074	-0.252*
	[0.130]	[0.129]	[0.127]	[0.134]	[0.124]	[0.122]	[0.149]
M2B	0.001	0.001	0.001	0.001	0	0	0.001
	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]
ROA	-0.091***	-0.090***	-0.091***	-0.076***	-0.071**	-0.072***	-0.062**
	[0.029]	[0.029]	[0.029]	[0.028]	[0.028]	[0.028]	[0.029]
SalesGrow	-0.014	-0.011	-0.003	-0.001	-0.002	-0.002	-0.001
	[0.015]	[0.012]	[0.005]	[0.003]	[0.004]	[0.005]	[0.002]
Age	-0.007	-0.007	-0.007	-0.01	-0.01	-0.009	-0.014
	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.012]
December	0.058	0.054	0.063	-0.029	-0.104	-0.102	-0.126
	[0.228]	[0.227]	[0.227]	[0.230]	[0.224]	[0.225]	[0.269]
Segments	0.049	0.048	0.049	0.056	0.074	0.068	0.049
	[0.069]	[0.070]	[0.069]	[0.067]	[0.064]	[0.063]	[0.084]
Constant	-2.786***	-2.796***	-2.780***	-2.953***	-2.479***	-2.478***	-1.624***
	[0.495]	[0.496]	[0.491]	[0.444]	[0.418]	[0.411]	[0.525]
Observations	4279	4279	4279	5019	5019	5019	3252
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.616	0.614	0.614	0.675	0.607	0.606	0.62
Pseudo R2	0.022	0.021	0.020	0.047	0.019	0.018	0.023

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

DV: Due professional care allegation	(1) BigN	(2) Audit Fee Ratio	(3) Audit Fee City Ratio	(4) Tenure	(5) New Client	(6) Top 20 City	(7) Auditor Firm Diff	(8) City Specialist	(9) Industry Specialist
AQ Measure	-0.832***	-0.601	0.747*	0.011	-0.12	0.423	0.262	-0.746***	-0.169
	[0.272]	[0.398]	[0.439]	[0.018]	[0.232]	[0.282]	[0.290]	[0.232]	[0.215]
LogAT	0.094	-0.099	-0.081	0.031	0.034	-0.051	-0.045	-0.012	-0.034
	[0.066]	[0.097]	[0.093]	[0.063]	[0.065]	[0.081]	[0.083]	[0.083]	[0.084]
Leverage	-0.062	0.374	0.32	-0.049	-0.051	-0.067	-0.064	-0.043	-0.063
	[0.078]	[0.254]	[0.262]	[0.077]	[0.077]	[0.074]	[0.074]	[0.072]	[0.074]
Loss	-0.690***	-0.721***	-0.688***	-0.707***	-0.705***	-0.801***	-0.798***	-0.814***	-0.818***
	[0.170]	[0.223]	[0.228]	[0.168]	[0.168]	[0.215]	[0.215]	[0.215]	[0.213]
AssetTurnover	-0.059	-0.337**	-0.345**	-0.077	-0.073	-0.235	-0.244*	-0.192	-0.246*
	[0.116]	[0.168]	[0.173]	[0.122]	[0.121]	[0.143]	[0.146]	[0.137]	[0.146]
M2B	0	0	0	0	0	0.001	0.001	0.001	0.001
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
ROA	-0.070**	0.211	0.201	-0.072***	-0.073***	-0.059**	-0.059**	-0.061**	-0.060**
	[0.027]	[0.146]	[0.151]	[0.028]	[0.028]	[0.028]	[0.028]	[0.027]	[0.028]
SalesGrow	-0.004	0.032	0.023	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001
	[0.007]	[0.037]	[0.040]	[0.004]	[0.004]	[0.002]	[0.002]	[0.002]	[0.002]
Age	-0.009	-0.021	-0.02	-0.012	-0.009	-0.013	-0.014	-0.013	-0.013
	[0.009]	[0.014]	[0.014]	[0.011]	[0.010]	[0.012]	[0.012]	[0.012]	[0.012]
December	-0.109	-0.234	-0.252	-0.098	-0.1	-0.144	-0.131	-0.111	-0.139
	[0.226]	[0.289]	[0.293]	[0.225]	[0.225]	[0.268]	[0.268]	[0.268]	[0.271]
Segments	0.049	0.072	0.053	0.07	0.069	0.057	0.052	0.063	0.044
	[0.065]	[0.093]	[0.092]	[0.064]	[0.064]	[0.084]	[0.083]	[0.084]	[0.084]
Constant	-1.503***	-0.284	-0.515	-1.729***	-1.708***	-0.781	-0.789	-0.777	-1.487***
	[0.406]	[0.687]	[0.568]	[0.418]	[0.418]	[0.533]	[0.527]	[0.525]	[0.511]
Observations	5019	2798	2798	5019	5019	3236	3236	3236	3236
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.634	0.642	0.650	0.606	0.606	0.628	0.621	0.659	0.624
Pseudo R2	0.028	0.031	0.032	0.018	0.018	0.027	0.024	0.036	0.023

Table 6: Failure to Express an Appropriate Audit Opinion Allegation
This table presents the results of Model (1). The dependent variable equals one if there is an alleged violation of "failure to express an appropriate audit opinion." 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. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. 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)	(6)	(7)
DV: Appropriate audit opinion allegation	**DA**	**AbsDA**	**Total Accruals**	**Rstmt**	**SmlProfit**	**SmlBeat**	**GC**
AQ Measure	0.087***	0.077***	0.004	1.064***	-0.05	-0.023	-0.247
	[0.024]	[0.022]	[0.008]	[0.186]	[0.233]	[0.130]	[0.577]
LogAT	0.105	0.106	0.102	0.074	0.072	0.071	0.004
	[0.081]	[0.081]	[0.081]	[0.062]	[0.061]	[0.061]	[0.073]
Leverage	-0.045	-0.05	-0.049	-0.024	-0.031	-0.033	-0.059
	[0.078]	[0.077]	[0.078]	[0.076]	[0.078]	[0.079]	[0.078]
Loss	-0.614***	-0.623***	-0.628***	-0.657***	-0.650***	-0.631***	-0.795***
	[0.185]	[0.185]	[0.185]	[0.172]	[0.187]	[0.184]	[0.221]
AssetTurnover	-0.206	-0.208	-0.192	-0.245	-0.199	-0.195	-0.484**
	[0.161]	[0.159]	[0.157]	[0.171]	[0.156]	[0.157]	[0.209]
M2B	0.001	0.001	0.001	0.001	0	0	0.001
	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]
ROA	-0.083***	-0.082***	-0.083***	-0.080***	-0.075***	-0.075***	-0.072**
	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.030]
SalesGrow	-0.007	-0.006	-0.001	0	-0.001	-0.001	0
	[0.010]	[0.009]	[0.002]	[0.002]	[0.002]	[0.002]	[0.001]
Age	-0.006	-0.006	-0.006	-0.003	-0.003	-0.003	-0.006
	[0.010]	[0.010]	[0.010]	[0.010]	[0.009]	[0.009]	[0.012]
December	-0.193	-0.197	-0.184	-0.198	-0.275	-0.274	-0.416
	[0.238]	[0.239]	[0.238]	[0.232]	[0.227]	[0.227]	[0.272]
Segments	0.034	0.033	0.034	0.014	0.028	0.027	0.006
	[0.074]	[0.074]	[0.074]	[0.067]	[0.064]	[0.064]	[0.085]
Constant	-2.839***	-2.852***	-2.825***	-3.169***	-2.664***	-2.661***	-1.732***
	[0.512]	[0.512]	[0.507]	[0.472]	[0.445]	[0.439]	[0.568]
Observations	4279	4279	4279	5019	5019	5019	3252
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.619	0.618	0.617	0.685	0.618	0.618	0.628
Pseudo R2	0.024	0.024	0.021	0.056	0.022	0.022	0.030

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

DV: Appropriate audit opinion allegation	(1) BigN	(2) Audit Fee Ratio	(3) Audit Fee City Ratio	(4) Tenure	(5) New Client	(6) Top 20 City	(7) Auditor Firm Diff	(8) City Specialist	(9) Industry Specialist
AQ Measure	-0.304	-0.721*	0.879	0.015	0.086	0.352	0.307	-0.766***	-0.26
	[0.305]	[0.402]	[0.626]	[0.019]	[0.210]	[0.308]	[0.309]	[0.242]	[0.218]
LogAT	0.088	-0.043	-0.026	0.064	0.071	-0.009	-0.006	0.029	0.008
	[0.060]	[0.083]	[0.080]	[0.059]	[0.060]	[0.072]	[0.073]	[0.072]	[0.073]
Leverage	-0.038	0.333	0.255	-0.034	-0.032	-0.07	-0.069	-0.045	-0.067
	[0.079]	[0.299]	[0.322]	[0.079]	[0.080]	[0.080]	[0.080]	[0.079]	[0.079]
Loss	-0.629***	-0.793***	-0.752***	-0.635***	-0.636***	-0.803***	-0.798***	-0.808***	-0.826***
	[0.176]	[0.239]	[0.240]	[0.174]	[0.174]	[0.222]	[0.224]	[0.221]	[0.220]
AssetTurnover	-0.187	-0.564**	-0.582**	-0.201	-0.195	-0.463**	-0.471**	-0.404**	-0.477**
	[0.154]	[0.239]	[0.236]	[0.158]	[0.157]	[0.205]	[0.204]	[0.198]	[0.205]
M2B	0	0.001	0.001	0	0	0.001	0.001	0.002	0.001
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
ROA	-0.074***	0.166	0.144	-0.075***	-0.074***	-0.070**	-0.070**	-0.071**	-0.071**
	[0.028]	[0.167]	[0.176]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]
SalesGrow	-0.001	0.055	0.044	-0.001	-0.001	0	0	-0.001	-0.001
	[0.002]	[0.043]	[0.053]	[0.002]	[0.002]	[0.001]	[0.001]	[0.001]	[0.001]
Age	-0.003	-0.013	-0.012	-0.005	-0.003	-0.005	-0.006	-0.005	-0.005
	[0.009]	[0.013]	[0.013]	[0.011]	[0.009]	[0.012]	[0.012]	[0.012]	[0.012]
December	-0.275	-0.558*	-0.586**	-0.272	-0.274	-0.431	-0.416	-0.396	-0.429
	[0.227]	[0.290]	[0.297]	[0.226]	[0.227]	[0.273]	[0.275]	[0.274]	[0.274]
Segments	0.021	0.027	0.007	0.03	0.026	0.013	0.011	0.023	0.001
	[0.063]	[0.095]	[0.092]	[0.064]	[0.064]	[0.086]	[0.085]	[0.087]	[0.085]
Constant	-2.526***	-0.923	-1.550***	-2.674***	-2.685***	-1.769***	-1.769***	-1.794***	-1.519***
	[0.457]	[0.688]	[0.597]	[0.447]	[0.448]	[0.573]	[0.569]	[0.565]	[0.534]
Observations	5019	2798	2798	5019	5019	3236	3236	3236	3236
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.622	0.650	0.645	0.620	0.618	0.636	0.638	0.664	0.633
Pseudo R2	0.023	0.039	0.041	0.023	0.022	0.033	0.033	0.044	0.031

Table 7: Inadequate Planning and Supervision Violation

This table presents the results of Model (1). The dependent variable equals one if there is an alleged violation of "Inadequate planning and supervision." 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. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. 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

DV: Inadequate planning and supervision violation	(1) DA	(2) AbsDA	(3) Total Accruals	(4) Rstmt	(5) SmlProfit	(6) SmlBeat	(7) GC
AQ Measure	0.037	-0.03	0.006	0.925***	-0.091	0.052	-0.516
	[0.036]	[0.059]	[0.012]	[0.186]	[0.256]	[0.136]	[0.649]
LogAT	0.054	0.054	0.054	0.031	0.034	0.029	-0.077
	[0.103]	[0.103]	[0.103]	[0.082]	[0.081]	[0.080]	[0.097]
Leverage	-0.468	-0.471	-0.468	0.096	0.064	0.049	0.167
	[0.431]	[0.432]	[0.431]	[0.212]	[0.215]	[0.239]	[0.207]
Loss	-0.758***	-0.758***	-0.758***	-0.830***	-0.860***	-0.839***	-0.894***
	[0.201]	[0.202]	[0.202]	[0.186]	[0.203]	[0.197]	[0.226]
AssetTurnover	-0.024	-0.023	-0.024	-0.187	-0.151	-0.144	-0.414**
	[0.138]	[0.138]	[0.138]	[0.175]	[0.159]	[0.161]	[0.198]
M2B	0.001	0.001	0.001	0	0	0	0
	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]
ROA	0.011	0.01	0.011	0.117	0.068	0.071	0.163
	[0.103]	[0.100]	[0.103]	[0.199]	[0.162]	[0.166]	[0.281]
SalesGrow	-0.029	-0.027	-0.033	-0.014	-0.019	-0.018	-0.022
	[0.029]	[0.028]	[0.035]	[0.017]	[0.019]	[0.019]	[0.029]
Age	-0.011	-0.011	-0.011	-0.012	-0.012	-0.011	-0.017
	[0.011]	[0.011]	[0.011]	[0.010]	[0.011]	[0.010]	[0.014]
December	-0.24	-0.238	-0.239	-0.298	-0.357	-0.354	-0.396
	[0.249]	[0.249]	[0.249]	[0.247]	[0.244]	[0.244]	[0.283]
Segments	0.026	0.026	0.026	0.044	0.057	0.054	0.047
	[0.076]	[0.076]	[0.076]	[0.067]	[0.065]	[0.064]	[0.080]
Constant	-2.455***	-2.445***	-2.454***	-2.801***	-2.380***	-2.409***	-1.154*
	[0.579]	[0.578]	[0.579]	[0.517]	[0.495]	[0.486]	[0.595]
Observations	4279	4279	4279	5019	5019	5019	3252
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.611	0.611	0.611	0.680	0.624	0.624	0.650
Pseudo R2	0.022	0.022	0.022	0.050	0.025	0.025	0.036

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

DV: Inadequate planning and supervision violation	(1) BigN	(2) Audit Fee Ratio	(3) Audit Fee City Ratio	(4) Tenure	(5) New Client	(6) Top 20 City	(7) Auditor Firm Diff	(8) City Specialist	(9) Industry Specialist
AQ Measure	-1.104***	-0.755*	1.456***	-0.008	-0.159	0.563*	0.197	-0.624**	-0.036
	[0.291]	[0.422]	[0.482]	[0.019]	[0.251]	[0.289]	[0.309]	[0.245]	[0.236]
LogAT	0.114	-0.116	-0.086	0.035	0.029	-0.096	-0.081	-0.052	-0.074
	[0.079]	[0.108]	[0.100]	[0.078]	[0.080]	[0.095]	[0.096]	[0.096]	[0.097]
Leverage	-0.01	0.316	0.219	0.05	0.053	0.128	0.147	0.147	0.152
	[0.285]	[0.282]	[0.320]	[0.238]	[0.232]	[0.205]	[0.207]	[0.208]	[0.208]
Loss	-0.810***	-0.918***	-0.859***	-0.832***	-0.829***	-0.915***	-0.918***	-0.929***	-0.927***
	[0.192]	[0.246]	[0.249]	[0.188]	[0.188]	[0.226]	[0.228]	[0.225]	[0.226]
AssetTurnover	-0.113	-0.443**	-0.475**	-0.141	-0.144	-0.388**	-0.404**	-0.348*	-0.405**
	[0.149]	[0.208]	[0.209]	[0.160]	[0.161]	[0.190]	[0.193]	[0.184]	[0.194]
M2B	0	0	0	0	0	0	0	0.001	0
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
ROA	0.055	0.196	0.18	0.068	0.068	0.164	0.17	0.162	0.171
	[0.150]	[0.172]	[0.187]	[0.164]	[0.163]	[0.245]	[0.265]	[0.269]	[0.270]
SalesGrow	-0.023	-0.012	-0.027	-0.02	-0.019	-0.019	-0.021	-0.022	-0.023
	[0.020]	[0.029]	[0.028]	[0.020]	[0.019]	[0.029]	[0.029]	[0.031]	[0.030]
Age	-0.011	-0.025	-0.023	-0.01	-0.011	-0.016	-0.017	-0.016	-0.017
	[0.010]	[0.016]	[0.016]	[0.012]	[0.010]	[0.014]	[0.014]	[0.014]	[0.014]
December	-0.368	-0.46	-0.494	-0.357	-0.355	-0.419	-0.409	-0.39	-0.419
	[0.247]	[0.301]	[0.305]	[0.245]	[0.244]	[0.282]	[0.283]	[0.283]	[0.285]
Segments	0.03	0.083	0.041	0.053	0.056	0.059	0.048	0.058	0.044
	[0.065]	[0.087]	[0.085]	[0.065]	[0.065]	[0.081]	[0.080]	[0.080]	[0.081]
Constant	-2.006***	-0.35	-1.136*	-2.381***	-2.362***	-1.235**	-1.182**	-1.206**	-1.130*
	[0.460]	[0.666]	[0.595]	[0.497]	[0.499]	[0.605]	[0.597]	[0.591]	[0.583]
Observations	5019	2798	2798	5019	5019	3236	3236	3236	3236
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.666	0.664	0.685	0.623	0.625	0.664	0.649	0.664	0.648
Pseudo R2	0.044	0.045	0.059	0.025	0.025	0.043	0.036	0.045	0.035

Table 8: Independence Violation

This table presents the results of Model (1). The dependent variable equals one if there is an alleged violation of "lack of independence from client." 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. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. Standard-errors are clustered at firm level. Associated p-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels respectively.

DV: Independent violation	(1) DA	(2) AbsDA	(3) Total Accruals	(4) Rstmt	(5) SmlProfit	(6) SmlBeat	(7) GC
AQ Measure	-0.002	-0.129	0.011	0.714***	-0.198	-0.091	-1.625
	[0.043]	[0.142]	[0.014]	[0.216]	[0.270]	[0.158]	[1.293]
LogAT	0.113	0.11	0.113	0.091	0.096	0.093	0.063
	[0.092]	[0.092]	[0.092]	[0.080]	[0.079]	[0.079]	[0.097]
Leverage	-0.02	-0.024	-0.021	0.097	0.091	0.068	0.118
	[0.266]	[0.262]	[0.266]	[0.214]	[0.214]	[0.227]	[0.216]
Loss	-0.436**	-0.436**	-0.435**	-0.521***	-0.582***	-0.502**	-0.620**
	[0.209]	[0.208]	[0.209]	[0.197]	[0.216]	[0.208]	[0.268]
AssetTurnover	-0.23	-0.23	-0.231	-0.293	-0.278	-0.256	-0.532
	[0.213]	[0.213]	[0.213]	[0.237]	[0.222]	[0.225]	[0.335]
M2B	0.002**	0.002**	0.002**	0.001*	0.001	0.001	0.003**
	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.002]
ROA	0.022	0.018	0.022	0.056	0.039	0.031	0.017
	[0.156]	[0.143]	[0.157]	[0.174]	[0.142]	[0.142]	[0.150]
SalesGrow	-0.024	-0.019	-0.031	-0.014	-0.018	-0.021	-0.019
	[0.033]	[0.031]	[0.040]	[0.022]	[0.024]	[0.026]	[0.037]
Age	-0.008	-0.008	-0.008	-0.003	-0.003	-0.003	-0.009
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.011]
December	0.027	0.027	0.028	-0.157	-0.209	-0.206	-0.184
	[0.304]	[0.304]	[0.304]	[0.293]	[0.290]	[0.290]	[0.365]
Segments	0.12	0.121	0.12	0.078	0.088	0.083	0.135
	[0.080]	[0.080]	[0.080]	[0.071]	[0.068]	[0.068]	[0.085]
Constant	-3.621***	-3.575***	-3.620***	-3.706***	-3.354***	-3.341***	-3.046***
	[0.654]	[0.655]	[0.655]	[0.620]	[0.584]	[0.571]	[0.800]
Observations	4279	4279	4279	5019	5019	5019	3252
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.625	0.624	0.625	0.657	0.639	0.635	0.677
Pseudo R2	0.023	0.024	0.023	0.042	0.028	0.028	0.046

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

DV: Independent violation	(1) BigN	(2) Audit Fee Ratio	(3) Audit Fee City Ratio	(4) Tenure	(5) New Client	(6) Top 20 City	(7) Auditor Firm Diff	(8) City Specialist	(9) Industry Specialist
AQ Measure	-0.566	-1.296**	0.585	0.02	-0.123	0.388	0.378	-0.397	-0.073
	[0.381]	[0.548]	[0.593]	[0.019]	[0.237]	[0.338]	[0.331]	[0.281]	[0.276]
LogAT	0.122	0.024	0.047	0.081	0.087	0.054	0.055	0.082	0.071
	[0.076]	[0.111]	[0.106]	[0.079]	[0.078]	[0.093]	[0.094]	[0.096]	[0.097]
Leverage	0.039	0.292	0.147	0.068	0.066	0.062	0.063	0.079	0.078
	[0.235]	[0.346]	[0.404]	[0.233]	[0.232]	[0.247]	[0.248]	[0.235]	[0.255]
Loss	-0.504**	-0.669**	-0.619**	-0.515***	-0.514***	-0.657**	-0.652**	-0.669**	-0.673**
	[0.201]	[0.287]	[0.302]	[0.198]	[0.198]	[0.269]	[0.271]	[0.267]	[0.266]
AssetTurnover	-0.236	-0.49	-0.483	-0.266	-0.256	-0.496	-0.502	-0.473	-0.515
	[0.213]	[0.350]	[0.343]	[0.227]	[0.225]	[0.322]	[0.319]	[0.319]	[0.327]
M2B	0.001	0.002	0.001	0.001	0.001	0.002*	0.002*	0.002**	0.002*
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
ROA	0.029	0.131	0.071	0.036	0.034	0.025	0.024	0.024	0.029
	[0.136]	[0.201]	[0.230]	[0.149]	[0.149]	[0.143]	[0.142]	[0.139]	[0.152]
SalesGrow	-0.02	-0.001	-0.001	-0.016	-0.018	-0.016	-0.015	-0.018	-0.019
	[0.024]	[0.040]	[0.030]	[0.022]	[0.024]	[0.037]	[0.036]	[0.039]	[0.038]
Age	-0.002	-0.016	-0.014	-0.007	-0.003	-0.009	-0.009	-0.008	-0.009
	[0.009]	[0.013]	[0.013]	[0.011]	[0.009]	[0.011]	[0.011]	[0.011]	[0.011]
December	-0.204	-0.321	-0.348	-0.202	-0.203	-0.198	-0.182	-0.189	-0.211
	[0.290]	[0.379]	[0.386]	[0.289]	[0.290]	[0.363]	[0.360]	[0.364]	[0.368]
Segments	0.074	0.153	0.141	0.087	0.084	0.149*	0.145*	0.146*	0.132
	[0.068]	[0.094]	[0.090]	[0.069]	[0.068]	[0.087]	[0.085]	[0.087]	[0.085]
Constant	-3.118***	-1.881**	-2.888***	-3.383***	-3.357***	-3.141***	-3.143***	-3.113***	-3.020***
	[0.601]	[0.950]	[0.821]	[0.580]	[0.582]	[0.796]	[0.794]	[0.784]	[0.770]
Observations	5019	2798	2798	5019	5019	3236	3236	3236	3236
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.645	0.680	0.672	0.635	0.635	0.669	0.672	0.679	0.668
Pseudo R2	0.031	0.049	0.039	0.029	0.028	0.045	0.045	0.045	0.041

Table 9: Internal Control Violation

This table presents the results of Model (1). The dependent variable equals one if there is an alleged violation of "failure to obtain an understanding of internal control." 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. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. Standard-errors are clustered at firm level. 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

DV: Internal control violation	(1) DA	(2) AbsDA	(3) Total Accruals	(4) Rstmt	(5) SmlProfit	(6) SmlBeat	(7) GC
AQ Measure	0.033	-0.108	0.005	1.074***	-0.046	-0.021	-0.545
	[0.029]	[0.119]	[0.014]	[0.204]	[0.242]	[0.159]	[0.622]
LogAT	0.146*	0.143*	0.145*	0.106*	0.101	0.1	0.05
	[0.087]	[0.087]	[0.087]	[0.063]	[0.062]	[0.062]	[0.071]
Leverage	-0.044	-0.041	-0.045	0.016	0.009	0.008	-0.022
	[0.071]	[0.071]	[0.071]	[0.082]	[0.082]	[0.082]	[0.078]
Loss	-0.537**	-0.540***	-0.540***	-0.616***	-0.608***	-0.589***	-0.761***
	[0.209]	[0.209]	[0.209]	[0.184]	[0.205]	[0.201]	[0.227]
AssetTurnover	-0.3	-0.3	-0.299	-0.420*	-0.364*	-0.359*	-0.725**
	[0.207]	[0.208]	[0.207]	[0.228]	[0.208]	[0.211]	[0.288]
M2B	0.001	0.001	0.001	0	0	0	0.001
	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]
ROA	-0.084***	-0.084***	-0.084***	-0.073**	-0.066**	-0.067**	-0.072**
	[0.027]	[0.027]	[0.027]	[0.034]	[0.032]	[0.032]	[0.032]
SalesGrow	-0.036	-0.028	-0.034	-0.01	-0.014	-0.014	-0.008
	[0.040]	[0.036]	[0.043]	[0.018]	[0.019]	[0.019]	[0.030]
Age	-0.009	-0.009	-0.009	-0.006	-0.006	-0.006	-0.007
	[0.011]	[0.011]	[0.011]	[0.009]	[0.009]	[0.009]	[0.011]
December	-0.384	-0.385	-0.384	-0.342	-0.405*	-0.405*	-0.406
	[0.262]	[0.262]	[0.262]	[0.241]	[0.239]	[0.239]	[0.275]
Segments	0.041	0.042	0.041	0.064	0.073	0.071	0.052
	[0.080]	[0.080]	[0.080]	[0.068]	[0.065]	[0.064]	[0.080]
Constant	-3.193***	-3.149***	-3.189***	-3.472***	-2.944***	-2.942***	-2.129***
	[0.561]	[0.557]	[0.561]	[0.502]	[0.492]	[0.485]	[0.630]
Observations	4279	4279	4279	5019	5019	5019	3252
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.632	0.632	0.631	0.706	0.652	0.651	0.665
Pseudo R2	0.028	0.028	0.028	0.067	0.035	0.035	0.046

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

DV: Internal control violation	(1) BigN	(2) Audit Fee Ratio	(3) Audit Fee City Ratio	(4) Tenure	(5) New Client	(6) Top 20 City	(7) Auditor Firm Diff	(8) City Specialist	(9) Industry Specialist
AQ Measure	-0.304	-1.337***	0.179	0.015	-0.235	0.198	0.255	-0.565**	-0.226
	[0.361]	[0.416]	[0.655]	[0.019]	[0.262]	[0.327]	[0.321]	[0.261]	[0.234]
LogAT	0.116*	-0.049	-0.027	0.093	0.096	0.044	0.042	0.069	0.055
	[0.060]	[0.082]	[0.080]	[0.060]	[0.061]	[0.071]	[0.073]	[0.071]	[0.071]
Leverage	0.004	0.729**	0.630**	0.007	0.002	-0.032	-0.033	-0.013	-0.031
	[0.081]	[0.286]	[0.270]	[0.083]	[0.084]	[0.075]	[0.075]	[0.075]	[0.076]
Loss	-0.586***	-0.703***	-0.659**	-0.592***	-0.590***	-0.783***	-0.777***	-0.782***	-0.800***
	[0.189]	[0.264]	[0.271]	[0.188]	[0.188]	[0.227]	[0.228]	[0.225]	[0.225]
AssetTurnover	-0.347*	-0.981***	-0.954***	-0.367*	-0.358*	-0.702**	-0.703**	-0.646**	-0.713**
	[0.208]	[0.334]	[0.329]	[0.212]	[0.212]	[0.282]	[0.280]	[0.279]	[0.282]
M2B	0	0.001	0.001	0	0	0	0	0.001	0
	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
ROA	-0.065**	0.578	0.525	-0.066**	-0.069**	-0.065**	-0.065**	-0.066**	-0.066**
	[0.031]	[0.573]	[0.570]	[0.032]	[0.032]	[0.030]	[0.030]	[0.030]	[0.030]
SalesGrow	-0.015	0.005	0.006	-0.013	-0.014	-0.007	-0.006	-0.007	-0.012
	[0.019]	[0.033]	[0.028]	[0.017]	[0.019]	[0.028]	[0.026]	[0.029]	[0.032]
Age	-0.006	-0.011	-0.009	-0.009	-0.006	-0.007	-0.007	-0.006	-0.007
	[0.009]	[0.012]	[0.012]	[0.011]	[0.009]	[0.011]	[0.011]	[0.011]	[0.011]
December	-0.404*	-0.580**	-0.604**	-0.402*	-0.403*	-0.423	-0.41	-0.397	-0.425
	[0.239]	[0.289]	[0.299]	[0.238]	[0.239]	[0.277]	[0.276]	[0.277]	[0.276]
Segments	0.066	0.059	0.054	0.074	0.074	0.056	0.057	0.067	0.048
	[0.065]	[0.091]	[0.092]	[0.065]	[0.065]	[0.083]	[0.081]	[0.083]	[0.081]
Constant	-2.803***	-0.676	-1.690**	-2.956***	-2.914***	-2.167***	-2.178***	-2.200***	-1.956***
	[0.521]	[0.732]	[0.679]	[0.491]	[0.497]	[0.632]	[0.626]	[0.625]	[0.591]
Observations	5019	2798	2798	5019	5019	3236	3236	3236	3236
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.654	0.703	0.68	0.653	0.652	0.663	0.669	0.679	0.664
Pseudo R2	0.036	0.065	0.053	0.035	0.035	0.045	0.046	0.052	0.045

Table 10: Predicting Specific Audit Deficiencies Using All AQ Measures

This table presents the results of Model (1) when using combined regressions by including all the audit quality measures. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. Standard-errors are clustered at firm level. Model (5) does not include variables GC and Industry Specialist. This is because GC=0 and Industry Specialist=1 perfectly predicts independence violation. Therefore, Model (5) has lower number of observations. Associated p-values are reported using ***,**, and *, representing significance at the 1%, 5%, and 10% levels respectively.

Variables	(1) Evidence	(2) DueCare	(3) Opinion	(4) Plan	(5) Indep	(6) IntControl
DA	0.089***	0.090***	0.126***	-0.029	0.036	0.084*
	[0.031]	[0.032]	[0.035]	[0.051]	[0.053]	[0.044]
Rstmt	1.301***	1.474***	1.670***	1.021***	1.603***	1.762***
	[0.287]	[0.305]	[0.364]	[0.297]	[0.451]	[0.406]
SmlProfit	-0.753**	-0.835**	-0.876***	-1.194***	-1.152***	-0.844**
	[0.296]	[0.328]	[0.319]	[0.414]	[0.393]	[0.334]
SmlBeat	0.201	0.119	0.134	0.168	-0.073	0.058
	[0.180]	[0.185]	[0.180]	[0.198]	[0.259]	[0.229]
GC	-0.729	-0.328	0.063	-0.386		-1.279
	[0.853]	[0.685]	[0.674]	[0.851]		[1.201]
BigN	-1.543***	-1.571***	-0.488	-1.557***	-0.818	-0.693
	[0.434]	[0.436]	[0.494]	[0.484]	[0.643]	[0.554]
Audit Fee Ratio	-0.990**	-0.886**	-0.666	-1.378***	-1.583**	-1.648***
	[0.398]	[0.442]	[0.443]	[0.461]	[0.666]	[0.521]
Audit Fee City Ratio	1.315*	0.832	1.481*	1.747**	0.871	0.855
	[0.750]	[0.644]	[0.823]	[0.732]	[0.706]	[0.861]
Tenure	0.001	-0.023	0.014	-0.053**	0.024	0.017
	[0.026]	[0.024]	[0.029]	[0.026]	[0.031]	[0.026]
New Client	-1.035**	-0.911**	-0.391	-1.198***	-0.759	-0.587
	[0.437]	[0.397]	[0.396]	[0.400]	[0.545]	[0.416]
Top 20 City	0.274	0.209	-0.16	0.679*	-0.347	-0.268
	[0.351]	[0.382]	[0.369]	[0.383]	[0.511]	[0.437]
Auditor Firm Diff	0.123	0.18	0.462	0.192	0.417	0.467
	[0.358]	[0.369]	[0.352]	[0.401]	[0.497]	[0.390]
Industry Specialist	1.284*	1.123	1.191	1.594		1.795*
	[0.737]	[0.719]	[0.738]	[0.997]		[1.054]
City Specialist	-0.446*	-0.628**	-0.943***	-0.467*	-0.535	-0.552*
	[0.249]	[0.260]	[0.285]	[0.277]	[0.366]	[0.324]
Constant	-1.778*	-2.515**	-3.243***	-1.499	-2.453**	-3.111**
	[1.008]	[1.007]	[1.061]	[1.179]	[1.165]	[1.244]
Observations	2377	2377	2377	2377	2192	2377
Cluster by Firm	Yes	Yes	Yes	Yes	Yes	Yes
AUC	0.797	0.785	0.791	0.825	0.783	0.803
Pseudo R2	0.18	0.178	0.16	0.214	0.168	0.155

Table 11: Predicting Specific Audit Deficiencies Using Entropy Balanced Sample

Panels A and B present descriptive statistics for control variables before and after applying entropy balancing method. Panel C replicates Table 10 using entropy balanced sample presented in Panel B of Table 11. All control variables are included in the model, but not reported in Panel C for brevity. Model (5) in Panel C does not include variables GC and Industry Specialist. This is because GC=0 and Industry Specialist=1 perfectly predicts independence violation. Therefore, Model (5) has lower number of observations. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. Standard-errors are clustered at firm level. Associated p-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels respectively.

Panel A: Descriptive statistics before Entropy Balancing

	Treat Sample (N=195)		Control Sample (N=2182)		Difference in means
	Mean	Variance	Mean	Variance	p-value
LogAT	6.095	5.293	6.527	4.176	0.005
Leverage	0.460	0.085	0.513	0.508	0.304
Loss	0.308	0.214	0.430	0.245	0.001
AssetTurnover	0.891	0.401	0.965	0.705	0.231
M2B	3.893	17.510	3.771	983.600	0.957
ROA	-0.061	0.274	-0.150	1.787	0.358
SalesGrow	0.585	6.085	0.339	2.308	0.042
Age	21.810	283.500	25.680	282.600	0.002
December	0.672	0.222	0.678	0.218	0.853
Segments	2.026	2.118	2.109	2.237	0.457

Panel B: Descriptive statistics after Entropy Balancing

	Treat Sample (N=195)		Control Sample (N=2182)		Difference in means
	Mean	Variance	Mean	Variance	p-value
LogAT	6.095	5.293	6.095	3.464	0.999
Leverage	0.460	0.085	0.460	0.184	0.995
Loss	0.308	0.214	0.308	0.213	1.000
AssetTurnover	0.891	0.401	0.891	0.424	1.000
M2B	3.893	17.510	3.893	1285.000	1.000
ROA	-0.061	0.274	-0.062	0.309	0.994
SalesGrow	0.585	6.085	0.585	10.160	1.000
Age	21.810	283.500	21.810	186.300	1.000
December	0.672	0.222	0.672	0.221	1.000
Segments	2.026	2.118	2.026	2.103	1.000

Panel C: Predicting specific audit deficiencies using entropy balanced sample

Variables	(1) Evidence	(2) Due Care	(3) Opinion	(4) Planning	(5) Independence	(6) IntControl
DA	0.105***	0.122**	0.140***	-0.082	0.053	0.085*
	[0.037]	[0.050]	[0.040]	[0.086]	[0.034]	[0.048]
Rstmt	1.347***	1.512***	1.701***	0.969***	1.357***	1.584***
	[0.207]	[0.234]	[0.246]	[0.241]	[0.342]	[0.281]
SmlProfit	-0.704**	-0.802**	-0.971***	-0.987**	-1.200***	-0.885**
	[0.317]	[0.324]	[0.337]	[0.433]	[0.383]	[0.349]
SmlBeat	0.295	0.097	0.147	0.163	-0.08	0.141
	[0.208]	[0.215]	[0.221]	[0.236]	[0.276]	[0.249]
GC	-0.63	-0.134	0.526	-0.217		-0.888
	[0.748]	[0.674]	[0.731]	[0.651]		[1.116]
BigN	-1.301***	-1.202***	0.555	-1.137***	0.116	-0.106
	[0.331]	[0.362]	[0.351]	[0.395]	[0.495]	[0.391]
Audit Fee Ratio	-1.269**	-0.455	0.01	-1.907***	-1.551**	-1.803***
	[0.542]	[0.493]	[0.520]	[0.565]	[0.641]	[0.552]
Audit Fee City Ratio	1.363***	0.585	1.493***	1.812***	0.522	0.355
	[0.425]	[0.498]	[0.500]	[0.425]	[0.520]	[0.582]
Tenure	0.011	-0.039**	0.019	-0.068***	0.013	0.018
	[0.019]	[0.019]	[0.019]	[0.025]	[0.023]	[0.022]
New Client	-0.971**	-1.052**	-0.398	-1.217**	-0.903	-0.514
	[0.445]	[0.418]	[0.387]	[0.504]	[0.651]	[0.488]
Top 20 City	0.441*	0.169	-0.417*	0.999***	-0.499	-0.434
	[0.253]	[0.239]	[0.242]	[0.277]	[0.364]	[0.284]
Auditor Firm Diff	0.146	0.245	0.713***	0.301	0.451	0.540**
	[0.228]	[0.225]	[0.226]	[0.273]	[0.317]	[0.261]
Industry Specialist	0.97	0.605	0.848	1.359		1.342
	[0.810]	[0.817]	[0.802]	[0.938]		[1.146]
City Specialist	-0.371*	-0.726***	-1.182***	-0.454*	-0.508*	-0.437*
	[0.213]	[0.225]	[0.261]	[0.236]	[0.287]	[0.262]
Constant	1.001	-0.252	-1.166*	1.625**	-1.611*	-0.03
	[0.662]	[0.637]	[0.677]	[0.692]	[0.830]	[0.772]
Observations	2,377	2,377	2,377	2,377	2,192	2,377
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
F Stat	3.45	2.53	3.67	3.018	2.28	2.639

Table 12: Seemingly Unrelated Regressions

This table presents results for seemingly unrelated regressions that use the top 6 most cited audit violations as dependent variables. The independent variables include all the audit quality measures and control variables. Variable definitions are provided in Appendix A. Standard-errors are clustered at firm level. Standard-errors are clustered at firm level. Associated p-values are reported using ***, **, and *, representing significance at the 1%, 5%, and 10% levels respectively.

Variables	(1) Evidence	(2) DueCare	(3) Opinion	(4) Plan	(5) Indep	(6) IntControl
DA	0.008***	0.008***	0.009***	0.000	0.001	0.001
	[0.003]	[0.003]	[0.002]	[0.002]	[0.002]	[0.002]
Rstmt	0.065***	0.069***	0.067***	0.040***	0.043***	0.056***
	[0.010]	[0.009]	[0.009]	[0.009]	[0.007]	[0.008]
SmlProfit	-0.03**	-0.03***	-0.03**	-0.04***	-0.03***	-0.02**
	[0.015]	[0.015]	[0.014]	[0.014]	[0.011]	[0.013]
SmlBeat	0.012	0.007	0.007	0.006	-0.00	0.001
	[0.010]	[0.010]	[0.009]	[0.009]	[0.008]	[0.008]
GC	-0.04*	-0.02	-0.00	-0.03	-0.03*	-0.02
	[0.027]	[0.026]	[0.024]	[0.024]	[0.020]	[0.022]
BigN	-0.10***	-0.10***	-0.02	-0.08***	-0.02*	-0.02*
	[0.016]	[0.015]	[0.015]	[0.014]	[0.012]	[0.013]
Audit Fee Ratio	-0.05***	-0.05**	-0.03**	-0.06***	-0.05***	-0.07***
	[0.020]	[0.019]	[0.018]	[0.018]	[0.015]	[0.017]
Audit Fee City Ratio	0.095***	0.054**	0.081***	0.126***	0.034*	0.029
	[0.025]	[0.025]	[0.023]	[0.023]	[0.019]	[0.021]
Tenure	-0.00	-0.00	0.000	-0.00**	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
New Client	-0.05***	-0.05***	-0.01	-0.05***	-0.01	-0.02
	[0.017]	[0.017]	[0.016]	[0.016]	[0.013]	[0.014]
Top 20 City	0.013	0.009	-0.00	0.031**	-0.01	-0.01
	[0.014]	[0.013]	[0.013]	[0.012]	[0.010]	[0.011]
Auditor Firm Diff	0.001	0.006	0.018	0.001	0.013	0.018
	[0.013]	[0.013]	[0.012]	[0.012]	[0.010]	[0.011]
Industry Specialist	0.048*	0.041*	0.042*	0.044*	0.037**	0.041*
	[0.025]	[0.024]	[0.023]	[0.023]	[0.019]	[0.021]
City Specialist	-0.02**	-0.03***	-0.04***	-0.02**	-0.01**	-0.02***
	[0.010]	[0.010]	[0.009]	[0.009]	[0.007]	[0.008]
Constant	0.184***	0.132***	0.070*	0.187***	0.040	0.089***
	[0.039]	[0.038]	[0.036]	[0.035]	[0.029]	[0.032]
Observations	2377	2377	2377	2377	2377	2377
Controls	Yes	Yes	Yes	Yes	Yes	Yes
F-stat	8.25	6.91	5.94	8.37	3.99	4.63
Pseudo R2	0.078	0.066	0.057	0.079	0.039	0.045