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Non-CPAs and Office Audit Quality

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Non-CPAs and Office Audit Quality

ABSTRACT
During the time surrounding the Sarbanes-Oxley Act of 2002, the Big 4 firms either spun-off or downsized their consulting practices. However, in recent years, consulting service lines of the large accounting firms have seen a dramatic resurgence and growth. Regulators have taken notice of, and expressed concern over, this renewed focus on consulting. The accounting firms claim that such services enhance audit quality, mainly due to the prominent role of non-accounting specialists in today's external audit function. This study examines whether the availability of non-CPAs in U.S. Big 4 firm offices is associated with audit quality. We find that greater access to non-CPAs in the office is associated with higher audit quality and conclude that office audit quality is not just a function of audit-specific human resources but also the availability of non-CPAs to support audit engagement teams.

Keywords: non-CPAs, audit quality, human resource capital, audit firm offices

JEL Classification: M41 - M42

Data Availability: Data on office on CPA composition was hand-collected from the annual *Book of Lists* publications of U.S. city business journals. Data on other variables are publicly available, as indicated in the paper.

I. INTRODUCTION

Recently, the Public Company Accounting Oversight Board (PCAOB) and other regulators have expressed concern that the growth in the number of non-CPA professionals employed by large public accounting firms might shift the focus of the firms away from financial statement audits. The increasing presence of personnel not conversant with, nor fully appreciative of, the vital importance of delivering quality accounting and audit services might shift the firm's culture towards emphasizing growing revenues from advisory-driven services at the expense of audit quality (Wyatt 2004; Suddaby, Gendron, and Lam 2009). At the same time, public accounting firms assert that, given the increase in audit complexity and demands for greater use of various kinds of non-accounting specialists on audits, the growth in the number of non-CPA professionals employed by audit firms actually enhances audit quality (Whitehouse

2014; Dancey 2018; Ucuzoglu 2018). Auditors often call upon subject matter experts for a variety of reasons, including when complex or subjective accounting matters exist (e.g., fair value measurements or intangible assets), when a client has complex or varied IT systems, and when guidance is needed on the use of emerging technologies such as drones and other matters requiring such experts as geologists, environmental experts, and actuaries (Bauer and Estep 2014; PCAOB 2017; Griffith 2019; Jenkins, Negangard, and Oler 2018). Prior literature examines the association between audit engagement quality and consulting service revenues at the audit firm level, as well as the relation between audit engagement quality and auditor provided non-audit services, such as tax services (Lisic, Myers, Pawlewicz and Seidel 2019 and Bell, Causholli and Knechel 2015, respectively). However, there is no research on the relation between office-level consulting services and audit engagement quality, particularly from a human resource perspective. This study adds to the current literature by examining the association between the levels of non-CPAs in audit firm offices and audit engagement quality.

We introduce a novel measure for assessing the availability of non-CPAs in an audit firm office: the ratio of non-CPAs to total office employees. We hand-collect data on the number of CPAs and the total number of professionals and employees within U.S. Big 4 offices from the annual *Book of Lists* publications (Top/Largest Accounting Firms lists). We recognize that non-CPAs typically fall into one of the following categories: client-facing employees aspiring to be CPAs, client-facing employees not aspiring to be CPAs, and non-client-facing administrative employees. The *Book of Lists* data do not allow us to distinguish among the various non-CPA employee categories. However, under the general presumption that staffing ratios of the junior and administrative staff among financial statement audit and tax personnel are relatively consistent among audit offices, we infer that non-CPA professionals working in

consulting/advisory practices represent the primary source of variation among office non-CPA levels. Furthermore, we argue that the non-CPA professionals available to advise and lend their expertise to support the audit function have the most significant impact on audit outcomes among the aforementioned non-CPA categories. Although we provide some evidence, both anecdotally and from additional analyses, that supports these inferences, we acknowledge that the inability to directly measure the employee mix of non-CPAs and the number of professionals by service line within an office adds noise to our test variable and is a limitation of our study.

We analyze audits conducted by U.S. Big 4 firms from 2009 to 2014 and find that Big 4 offices with higher percentages of non-CPAs are associated with higher audit quality as proxied by lower rates of restatements and lower performance-adjusted discretionary accruals. In addition, we do not find a significant association between the office non-CPA percentage and the likelihood of issuing a going-concern modified opinion. The additional analyses indicate that the association between non-CPA levels and audit quality is greater for complex clients, which lends some support to the notion that non-CPA professionals are driving the results rather than uncertified junior staff or administrative staff.[1] However, we caution against making any definitive conclusions on the specific non-CPA groups' effects on audit quality due to the limitations of our data.

This study makes several contributions to both auditing practice and literature by extending the research stream on the effect of non-CPAs available within a given audit office on audit quality. First, this study provides evidence to regulators, accounting firms, and investors on the benefits of an audit office having more non-CPA personnel to support the audit function.

[1] We use the terms "local specialist," "same-office specialist," "in-house specialist," and "auditor-employed specialist" interchangeably throughout this paper. The terms all represent the concept that the non-CPAs are housed in the same audit firm office as the audit engagement team.

Regulators have once again become wary of the growing non-accounting practices of the large public accounting firms. For example, the United Kingdom's Competition and Markets Authority (CMA) recently completed a study on the statutory audit services market in the U.K. and recommended, among other things, an operational split of the Big 4's U.K. audit work (CMA 2019; Giles 2019). Some of the U.K. Big 4 firms have begun the process of splitting up their practices to address regulator concerns (Pooley 2019, Evans 2019). Our results do not support these concerns; rather, we find that having higher levels of non-CPAs in audit firm offices enhances audit quality. Second, our study extends the office-level audit outcomes literature stream by being the first to empirically examine the association between non-CPA levels and audit quality at the office level. This study is the first large-scale archival examination of office human resource composition on office audit quality. Finally, we answer the call by Boritz, Kochetova, Robinson, and Wong (2017) to provide some empirical archival evidence that complements the prior behavioral research on the use of specialists on financial statements audits. While data limitations restrict us from directly measuring specialists' effects on audit quality, our results do provide some insight on the non-CPA professionals' effect on audit quality.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

Soon after the demise of Arthur Andersen, former audit firm partner and Financial Accounting Standards Board (FASB) member Arthur Wyatt suggested that "the increasing infusion of personnel not conversant with, or even appreciative of, the vital importance of delivering quality accounting and audit services affected the internal firm culture, its top-level decisions, and the behavior patterns of impressionable staff personnel" (Wyatt 2004). He noted that this infusion of personnel began in the 1960s when accounting firms started pursuing non-

audit revenue streams. In recent years, accounting and auditing regulators have once again taken notice of the significant growth in advisory and consulting services by the large accounting firms. For example, in a 2013 speech, former Chief Accountant of the Securities and Exchange Commission (SEC) Paul Beswick echoed Wyatt's sentiments that he too was concerned that accounting firms' expansion into businesses that have little relevance to their primary competencies probably does little to promote audit quality (Beswick 2013). Likewise, in his 2014 speech entitled "Concerns of Investors," PCAOB board member Steven Harris said, "Consulting revenue for the Big Four global network firms has increased over the past five years by 33 percent, versus only 6 percent in audit revenue. Based on acquisitions and other activities at the firms, it is likely that consulting revenue will continue its rise." He further noted that at the time, the Big Four firms and their affiliates had announced over 36 acquisitions of consulting businesses, with the Big Four U.S. firms accounting for 19 of those acquisitions (Harris 2014). Finally, both the PCAOB Investor Advisory Group and the International Forum of Independent Audit Regulators' (IFIAR) Investor and Other Stakeholders Working Group have raised similar concerns about the rise of advisory and consulting services and the implications for independence, objectivity, skepticism, and audit quality at the largest accounting firms (Harris 2014). The United Kingdom's Competition and Markets Authority has begun acting on these concerns by recently completing an extensive study on the statutory audit services market. In their final report, the CMA recommends, among other things, an operational split of the Big 4's U.K. audit work (CMA 2019).

However, not all are convinced that the audit firms' array of services has a negative influence on audit quality. Representatives of the large accounting firms argue that the in-house expertise of non-audit service professionals supports audit work, particularly for the complex

audits of today (Whitehouse 2014; Dancey 2018; Ucuzoglu 2018). Accounting firm leaders explain that employing specialists such as actuaries, real estate valuation experts, and engineers to perform audit tests of complex estimates improves audit quality and financial reporting quality. Both auditors and regulators expect the use of specialists to continue to rise due to the expansion of complex accounting situations such as reporting and disclosure of assets and liabilities at fair value (Kaiser 2018; PCAOB 2009, 2014, 2015, 2017, 2018).

The PCAOB recently amended auditing standards to expand guidance on auditors' use of work performed by specialists in the audit (PCAOB 2017, 2018). The Board justified the amendments, in part, because the use of specialists' work continues to increase in both frequency and significance due to accounting estimates becoming more prevalent and more significant as business transactions increase in complexity and financial reporting frameworks continue to evolve and require greater use of estimates (Barac, Gammie, Howieson, and van Staden 2016; PCAOB 2017, 2018; Pyzoha, Taylor, and Wu 2020; Griffith 2019). The participants of a recent Canadian qualitative study report that over 50 percent of audits require the use of at least one type of specialist (Boritz et al. 2017), while the participants of another study report that over 60 percent of audits require the use of valuation specialists (Griffith 2019).

The growing literature on auditors' use of in-house specialists to complete audit work mainly consists of interview-based, survey-based, and experimental studies. Boritz et al. (2017) performed an interview-based study of 40 practitioners and found that auditors and specialists disagree on how firm policies are applied and how they influence the use of specialists. Bauer and Estep (2014, 2019) also conducted an interview-based study of 33 financial and IT auditors, and they posit that the involvement of IT auditors in audits is a relatively subjective process that results in significant variation of the extent to which IT auditors are used. Building on this

interview/survey-based research, Cannon and Bedard (2017) use data from a sample of 115 fair value measurement audits and find that inherent risk and control risk are associated with the decision to use a valuation specialist and that auditors typically use a specialist when the client does. Griffith (2019) uses Giddens's (1990, 1991) theories of trust in expert systems to analyze the interviews of 28 auditors and 14 valuation specialists to explain why auditors use specialists and how the auditors' approach to specialists might systematically affect the way auditors incorporate specialists' work into their judgments. Griffith (2019) concludes that it is logical for auditors to rely on an expert system (i.e., specialists) to provide the specific knowledge needed to complete audits. Griffith also notes that because auditing standards require auditors to take responsibility for the work performed by specialists (PCAOB 2009, 2014, 2015, 2017), the level of trust between the audit team and the specialist is a critical element in the willingness of the audit team to engage and rely on a specialist.

Audit firms may promote rapport between non-accounting professionals and auditors by having them work in the same physical location. The goal is to increase the sense that auditors and specialists are all members of the same team, or by combining some elements of training for auditors and specialists to increase familiarity and crossover knowledge (Griffith 2019; Joe, Wu, Zimmerman 2019). Frequent interactions between auditors and specialists should allow for greater opportunity for trust to develop, which could promote a greater acceptance of specialists' work, as well as critical evaluation and integration of their work by auditors (Knights, Noble, Vurdubakis, and Willmott 2001; Griffith 2019; Joe et al. 2019). The PCAOB (2017, Background) notes that "if a specialist's work is not properly overseen or evaluated by the auditor, there may be a heightened risk that the auditor's work will not be sufficient to detect a material misstatement in accounting estimates." According to the PCAOB, greater audit quality

should result (or fewer audit deficiencies would be found) from an auditor's more appropriate use, evaluation, and integration of a specialist's audit procedures over complex estimates (PCAOB 2015, 2017). The increased level of auditor's trust arising from the availability of same-office specialists would expectedly enhance the appropriate use, evaluation, and integration of such specialists by the local auditors.

There are opposing views on the relation between greater availability of (access to) non-accounting professionals in the office and audit quality. Offices with significant consulting/advisory service lines may focus resources and tone-at-the-top on the more lucrative and growing consulting business, and less on the auditing practice, ultimately lowering audit quality. However, offices with significant consulting/advisory service lines may also provide better access to an assembly of auditor-employed specialists and facilitate greater trust between the audit teams and the local specialists, ultimately resulting in higher audit quality. Assuming that staffing ratios of the junior and administrative staff among financial statement audit and tax personnel are relatively consistent across audit offices, we infer that non-CPA professionals working in consulting/advisory practices represent the primary source of variation among office non-CPA levels. Furthermore, we expect this group of non-CPAs to have the most significant impact on audit outcomes among all of the non-CPA groups in an audit firm's office. The opposing propositions of the relation between the level of non-CPAs in the office and audit quality leads to the following non-directional hypothesis.

H1: *There is no association between the level of non-CPAs in an audit firm office and the office's audit engagement quality.*

III. METHODOLOGY

Data and Sample

To determine the level of non-CPAs in U.S. Big 4 firm offices, we hand-collect office personnel composition data from a special annual publication entitled the "Book of Lists" that is published in major U.S. cities by either *American City Business Journals* or *Crain's Business Journals*. The Book of Lists publication ranks the top accounting firm in each city or metro area by size and includes various information on the offices of top accounting firms in that area, such as the name of the office managing partner, the number of CPAs, and the number of employees.[2] The information included in the list of top accounting firms varies and is not identical for each Metropolitan Statistical Area (MSA).[3] Our sample is limited to the inclusion of firm-year observations from MSAs for which the Book of Lists provides all of the data necessary for the computation of our primary test variable.[4] To increase cross-MSA comparability within our sample, we require an MSA's Book of Lists to report the number of CPAs and the number of total accounting office employees for at least three years.[5]

Table 1 reports the sample attrition for each of the samples we employ to estimate our regression models. We begin by merging the hand-collected Book of Lists dataset with data from Audit Analytics and Compustat based on audit firm, year, and MSA code. This results in a combined dataset containing 25,405 company-year observations between 2009 and 2014. To

[2] While the Book of Lists classifies the publications by "city," Metropolitan Statistical Area (MSA) is a more accurate description. The MSA is a geographic unit comprising of one or more counties, including the counties containing the core urban area and adjacent counties with a high degree of social and economic integration (see http://www.census.gov/population/metro/). For example, neither the U.S. Census Bureau-defined MSAs nor the Book of Lists publications distinguish between Kansas City, Kansas and Kansas City, Missouri, despite the fact that they are separate cities. We use the terms city, MSA, and metro area interchangeably throughout this paper.

[3] Keune, Mayhew and Schmidt (2016) also use data from the Book of Lists in their examination of the effect of non-Big 4 firm local market leadership on audit market competition. We require the Book of Lists data to report both the number of CPAs and the total number of employees in order to compute our *NONCPA%*, whereas they require only the rank of the firm office in relation to the other local offices. Thus, given that not all Book of Lists publications include both the number of CPAs and the total number of employees, our MSA sample size is smaller than that used by Keune et al. (2016).

[4] See the Limitations section of the paper for further discussion on this data restriction.

[5] For further details regarding the MSAs with incomplete data and the results of analyses with their inclusion in our sample, see the Additional Analysis section later in the paper.

eliminate the potential influence of differences in firm-wide resources that might occur between Big 4 and non-Big 4 firms, we limit our sample to the 18,048 observations audited by Big 4 firms. Following prior research, we omit 6,890 observations associated with financial institutions and utility companies due to their unique nature and a high degree of regulation (Reichelt and Wang 2010). This results in a base sample of 11,158 company-year observations. Panel A of Table 1 shows the sample selection for the misstatement analysis. We omit 5,755 observations due to missing necessary data elements, resulting in a sample of 5,403 observations.[6] Panel B of Table 1 shows the sample selection for the discretionary accruals analysis. We omit 5,789 observations due to missing control variables, resulting in a sample of 5,369 observations. Panel C shows the sample selection for the going concern modified audit opinion analysis. We limit the sample to financially distressed companies defined as those with current year net loss or negative operating cash flows. After omitting 3,113 observations due to their missing data for control variables, the final sample consists of 1,630 observations.

[Insert Table 1 about here.]

Variables and Models

Using the Book of Lists data, we introduce *NONCPA%* as a novel measure to proxy for the availability of non-CPAs in an accounting firm office. We estimate *NONCPA%* using equation (1), as follows:

NONCPA% = (Number of Employees – Number of CPAs) / Number of Employees (1)

[6] 2014 is used as the sample cutoff for examining material misstatements that results in a restatement of previously issued financial statements to allow sufficient time for detection and correction of the material misstatement. This is in line with prior research (Francis, Michas, and Yu 2013).

The numerator in equation 1 represents the number of non-CPAs at the accounting-firm MSA level for which data are available via the Book of Lists.[7] The denominator of equation (1) represents the total number of employees of the accounting firm in the corresponding MSA.

Existing research finds that the limited authoritative guidance regarding the use of non-CPA specialists on audit engagements results in firms developing and relying on their own internal guidance on the nature, timing, and extent of the use of such specialists (Bauer and Estep 2014; Glover, Taylor and Wu 2017, 2019; Griffith 2019). This limited guidance allows for significant variability in regard to the availability and usage of such specialists both among and within audit firms. Some variation is also expected within the other two groups of non-CPAs: uncertified staff and office support professionals; however, this variation is likely to be considerably less than the variation within the non-CPAs specialists. Based on inquiries with a couple of leading partners of Big 4 accounting firms, the number of unlicensed staff and office support staff are proportionally similar across offices due to firm-level (rather than office-level) guidance on hiring assurance and tax staff and office support.[8] Presuming unlicensed staff and office support staff are proportionally similar across offices, our test variable (*NONCPA%*) should primarily capture the level of variation among the consulting/advisory professionals residing in the firms' offices. However, we recognize that the inability to directly measure the office non-CPA employee mix adds noise to our test metric and is a limitation of our study. We

[7] In a few major cities (e.g., New York City, Los Angeles), accounting firms might have multiple physical locations. The Book of Lists report personnel figures that represent all of an accounting firm's offices within a city in total (i.e., the MSA level, as described in footnote 2). We map auditor offices (per the audit report) into MSAs, which allows us to match audit office data with Book of Lists data according to MSA. Thus, the numerator of equation (1) represents an accounting firm's number of employees within an MSA minus its number of CPAs within the MSA. Based on discussions with the Big 4 audit firms, due to the geographical proximity of audit firm offices within an MSA, there is a consistent tone-at-the-top across offices within an MSA. In sensitivity analyses, we limit our sample to include only the primary signing office within each MSA and find substantially similar results.

[8] The former office managing partners note that unlicensed staff and office support would be proportionally similar across offices and regions within the same firm, as such staffing levels are monitored by regional and firm administrators. However, we do not have empirical evidence to support this anecdotal evidence.

also recognize that office size might influence the variation we are attempting to identify, as having more employees within an office affords that office the chance to have greater variation within its employees. In an effort to mitigate this potential office size effect, we control for the total number of office employees in our audit quality models.[9]

Based on DeFond and Zhang (2014), who recommend using multiple proxies to test audit quality, we utilize multiple audit quality models to test our hypothesis (H1): material misstatements that result in subsequent restatements, performance-adjusted abnormal discretionary accruals, and the issuance of a going concern (GC) modified audit opinion. As noted in DeFond and Zhang (2014), the GC model provides evidence on the extent to which auditors are independent, which is a key component of audit quality.

First, we rely on prior literature and employ the following restatement logistic regression model:

$$\begin{aligned} Prob(MISSTATE = 1) = {} & b_0 + b_1 NONCPA\% + b_2 SIZE + b_3 ROA + b_4 LEVERAGE + b_5 LOSS \\ & + b_6 CAPITAL + b_7 SI + b_8 RESTRUCT + b_9 MERGER + b_{10} LIT + b_{11} FOREIGN \\ & + b_{12} SEG + b_{13} ICMW + b_{14} BM + b_{15} INDSPE + b_{16} AUDTEN + b_{17} GC \\ & + b_{18} EMPCOUNT + b_{19} AUDITFEES + b_{20} NASFEES + b_{21} FEERATIO \\ & + b_{22} CLIENTIMP + b_{23} MEDINCOME + b_{24} UNEMPRATE \\ & + Industry, Year, and\ MSA\ Dummies + e \end{aligned} \quad (2)$$

The dependent variable, *MISSTATE*, equals 1 when an issuer's annual audited financial statements are subsequently found to contain a material misstatement and are therefore restated in a subsequent period, and 0 otherwise. The coefficient on *NONCPA%* shows the intercept shift capturing the change in likelihood of a material misstatement as the percentage of non-CPAs within an audit office increases. A negative coefficient for *NONCPA%* indicates a decrease in the likelihood of a misstatement occurring for audits performed by offices with a greater proportion of non-CPAs. Lower likelihood of a restatement indicates higher audit quality.

[9] We thank an anonymous reviewer for the suggestion of including the total number of employees at the office-level as a control variable in the models.

Additional control variables for equation (2) are drawn from the prior literature on misstatements (Burns and Kedia 2006; Chen and Li 2013; Lobo and Zhao 2013). These variables encompass various proxies for firm performance and audit risk, both of which affect the likelihood of a restatement. Client size is measured as the natural log of the issuer's total assets (*SIZE*). Firm performance and profitability controls include return on assets (*ROA*), the debt-to-total assets ratio (*LEVERAGE*), the presence of net losses (*LOSS*), the degree of capital (fixed assets) intensiveness (*CAPITAL*), and the amount of special items income reported (*SI*). Firm complexity control variables include the presence of restructuring charges (*RESTRUCT*), mergers and acquisitions (*MERGER*), operating in a highly litigious industry (*LIT*), foreign transactions (*FOREIGN*), and the number of segments (*SEG*), as well as the nature of the issuer's internal control environment, proxied by the existence or not of material weaknesses in internal controls over financial reporting (*ICMW*). The book-to-market equity ratio (*BM*) controls for financing activities. Characteristics of the firm's auditor such as industry specialization at the national and city level (*INDSPE*), audit firm tenure (*AUDTEN*), issuance of a going concern modified audit opinion (*GC*), and the natural log of the number of employees within the accounting firm office (*EMPCOUNT*) are included as additional control variables. We also control for features of the client-auditor relationship, such as the engagement level audit fees (*AUDITFEES),* the engagement level non-audit services fees, (*NASFEES*), the ratio of non-audit service fees to the total fees paid to the audit firm by the client (*FEERATIO*), and the client's degree of economic importance to the audit office (*CLIENTIMP*) (Li 2009; Craswell, Stokes, and Laughton 2002).[10]

[10] We use non-audit service fees, net of any tax service fees, paid by the client to the auditor. Our results are consistent in magnitude, direction, and significance when the regressions are estimated using the reported non-audit service fees including tax fees.

Since we are unable to include all MSAs with a Big 4 office in our sample due to data restrictions, we also include two controls for the economic conditions within the MSAs in our sample. We control for the median income within the MSA (*MEDINCOME*) and the MSA's annual unemployment rate (*UNEMPRATE*) (Beck, Francis, and Gunn 2018). All continuous variables are winsorized at the 1 percent and 99 percent levels. In addition, given that misstatement occurrence is non-systematic per the unique characteristics of individual industries and MSAs, we include year, industry, and MSA indicator variables when estimating equation (2). Otherwise, our findings might be, at least in part, due to general increases or decreases in year-over-year restatement rates, or other conditions within an industry and geographic location correlated with misstatement rates. We list the definitions of the control variables in Appendix A.

Second, we examine the relation between the office's *NONCPA%* and audit client discretionary accruals, a proxy for client earnings management. Higher discretionary accruals indicate lower audit quality. We rely on prior literature to develop the following OLS regression model to predict discretionary accruals:

$$\begin{aligned} DA = \; & b_0 + b_1 NONCPA\% + b_2 SIZE + b_3 LEVERAGE + b_4 LIT + b_5 SCALEDOANCF + b_6 SALEGR \\ & + b_7 GC + b_8 FOREIGN + b_9 SEG + b_{10} ICMW + b_{11} AUDTEN + b_{12} EMPCOUNT \\ & + b_{13} AUDITFEES + b_{14} NASFEES + b_{15} FEERATIO + b_{16} CLIENTIMP \\ & + b_{17} MEDINCOME + b_{18} UNEMPRATE + Industry, Year, and\ MSA\ Dummies \\ & + e \end{aligned} \quad (3)$$

The dependent variable (*DA*) is the value of performance-adjusted discretionary accruals. We employ signed accruals because prior studies (Caramanis and Lennox 2008; Ke, Lennox, and Xin 2015) argue that overstating rather than understating earnings is of greater concern to auditors and that absolute accruals can be more susceptible to false positives than signed accruals (Hribar and Nichols 2007). A positive coefficient associated with *NONCPA%* will indicate that client discretionary accruals are higher for offices where non-CPAs make up a larger percentage

of employees. The higher the discretionary accruals, the greater the unconstrained earnings management in the company, and therefore, the lower the quality of the audit.

We follow prior studies to obtain additional control variables for equation (3) (Ashbaugh, LaFond, and Mayhew 2003; Hribar and Nichols 2007; Lim and Tan 2008; Wang and Zhou 2012; Ke et al. 2015). These control variables include company size (*SIZE*), financial leverage ratio (*LEVERAGE*), litigiousness of the client's industry (*LIT*), standard deviation of operating cash flows (*SCALEDOANCF*), sales growth (*SALEGR*), issuance of a going concern modified audit opinion (*GC*), presence of foreign operations (*FOREIGN*), natural logarithm of the client's total number of segments (*SEG*), presence of an internal control material weakness (*ICMW*), auditor's tenure with the client (*AUDTEN*), and office employee count (*EMPCOUNT*). Consistent with equation (2), we control for specific characteristics of the client-auditor relationship (*AUDITFEES*, *NASFEES, FEERATIO*, *CLIENTIMP*), for the economic conditions within the MSAs in our sample (*MEDINCOME*, *UNEMPRATE*), and for the unique industry, MSA, and year effects (*Industry, Year, and MSA Dummies*). Definitions of the control variables can be found in Appendix A.

Third, we examine the relation between the office's *NONCPA%* and the likelihood of the auditor issuing a going concern modified audit opinion (*GC*) to financially distressed clients. DeFond and Zhang (2014, p. 287) state that "GCs have several advantages in measuring audit quality. First, failing to issue a GC when one is appropriate is a clear indication of low audit quality (holding measurement issues aside). Second, the GC opinion formulation process is a setting that allows direct insights on auditor independence. This is an advantage because auditor independence is a necessary condition for auditing to have value (Watts and Zimmerman 1981)." A greater likelihood of issuing a going concern modified opinion indicates higher auditor

independence and higher audit quality (Li 2009; Francis and Yu 2009). We test the relation between the *NONCPA%* and auditor independence using the following going concern modified audit opinion prediction model estimated using logistic regression:[11]

$$\begin{aligned} Prob(GC = 1) &= b_0 + b_1 NONCPA\% + b_2 SIZE + b_3 ROA + b_4 LEVERAGE + b_5 BM \\ &+ b_6 ISSUE + b_7 MERGER + b_8 NEGEQUITY + b_9 SALEGR + b_{10} ICMW \\ &+ b_{11} INVAT + b_{12} EXTFINDMD + b_{13} AUDTEN + b_{14} INDSPE \\ &+ b_{15} EMPCOUNT + b_{16} AUDITFEES + b_{17} NASFEES + b_{18} FEERATIO \\ &+ b_{19} CLIENTIMP + b_{20} MEDINCOME + b_{21} UNEMPRATE \\ &+ Industry, Year, and\ MSA\ Dummies + e \end{aligned} \quad (4)$$

A positive coefficient on *NONCPA%* indicates higher audit quality for audit clients of offices having relatively greater availability of non-CPAs in the office.

The control variables are based upon prior studies on the determinants of issuing a going concern modified audit opinion (Craswell et al. 2002; Francis and Yu 2009; Li 2009) and encompass various proxies for firm financial stability, audit effort, and audit risk. These control variables include client size (*SIZE*), profitability (*ROA*), leverage (*LEVERAGE*), book-to-market equity ratio (*BM*), issuance of new debt or equity (*ISSUE*), merger and acquisition activity (*MERGER*), negative equity (*NEGEQUITY*), sales growth (*SALEGR*), presence of a material weakness in the client's internal controls over financial reporting (*ICMW*), inventory conversion rate (*INVAT)*, and the need for external financing (*EXTFINDMD*).

Consistent with our other models, we control for other determinants of audit firm and office quality, including industry specialization at the national and city level (*INDSPE*), auditor tenure (*AUDTEN*), and audit office employee count (*EMPCOUNT*), a proxy for office size. Furthermore, we control for specific characteristics of the client and auditor relationship (*AUDITFEES*, *NASFEES, FEERATIO*, *CLIENTIMP*), for the economic conditions within the

[11] We estimate the model on two common going concern measures: 1) the issuance of a new going concern modified audit opinions only and 2) any issuance of a going concern modified audit opinion.

MSAs in our sample (*MEDINCOME*, *UNEMPRATE*), and for the unique industry, MSA, and year effects (*Industry, Year, and MSA Dummies*). Definitions of the control variables can be found in Appendix A.

IV. RESULTS

Descriptive Statistics

Table 2 presents information about the distribution of our sample across MSAs and accounting firms. Panel A of Table 2 reports the percentage of the sample observations by MSA. The highest percentage of our sample observations reside in Boston, Dallas, Houston, and New York. Panel B of Table 2 presents the average *NONCPA%* across all of the Big 4 firm offices in each MSA by year of available data.[12] The presented amounts show wide variation in *NONCPA%* among the MSAs included in our sample. Panel C of Table 2 reports each Big 4 firm's average *NONCPA%* by MSA within our sample. While the MSA-level averages closely align with those presented in Panel B, the results show some firm-level variation in the *NONCPA%* measure.

[Insert Table 2 about here.]

Table 3 reports descriptive statistics (mean, median, and standard deviation) for the sample of firm-year observations used in the estimation of each of the models. The average *NONCPA%* of the samples is between 0.61 and 0.63. The control variables common to multiple models are consistent across the samples.

[Insert Table 3 about here.]

[12] While most of the MSAs in our sample contain offices of each Big 4 accounting firm, and most accounting firms disclose employee and CPA count data for each MSA, the presence or disclosure of employee and CPA count data by all four of the Big 4 firms within an MSA is not a requirement for inclusion in our sample. In a sensitivity test, we limit the sample to only MSAs with offices of each Big 4 accounting firm and complete data on employee and CPA counts and find results consistent with those reported in the Results section.

Table 4 reports the Pearson correlation coefficients between the variables used in the study. The results indicate a negative correlation between *NONCPA%* and both restatements and discretionary accruals, which suggests higher levels of non-CPAs in audit firm offices are associated with higher audit quality.

[Insert Table 4 about here.]

Hypothesis Testing

Restatements

Table 5 reports the logistic regression estimation of equation (2) using a sample of 5,403 firm-year observations. Coefficients, z-statistics, and significance levels are shown along with model statistics. The model is significant with an area under the ROC curve of 72 percent, indicating an acceptable model fit. The negative and significant ($p < 0.01$) coefficient on *NONCPA%* indicates that offices with relatively more non-CPAs are associated with lower restatement rates, indicating such offices have higher audit quality. Economically speaking, as *NONCPA%* increases from the 25th percentile to the 75th percentile, the likelihood of material misstatements is reduced by approximately 32 percent. Consistent with prior literature, *ROA* and *FOREIGN* are negatively associated with restatements, and *SI, ICMW,* and *UNEMPRATE* are positively related to restatements, $p < 0.05$. In addition, *FEERATIO* and *BM* are also positively associated with restatements, $p < 0.10$. The *NONCPA%* result provides evidence to reject the null hypothesis H1 and suggests that offices with greater availability of non-CPAs perform higher quality audits.

[Insert Table 5 about here.]

Discretionary Accruals

Table 6 reports the results of estimating equation (3) for the value of performance-adjusted discretionary accruals. The model is statistically significant and explains 13 percent of the variation in performance-adjusted discretionary accruals. The coefficient on *NONCPA%* is negative and significant ($p < 0.05$) and suggests offices with greater availability of non-CPAs are associated with higher quality audits. The results of the discretionary accruals model provide further evidence to reject the null hypothesis H1. The results also show that *LEVERAGE, LIT*, *SCALEDOANCF, GC, NASFEES, CLIENTIMP,* and *MEDINCOME* are negatively associated with discretionary accruals, and *SIZE* and *EMPCOUNT* are positively related to discretionary accruals. The results for the other control variables are insignificant.

[Insert Table 6 about here.]

Going Concern Modified Opinions

The GC opinion formulation process is a setting that allows direct insights on auditor independence (DeFond and Zhang 2014). Table 7 shows the results of estimating the likelihood of issuing a GC-modified opinion, equation (4). Column I reports the results when the dependent variable is the issuance of a first-time going concern modified opinion (*NEWGC*), and column II reports the results when the dependent variable is the likelihood of issuing any going concern modified audit opinion (*GC*). In both models, the coefficient of *NONCPA%* is negative and insignificant. The lack of a significant coefficient on *NONCPA%* indicates that there is no conclusive evidence that more availability of non-CPAs in the office compromises auditors' independence.

Consistent with prior literature (e.g., Li 2009), larger firms (*SIZE*) and firms with greater book-to-market ratios (*BM*) are less likely to receive a GC modified audit opinion, whereas firms with negative equity (*NEGEQUITY*), more inventory and accounts receivable (*INVAT*), greater

need of external financing (*EXTFINDMD*), higher audit fees (*AUDITFEES*), and auditors from larger offices (*EMPCOUNT*) are more likely to receive a GC modified audit opinion.

[Insert Table 7 about here.]

V. ADDITIONAL ANALYSES AND ROBUSTNESS CHECKS

Client Complexity Analyses

More complex audit engagements are more likely to benefit from the assistance of non-accounting specialists such as IT specialists, actuaries, engineers, lawyers, and other non-accounting professionals to help complete audit procedures and gather audit evidence to support an audit opinion. Thus, we expect a more profound effect of the availability of non-CPAs on audit quality for audit engagements of greater complexity as compared to audit engagements of lesser complexity. Client complexity varies both between and within audit firms based on the characteristics of the client base at the MSA level. Further, the local client base is subject to change on an annual basis due to clients switching auditors from one year to the next. Therefore, we compute our measures of client complexity by accounting firm, at the MSA level, on an annual basis.[13] The annual medians of the client base of each audit firm MSA combination are used to bifurcate the client sample into clients of high or low complexity. The annual division of the sample by location and audit firm accounts for the influence of both macroeconomic factors that might influence all firms as well as local microeconomic factors that might influence only a few MSAs.

We employ the following four proxies of firm complexity likely to be associated with the use of specialists for areas such as valuation and actuarial services: the annual pension and

[13] As a robustness test, we compute median cut-off points using two alternative approaches. First, we compute the cut-off point based on accounting firm, regardless of MSA, and second, we compute the complexity cut-off points based on MSA regardless of accounting firm. The untabulated results of estimating the models using these alternative median cut-offs are consistent with the results presented in the paper.

retirement expense, goodwill balance, soft assets balance, and investments (financial instruments) balance.[14] The results from estimating the restatement (2) and discretionary accruals (3) equations on the high and low client complexity sub-samples based on each of the four measures are presented in Table 8 (we do not tabulate the control variables' results for the sake of brevity). In all instances, the coefficient on *NONCPA%* is statistically significant ($p < 0.05$) in the appropriate higher audit quality direction for the high complexity clients, but not significant for the low complexity clients. This suggests that the results from the primary analyses are driven by high complexity clients that are more likely to require the use of specialists as compared to low complexity clients.

In addition, we perform a counterfactual test to examine whether other complexity measures that would most likely not require the assistance of specialists are associated with *NONCPA%*. In untabulated analyses, we find that when the division between high and low complexity is based on measures that would not be expected to be correlated with the use of specialists, such as accounts receivable and fixed assets, the likelihood of misstatement and the level of discretionary accruals are not significantly associated with the *NONCPA%* variable. The additional analyses and the related counterfactual tests provide some support for our argument that the non-CPA professionals of the consulting/advisory practices are driving the results, rather than non-certified audit/tax staff and administrative personnel.

[Insert Table 8 about here.]

In sum, the results from the client complexity additional analyses coupled with the results from the restatement and discretionary accruals models presented in Tables 5 and 6, respectively,

[14] The results in Table 8 compute the median cut-off point using the reported raw values in client financial statements. In unreported additional analyses, we compute the median cut-off point after scaling each complexity variable by firm size (e.g., the natural log of client total assets) to account for the proportional weight of each variable. We find that the results when using the scaled values of the complexity variable to identify the median cut-off point are consistent with the reported results.

are consistent with the theory that auditors develop trust with same-office specialists, which in turn creates ontological security for the auditors. By improving the coordination and critical evaluation of work between specialists and auditors, this trust translates to higher quality audits. While the results are consistent with the ontological security theory, we caution against making any firm conclusions given the noisiness of our test metric.

The majority of the Book of Lists publications report aggregate accounting firm personnel numbers for the office without distinguishing CPA/employee counts by lines of service. However, as the publications are independently compiled using data from local accounting firm offices, there are a limited number of instances in which the data are more granular. In total, 788 of the observations from our sample contain the data necessary to estimate a *NONAUDITOR%* variable (the ratio of non-auditors [total professionals – audit practice employees] to total employees). In untabulated analyses, we use this subsample to estimate the regression models employed in our main analyses: the likelihood of restatement, client discretionary accruals, and the likelihood of issuing a GC modified audit report. In each case, we find that the direction, magnitude, and significance level of the *NONAUDITOR%* variable is qualitatively similar to the results of the *NONCPA%* variable presented in the main tables.

The Book of Lists data originate from two sources: *American Business Journals* and *Crain's Business*. We are unaware of any systematic differences in how each publication obtains, compiles, and presents the local accounting firm personnel data. Further, we include MSA control variables when estimating each regression to account for MSA specific conditions that might affect the regression estimation. Nonetheless, as an additional analysis, we estimate the regression models including a dichotomous variable (*CRAINS*), set to 1 if the data are from a *Crain's* publication and 0 if the data are from an *American City Business Journal* publication,

and a related interaction term (*CRAINS*NONCPA%*). The direction and significance of the coefficient on the *NONCPA%* variable for each of the models are qualitatively similar to those reported in the main tables. The *CRAINS* variable and the related interaction term (*CRAINS*NONCPA%*) are insignificant in all the models. We conclude that the originating source of the Book of Lists data does not significantly affect the main results of our study.

Some MSAs have less than three years of available CPA and total employee data and thus are excluded from the main samples.[15] In unreported analyses, we estimate the regression models using three alternative samples: 1) the study's primary sample plus all MSAs with a single year of *NONCPA%* data, 2) the study's primary sample plus all MSAs with two years of *NONCPA%* data, and 3) the study's primary sample plus all MSAs with either one or two years of *NONCPA%* data. For each alternative sample, we find the results are similar in direction, magnitude, and significance as those reported in the main tables.

Limitations

The application of similar staffing models across offices of an accounting firm is a presumption within our study. While in general, the presumption is reasonable, we acknowledge that the staff mix is likely to differ between service lines. Thus, even if offices within a firm follow the same general staffing guidelines, differences in the office-level mix of work (i.e., advisory versus assurance and tax) and/or the size of the office, may affect the comparability of our test measure across offices and reduce its precision. Due to data restrictions on the mix among the lines of service at the office-level, we are unable to control for any unobservable differences in office staff composition specifically. However, we can use overall office size, in

[15] The following MSAs provide CPA and total employee data for a single year during our sample period: Charlotte, Miami, Nashville, and Wichita, while the following three MSAs provide the data for two years within our sample period: Los Angeles, Memphis and Seattle. Due to the limited number of years for which total CPAs and total employees are available, the main sample does not include these MSAs.

terms of employees, as a proxy for the degree to which an office might diversify the types of engagements it performs, and thus utilize alternative staffing models. The larger the overall size of the office, the greater the probability that the office engages in advisory, non-issuer assurance, or other non-assurance engagements. Therefore, we include the natural log of the number of office employees as a control variable in all of our main models.[16] Nonetheless, the inability to accurately measure the specific non-CPA groups within audit firms' offices is a limitation of this study.

This study is subject to several other limitations. Due to the restrictions of the data, we are not able to discern fully the underlying drivers of the positive association between the proportion of audit firm office personnel that are non-CPAs and the office's audit quality. We argue and find some support for the notion that the variation in the availability of same-office (in-house) specialists is the reason offices with more non-CPAs deliver higher quality audits. However, we do not have engagement-level empirical evidence to support this position. We recognize the possibility that the higher levels and utilization of not-yet-CPA-certified audit staff may be the reason for higher quality audits from offices with higher levels of non-CPAs. The employee mix at an individual office could be correlated with the ratio of non-CPAs to total employees, and with audit quality, for example, if an audit relies more or less heavily on junior staff to complete audit work. We call for future research to disentangle the individual effects of the non-CPA groups on audit quality.

Another limitation of our measure is that not all specialists are non-CPAs. Whether in-house specialists and consultants are the same remains a question that continues to be debated in

[16] Note that employee count and issuer audit client count measures have a very high correlation and including both measures in the model causes multicollinearity issues. However, when including both measures in the models, the results on our test measure are consistent with, or better than, our tabulated results in terms of magnitude and significance.

the literature and is a fruitful avenue for future research (Bauer and Estep 2014, 2019; Jenkins et al. 2018; Boritz et al. 2017). For example, in some areas such as forensics, specialists are more likely to have a CPA background. However, if some specialists are CPAs, then our measure underestimates the availability of non-accounting subject matter experts in an office and would bias against finding results.

The Book of Lists data set does not cover all U.S. Big 4 offices, as it does not report accounting firm information for all of the MSAs where the Big 4 reside. For example, there are Big 4 offices located in both Midland, MI, and Charleston, WV, and neither of these MSAs are included in a Book of Lists publication. In addition, due to source data variation, not every MSA included in a Book of Lists publication is suitable for inclusion in our study; we can only include MSAs if the publication for that MSA reports both the number of CPAs and the number of employees for each Big 4 firm located in that MSA. For example, Minneapolis, Portland, and San Francisco each have an annual Book of Lists publication; however, either the number of CPAs, the total number of employees, or both are not reported within the accounting firm listings. The non-reporting of the data elements necessary for inclusion in our sample appears to be random, suggesting that the MSAs with missing data do not differ systematically from the MSAs for which the data are available. Nonetheless, we recognize that the incomplete data set limits the generalizability of our results.

Finally, our analysis provides evidence of an association between non-CPA availability in the office and audit quality and not a causal effect. Future empirical archival research testing natural settings of audits using specialists would be best suited for causal inferences of the effect of specialists on audit quality, as called for in Boritz et al. (2017). Our study provides some initial broad empirical evidence that the availability of non-CPAs in an audit firm office is

associated with higher office audit quality. We call on future research to find the causal underpinning of this relation.

VI. CONCLUSION

This study examines whether the level of non-CPAs in an audit firm office is associated with engagement-level audit quality. For over 50 years, critics have voiced that a focus on non-audit services might lead to cultural changes (i.e., fewer accounting "professionals") within the accounting firms. They argue that such a culture emphasizes growing revenues from commercially driven non-audit services often at the expense of audit quality. During the time surrounding the Sarbanes-Oxley Act of 2002, the Big 4 firms either spun-off or downsized their consulting practices. However, in recent years, consulting/advisory service lines have seen a dramatic resurgence and growth. Accounting regulators have taken notice of, and expressed concern over, the renewed focus on consulting by the large accounting firms. The U.K.'s Competition and Markets Authority (CMA) has begun action on this concern and issued a final report in April 2019 proposing an operational split of the Big 4's U.K. audit and consultancy practices (CMA 2019).

The accounting firms, along with several leading professional organizations, question these concerns, and in fact, suggest that such services help enhance audit quality. The increased complexity of business transactions, the complicated nature of IT systems, and changes in accounting standards towards more emphasis of fair value measurement in financial statements have caused auditors to call on non-accounting specialists more frequently to complete their audits (PCAOB 2015; IFIAR 2015; Kaiser 2018). Furthermore, limited authoritative guidance on the use of non-audit experts on audits has resulted in firms developing and relying on their own internal guidance on the nature, timing, and extent of use of specialists (Glover et al. 2017;

Griffith 2019). The accounting firms argue that having in-house specialists readily available to support the audit function in today's environment results in higher quality audits.

We hand-collect audit firm self-reported data on office human resource composition from city business journals and calculate the ratio of the number of non-CPAs to total employees at the office level. We estimate audit quality and auditor independence models using a sample of U.S. Big 4 audit clients from 2009 to 2014 to analyze the association between the office non-CPAs percentage and audit quality. The results of our analyses suggest a positive relation between the level of non-CPAs of an office and audit quality. Furthermore, we do not find evidence that a greater non-CPA presence reduces auditor independence as measured by the likelihood of issuing a going concern modified audit opinion to financially distressed clients.

This study's results have implications for the regulation of public company auditing. The findings suggest that offices with a greater presence of non-CPA personnel provide higher quality audits than offices with a lesser non-CPA presence. The results of the client complexity additional analyses suggest that the key driver of this association is the specialist services provided by the consulting/advisory group of the audit firm office. These results further suggest that audit firm offices with higher levels of non-CPAs are better equipped to provide high-quality audits in today's complex business environment. However, this evidence, along with the conclusions of this study, should be interpreted carefully in light of our inability to measure an office's service line mix of the non-CPAs. We encourage future research to disentangle among the non-CPA groups' effects on audit quality and to examine the role of non-CPAs at both the office and the engagement levels, assuming such data become available from firms or regulators.

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APPENDIX A
Variable definitions

Variable Name		Variable Definition
Dependent Variables		
DA	=	Performance adjusted discretionary current accruals. To calculate *DA*, we partition the entire population of Compustat firms, excluding financial sector firms, by two-digit SIC code, and remove industries with fewer than 15 firms. We estimate parameters for normal accruals for each two-digit SIC industry by year using the following equation: $NA_t = \beta0 + \beta1\ (1/TA_{t-1}) + \beta2\ (\Delta Rev_t) + \beta3\ (ROA_{t-1}) + \varepsilon_t$, where: NA_t = current accruals, reflected by net income before extraordinary items plus depreciation and amortization minus operating cash flows scaled by total assets at the beginning of year. TA_{t-1} = total assets at the beginning of the fiscal year *t*. ΔRev_t = net sales in year *t* minus net sales in year *t*-1 scaled by the beginning of the year total assets. ROA_{t-1} = income before extraordinary items scaled by total assets in year *t*-1. All variables are winsorized at the 1st and 99th percentiles. The parameters estimated from the above equation are used to calculate expected current accruals (*ENA*): $ENA_t = b0 + b1\ (1/TA_{t-1}) + b2\ (\Delta Rev_t - \Delta AR_t) + b3\ (ROA_{t-1})$, where ΔAR_t = accounts receivable in year *t* minus accounts receivable in year *t*-1, scaled by the beginning of year total assets. The discretionary current accruals (*DA*) are calculated as follows: $DA_t = NA_t - ENA_t$.
MISSTATE	=	Indicator variable set to 1 if the audited financial statements issued for the fiscal year of the observation were subsequently restated due to a material misstatement, and 0 otherwise.
GC	=	Indicator variable set to 1 if the audited financial statements issued for the fiscal-year contain a going concern modified audit opinion, and 0 otherwise.
NEWGC	=	Indicator variable set to 1 if the audited financial statements issued for the fiscal-year contain a first time going concern modified audit opinion, and 0 otherwise.
Test Variable		
NONCPA%	=	Number for non-CPAs per accounting firm at the MSA level divided by the total number of employees per firm at the MSA level.
NONAUDITOR%	=	The ratio of non-auditors [total professionals – audit practice employees] to total employees per accounting firm at the MSA level.
Control Variables		
AUDITFEES	=	Natural logarithm of the audit fees paid to the external auditor in conjunction with the annual financial statement audit (obtained from Audit Analytics).
AUDTEN	=	Natural logarithm of the number of years the client firm has engaged the current auditor.
BM	=	The firm's book-to-market ratio defined as its book value (CEQ) divided by market value of equity (CSHO*PRCC_F).
CAPITAL	=	Net plant, property, and equipment (PPENT) divided by total assets (AT).
CLIENTIMP	=	Each individual client's audit engagement fee divided by the sum of the office-level audit fees charged to all audit clients.
EMPCOUNT	=	Natural logarithm of the number of employees within an accounting firm office from the *Book of Lists* publication.
EXTFINDMD	=	1 if free cash flow (defined as operating cash flow (OANCF) – the average capital expenditures from the prior three years (CAPX)) is less than -0.5, 0 otherwise.

APPENDIX A (Continued)

FEERATIO	=	The ratio of non-audit fees to total fees paid by the client to the external auditor.
FOREIGN	=	1 if a client has foreign transactions (FCA not equal to zero), 0 otherwise.
ICMW	=	1 if the firm has at least one internal control material weakness related to the fiscal year end, 0 otherwise.
INDSPE	=	1 if the auditor is a national industry specialist and an MSA-level industry specialist, both based on a 30 percent market share of audit fees in the industry and year, 0 otherwise.
INVAT	=	The firm's inventory (INV) divided by its total assets (AT).
ISSUE	=	1 if a client issued new debt (DLTIS) or equity (SSTK), 0 otherwise.
LEVERAGE	=	The sum of long-term debt (DLTT) and short-term debt reported in current liabilities (DLC) divided by total assets (AT).
LIT	=	1 if a client operates in the following industries: biotechnology (2833–2836 and 8731–8734), computers (3570–3577 and 7370–7374), electronics (3600–3674), and retail (5200–5961) (based on Francis, Philbrick, and Schipper 1994), 0 otherwise.
LOSS	=	1 if the firm's net income before extraordinary items (IB) is negative, 0 otherwise.
MEDINCOME	=	Annual median income at the MSA level, per US Census Bureau website.
MERGER	=	1 if a client undertook a merger or acquisition (AQS not equal to zero), 0 otherwise.
NASFEES	=	Natural logarithm of the non-audit service fees, less the tax fees, paid by the auditee to the external auditor.
NEGEQUITY	=	1 if the long-term liabilities (LT) exceed total assets (AT) and 0 otherwise.
Pension Expense	=	The natural log of the firm's pension expense (XPR) measured in millions of dollars.
RESTRUCT	=	1 if aggregate restructuring charges (RCP) in year t and t–1 is negative, 0 otherwise.
ROA	=	The firm's return-on-asset ratio calculated as net income before extraordinary items (IB) divided by the beginning of the year total assets (lagged AT).
SALEGR	=	Percentage increase in sales from the prior year ((sales in year t – sales in year t – 1)/sales in year t – 1)).
SCALEDOANCF	=	The standard deviation of cash flows from operations over the prior ten years scaled by total assets, or operating cash flow (OANCF)/assets (AT).
SEG	=	The logarithm of the sum of the number of business segments reported by the Compustat Segments database.
SI	=	Special items (SPI) divided by total assets (AT).
SIZE	=	The natural log of the firm's total assets (AT) measured in millions of dollars.
Soft Assets	=	(Total assets (AT) – net PPE – Cash & cash equivalents))/Total assets (AT)
UNEMPRATE	=	Annual unemployment rate at the MSA level, per US Census Bureau website.
Industry dummies	=	Industry dummy variable based on company's two-digit SIC code
Year dummies	=	Indicator variable based on the fiscal year-end of the audited financial statements.
MSA dummies	=	Dummy variable based on the audit firm office's Metropolitan Statistical Area.

TABLE 1
Sample Attrition by Analysis

Panel A: Sample for Misstatement Analysis	
Merger of top accounting firm by city/year data with Audit Analytics and Compustat databases for 2009-2014, big 4 audited observations only	18,048
Less: Financial institutions and utilities	6,890
Sub-total	11,158
Less: Observations missing control variables for misstatement analysis	5,755
Total company-year observations in misstatement sample *(Sample for Table 5)*	**5,403**
Panel B: Sample for Discretionary Accruals Analysis	
Observations between fiscal years 2009 and 2014 (inclusive)	11,158
Less: Observations missing control variables for discretionary accruals analysis	5,789
Discretionary accruals analysis sample *(Sample for Table 6)*	**5,369**
Panel C: Sample for Going Concern Analysis	
Distressed Firm Observations between fiscal years 2009 and 2014 (inclusive)	4,743
Less: Observations missing control variables for going concern analysis	3,113
(Sample for Table 7)	**1,630**

Note: Table 1 reports the sample determination process for each of the analyses conducted in the paper. The samples are limited to companies located within one of the cities listed in Table 2 that engage a Big 4 audit firm as the external financial statement auditor.

TABLE 2
Additional Sample Information by MSA

Panel A: Percentage of Sample Firm-year Observations per MSA

MSA	Misstatement Analysis % of Sample	Disc. Accrual Analysis % of Sample	Going Concern Analysis % of Sample
Albany-Schenectady-Troy[a]	0.6%	0.5%	0.7%
Albuquerque[a]	0.1%	0.1%	0.2%
Atlanta - Sandy Springs – Marietta[a]	5.6%	5.7%	6.1%
Austin - Round Rock[a]	1.5%	1.5%	1.2%
Baltimore – Towson[a]	2.3%	2.5%	3.1%
Birmingham – Hoover[a]	0.8%	0.7%	0.7%
Boston - Cambridge – Quincy[a]	14.2%	14.2%	20.5%
Buffalo - Cheektowaga – Tonawanda[a]	0.8%	0.9%	0.9%
Chicago-Naperville-Joliet[b]	6.9%	7.1%	4.5%
Cincinnati – Middletown[a]	2.0%	2.0%	1.9%
Cleveland-Elyria-Mentor[b]	2.2%	2.4%	1.5%
Dallas-Fort Worth-Arlington[a]	8.2%	8.1%	8.1%
Dayton[a]	0.3%	0.3%	0.1%
Denver-Aurora[a]	4.4%	4.3%	4.5%
Detroit-Warren-Livonia[b]	2.1%	2.2%	1.9%
Greensboro-High Point[a]	0.7%	0.4%	0.4%
Honolulu[a]	0.4%	0.4%	0.3%
Houston-Baytown-Sugar Land[a]	10.4%	9.3%	10.5%
Jacksonville[a]	1.1%	1.0%	0.5%
Kansas City[a]	1.8%	1.6%	2.0%
Louisville[a]	1.1%	1.2%	0.6%
Milwaukee-Waukesha-West Allis[a]	1.8%	1.9%	1.0%
New York-Jersey City-Long Island[b]	11.5%	11.3%	9.6%
Philadelphia-Camden-Wilmington[a]	4.0%	4.4%	4.4%
Phoenix-Mesa-Scottsdale[a]	1.5%	1.6%	1.2%
Pittsburgh[a]	3.0%	3.2%	2.0%
San Antonio-New Braunfels[a]	1.4%	1.4%	1.4%
San Jose-Sunnyvale-Santa Clara[a]	3.8%	3.8%	4.3%
St. Louis[a]	3.5%	3.6%	4.0%
Tampa-St. Petersburg-Clearwater[a]	1.3%	1.4%	0.9%
Washington-Arlington-Alexandria[a]	0.9%	0.9%	0.9%
Total Average	100%	100%	100%

Note: MSAs for which data are obtained from the *American City Business Journals* "Book of Lists" are indicated with the letter a. MSAs for which data are obtained from the *Crain's Business Journals* "Book of Lists" are indicated with the letter b.

TABLE 2 (Continued)

Panel B: Average *NONCPA%* per Year for MSAs Examined in This Study

MSA	2009	2010	2011	2012	2013	2014
Albany-Schenectady-Troy	64.26%	64.26%	61.97%	66.83%	67.92%	NA
Albuquerque	52.05%	57.14%	48.39%	42.86%	42.86%	41.67%
Atlanta - Sandy Springs – Marietta	77.87%	72.26%	74.80%	71.31%	73.89%	74.97%
Austin - Round Rock	67.19%	69.91%	67.25%	65.88%	72.42%	66.70%
Baltimore – Towson	63.63%	65.62%	65.44%	69.01%	60.39%	58.00%
Birmingham – Hoover	35.60%	44.87%	31.52%	25.67%	34.83%	38.41%
Boston - Cambridge – Quincy	71.17%	67.55%	62.86%	65.20%	68.10%	69.65%
Buffalo - Cheektowaga – Tonawanda	47.24%	48.83%	42.26%	43.47%	35.38%	42.00%
Chicago-Naperville-Joliet	58.55%	60.18%	68.68%	71.27%	NA	NA
Cincinnati – Middletown	59.73%	65.29%	60.88%	60.22%	61.08%	63.48%
Cleveland-Elyria-Mentor	38.95%	NA	48.23%	NA	52.19%	55.70%
Dallas-Fort Worth-Arlington	76.34%	70.14%	74.06%	68.81%	74.83%	75.02%
Dayton	42.73%	59.92%	77.62%	80.56%	81.25%	84.03%
Denver-Aurora	59.13%	59.44%	57.03%	57.85%	55.88%	NA
Detroit-Warren-Livonia	29.35%	31.11%	34.66%	35.08%	35.36%	NA
Greensboro-High Point	49.51%	42.00%	46.03%	44.75%	36.22%	35.94%
Honolulu	56.81%	53.47%	47.33%	45.34%	23.29%	45.65%
Houston-Baytown-Sugar Land	68.26%	67.34%	67.54%	68.12%	74.48%	69.99%
Jacksonville	10.16%	38.56%	38.50%	40.82%	41.25%	32.82%
Kansas City	48.03%	48.66%	53.34%	55.00%	50.52%	52.93%
Louisville	46.36%	46.32%	47.63%	44.35%	48.93%	45.63%
Milwaukee-Waukesha-West Allis	NA	NA	NA	48.43%	47.94%	44.99%
New York-Jersey City-Long Island	31.65%	40.57%	40.57%	47.52%	NA	NA
Philadelphia-Camden-Wilmington	70.51%	69.54%	67.50%	70.18%	70.55%	71.78%
Phoenix-Mesa-Scottsdale	NA	NA	54.13%	60.57%	65.77%	64.74%
Pittsburgh	76.62%	70.85%	70.34%	71.61%	74.55%	74.79%
San Antonio-New Braunfels	56.91%	45.31%	53.80%	54.53%	54.69%	57.02%
San Jose-Sunnyvale-Santa Clara	75.19%	NA	72.69%	73.05%	61.61%	NA
St. Louis	65.95%	59.07%	57.35%	54.04%	53.73%	52.18%
Tampa-St. Petersburg-Clearwater	64.08%	NA	48.91%	52.91%	59.60%	66.83%
Washington-Arlington-Alexandria	77.37%	74.39%	70.37%	71.71%	72.64%	84.78%
Total Average	54.86%	56.51%	55.83%	56.49%	57.07%	58.94%

Note: The percentages represent the mean value of the *NONCPA%* at the MSA-level across all accounting firms in our sample. NA represents years for which the MSAs' Book of Lists publications did not disclose the data necessary to compute the *NONCPA%* measure. The publisher of each MSA's Book of Lists publication is shown in Panel A of Table 2.

TABLE 2 (Continued)

Panel C: Variation of NONCPA% within MSAs by Big 4 Accounting Firm

MSA	DT	EY	KPMG	PWC
Albany-Schenectady-Troy	NFO	NFO	61.72%	68.93%
Albuquerque	NFO	NFO	46.20%	NFO
Atlanta - Sandy Springs – Marietta	81.95%	72.21%	71.27%	70.53%
Austin - Round Rock	83.15%	55.00%	NFO	63.21%
Baltimore – Towson	70.96%	68.00%	62.90%	53.26%
Birmingham – Hoover	22.98%	47.32%	38.88%	31.42%
Boston - Cambridge – Quincy	68.96%	72.12%	67.10%	63.68%
Buffalo - Cheektowaga – Tonawanda	46.61%	39.18%	59.43%	41.59%
Chicago-Naperville-Joliet	77.22%	59.00%	56.60%	58.05%
Cincinnati – Middletown	67.08%	69.72%	51.47%	57.76%
Cleveland-Elyria-Mentor	51.06%	53.44%	49.35%	47.41%
Dallas-Fort Worth-Arlington	76.97%	72.25%	76.39%	66.87%
Dayton	75.36%	67.78%	NFO	53.75%
Denver-Aurora	69.21%	53.29%	50.87%	62.01%
Detroit-Warren-Livonia	41.99%	27.35%	28.43%	33.61%
Greensboro-High Point	NFO	44.26%	34.88%	50.82%
Honolulu	38.37%	50.01%	48.48%	NFO
Houston-Baytown-Sugar Land	73.13%	62.28%	73.57%	67.55%
Jacksonville	57.16%	20.73%	37.82%	21.70%
Kansas City	63.58%	58.50%	40.61%	45.30%
Louisville	NFO	43.14%	49.61%	48.89%
Milwaukee-Waukesha-West Allis	55.86%	45.10%	46.10%	NFO
New York-Jersey City-Long Island	36.17%	42.21%	48.22%	45.70%
Philadelphia-Camden-Wilmington	85.02%	75.05%	68.75%	66.35%
Phoenix-Mesa-Scottsdale	54.52%	59.06%	74.56%	63.33%
Pittsburgh	84.00%	71.76%	68.04%	66.74%
San Antonio-New Braunfels	NFO	55.45%	53.90%	NFO
San Jose-Sunnyvale-Santa Clara	71.46%	72.27%	WND	WND
St. Louis	60.77%	59.81%	56.57%	50.64%
Tampa-St. Petersburg-Clearwater	70.34%	57.58%	60.13%	56.23%
Washington-Arlington-Alexandria	85.02%	WND	73.77%	WND
Total Average	64.19%	56.21%	55.56%	54.21%

Note: The percentages represent the mean value by MSA-Firm combination of all years for which data are available during our sample period. NFO is an abbreviation for "no firm office" and indicates that the firm does not have a physical office in that MSA. WND is the abbreviation for "would not disclose" and indicates MSAs for which the accounting firms would not disclose in the Book of Lists publication all of the data necessary to compute the *NONCPA%* measure. The publisher of each MSA's Book of Lists publication is shown on Panel A of Table 2.

TABLE 3
Descriptive Statistics by Sample

Sample:	Misstatement (N=5,403)			Disc. Accr. (N=5,369)			Going Concern (N=1,630)		
Variable	**Mean**	**Med.**	**St. Dev**	**Mean**	**Med.**	**St. Dev**	**Mean**	**Med.**	**St. Dev**
AUDITFEES	14.23	14.12	1.00	14.27	14.17	0.98	13.94	13.85	0.91
AUDTEN	2.48	2.48	0.90	2.49	2.48	0.89	2.26	2.30	0.87
BM	0.44	0.42	0.93				0.40	0.45	1.52
CAPITAL	0.26	0.17	0.24						
CLIENTIMP							0.05	0.02	0.10
DA				0.05	0.03	0.06			
EMPCOUNT	6.74	6.96	1.12	6.74	6.96	1.11	6.77	6.95	1.03
EXTFINDMD							0.18	0.00	0.38
FEERATIO	0.15	0.12	0.14	0.15	0.12	0.14	0.13	0.09	0.13
FOREIGN	0.38	0.00	0.48	0.38	0.00	0.49			
GC				0.02	0.00	0.14			
ICMW	0.02	0.00	0.16	0.02	0.00	0.15	0.04	0.00	0.20
INDSPE	0.19	0.00	0.39				0.18	0.00	0.39
INVAT							0.09	0.03	0.14
ISSUE							0.91	1.00	0.28
LEVERAGE	0.25	0.20	0.27	0.25	0.21	0.26	0.30	0.24	0.34
LIT	0.34	0.00	0.47	0.34	0.00	0.47			
LOSS	0.31	0.00	0.46						
MEDINCOME	11.05	11.07	0.14	11.05	11.07	0.14	11.06	11.08	0.14
MERGER	0.10	0.00	0.31				0.08	0.00	0.27
MISSTATE	0.06	0.00	0.23						
NASFEES	8.63	10.55	4.98	8.82	10.65	4.90	7.82	9.8	4.98
NEGEQUITY							0.11	0.00	0.32
NEWGC							0.04	0.00	0.19
NONCPA%	0.61	0.64	0.15	0.62	0.64	0.15	0.63	0.67	0.14
RESTRUCT	0.47	0.00	0.50						
ROA	0.02	0.08	0.36	0.04	0.08	0.22	-0.13	-0.02	0.38
SALEGR				0.10	0.05	0.51	0.13	0.00	0.83
SCALEDOANCF				0.06	0.09	0.22			
SEG	0.93	1.10	0.55	0.96	1.10	0.54			
SI	0.02	0.01	0.06						
SIZE	20.84	20.87	1.85	20.90	20.93	1.79	20.03	19.93	1.80
UNEMPRATE	1.89	1.93	0.27	1.90	1.95	0.27	1.89	1.93	0.27

See Appendix A for variable definitions.

TABLE 4
Pearson Correlation Coefficients for Variables

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	*NONCPA%*	1.000														
2.	*AUDITFEES*	**-0.041**	1.000													
3.	*AUDTEN*	**-0.060**	**0.333**	1.000												
4.	*BM*	-0.021	**-0.051**	0.010	1.000											
5.	*CAPITAL*	**0.042**	**0.030**	**0.018**	**0.094**	1.000										
6.	*CLIENTIMP*	**-0.134**	**0.321**	**0.198**	**-0.021**	**0.083**	1.000									
7.	*DA*	**-0.033**	-0.014	0.015	**0.054**	-0.002	0.003	1.000								
8.	*EMPCOUNT*	**0.087**	**0.053**	**-0.040**	-0.019	**-0.143**	**-0.485**	0.010	1.000							
9.	*EXTFINDMD*	**0.062**	**-0.158**	**-0.115**	**-0.022**	**0.127**	**-0.070**	**0.060**	0.016	1.000						
10.	*FEERATIO*	**-0.062**	**0.076**	**0.072**	**-0.012**	**-0.042**	**0.028**	0.000	**0.069**	**-0.069**	1.000					
11.	*FOREIGN*	0.010	**0.284**	**0.074**	**-0.020**	**-0.121**	**0.054**	0.004	**0.052**	**-0.103**	**0.039**	1.000				
12.	*GC*	0.006	**-0.126**	**-0.055**	**-0.257**	-0.002	**-0.041**	**0.069**	-0.005	**0.232**	**-0.055**	**-0.038**	1.000			
13.	*ICMW*	0.012	**0.041**	**-0.026**	0.008	0.003	**0.022**	0.001	0.001	**0.022**	**-0.037**	**0.032**	**0.016**	1.000		
14.	*INDSPE*	**-0.100**	**0.132**	**0.075**	-0.013	**0.023**	**0.084**	-0.006	**0.055**	-0.010	**0.026**	-0.009	-0.007	0.006	1.000	
15.	*INVAT*	-0.016	**0.048**	**0.130**	**0.083**	**-0.082**	**0.067**	**0.024**	**-0.058**	**-0.170**	**-0.025**	**0.037**	**-0.043**	-0.001	**0.066**	1.000
16.	*ISSUE*	**0.035**	**0.296**	**0.054**	**-0.023**	-0.006	**0.054**	-0.007	**-0.040**	**0.059**	**0.022**	**0.101**	**-0.019**	0.006	0.016	-0.014
17.	*LEVERAGE*	**-0.043**	**0.085**	**-0.040**	**-0.295**	**0.186**	**0.075**	**0.041**	0.015	**0.054**	**0.052**	**-0.056**	**0.158**	-0.005	**0.017**	**-0.064**
18.	*LIT*	**0.035**	**-0.105**	**-0.087**	**-0.050**	**-0.261**	**-0.077**	**-0.045**	0.003	**0.078**	**-0.032**	**-0.019**	**0.045**	0.001	**-0.040**	**-0.034**
19.	*LOSS*	**0.081**	**-0.188**	**-0.194**	**-0.044**	**-0.081**	**-0.095**	**-0.087**	0.019	**0.308**	**-0.123**	**-0.058**	**0.215**	**0.056**	**-0.022**	**-0.120**
20.	*MEDINCOME*	**-0.023**	**-0.041**	**-0.097**	**-0.022**	**-0.260**	**-0.349**	**-0.039**	**0.537**	**0.060**	0.004	**0.051**	**0.027**	**0.018**	-0.010	**-0.167**
21.	*MERGER*	**0.024**	**0.094**	-0.009	0.014	**-0.052**	0.011	-0.009	**-0.019**	**-0.055**	**0.072**	**0.018**	**-0.042**	-0.007	-0.014	**-0.035**
22.	*MISSTATE*	**-0.026**	**0.018**	**0.027**	**0.033**	**0.019**	0.012	0.005	0.012	0.001	0.012	**-0.020**	-0.008	**0.065**	0.012	-0.009
23.	*NASFEES*	**-0.057**	**0.482**	**0.222**	**-0.033**	-0.011	**0.168**	-0.015	**0.071**	**-0.116**	**0.436**	**0.139**	**-0.086**	-0.006	**0.075**	**0.025**
24.	*NEGEQUITY*	**-0.045**	**-0.034**	**-0.065**	**-0.468**	-0.004	0.011	-0.006	**0.064**	**0.052**	-0.006	**-0.028**	**0.237**	0.004	**0.017**	**-0.048**
25.	*NEWGC*	-0.016	**-0.055**	**-0.033**	**-0.173**	0.011	**-0.023**	**0.044**	0.000	**0.152**	**-0.031**	**-0.031**	**0.625**	**0.021**	0.002	**-0.016**
26.	*RESTRUCT*	**-0.048**	**0.374**	**0.184**	**-0.046**	**-0.118**	**0.135**	**0.026**	**0.029**	**-0.101**	**0.059**	**0.212**	**-0.017**	**0.017**	**0.017**	**0.056**
27.	*ROA*	**-0.053**	**0.206**	**0.120**	**0.035**	**0.122**	**0.083**	**0.085**	**-0.026**	**-0.485**	**0.085**	**0.077**	**-0.215**	-0.012	**0.024**	**0.120**
28.	*SALEGR*	**0.031**	**-0.086**	**-0.081**	**-0.025**	**-0.043**	**-0.045**	**-0.018**	**0.027**	**0.096**	-0.009	**-0.040**	-0.001	-0.012	-0.007	**-0.067**
29.	*SCALEDOANCF*	**-0.037**	**0.282**	**0.118**	**0.076**	**0.177**	**0.083**	**-0.291**	**-0.053**	**-0.395**	**0.087**	**0.078**	**-0.417**	-0.006	**0.026**	**0.098**
30.	*SEG*	**0.041**	**0.357**	**0.131**	**0.025**	**-0.051**	**0.073**	**-0.028**	**-0.030**	**-0.184**	**0.028**	**0.249**	**-0.098**	**0.028**	**0.016**	**0.093**
31.	*SI*	**0.030**	**-0.033**	**-0.043**	**-0.061**	**-0.057**	-0.014	**-0.072**	0.016	**0.112**	0.004	-0.009	**0.149**	**0.041**	-0.015	**-0.048**
32.	*SIZE*	**-0.082**	**0.813**	**0.335**	0.004	**0.255**	**0.311**	**-0.018**	0.006	**-0.237**	**0.204**	**0.137**	**-0.226**	**-0.028**	**0.129**	**0.041**
33.	*UNEMPRATE*	**-0.258**	**0.026**	0.010	**0.037**	-0.008	0.010	0.014	**0.133**	**-0.066**	**0.031**	0.013	0.014	**-0.046**	**-0.018**	**-0.048**

TABLE 4 (Continued)

	16.	*17.*	*18.*	*19.*	*20.*	*21.*	*22.*	*23.*	*24.*	*25.*	*26.*	*27.*	*28.*	*29.*	*30.*	*31.*	*32.*	*33.*
16.	1.000																	
17.	0.008	1.000																
18.	**0.091**	**-0.145**	1.000															
19.	**0.024**	**0.071**	**0.166**	1.000														
20.	**0.021**	**-0.081**	**0.187**	**0.107**	1.000													
21.	**0.087**	**0.015**	-0.013	**-0.038**	-0.013	1.000												
22.	**0.023**	0.011	-0.003	-0.001	0.001	0.001	1.000											
23.	**0.128**	**0.080**	**-0.081**	**-0.160**	**-0.035**	**0.098**	**0.017**	1.000										
24.	**-0.032**	**0.502**	0.010	**0.164**	**0.034**	**-0.040**	0.005	0.000	1.000									
25.	-0.008	**0.071**	0.000	**0.135**	0.008	**-0.026**	-0.005	**-0.036**	**0.139**	1.000								
26.	**0.091**	**0.047**	**-0.052**	0.013	**-0.041**	**0.026**	0.007	**0.202**	**0.019**	0.002	1.000							
27.	**-0.024**	**0.037**	**-0.174**	**-0.397**	**-0.113**	**0.049**	-0.003	**0.151**	**-0.040**	**-0.092**	**0.068**	1.000						
28.	**0.050**	**-0.031**	**0.068**	**0.028**	**0.080**	**0.068**	-0.006	**-0.035**	**-0.017**	-0.001	**-0.106**	**-0.072**	1.000					
29.	0.004	**-0.176**	**-0.171**	**-0.387**	**-0.117**	**0.049**	0.006	**0.174**	**-0.174**	**-0.172**	**0.054**	**0.508**	**-0.062**	1.000				
30.	**0.173**	**-0.078**	0.002	**-0.108**	**0.019**	**0.050**	0.013	**0.166**	**-0.064**	**-0.057**	**0.199**	**0.186**	**-0.069**	**0.217**	1.000			
31.	**-0.025**	**0.073**	**0.021**	**0.201**	0.003	**0.023**	0.011	**-0.022**	**0.100**	**0.094**	**0.100**	**-0.155**	0.006	**-0.119**	**-0.023**	1.000		
32.	**0.106**	**0.127**	**-0.243**	**-0.402**	**-0.142**	**0.057**	0.001	**0.479**	**-0.082**	**-0.108**	**0.238**	**0.325**	**-0.086**	**0.426**	**0.214**	**-0.113**	1.000	
33.	**-0.051**	**0.031**	**-0.069**	**-0.023**	**-0.171**	**-0.020**	**0.041**	**0.055**	**0.038**	0.015	**0.092**	**0.057**	**-0.073**	**0.029**	-0.006	**0.029**	**0.023**	1.000

Note: This table represents the correlation between each of the variables employed within this study. Bolded items are significant at the 0.05 level. See Appendix A for variable definitions.

TABLE 5
Likelihood of Material Misstatement Resulting in Restatement

Regression Type: Logit

Dependent Variable: *MISSTATE*

Variable	**Coefficient**	**z-stat**	
NONCPA%	-2.350	-2.66	***
SIZE	0.053	0.52	
ROA	-0.384	-2.02	**
LEVERAGE	0.276	1.23	
LOSS	-0.140	-0.80	
CAPITAL	-0.560	-1.11	
SI	1.635	1.98	**
RESTRUCT	-0.132	-0.79	
MERGER	-0.108	-0.51	
LIT	-0.267	-1.05	
FOREIGN	-0.412	-2.15	**
SEG	0.193	1.07	
ICMW	0.815	2.52	**
BM	0.189	1.93	*
INDSPE	0.066	0.35	
AUDTEN	-0.010	-0.08	
GC	-0.328	-0.56	
EMPCOUNT	0.409	1.49	
AUDITFEES	-0.106	-0.54	
NASFEES	0.004	0.20	
FEERATIO	1.148	1.93	*
CLIENTIMP	0.518	0.50	
MEDINCOME	3.881	1.23	
UNEMPRATE	2.034	2.04	**
INTERCEPT	-51.689	-1.46	
Industry, Year and MSA FE	Yes		
N	5,403		
Chi2	171.97		
Prob > Chi2	0.000		
Pseudo R-Squared	0.086		
Area Under ROC	0.72		

Note: This table reports the results of estimating the likelihood of material misstatement in the audited annual financial statements for fiscal years 2009 through 2014. The estimated model is a nonlinear logistic regression model, with standard errors that are robust to heteroskedasticity and clustered by client (Petersen 2009).*, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, in two-tailed tests. Variable definitions are provided in Appendix A.

TABLE 6
Office Non-CPA Levels and Performance-adjusted Discretionary Accruals

Regression Type: OLS

Dependent Variable: Performance-adjusted discretionary accruals

Variable	Coefficient	t-stat	
NONCPA%	-0.028	-2.47	**
SIZE	0.006	3.03	***
LEVERAGE	-0.024	-1.68	*
LIT	-0.023	-4.21	***
SCALEDOANCF	-0.166	-6.86	***
SALEGR	0.000	0.04	
GC	-0.050	-2.92	***
FOREIGN	0.000	0.15	
SEG	0.004	1.66	
ICMW	-0.011	-1.02	
AUDTEN	0.002	0.84	
EMPCOUNT	0.004	1.66	*
AUDITFEES	-0.001	-0.19	
NASFEES	-0.001	-1.75	*
FEERATIO	0.001	0.09	
CLIENTIMP	-0.018	-1.76	*
MEDINCOME	-0.072	-2.42	**
UNEMPRATE	-0.016	-1.11	
INTERCEPT	0.726	2.24	**
Industry, Year and MSA FE	Yes		
N	5,369		
F-Value	2.80		
Prob > F2	0.000		
Adjusted R2	0.133		

Note: This table reports the results of estimating the firm-level performance-adjusted discretionary accruals using firm-year observations 2009 through 2014. The model is estimated using OLS with standard errors that are robust to heteroskedasticity and clustered by client (Petersen 2009). *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, in two-tailed tests. Variable definitions are provided in Appendix A.

TABLE 7
Likelihood of Issuing a Going Concern Modified Audit Opinion

Regression Type	Logit			Logit		
Dependent Variable:	First Time GC (Column I)			Any GC (Column II)		
Variable	**Coef.**	**z-stat**		**Coef.**	**z-stat**	
NONCPA%	-3.875	-1.64		-1.908	-0.78	
SIZE	-0.922	-3.39	***	-1.350	-5.77	***
ROA	0.671	0.70		-0.395	-1.10	
LEVERAGE	0.313	0.59		0.472	0.93	
BM	-0.409	-2.91	***	-0.412	-3.35	***
ISSUE	-0.512	-0.74		-0.811	-1.55	
MERGER	-1.335	-0.76		-1.070	-1.05	
NEGEQUITY	0.653	0.91		1.690	3.13	***
SALEGR	0.105	0.65		-0.105	-0.69	
ICMW	0.046	0.06		0.976	1.05	
INVAT	0.931	2.98	***	1.363	4.29	***
EXTFINDMD	1.726	2.52	**	1.330	3.30	***
AUDTEN	-0.204	-0.83		0.232	0.81	
INDSPE	-0.464	-0.88		-0.725	-1.35	
EMPCOUNT	1.915	2.64	***	1.220	2.18	***
AUDITFEES	1.216	2.78	***	1.407	3.08	***
NASFEES	-0.032	-0.73		-0.052	-1.37	
FEERATIO	-0.365	-0.20		1.687	1.17	
CLIENTIMP	-5.493	-0.63		-1.372	-0.25	
MEDINCOME	1.202	0.22		1.493	0.39	
UNEMPRATE	1.880	0.54		2.220	0.83	
INTERCEPT	-43.336	-0.72		-38.560	-0.93	
Industry, Year and MSA FE	Yes			Yes		
N	1,630			1,630		
Chi2	575.90			267.53		
Prob > Chi2	0.000			0.000		
Pseudo R-Squared	0.477			0.569		
Area Under ROC	0.958			0.961		

Note: This table reports the results of predicting the likelihood of an auditor modifying the audit opinion for going concern issues for companies that are in financial distress in the fiscal years 2009 through 2014. The dependent variable for the results presented in column 1 is *NEWGC*, while the dependent variable for the results presented in Column 2 is *GC*. The estimated models are both nonlinear logistic regression models, with standard errors that are robust to heteroskedasticity and clustered by client (Petersen 2009). *, **, *** indicates statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, in two-tailed tests. Variable definitions are provided in Appendix A.

TABLE 8
Additional Analyses of the Relation between Office Non-CPA Levels and Audit Quality for High Versus Low Accounting Complexity Audit Clients

		Misstatement Likelihood Model				Discretionary Accruals Model			
Accounting Complexity Measure	**Client Accounting Complexity**	**N**	**Coef.**	**z**	**P>|z|**	**N**	**Coef.**	**t**	**P>|t|**
Pension Expense	High	2,463	-3.181	-2.38	**0.017**	1,646	-0.048	-3.33	**0.001**
	Low	2,439	-1.476	-1.19	0.234	1,601	-0.036	-1.48	0.139
Soft Assets	High	2,854	-4.326	-3.84	**0.001**	1,885	-0.039	-2.16	**0.031**
	Low	2,549	-0.553	-044	0.660	1,665	-0.041	-1.72	0.086
Goodwill	High	2,111	-3.771	-2.81	**0.005**	1,931	-0.026	-2.38	**0.018**
	Low	1,793	-1.933	-1.45	0.147	1,600	-0.022	-1.29	0.198
Short-Term Investments	High	2,966	-2.657	-2.37	**0.001**	2,834	-0.033	1.99	**0.049**
	Low	607	-4.419	-1.63	0.105	682	-0.053	-1.57	0.117

Note: This table reports the results of additional analyses for the effect of office non-CPA percentage on the engagement audit quality of high versus low accounting complexity engagements. To determine high versus low complexity, we compute the median value of each complexity measure per audit firm at the MSA-level on an annual basis. We define a client as high complexity if the value of its complexity variable is equal to, or greater than, the annual median value of the complexity variable, at the MSA audit office level; otherwise, it is classified as low complexity. Because we compute the complexity median at the audit office level on an annual basis and do not simply split the population based on the overall median value, our high and low complexity sub-samples are not perfectly even. We note a large difference in the high versus low complexity sub-samples for the Short-Term Investments variable, due to office's where the median value of the measure is zero. In non-reported results, when we re-classify firms with zero value Short-Term Investments as low complexity instead of high, the results are similar in direction and magnitude as those presented above. The first set of results shows the estimation of the logit restatement regression model (equation (2)), while the second set of results shows the estimation of the discretionary accruals regression model (equation (3)). The misstatement model is a nonlinear logistic regression model, while the discretionary accruals regression model is estimated using OLS. In both instances, the standard errors are robust to heteroskedasticity and clustered by client (Petersen 2009). T-statistic probabilities in bold indicate significant at the 0.05 level or less. Variable definitions are provided in Appendix A.