The effect of individual auditor quality on audit outcomes: opening the black box of audit quality

Derrald Stice
HKU Business School, University of Hong Kong, Hong Kong, Hong Kong
Han Stice
School of Accountancy, Chinese University of Hong Kong, Hong Kong, Hong Kong, and
Roger White
W.P. Carey School of Business, Arizona State University, Tempe, Arizona, USA

Received 30 July 2021
Revised 5 February 2022
7 March 2022
Accepted 18 March 2022

Abstract

Purpose – This study aims to examine the effect of individual auditor quality (below the partner level) on overall audit quality.

Design/methodology/approach – We aggregate audit employee-level individual performance evaluations to create a measure of auditor quality at the office level.

Findings – We find that high-quality audit offices are associated with a lower likelihood of client restatement, fewer client abnormal accruals and a higher likelihood of a client receiving a going concern opinion. We partition employees into low, medium and high level, based on job title, to investigate which employee levels drive these results. We find that the restatement results are driven by high quality high-level employees (Senior Managers/Directors), whereas the going concern results are driven by high quality low-level employees (Seniors). Furthermore, we find evidence that high-quality audit teams are associated with all aspects of audit quality and the magnitude of these team effects are much larger than those of the effects for any individual employee type.

Originality/value – Our findings are consistent with higher-level auditors preventing the most serious financial statement deficiencies, low-level employees contributing to audit firm independence and overall team quality creating synergy which has the strongest effect on all aspects of audit quality. These insights based on individual auditor evaluations are new to the literature. Overall, our empirical results suggest that individual auditor quality is associated with higher quality audits and that employees at all levels affect audit outcomes.

Keywords Employee performance evaluations, Big N auditors, Audit quality, Restatements, Individual auditor

Paper type Research paper

The authors thank two anonymous reviewers, Thomas Bourveau, Nerissa Brown, Jian Cao (editor), Mark DeFond, Joseph Gerakos, Mingyi Hung, Steve Kaplan, Robert Knechel, Miguel Minutti-Meza, Nemit Shroff, Kay Stice, Florin Vasvari, Devin Williams and Donghui Wu for helpful comments and suggestions. We appreciate helpful comments and suggestions from workshop participants at HKUST and Chinese University of Hong Kong.
JEL classification: G01, M4, M49

Managerial Auditing Journal

0268-6902
DOI 10.1108/MAJ-07-2021-3235

1. Introduction

A long literature in accounting has examined the effect of audit *firm* quality on ex-post measures of auditing quality, such as the likelihood of restatement or level of abnormal accruals. Not surprisingly, this literature overwhelmingly finds that higher quality audit firms produce higher quality audits, which in turn lead to fewer negative audit outcomes (i.e. restatements) and higher quality financial statements. In recent years, archival studies have begun to examine the influence of individual auditors (typically those who sign the audit reports) on audit quality. These studies focus on high-level employees (i.e. partners) and measure the quality of these employees using external measures [2]. In this study, we empirically investigate the effect of individual auditor quality (aggregated to the office level), across all employee ranks and measured using in-firm individual employee evaluations, on audit quality in the United States [3], [4].

As a credence good, a completed audit, specifically the quality of that audit, is difficult to evaluate (Causholli and Knechel, 2012). This difficulty arises because both audit inputs and audit outcomes are largely unobservable [5]. These limitations are particularly strict in the case of audit inputs, such as the quality of the audit personnel who act as a subset of the "inputs." While experimental studies have been able to shed light on the function of audit personnel characteristics in shaping audit quality – the results from these studies suggest that individual auditors will vary in their performance based on the task, available resources, experience and cognitive ability –a lack of empirical data has made large-scale inferences problematic.

In contrast, we are able to break open the black box of audit inputs and examine how the quality of the pool of auditors available in an office, as measured by internal performance evaluations, influences observable audit outcomes. These measures are especially informative given the idiosyncratic nature of audit employees [6]. Each evaluation is the culmination of job-specific performance as evaluated by supervisory auditors who personally know the employee being evaluated and can therefore provide a better assessment of auditing ability than a statistical analysis of observable characteristics.

While a necessary assumption in most prior literature is that audit quality is constant across an audit firm, some prior studies have examined within firm variation in audit quality with respect to industry specialization (Francis *et al.*, 2005) and partner quality (Gul *et al.*, 2013; Aobdia *et al.*, 2015). The data we employ in this study allow us to relax this assumption and examine the variation in individual audit employee quality (at all levels below partner) within Deloitte. Our study examines within firm variation in office quality measured by aggregating individual employee performance evaluations – we find that audit quality varies predictably with auditor quality across the firm.

Specifically, we find that offices with higher quality employees have fewer restatements, lower abnormal accruals and issue more going concern opinions (though this last result is weak, with a two-tailed p-value = 0.15). These results are consistent with higher quality audit employees producing higher quality financial statements (restatements), limiting managerial opportunism (accruals) and acting more independently from their clients (going concerns). Furthermore, we find that differences in quality at *all* auditor employee levels, not just overall employee quality, influence audit quality. For example, we find that high quality junior employees (defined as audit seniors) drive our going concern result and high-quality senior managers drive our restatement results. This complements prior literature in which only the effect of the highest-level auditors (i.e. partners) can be tied to audit quality (Gul *et al.*, 2013; Aobdia *et al.*, 2015).

Interestingly, we find that internal measures of auditor quality are not associated with audit fees. This finding suggests that, While fees may capture overall audit firm effort for a given client, firms do not charge a fee premium for higher quality employees. This result is consistent with Bell, Landsman and Shackelford (2001) who find that audit firms bill more

hours, but do not charge higher fees per hour, to increase audit quality and mitigate audit risk. In supplemental tests we provide evidence that the local offices of peer accounting firms appear to respond to a high quality Deloitte office by charging lower fees, suggesting that the local quality of audit employees may drive competition among firms with similar national reputations. Our findings highlight the importance of understanding the quality of all audit inputs (i.e. employees) rather than relying only on audit fees or national and local reputation to capture audit quality.

We make several contributions to the literature. First, we add to a long line of literature in auditing that examines the influence of auditor quality on audit quality. Complementing prior studies, we find that higher quality individual auditors, aggregated to the office level, have clients with higher quality financial statements and fewer abnormal accruals. These higher quality auditors also appear to be more independent of their clients.

Second, we further relax the assumption that audit quality is constant across an audit firm and provide evidence that differences in individual audit employee quality (not only partner level) across a firm are associated with measures of audit quality. Third, we provide preliminary evidence that audit firms are able to accurately evaluate their employees with regard to auditing ability – these higher quality employees are associated with better audit production.

Fourth, we provide evidence that individual audit employee quality (a subset of actual audit input quality) does not appear to drive audit fees within the firm. However, we provide evidence that peer audit firms charge lower fees in MSAs in which Deloitte employs its highest quality teams. This is consistent with competition from a high-quality competitor driving prices down for peer accounting firms. As discussed above, this is an important insight given the tendency in the audit literature to rely on audit fees as an indirect measure of audit quality. Our study provides evidence that this measure, While easy to calculate, should be used with caution [7].

Last, we document that auditor quality at *all* employee levels has an influence on observable audit outcomes. This suggests that audit firms benefit from having not only high quality management but also high quality rank-and-file employees. This highlights the importance of recruiting competent new hires in the production of high-quality audits.

In the next section, we develop our hypotheses. We describe the sample selection procedures and variables used in this study in Section 3. Section 4 presents the empirical results. A summary and conclusions are provided in Section 5.

2. Background and hypothesis development

DeAngelo (1981) defines the quality of audit services to be the market-assessed joint probability that a given auditor will both:

(1) discover a breach in the client's accounting system; and

(2) report the breach.

The probability that an auditor will uncover a breach is determined by the quality of the audit process and the probability that a breach will be reported is determined by auditor independence. Prior research on audit quality has focused broadly in these two areas.

Prior studies of audit quality generally rely on simple classification methods to identify high quality auditors, with Big N audit firms and industry specialists serving as the typical condition for being "high" quality (DeFond and Zhang, 2014, for a review of this literature) [8], [9]. Industry specialists are typically defined as the audit firm with the highest proportion of audit fees within an industry for a particular metropolitan statistical area (hereafter, MSA) and as such, are almost always also Big N audit firms (Reichelt and Wang, 2010) [10], [11]. Overall, consistent with these classifications accurately identifying high

quality auditors, Big N audit firms and industry specialists have been found to be associated with higher audit quality [12].

Auditors can increase the quality of their audit process (i.e. their skills) in a variety of ways, including: improving audit technology (Messier, 1995; Bamber *et al.*, 1996; Bonner *et al.*, 1996), adjusting the employee mix to include more high level employees (Bell *et al.*, 2008) and acquiring additional industry-specific knowledge to better understand client-specific characteristics, including risk (Knechel *et al.*, 2007). To date, however, little empirical research has been done to identify the quality of audit inputs beyond firm-level measures (Chin and Chi, 2009) and a few small samples from the field (Smith *et al.*, 2018). Because of data limitations, the limited empirical research conducted until now has examined individual auditor characteristics on small samples of high-level employees, such as audit partners (Gul *et al.*, 2013; Cheng *et al.*, 2020). One notable exception, Ye *et al.* (2014), examines individual auditor quality for a sample of auditors in China.

We also acknowledge a large body of experimental research going back several decades which has examined the relation between auditor characteristics and audit outcomes (Nelson and Tan, 2005 and Nelson, 2009 for an in-depth review of this literature). For example, a recently published study (Blum *et al.*, 2022) examines the relation between auditor reputation quality and audit outcomes. Carpenter (2007) examines audit teams' abilities to identify fraud risk through brainstorming, and Lord and DeZoort (2001) examine the effect social pressures auditors face have on their willingness to sign-off on misstated financial statements. The takeaway from this large body of literature suggests that, in a laboratory setting, auditor characteristics influence audit outcomes. We view our study and others that use available archival data as complementary to those experimental studies in this area.

Auditors can further increase the probability of uncovering a breach by increasing the effort expended on the audit, typically by increasing sampling (employee hours). Prior literature has demonstrated that audit firms that expend more effort (input more employee-hours) will produce higher quality audits (Caramanis and Lennox, 2008). Additionally, larger firms (i.e. Big N) have more resources to devote to audits than smaller firms and may be able to devote more employee hours to a particular client. At the limit, however impractical, auditors could examine every item pertaining to the financial statements and effectively drive the probability of uncovering a breach to 100%, fraud notwithstanding.

Increasing auditor skill or adding employee hours to an audit client are both costly to the auditor and these costs may be passed on to audit clients. Higher quality auditors (i.e. Big N auditors and industry specialist auditors) have been shown in prior literature to command higher audit fees (Francis *et al.*, 2005). This suggests that auditors expend more effort on these clients (clients that are charged higher fees) and therefore, produce higher quality audits.

The second component of audit quality is the probability that an auditor will report any given breach. Audit firms are more likely to report a breach if they have the proper incentives to do so. DeAngelo (1981) and Datar *et al.* (1991) argue that large, prestigious public accounting firms (Big N auditing firms) have incentives to protect their investment in reputational capital and are more likely than other auditors to supply a high-quality audit [13]. Not surprisingly, prior literature suggests that these higher quality audit firms produce higher quality audit outcomes and improve financial reporting quality in the U.S. (Chung and Lindsay, 1988; DeFond and Jiambalvo, 1993; Teoh and Wong, 1993; DeFond *et al.*, 2000; Krishnan, 2003a; Francis, 2004; Lennox and Pittman, 2010).

Dopuch and Simunic (1982) suggest that industry specialists will provide higher quality audits because they have a better understanding of their clients' business and accounting practices than nonspecialists. Thus, the probability of uncovering a breach is higher for

specialist auditors than other, nonspecialist, auditors. In addition, similar to Big N firms, these specialists have an incentive to protect their reputation and report observed breaches (Simunic, 1980) [14]. Last, Francis (2011) provides a framework for audit quality and suggests that two inputs that effect quality are audit-testing procedures and engagement team personnel. Thus, the makeup of the *individual* members of an engagement will influence the quality of the audit work and in turn, the audit outcomes that we observe.

These studies highlight the focus of most prior literature on audit firm-level quality when investigating the effects of auditor quality on audit outcomes. Limited data availability is the main driver of firm-level emphasis. Recently, as more data has become available, studies have examined the effect of individual partners on audit quality. For example, using data from Taiwan, Aobdia *et al.* (2015) identify individual partner quality using client discretionary accruals and Chin and Chi (2009) find that audit partner-level specialization results in fewer client restatements, suggesting that auditors who are more qualified produce better quality audits. Additionally, Gul *et al.* (2013) measure individual signing-auditor quality using an array of observable characteristics including gender, Big N experience and political affiliation in China [15].

A benefit of these studies is their ability to match an individual partner with an individual client. This matching allows researchers to examine the influence of individual auditor characteristics on audit outcomes. A limitation of these studies, however, is that audit quality is necessarily attributed to the characteristics of one (or a few) member(s) of the audit team. Furthermore, in prior studies, because of inherent data limitations, researchers must infer audit partner quality based on observable audit outcomes.

In contrast, in this study we are able to determine individual auditor quality using internal performance evaluations, which take into account a wide range of employee characteristics, including difficult to obtain, intangible characteristics. Furthermore, While prior studies examine the influence of high-level auditors (partners and directors) on audit quality, we are able to examine the influence of auditors at *every* level of the audit production process. An underlying assumption in many prior studies is that audit quality is constant across an audit firm. However, the main reason this has been assumed is the lack of empirical data with which to examine within-firm differences in audit quality [16].

We expect that higher quality individual employees (as measured by internal performance ratings) will be associated with higher audit quality. We measure audit quality following the prior literature and examine three audit outcomes:

(1) restatements;

(2) abnormal accruals; and

(3) issuance of going concern opinions.

Expressed formally, our first hypothesis is as follows:

H1. Audit offices with higher quality employees will have clients with higher quality audit outcomes than offices with lower quality employees.

As mentioned above, prior research has identified a relation between audit firms charging higher fees and producing higher quality audits. This suggests that, within a firm, offices with higher quality employees could produce higher quality audits as well as charge higher fees to their clients. We use this intuition to motivate our second formal hypothesis below:

H2. Audit offices with higher quality employees will charge higher fees than offices with lower quality employees.

3. Research design and sample selection

3.1 Research design

3.1.1 Ratings. Auditors rarely work alone. Rather, they are typically assigned to engagement teams. We therefore examine both the effect of auditors of individual types (i.e. Senior Manager/Director, Manager and Senior) as well as an aggregate measure of team quality. It is important to note that we examine only auditors below the partner level. Employee ratings are aggregated to the office-level for testing purposes, as team and client assignments are not available in our data set. We calculate several variables to determine the effect of individual auditor quality on a variety of audit outcome variables.

To calculate our measure, we first calculate summary statistics for the ratings by employee title: Senior Manager/Director, Manager and Senior [17]. We calculate each office's average employee rating for each of the three employee levels. We then assign an indicator variable equal to one if the office-title average rating is greater than the median office-title average rating for all offices in the U.S. and zero otherwise. This measures whether, for a given job title, an office's employees are in the top-half of the firm, on average. We calculate another indicator variable taking the value of one if an office's Senior Manager [18], Manger and Senior averages *all* rank above their respective national medians and zero otherwise. This variable (*High Quality Audit Team*) would signify an office where all employee ranks, on average, are rated in the top half of their peers nationally. We interpret this variable as identifying offices with higher quality teams, top to bottom.

3.1.2 Audit quality. Audit quality is difficult to define at the engagement level because no one proxy satisfies all stakeholders (Knechel *et al.*, 2012; DeFond and Zhang, 2014; Boskou *et al.*, 2019; Durand, 2019). Our variables of interest (internal ratings) are input measures of audit quality, and we hypothesize that the inputs of audit quality will "flow through" the audit process to affect outcome measures. DeFond and Zhang (2014) recommend utilizing multiple proxies to take advantage of the strengths of each measure. Thus, we hypothesize and perform tests of restatements, accruals and going concern opinions. Additionally, we test audit fees, which are the result of negotiations between auditors and the client (audit committee) and which have been used in prior literature as a measure of auditor effort (and indirectly, quality).

3.1.3 Restatements. To test *H1* in a multivariate setting, we estimate restatements using a model based on Knechel and Sharma (2012) [19]. The dependent variable, *Restatement*, is an indicator variable taking the value of one if the year's financial statements are later restated; zero otherwise. The model is as follows:

$$\begin{aligned} Restatement = {} & \beta_0 + \beta_1(Ratings) + \beta_2(Total\ Office\ Employees) \\ & + \beta_3(Herfindahl\ Index) + \beta_4(Non\ Audit\ Services) + \beta_5(Initial\ Audit) \\ & + \beta_6(Ln(MVE)) + \beta_7(MTB) + \beta_8(Loss) + \beta_9(Recent\ Financing) \\ & + \beta_{10}(Leverage) + \beta_{11}(Litigation) + \beta_{12}(Company\ Age) \\ & + \beta_{13}(Going\ Concern) + \beta_{14}(Merger) + \beta_{15}(December\ Year\ End) \\ & + \beta_{16}(Internal\ Control\ Weakness) + \sum \beta\,(Industry\ fixed\ effects) + \varepsilon \end{aligned} \tag{1}$$

The variable *Ratings* is a placeholder for the several indicator variables, which indicate a particular client is served by an office with greater than median average ratings, whether measured against other offices as a whole or measured against similarly ranked-employees of

other offices. For example, *High Quality Audit Team* is an indicator taking the value of one if all levels within an office have an average rating above the national median for their respective level, zero otherwise. Similarly, *High Quality Manager* is an indicator taking the value of one if the average manager ranking for a particular office is above the median for all offices' average manager ranking. Consistent with *H1*, we expect negative coefficients on our *Ratings* variables in the restatement model (i.e. higher quality auditors correspond to fewer restatements). The variable *Total Office Employees* is a measure of office size. Our data enable us to measure the total number of employees in an office which allows for a better measure of office size than simply calculating total office-level fees. Industry fixed effects are based on two-digit SIC code classifications and robust standard errors are clustered by MSA.

3.1.4 Accruals. As a second audit quality proxy, we utilize absolute abnormal accruals. We calculate abnormal accruals based on Butler *et al.* (2004), Minutti-Meza (2013) and Chen *et al.* (2016). We estimate the following model:

$$\begin{aligned} ABS(Accruals) = {} & \beta_0 + \beta_1(Ratings) + \beta_2(Total\ Office\ Employees) + \beta_3(Herfindahl\ Index) \\ & + \beta_4(Specialist) + \beta_5(Ln(MVE)) + \beta_6(Leverage) + \beta_7(ROA) \\ & + \beta_8(Loss) + \beta_9(Cash\ Flow) + \beta_{10}(MTB) + \beta_{11}(Abs(Total\ Accruals)) \\ & + \beta_{12}(SalesGrowth) + \beta_{13}(Z-Score) + \beta_{14}(STDev\ Earnings) \\ & + \beta_{15}(Initial\ Audit) + \sum \beta(Industry\ fixed\ effects) + \varepsilon \end{aligned} \tag{2}$$

Industry effects are based on two-digit SIC code classification and robust standard errors are clustered by MSA (to address potential correlated errors stemming from common local influences). Again, the *Ratings* measures vary depending on the iteration of the model and represent higher quality individual average ratings for the office or employee teams. We expect negative coefficients on the *Ratings* variables consistent with higher quality auditors constraining earnings management via accruals more than lower-quality auditors.

3.1.5 Going concern opinions. Another proxy for audit quality is the auditor's issuance of a going-concern opinion. Auditors who issue going concern opinions are said to be more independent and more conservative than their counterparts who should have issued a going concern but did not because of client pressure. Our multivariate model for going concern opinions follows Minutti-Meza (2013). The dependent variable is an indicator variable taking the value of one if the auditor assigned a going concern opinion; and zero otherwise. The model is as follows:

$$\begin{aligned} Going\ Concern = {} & \beta_0 + \beta_1(Ratings) + \beta_2(Total\ Office\ Employees) + \beta_3(Specialist) \\ & + \beta_4(Non\ Audit\ Services) + \beta_5(Ln(MVE)) + \beta_6(Leverage) \\ & + \beta_7(Loss) + \beta_8(MTB) + \beta_9(Abs(Total\ Accruals)) \\ & + \beta_{10}(Sales\ Growth) + \beta_{11}(Z-Score) + \beta_{12}(STDev\ Earnings) \\ & + \beta_{13}(Initial\ Audit) + \sum \beta(Industry\ fixed\ effects) + \varepsilon \end{aligned} \tag{3}$$

Again, *Ratings* takes on several values of office-job title ratings. Robust standard errors are clustered at the MSA level.

3.1.6 Audit fees. If higher rated auditors do provide higher audit quality the firm may be able to charge higher fees. Whether the fees are driven by the higher salaries for higher-rated employees or driven by the higher quality audit, we may see higher fees in offices employing better than median auditors. Thus, we estimate an OLS regression model based on Simunic (1980) with additional control variables as suggested in Hay *et al.* (2006) to determine the association between employee ratings and audit fees. The model is as follows:

$$\begin{aligned} Ln(Audit\ Fees) = {} & \beta_0 + \beta_1(Ratings) + \beta_2(Total\ Office\ Employees) \\ & + \beta_3(Herfindahl\ Index) + \beta_4(Ln(Assets)) + \beta_5(Current\ Ratio) \\ & + \beta_6(Leverage) + \beta_7\big((INV + AR)/Assets\big)) + \beta_8(ROA) \\ & + \beta_9(Business\ Segments) + \beta_{10}(Foreign) + \beta_{11}(Specialist) \\ & + \beta_{12}(Merger) + \beta_{13}(Going\ Concern) + \beta_{14}(Loss) \\ & + \beta_{15}(December\ Year\ End) + \beta_{16}(Non\ Audit\ Services) \\ & + \beta_{17}(Internal\ Control\ Weakness) + \beta_{18}(Initial\ Audit) \\ & + \sum \beta\,(Industry\ fixed\ effects) + \varepsilon \end{aligned} \tag{4}$$

3.2 Data sources and sample selection

3.2.1 Sample selection. We employ a new and novel dataset that may potentially be useful in a variety of accounting and management studies. In 2006, Deloitte's human resources team conducted an internal study to determine if the firm was systematically underpaying minority employees. To conduct this study, the HR team collected data on performance evaluation, salary, bonus, position (senior, manager, senior manager, director, etc.), office location, service line and demographic data for the population of current (as of year-end 2005) Deloitte employees below the partner level. The HR study focused on U.S. employees of Deloitte and includes data on approximately 30,000 individuals.

Inadvertently, this complete report and associated source datasets ended up on the computer servers of Sony Pictures Entertainment sometime prior to November 2014. Reporters speculate that an employee moved from Deloitte to Sony and unintentionally brought the files along [20]. In late November 2014, news broke that Sony's network had been compromised by hostile parties (the hacker group "Guardians of Peace"). These hackers proceeded to release several hundred gigabytes of data originating from the Sony servers over the following weeks. These releases, which were the subject of intense press coverage, included forthcoming films, private messages between Sony executives and movie star contracts [21].

The Deloitte diversity report (and data) was included as one of the thousands of folders of hacked data released to the public and it attracted at least modest coverage from news outlets serving the accounting and financial services industries [22]. We download these data (now available publicly from a variety of providers and online torrents) and use them as the basis for our analysis [23], [24]. While the data employed in this study are from one Big 4 audit firm, we have confirmed with current and past audit employees that the evaluation system in place at Deloitte at this time is similar to that in other Big 4 and non-Big 4 audit firms. Thus, we believe that our inferences are likely generalizable to other audit

firms, especially other Big 4 audit firms, but we caution that our results should be interpreted with the appropriate caveats in mind.

We are not the first study to employ data obtained in this manner. Mironov (2013), published in the *Journal of Finance*, uses leaked banking transaction; Griffin *et al.* (2019), published in *Proceedings of the National Academy of Sciences* (*PNAS*), use hacked data from an online website facilitating extramarital affairs (Ashley Madison) to examine how managers' ethics predict corporate behavior; Caruana-Galizia and Caruana-Galizia (2016) , published in the *Journal of Public Policy*, uses a precursor dataset of the Panama Papers. Recently, Bourveau *et al.* (2021) use our exact sample of leaked Deloitte data to investigate the pay differential of H-1B visa holders versus local hires.

Given the source of the data, our sample is constrained to one Big 4 audit firm (Deloitte) and its public clients. Further, data on our variable of interest (employee ratings) were obtained for only one year (2005), yielding one rating per employee. Our audit quality measures and applicable control variables were taken for this year from the intersection of Compustat and Audit Analytics. This intersection produced 1,031 public clients. To analyze inter-office differences, each client is assigned to its Metropolitan Statistical Area (MSA) [25]. Some public companies either are not located within an MSA or their city-county-state combination are not found within the census bureau's records. Requiring an MSA for our analysis omits 162 observations. Lastly, we omit banking and utility companies because of the highly regulated nature of these industries (potentially affecting our dependent variables: audit fees, restatements, accruals and going concern opinions). Omitting these industries reduces the sample to 611 observations. Further restrictions are imposed by lack of control variables for the respective models. See Table 1 for detail on sample restrictions.

3.3 Descriptive statistics

Table 2 Panel A reports the descriptive statistics for the variables used in this study. By construction, approximately half of the clients analyzed are audited by offices with senior managers, managers or seniors who are rated above the median. Only 8% of the clients are audited by offices that have all levels rated above median (*high quality audit team*), indicating that the by-level results are not driven by only a few offices. Almost one quarter of the clients' financial statements are restated While only 4% of clients receive a going-concern opinion. All continuous variables are winsorized at the 1st and 99th percentiles.

Intersection of Audit Analytics and Compustat (year 2005)		1,031	
Less: All Utilities and Financial Services firm years		(258)	
Less: Those clients not assigned an MSA		(162)	
Remaining Firms		611	
	Remaining Firms	Firms Without Necessary Controls	Final Sample
Restatement Sample	611	(112)	499
Accrual Sample	611	(106)	505
Going Concern Sample	611	(125)	486
Audit Fee Sample	611	(62)	549

Notes: Metropolitan Statistical Area (MSA) is a geographical region with a relatively high population density. We match firms to an MSA based on the city in which they are headquartered. We only include MSAs for which our audit firm has at least five employees. Our sample includes 59 MSAs. This table reports the sample size restrictions for our various samples

Table 1.
Sample selection

The average number of rated employees for the levels analyzed (senior manager, manager and senior) in a given office is 134. Clients, on average, are larger than the Compustat global average, as we have constrained the sample to the clients of a Big 4 audit firm. Average *ROA* is negative, but the median *ROA* is positive. Table 2 Panel B presents descriptive statistics of performance ratings.[26] Higher rank employees, on average, receive better ratings than lower level employees. This is likely due to the fact that only the best employees are promoted to the next employee rank (i.e. below average Managers are not promoted to Senior Manager).

The Pearson correlations for variables used are reported in Table 2 Panel C. In this univariate setting, employee ratings at the top level (senior managers and directors) are positively related to audit fees, While the other levels' ratings are not related. Ratings' correlations with audit quality proxies are largely positive, although none are significant at

	Count	Mean	Median	SD
Panel A: Sample Descriptive Statistics				
(1) *High Quality Audit Team*	549	0.08	0.00	0.28
(2) *High Quality SrMgr/Director*	549	0.55	1.00	0.50
(3) *High Quality Manager*	549	0.51	1.00	0.50
(4) *High Quality Senior*	549	0.40	0.00	0.49
(5) *Audit Fees(Millions)**	549	1.614	0.884	2.231
(6) *Restatement*	549	0.22	0.00	0.41
(7a) *Absolute Accruals*	544	1.38	0.19	3.31
(7 b) *Signed Accruals*	544	0.79	0.03	3.04
(8) *Going Concern*	549	0.04	0.00	0.20
(9) *Total Office Employees (Hundreds)**	549	1.34	0.79	1.64
(10) *Herfindahl Index*	549	0.57	0.49	0.28
(11) *Assets(Billions)**	549	2.107	0.475	6.005
(12) *Current Ratio*	549	2.79	2.00	2.48
(13) *Leverage*	549	0.53	0.49	0.33
(14) *(Inv+AR) Assets*	549	0.26	0.23	0.18
(15) *ROA*	549	−0.01	0.04	0.22
(16 *Business Segments*	549	2.62	1.00	2.15
(17) *Foreign*	549	0.24	0.00	0.43
(18) *Specialist*	549	0.62	1.00	0.49
(19) *Merger*	549	0.57	1.00	0.50
(20) *Loss*	549	0.26	0.00	0.44
(21) *December Year End*	549	0.61	1.00	0.49
(22) *Non Audit Services*	549	0.94	1.00	0.24
(23) *Internal Control Weakness*	549	0.16	0.00	0.37
(24) *Initial Audit*	549	0.11	0.00	0.31

	Count	Mean
Panel B: Ratings Descriptive Statistics		
SrMgr/Director	1,039	1.89
Manager	933	1.95
Senior	1,021	2.06

Table 2.
Summary statistics and correlations

Notes: This Panel A reports descriptive statistics for our main sample. All variables are winzorized at the 1 and 99% levels. See Appendix 1 for variable definitions. *Summary statistics reported for raw number. In the multivariate tests the natural log of the variable is used. This Panel B reports descriptive statistics for performance ratings by employee category. Ratings run from 1 (best) to 5 (worst)

(*continued*)

Table 2.

	−1	−2	−3	−4	−5	−6	(7a)	(7b)	−8	−9	−10	−11	−12	−13	−14	−15	−16	−17	−18	−19	−20	−21	−22	−23	−24	−25
Panel C: Pearson Correlation																										
(1) High Quality Audit Team	1																									
(2) High Quality SrMgr/Director	0.27*	1																								
(3) High Quality Manager	0.30*	−0.06	1																							
(4) High Quality Senior	0.37*	−0.13*	−0.02	1																						
(5) LN(Audit Fees)	−0.07	0.13*	−0.07	−0.01	1																					
(6) Restatement	−0.03	−0.05	0.05	0.01	0.04	1																				
(7a) Absolute Accruals	−0.05	−0.03	0.02	−0.03	−0.02	−0.02	1																			
(7 b) Signed Accruals	−0.06	−0.06	−0.01	0.05	−0.05	−0.07	0.76*	1																		
(8) Going Concern	0.01	0.04	−0.04	0.01	−0.06	−0.05	−0.05	−0.06	1																	
(9) Total Office Employees	−0.20*	0.32*	0.23*	−0.26*	0.15*	0.08*	0.05	−0.03	−0.01	−0.03	1															
(10) Herfindahl Index	0.20*	−0.16*	−0.05	−0.01	−0.06	0.08	−0.23*	−0.20*	0.03	−0.09*	−0.43*	1														
(11) LN(Assets)	0	0.10*	−0.07	−0.03	0.77*	0.01	−0.15*	−0.15*	−0.15*	−0.11*	0.04	0.11*	1													
(12) Current Ratio	−0.11*	−0.01	−0.01	0.04	−0.26*	0.01	−0.06	−0.04	−0.08	0.16*	0.05	−0.17*	−0.31*	1												
(13) Leverage	0.04	0.04	0	−0.07	0.18*	0.06	0.01	0.02	0.33*	−0.14*	−0.04	0.18*	0.19*	−0.46*	1											
(14) (Inv+AR) Assets	0.03	−0.01	−0.09*	0.02	0.01	0.03	−0.10*	−0.08	−0.05	−0.02	−0.02	0.18*	−0.05	−0.16*	0.03	1										
(15) ROA	0.03	0.05	−0.06	0.01	0.20*	−0.01	−0.08	−0.06	−0.37*	0.05	−0.01	0.04	0.39*	−0.06	−0.28*	0.19*	1									
(16) Business Segments	−0.05	0.09*	−0.01	−0.17*	0.34*	−0.05	0.01	0.01	−0.05	−0.05	0.04	0.10*	0.30*	−0.13*	0.08*	0.01	0.14*	1								
(17) Foreign	−0.05	0.01	0.01	0.02	0.23*	0	0.03	0.01	−0.03	−0.03	0.08	−0.14*	0.08*	0.06	−0.03	0.06	0.10*	0.05	1							
(18) Specialist	0.16*	−0.05	0.04	−0.10*	0.19*	0.05	−0.08	−0.08	0.03	−0.05	−0.18*	0.51*	0.23*	−0.18*	0.17*	0.13*	0.13*	0.15*	−0.02	1						
(19) Merger	0.02	0.09*	0.02	−0.05	0.30*	−0.02	0.14*	0.11*	−0.10*	−0.01	0.03	−0.05	0.25*	−0.12*	−0.02	−0.03	0.16*	0.20*	0.21*	0.06	1					
(20) Loss	−0.03	−0.02	0.06	−0.03	−0.21*	0.02	0.08	0.02	0.32*	−0.18*	0.02	−0.03	−0.37*	0.03	0.30*	−0.21*	−0.65*	−0.12*	−0.04	−0.12*	−0.15*	1				
(21) December Year End	−0.04	0.05	0.05	−0.01	0.06	−0.13*	0.07	0.08	0.09*	−0.01	0.02	−0.09*	0.03	−0.03	0.05	−0.21*	−0.04	0.10*	0.01	0.03	0.03	0.03	1			
(22) Non Audit Services	0.02	−0.01	0.07	0.01	0.11*	0.10*	−0.09*	−0.08*	−0.26*	−0.01	0	0.03	0.17*	−0.01	−0.05	0.05	0.14*	0.08	0.06	−0.01	0.04	−0.12*	0	1		
(23) Internal Control Weakness	−0.01	−0.04	0	0.06	0.09*	0.36*	0	−0.01	0.09*	0.05	−0.01	−0.05	−0.10*	−0.01	0.08*	0.02	−0.10*	−0.03	0.04	0.01	−0.03	0.15*	−0.06	−0.01	1	
(24) Initial Audit	0	0	0.02	0	0.06	−0.04	0.15*	0.11*	0.02	0.03	−0.04	−0.07	−0.05	−0.01	0.02	−0.07	−0.08	−0.04	0.01	−0.01	0.06	0.08	0.04	−0.28*	0.19*	1

Notes: This Panel C reports Pearson correlations for our variables of interest. See Appendix 1 for variable definitions. * indicates statistical significance at the $p < 0.05$ level. All tests are two-tailed

the five percent level. Overall, Table 2 suggests that there are at least some parallels between traditional measures of audit quality and our individual auditor rating data. Next, we estimate regression models in an effort to further investigate our hypotheses.

4. Empirical results

4.1 Restatements

Table 3 examines the effect of individual auditor performance ratings on the likelihood that their clients will restate current period financial statements. We regress *Restatement* on our variables of interest and a set of control variables. Column 1 reports the estimate of our restatement model with indicator variables for offices with employees whose evaluations are above the national median for each job title. The coefficient on *High Quality SrMgr/Director* is −0.485 and statistically significant. This indicates that offices with highly rated senior managers and directors are 38.4% less likely to have a restatement. The coefficients on *High Quality Manager* and *High Quality Senior* are negative but not statistically significant. The insignificance of these coefficients is consistent with senior-level employees, not junior-level employees, affecting the likelihood that a client issues a restatement.

Column 2 includes the variable *High Quality Audit Team*, which takes a value of one if all three employee-levels (senior manager/director, manager and senior) in a given office are

	(1) Restatement	(2) Restatement
High Quality SrMgr/Director	−0.485* (1.67)	
High Quality Manager	−0.139 (0.49)	
High Quality Senior	−0.132 (0.59)	
High Quality Audit Team		−1.006** (2.07)
Total Office Employees	0.423* (1.77)	0.330* (1.77)
Herfindahl Index	1.202* (1.69)	1.361* (1.91)
Non Audit Services	0.230 (0.45)	0.239 (0.47)
Initial Audit	−0.639 (1.12)	−0.623 (1.07)
LN(MVE)	−0.053 (0.62)	−0.078 (0.85)
MTB	0.066 (1.54)	0.068 (1.57)
Loss	−0.265 (0.70)	−0.302 (0.82)
Finance	−0.481* (1.71)	−0.474* (1.70)
Leverage	0.901** (2.09)	0.859* (1.93)
Litigation	0.222 (0.32)	0.238 (0.34)
Company Age	−0.020* (1.69)	−0.019 (1.62)
Going Concern	−1.048 (1.05)	−1.114 (1.08)
Merger	0.344 (1.04)	0.341 (1.02)
December Year End	−0.462 (1.54)	−0.502 (1.60)
Internal Control Weakness	2.752*** (6.78)	2.725*** (6.80)
Intercept	−3.119** (1.98)	−3.073** (2.10)
Industry Fixed Effects	Yes	Yes
Pseudo *R*2	0.239	0.240
Number of Restatements	142	142
Number of Observations	497	499

Table 3.
Audit quality and internal ratings: restatements

Notes: Table 3 presents the results from the estimation of Model (1) and examines the relation between our measures of auditor quality and an indicator variable for whether or not a client later restated their financials. This logit model is based on Knechel and Sharma (2012) and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at $p < 0.10, 0.05, 0.01$, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for variable definitions

rated above the national median for their respective job title and zero otherwise. The coefficient is statistically significant and signifies that for clients audited by high quality offices, the odds of restatement are 63.4% lower than that of clients audited by other offices. Overall, these results imply that highly-rated employees significantly reduce the likelihood of restatement and this effect is driven primarily by senior-level employees (i.e. senior managers and directors).

These results are intuitively appealing because the higher-level auditors are most likely to interact with higher-level management and the audit committee to determine the reliability of the financial statements. Together, these results suggest that high quality high level auditors improve audit quality by a considerable margin, especially when paired with high quality junior auditors (e.g. when seniors, managers and senior managers/directors are all highly rated).

4.2 Abnormal accruals

In addition to restatements, accrual quality is another commonly used output measure of audit quality, and we predict that high quality individual auditors will lead to a lower level of absolute abnormal accruals. Table 4 presents the effect of individual auditor performance ratings on abnormal accruals. Column 1 reports the estimate of our abnormal accruals model

	(1) Abs. Abn. Acc.	(2) Abs. Abn. Acc.
High Quality SrMgr/Director	−0.126 (0.71)	
High Quality Manager	0.089 (0.45)	
High Quality Senior	0.205 (0.97)	
High Quality Audit Team		−0.480** (2.54)
Total Office Employees	−0.207 (1.35)	−0.254* (1.75)
Herfindahl Index	−1.308** (2.53)	−1.243** (2.46)
Specialist	0.358 (1.17)	0.371 (1.15)
Ln(MVE)	−0.045 (0.56)	−0.052 (0.64)
Leverage	0.064 (0.16)	0.002 (0.01)
ROA	−0.760 (0.98)	−0.755 (0.98)
Loss	0.244 (0.85)	0.228 (0.79)
Cash Flow	1.613 (1.64)	1.618 (1.63)
MTB	0.026 (0.63)	0.025 (0.61)
ABS(Accruals)	1.107***(9.75)	1.080*** (9.46)
Sales Growth	0.137 (1.20)	0.133 (1.17)
Z-Score	−0.023 (0.12)	−0.023 (0.11)
STDev Earnings	0.000 (0.82)	0.000 (0.54)
Initial Audit	−0.249 (0.81)	−0.253 (0.83)
Intercept	1.380* (1.68)	1.611** (2.24)
Industry Fixed Effects	Yes	Yes
R-Square	0.668	0.668
Adj. *R*-Square	0.618	0.620
Number of Observations	503	505

Notes: Table 4 presents the results from the estimation of Model (2) and examines the relation between our measures of auditor quality and absolute abnormal accruals. We estimate accruals based on Butler *et al.* (2004), Minutti-Meza (2013) and Chen *et al.* (2016). The model is based on Minutti- Meza (2013) and Reichelt and Wang (2010) and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10, 0.05, 0.01$, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for definitions

Table 4. Audit quality and internal ratings: absolute abnormal accruals

with indicator variables for offices with high quality audit employees at each of the three employee levels we examine. The results in Column 1 provide no evidence of a relation between high quality audit employees and the level of abnormal accruals. However, in Column 2 the coefficient on *High Quality Audit Team* is negative and statistically significant. This coefficient (−0.480) indicates that offices in which all employee ranks are rated above the median, the predicted level of absolute abnormal accruals is reduced by 32.0%. This result is consistent with high quality audit teams (not just one rank of auditor) producing higher quality audits and audit outcomes.

4.3 Going concern opinions

Going concern opinions are given when the auditor has substantial doubt that the client will continue as a going concern in the upcoming year. Issuing a going concern opinion is costly to an audit firm, because they will likely lose their client and can be a sign of an auditor's independence (Carcello and Neal, 2003; Louwers, 1998; Vanstraelen, 2003). Table 5 reports the results of Model 3. In Column 1 we find no significant relation between the quality of auditors at different job levels and the probability of a client receiving a going concern opinion. Similarly, in Column 2 we find no significant relation between a high quality office and the probability of a client receiving a going concern opinion. However, it is important to note that the coefficients on *High Quality Senior* (Column 1) and *High Quality Audit Team* (Column 2) are marginally significant (two-tailed p-value =0.15) in the expected direction and suggest economic significance.

	(1) GC	(2) GC
High Quality SrMgr/Director	1.047 (0.97)	
High Quality Manager	0.347 (0.36)	
High Quality Senior	1.275 (1.47)	
High Quality Audit Team		1.885 (1.46)
Total Office Employees	−0.236 (0.78)	0.001 (0.00)
Specialist	0.304 (0.29)	0.109 (0.12)
Non Audit Services	−3.099*** (2.79)	−3.046*** (2.99)
LN(MVE)	−0.968** (2.39)	−0.936** (2.32)
Leverage	3.423*** (2.72)	3.673** (2.31)
Loss	3.822*** (4.31)	3.531*** (3.13)
MTB	0.124 (1.35)	0.114 (1.36)
ABS(Accruals)	0.092 (0.32)	−0.009 (0.03)
Sales Growth	0.319 (1.00)	0.284 (1.04)
Z-Score	−0.214 (0.36)	−0.131 (0.23)
STDev Earnings	0.001 (1.45)	0.001 (1.41)
Initial Audit	−0.031 (0.04)	0.321 (0.38)
Intercept	−2.184 (0.73)	−2.142 (0.72)
Industry Fixed Effects	Yes	Yes
Pseudo *R*2	0.675	0.667
Number of Going Concerns	22	22
Number of Observations	485	486

Table 5.
Audit quality and internal ratings: going concern opinions

Notes: Table 5 presents the results from the estimation of Model (3) and examines the relation between our measures of auditor quality and whether or not a firm received a going concern opinion. This logit model is estimated based on Minutti-Meza (2013) and Reichelt and Wang (2010) and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute t-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10, 0.05, 0.01$, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for definitions

The coefficient (and corresponding odds ratio) on *High Quality Senior* suggests that audit offices with high rated senior auditors are more than three times as likely to issue going concern opinions relative to offices with low rated seniors (controlling for client characteristics). This could be attributed to seniors being:

- in a better position to discover information pertinent to the going-concern decision as they are on site with the client more often and have more day-to-day contact with the client; and
- high quality auditors exhibiting more independence.

One possible reason for the lack of significance is the relative infrequency of receiving a going concern opinion. We only observe 22 going concern events in our sample which greatly reduces the power of our tests. Thus, While the results in this table do not provide statistically compelling evidence, the pattern of results is consistent with that observed in Table 3 and Table 4 – high quality auditors at all levels influence the quality of audits and audit outcomes. This table raises the interesting possibility that low-level employees can affect the likelihood of a client receiving a going concern opinion; however, the limitations of our sample prevent us from fully examining this possibility. Broadly, we view this result as weak, but at least suggestive of high quality auditors being more willing to issue going concern opinions.

4.4 Audit fees

Lastly, the results of our tests of audit fees are reported in Table 6. The r-square is slightly lower than other audit fee models from the same time frame as our sample consists of only one Big 4 firm; thus, no inter-firm variation is exploited in the model. All control variables load in directions consistent with prior research with the exception of *Initial Audit*, which loads positively indicating no low-balling (rather a premium) for a client switching to Deloitte.

The coefficients on the variables of interest are not statistically significant indicating the audit office does not charge its clients for its above-average employees. An office wishing to do so would only have evidence from internally generated ratings, which could be viewed as suspect by audit committees. Our evidence does not support the conjecture that audit firms charge higher fees to clients that receive higher quality audit personnel. This suggests that the quality of the work done by these better employees is not fully captured by prior studies which use fees as a proxy for effort and quality (Simunic, 1980).

5. Additional analyses

5.1 Cross-sectional tests

In addition to our main tests we run a number of cross sectional tests to determine if the results vary predictably with office-level characteristics. Specifically, we partition the sample at the median for audit office size, the percentage of client assets that are intangible and whether or not a client disclosed an internal control weakness (*ICW*) in a prior period. We re-estimate our restatement model and present the results in Table 7. Panel A presents the results of the partition based on office size. Columns 1(3) and 2(4) present the results for offices above(below) the median audit office size. The coefficient on *High Quality SrMgr/ Director* in Column 1 is negative and statically significant. Additionally, the coefficient is larger in magnitude than the corresponding insignificant coefficient in Column 3. This indicates that high quality senior managers and directors are associated with fewer restatements in large offices but not in small offices. The coefficients on *High Quality Audit*

	(1) Audit Fees	(2) Audit Fees
High Quality SrMgr/Director	−0.018 (0.37)	
High Quality Manager	−0.067 (1.16)	
High Quality Senior	0.105 (1.63)	
High Quality Audit Team		−0.104 (1.06)
Total Office Employees	0.076* (1.97)	0.059 (1.47)
Herfindahl Index	−0.394*** (2.76)	−0.370** (2.54)
LN (Assets)	0.489*** (26.09)	0.494*** (26.19)
Current Ratio	−0.022* (1.87)	−0.021* (1.85)
Leverage	−0.076 (0.83)	−0.102 (1.10)
(Inv+AR) Assets	0.299 (1.19)	0.336 (1.35)
ROA	−0.579*** (3.71)	−0.575*** (3.71)
Business Segments	0.049*** (3.76)	0.045*** (3.39)
Foreign	0.224*** (3.52)	0.225*** (3.30)
Specialist	0.210** (2.62)	0.210** (2.43)
Merger	0.093* (1.87)	0.085* (1.74)
Going Concern	0.019 (0.13)	0.047 (0.33)
Loss	0.062 (0.84)	0.063 (0.83)
December Year End	0.004 (0.07)	0.012 (0.22)
Non Audit Services	−0.050 (0.46)	−0.043 (0.40)
Internal Control Weakness	0.380*** (5.42)	0.392*** (5.40)
Initial Audit	0.190** (2.50)	0.188** (2.59)
Intercept	10.090*** (22.13)	10.108*** (20.75)
Industry Fixed Effects	Yes	Yes
R-Square	0.743	0.743
Adj. R-Square	0.704	0.705
Number of Observations	545	549

Notes: Table 6 presents the results from the estimation of Model (4) and examines the relation between our measures of auditor quality and audit fees. We use the standard audit fee model based on Simunic (1980) with additional control variables from Hay *et al.* (2006) and robust standard errors are clustered by MSA. Our dependent variable is the natural log of audit fees. Industry effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for definitions

Table 6.
Audit quality and internal ratings: Audit fees

Team in Columns 2 and 4 are both statistically significant but not statistically different from each other, indicating that high employee quality offices, whether large or small, decrease the likelihood of client restatements.

Panel B presents the results of the partition based on whether or not a client has reported an ICW in the prior year. Columns 1(3) and 2(4) present the results for clients reporting (not reporting) an ICW in the prior year. The coefficient on *High Quality SrMgr/Director* in Column 1 is negative and statically significant. Additionally, the coefficient is larger in magnitude than the corresponding insignificant coefficient in Column 3. This indicates that high quality senior managers and directors are associated with fewer restatements in offices that have previously reported an ICW.

Interestingly, the coefficients on *High Quality Manager* and *High Quality Senior* in Column 1 are both positive and statistically significant. This reversal in sign, indicating that higher rated managers and seniors lead to more restatements for firms that previously reported an ICW, may suggest that auditors assign higher quality low level staff to clients that have been shown previously to be higher risk, though this interpretation is beyond the scope of our study. The coefficients on *High Quality Audit Team* in Columns 2 and 4 are

	(1) Large = 1	(2) Large = 1	(3) Large = 0	(4) Large = 0
Panel A: Internal Ratings and Restatements				
High Quality SrMgr/Director	−1.978*** (2.58)		−0.085 (0.15)	
High Quality Manager	0.132 (0.23)		0.065 (0.12)	
High Quality Senior	0.585 (0.92)		−0.111 (0.25)	
High Quality Audit Team		−2.456** (2.03)		−1.415** (2.47)
Controls	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.400	0.366	0.240	0.252
Number of Observations	234	234	186	187
Panel B: Internal Ratings and Restatements				
	(1) ICW = 1	(2) ICW = 1	(3) ICW = 0	(4) ICW = 0
High Quality SrMgr/Director	−8.129* (1.84)		−0.354 (1.05)	
High Quality Manager	6.116* (1.82)		−0.125 (0.36)	
High Quality Senior	6.439*** (2.96)		−0.222 (0.83)	
High Quality Audit Team		−12.656** (2.38)		−1.187* (1.71)
Controls	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.522	0.383	0.136	0.142
Number of Observations	55	55	382	383
Panel C: Internal Ratings and Restatements				
	(1) High Intangible	(2) High Intangible	(3) Low Intangible	(4) Low Intangible
High Quality SrMgr/Director	−0.166 (0.40)		−0.826** (2.04)	
High Quality Manager	0.205 (0.40)		−0.693* (1.78)	
High Quality Senior	−0.557 (1.17)		0.409 (1.06)	
High Quality Audit Team		−0.861 (1.08)		−1.757 (1.14)
Controls	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.228	0.227	0.259	0.250
Number of Observations	221	221	209	210

Notes: Table 7 Panel A presents the results of a cross-sectional estimation of Model (1) and examines the relation between our measures of auditor quality and an indicator variable for whether or not a client later restated their financials. We partition our sample into two groups based on the size of the office large offices are audit offices of above median size. This logit model is based on Knechel and Sharma (2012), and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for variable definitions. Table 7 Panel B presents the results of a cross-sectional estimation of Model (1) and examines the relation between our measures of auditor quality and an indicator variable for whether or not a client later restated their financials. We partition our sample into two groups based on the prior disclosure of an internal control weakness (ICW) ICW is equal to one if the client had a prior internal control weakness. This logit model is based on Knechel and Sharma (2012) and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for variable definitions. Table 7 Panel C presents the results of a cross-sectional estimation of Model (1) and examines the relation between our measures of auditor quality and an indicator variable for whether or not a client later restated their financials. We partition our sample into two groups based on a firms intangible assets high intangible firms are firms with above median intangible assets. This logit model is based on Knechel and Sharma (2012) and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for variable definitions

Table 7.
Cross-Sectional Restatement tests

both statistically significant and statistically different from each other, indicating that high quality audit teams decrease the probability of a future restatements more for clients who have previously reported an internal control weakness.

Panel C presents the results of the partition based on percentage of intangible assets. The coefficient on *High Quality SrMgr/Director* in Column 1 (high proportion of intangible assets) is negative but not statically significant, While the coefficient on the corresponding variable in Column 3 (low proportion of intangible assets) is negative and statistically significant. The coefficient in Column 3 is larger in magnitude than the insignificant coefficient in Column 1, though only at the 10% level for a one-tailed test. The same pattern of results holds for *High Quality Manager* in Columns 1 and 3. Taken together, these results indicate that firms with a lower proportion of intangible assets benefit more from mid- and high-level high quality audit employees. In this case, high auditor quality matters more when auditing is relatively easier (i.e. when intangibles are lower, see Gu and Wang, 2005). Put differently, high quality auditors matter more when auditing is more straightforward, as compared to more complex audits of intangible assets, where auditor quality does not seem to improve audit outcomes. This result is perhaps counterintuitive and we encourage future research to further explore it. Overall, however, these results are consistent with the main tests we report in Table 3 and provide further evidence that high quality auditors improve the quality of audits.

We perform several additional cross-sectional tests related to the other audit outcomes that we test. For brevity, we do not tabulate these results and highlight the main results of interest here. In tests of accruals, we find that high employee quality offices are associated with fewer abnormal accruals for clients who have not previously reported an ICW. This is consistent with prior research that finds clients who have previously reported an ICW will have fewer abnormal accruals in future periods (Ashbaugh-Skaife *et al.*, 2008). Our results are consistent with the notion that auditors of clients who have previously reported an ICW are on "red alert" and therefore the quality of individual auditors may be of less import because the client, overall, is being more closely scrutinized. Conversely, auditors of clients who have not previously reported an ICW are not on "red alert" and high quality audit teams are more likely to find and remediate questionable accounting practices than lower quality audit teams. Furthermore, we find no difference in the effect of high quality auditors on accruals between large and small audit offices. This provides some evidence that these standardized ratings are equivalent across different offices.

5.2 Falsification test

We conduct a falsification test to provide confidence that these performance evaluations relate to the audit firm to which we match the data. To do so, we match the clients of Big 4 firms other than Deloitte to the Deloitte office in the same city (as the client's current EY, PWC or KPMG auditor) and re-estimate our models to ensure that our findings are not the spurious result of local effects or industry wide variation in auditor quality. In Table 8, Panels A–D, we present results of this falsification test (for restatements, abnormal accruals, going concern opinions and fees, respectively). We find no cohesive pattern of results (as expected) in the tests for restatements, accruals, or going concerns.

The most surprising finding in this falsification test comes in our examination of audit fees in Panel D. We find that in cities where Deloitte employs high quality audit teams, other Big 4 firms charge lower fees. This is consistent with these other Big 4 auditors pricing their services more competitively in response to higher quality competition (which is perhaps observable to them through audit outcomes or other private insight into local competitor quality). In conjunction with our earlier results regarding *H2*, we can conclude that there is

	(1) Other Big4	(2) Other Big4
Panel A: Internal Ratings and Restatements		
High Quality SrMgr/Director	0.336*** (2.61)	
High Quality Manager	−0.179 (1.31)	
High Quality Senior	0.122 (0.80)	
High Quality Audit Team		0.131 (0.67)
Total Office Employees	−0.222*** (3.45)	−0.206** (2.46)
Herfindahl Index	−0.961*** (3.02)	−0.866** (2.53)
Non Audit Services	0.203 (0.80)	0.200 (0.78)
Initial Audit	−0.100 (0.37)	−0.094 (0.34)
LN (MVE)	0.021 (0.41)	0.036 (0.70)
MTB	−0.025 (1.43)	−0.024 (1.47)
Loss	0.267 (1.63)	0.278* (1.77)
Finance	0.437** (2.36)	0.423** (2.29)
Leverage	−0.035 (0.13)	−0.056 (0.21)
Litigation	0.058 (0.30)	0.065 (0.34)
Company Age	0.000 (0.02)	−0.002 (0.35)
Going Concern	−0.387 (0.79)	−0.380 (0.79)
Merger	0.075 (0.51)	0.096 (0.70)
December Year End	−0.578*** (4.47)	−0.602*** (4.52)
Internal Control Weakness	0.897*** (4.53)	0.897*** (4.64)
Intercept	0.027 (0.02)	−0.013 (0.01)
Industry Fixed Effects	Yes	Yes
Pseudo *R*2	0.085	0.079
LROC	0.696	0.705
Number of Restatements	319	316
Number of Observations	1,810	1,832
Panel B: Absolute Abnormal Accruals		
High Quality SrMgr/Director	0.172 (1.05)	
High Quality Manager	0.194 (1.32)	
High Quality Senior	0.117 (0.82)	
High Quality Audit Team		0.088 (0.35)
Total Office Employees	−0.024 (0.43)	0.032 (0.83)
Herfindahl Index	−0.378* (1.79)	−0.367* (1.72)
Specialist	−0.026 (0.18)	−0.047 (0.30)
Ln(MVE)	−0.064* (1.76)	−0.068* (1.96)
Leverage	0.159 (0.64)	0.160 (0.64)
ROA	−0.856 (1.38)	−0.791 (1.29)
Loss	−0.409** (2.26)	−0.368** (2.03)
Cash Flow	0.465 (0.74)	0.445 (0.72)
MTB	−0.017 (1.31)	−0.018 (1.40)
ABS(Accruals)	0.841** (2.57)	0.849** (2.65)
Sales Growth	0.099** (2.51)	0.098** (2.47)
Z-Score	0.006 (0.07)	0.003 (0.04)
STDev Earnings	−0.000 (0.77)	−0.000 (0.65)
Initial Audit	0.210 (0.67)	0.214 (0.68)
Intercept	0.585 (1.46)	0.710* (1.85)
Industry Fixed Effects	Yes	Yes
R-Square	0.570	0.560
Adj. *R*-Square	0.552	0.542
Number of Observations	1,791	1,807

(*continued*)

Table 8.
Falsification tests

	(1) Other Big4	(2) Other Big4
Panel C: Internal Ratings and Going Concern		
High Quality SrMgr/Director	−0.006 (0.01)	
High Quality Manager	−0.394 (0.80)	
High Quality Senior	0.185 (0.45)	
High Quality Audit Team		0.272 (0.37)
Total Office Employees	0.390 (1.48)	0.251 (1.37)
Specialist	0.964* (1.73)	1.034* (1.88)
Non Audit Services	−0.084 (0.14)	−0.553 (0.89)
LN(MVE)	−1.023*** (7.29)	−0.837*** (6.66)
Leverage	2.498*** (4.72)	2.254*** (4.15)
Loss	2.099*** (3.58)	1.337** (2.19)
MTB	0.027 (1.05)	0.006 (0.28)
ABS(Accruals)	0.648 (1.32)	0.475 (0.86)
Sales Growth	0.009 (0.10)	−0.027 (0.33)
Z-Score	−0.262 (0.73)	−0.078 (0.23)
STDev Earnings	0.000 (0.36)	0.000 (0.33)
Initial Audit	0.000 (.)	0.000 (.)
Intercept	−3.303 (1.62)	−3.280** (2.10)
Industry Fixed Effects	Yes	Yes
Pseudo *R*2	0.466	0.497
LROC	0.956	0.961
Number of Going Concerns	46	46
Number of Observations	1,546	1,560
Panel D: Internal Personnel Ratings and Audit Fees		
High Quality SrMgr/Director	0.063 (1.30)	
High Quality Manager	−0.070 (1.29)	
High Quality Senior	0.070 (1.32)	
High Quality Audit Team		−0.161** (2.56)
Total Office Employees	0.113*** (5.86)	0.101*** (3.88)
Herfindahl Index	0.116 (1.41)	0.130 (1.43)
LN(Assets)	0.505*** (37.05)	0.509*** (41.28)
Current Ratio	−0.026*** (4.43)	−0.026*** (4.22)
Leverage	−0.020 (0.24)	−0.004 (0.05)
(Inv+AR) Assets	0.283*** (2.92)	0.281** (2.63)
ROA	−0.515*** (8.71)	−0.510*** (9.68)
Business Segments	0.024*** (3.69)	0.022*** (3.06)
Foreign	0.239*** (7.25)	0.241*** (7.48)
Specialist	0.137*** (3.69)	0.137*** (3.68)
Merger	0.071** (2.10)	0.065* (1.90)
Going Concern	0.218*** (2.88)	0.219*** (3.05)
Loss	0.027 (0.87)	0.018 (0.53)
December Year End	0.002 (0.05)	0.004 (0.13)
Non Audit Services	0.051 (0.72)	0.051 (0.71)
Internal Control Weakness	0.357*** (8.42)	0.364*** (8.65)
Initial Audit	0.061 (0.80)	0.069 (0.91)
Intercept	9.461*** (26.58)	9.523*** (23.96)
Industry Fixed Effects	Yes	Yes

Table 8.

(*continued*)

	(1) Other Big4	(2) Other Big4
R-Square	0.761	0.760
Adj. *R*-Square	0.750	0.749
Number of Observations	1,918	1,927

Notes: Table 8 Panel A presents the results of a falsification test based on Model (1) and examines the relation between our measures of auditor quality and an indicator variable for whether or not a client later restated their financials. In this model, we assign auditor quality values to the clients of all other Big4 audit firms. This logit model is based on Knechel and Sharma (2012), and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for variable definitions. Table 8 Panel B presents the results of a falsification test based on Model (2) and examines the relation between our measures of auditor quality and absolute abnormal accruals. In this model, we assign auditor quality values to the clients of all other Big4 audit firms. We estimate accruals based on Butler *et al.* (2004), Minutti-Meza (2013) and Chen *et al.* (2016). The model is based on Minutti-Meza (2013) and Reichelt and Wang (2010), and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for definitions. Table 8 Panel C presents the results of a falsification test based on Model (3) and examines the relation between our measures of auditor quality and whether or not a firm received a going concern opinion. In this model, we assign auditor quality values to the clients of all other Big4 audit firms. This logit model is estimated based on Minutti-Meza (2013) and Reichelt and Wang (2010), and robust standard errors are clustered by MSA. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for definitions. Table 8 Panel D presents the results of a falsification test based on Model (4) and examines the relation between our measures of auditor quality and audit fees. In this model, we assign auditor quality values to the clients of all other Big4 audit firms. We use the standard audit fee model based on Simunic (1980) with additional control variables from Hay *et al.* (2006) and robust standard errors are clustered by MSA. Our dependent variable is the natural log of audit fees. Industry fixed effects are based on SIC two digit classifications. Absolute *t*-values are shown in parentheses. *, **, *** indicate statistical significance at the $p < 0.10$, 0.05, 0.01, respectively. All tests are two-tailed. All variables are winsorized at 1 and 99%. See Appendix 1 for definitions

Table 8.

no observable in-firm variation in fees as a result of auditor quality, but between firms in the same local market, fees do reflect auditor quality.

6. Summary and conclusions

In this paper we examine the effect of auditor quality on audit quality. Prior studies have examined firm-level measures of quality and found that higher quality firms (i.e. Big N audit firms and industry specialists) are associated with higher quality audits. These prior studies have two limitations:

(1) they assume, necessarily, that audit quality is constant across an audit firm (with a few notable exceptions); and

(2) they do not examine specific audit inputs (i.e. audit firm employee quality) because such data are not available.

In this paper, we examine the association between firm-generated individual auditor performance ratings and measures of audit quality. We find that, within-firm, higher quality employees are associated with fewer restatements and lower abnormal accruals; and a weakly higher probability of a client receiving a going concern opinion. Furthermore, we

find that auditor quality is not associated with audit fees. This suggests that While audit firms do not charge clients more when assigning higher quality employees, these clients receive a higher quality audit product (indicative of fees not being an ideal proxy for audit quality). We also find evidence that other Big N auditors charge lower fees in MSAs where a competing firm has higher quality local employees. This could be interpreted as a competitive response to a high quality peer firm.

Like all studies, our analysis and interpretation face certain limitations. First, as we only examine one year of data for a single audit firm, readers should use caution when generalizing our results. Second, as we only examine office-level auditor quality, we are not able to exactly identify the quality of auditors assigned to specific clients. Both of these limitations are imposed by the novel data set we employ and future researchers.

Our results are of interest not only to academics who strive to understand the inputs of audit quality but also to audit firms and their clients. This study delves into the black box of audit inputs and finds that individual audit inputs (audit firm employees) influence observed audit outcomes in a meaningful and measurable way. We also provide evidence that audit firms are accurately able to evaluate the quality of their own employees. Much more research can and should be done in this area to uncover further insights into the influence of audit inputs on audit quality and perhaps the data set we describe and introduce to the literature could be useful in this endeavor.

Notes

1. There is a long experimental literature that examines individual auditor expertise and characteristics on audit quality (Nelson and Tan, 2005 and Nelson, 2009 for an in-depth review of this literature).
2. For example, Aobdia *et al.* (2015) measures individual partner quality using client discretionary accruals, and Gul *et al.* (2013) measures individual signing-auditor quality using ex-post measures of audit quality and an array of observable characteristics including gender, Big N experience and political affiliation. Relatedly, He *et al.* (2017) examine how relationships between auditors and audit committees affect audit quality.
3. These are audit firm-generated employee evaluations. This is the audit firm's best estimation of the quality of this employee taking into account specific individual characteristics of each employee evaluated. Accordingly, this measure likely does a better job of capturing auditors' ability than previous measures of individual auditor quality.
4. We aggregate individual auditor ratings to the office level because we do not have access to data that would all us to match individual auditors to specific audit clients.
5. Further complicating the issue: (1) Observable adverse audit outcomes are not necessarily the result of low-quality audit inputs, and (2) Even if inputs and outcomes were observable, audit quality would remain difficult to measure because assurance is defined in the eye of the beholder (Knechel *et al.*, 2013).
6. While internal performance evaluations might be biased (e.g. ratings inflation in overconfident offices where leaders are more biased toward their employees), empirically we find a substantial amount of variation in the ratings given to employees at all levels and across all offices. For example, only 8% of offices have employees with evaluation ratings that are above the median at all employee levels. Additionally, anecdotal evidence provided by current and/or former Big N auditors indicates that the rating process is top-down and consistent on a firm-wide basis. Descriptive statistics of the employee evaluations are provided in Table 2. We acknowledge we are unable to disentangle whether our results are driven by offices where leaders are more biased

toward their employees (and therefore give them artificially high ratings) or by employees who are higher rated due to skill or effort.

7. Similarly, Rajgopal *et al.* (2015) provide evidence that indicates most conventional audit quality proxies used in archival research have little power in predicting audit failures (as measured by AAERs against auditors). Broadly, our study somewhat helps resolve this issue, in that we provide insight into a more direct measure of audit quality.

8. For example, Hoopes *et al.* (2018) provide evidence that higher salaries paid to auditors is associated with higher quality audit outcomes and Beck *et al.* (2018) find that the average education level in a city leads to higher quality audit outcomes.

9. One of the arguments offered for why Big N audit firms provide higher quality audits is that their large size allows them to be more independent of their clients, as each client represents a relatively small portion of the firm's business (DeAngelo, 1981). Furthermore, Big N audit firms face higher litigation risk because of their perceived "deep pockets," increasing their incentive to avoid the negative audit outcomes which often precede lawsuits (Bar-Yosef and Sarath, 2005).

10. Other common definitions of industry specialist require the difference in the proportion of industry audit fees compared to the next highest audit firm to be at least 10% (Mayhew and Wilkins, 2003) or require market share to exceed a somewhat arbitrary threshold (e.g. 30%. See Numan and Willekens, 2012).

11. The clients of industry specialist auditors have been found to have a lower level of abnormal accruals (Balsam *et al.*, 2003), a higher likelihood of being issued a going concern opinion (Lim and Tan, 2008) and better disclosure quality (Dunn and Mayhew, 2004); in return for these audit outcome benefits, industry specialists have been shown to command higher audit fees (Chan, 1999; Ferguson *et al.*, 2003; Francis *et al.*, 2005; Campbell *et al.*, 2022). The fee premiums of specialists further incentivize them to avoid negative audit outcomes to maintain their specialist status.

12. Both Rajgopal *et al.* (2015) and DeFond and Zhang (2014) review the audit literature in accounting and summarize the measures of audit quality found in recent empirical studies: likelihood of restatement, going concern opinions, abnormal accruals, audit fees, PCAOB inspections, etc.

13. Previous studies also suggest that Big N auditors increase financial reporting quality using samples of non-U.S. firms (Francis and Wang, 2008). Overall, market participants have greater confidence in the financial reports of Big N clients. One offered explanation for this documented effect is that Big N auditors constrain aggressive earnings management, thereby resulting in more credible financial reporting (Becker *et al.*, 1998; Francis *et al.*, 1999; Krishnan, 2003b). Another explanation is that Big N auditors are more likely to indicate early warnings of going-concern issues or disagreements pertaining to financial reporting than non–Big N auditors, given the same set of client circumstances (Francis and Krishnan, 1999, 2002).

14. Industry specialists are almost always Big N audit firms.

15. Likewise, using unique data from Sweden, Zerni (2012) also reports that engagement partner industry specialization is associated with higher fees; Knechel *et al.* (2013) show that individual audit partner compensation is associated with audit failures (i.e., reporting errors related to issuing a GC opinion); Knechel *et al.* (2015) find that reporting style (aggressive versus conservative) persists across individual audit partners over time; Kao *et al.* (2021) and Frost *et al.* (2022) show that individual audit partners influence the financial statement comparability and audit quality of their audit clients.

16. Furthermore, prior studies look at outcomes related to audit quality such as the likelihood of whistleblowing by an auditor, but these studies rely on firm-level or office-level data (Mansor *et al.*, 2020).

17. Staff are excluded from our analysis because they comprise a small number of observations in our data.
18. We include Directors in with our Senior Manager classification for ease of interpretation, as it leaves us with three intuitive levels (low, mid, high) of employees in Seniors, Managers and Senior Managers/Directors.
19. In our regression specifications we follow recent well-known papers in the auditing literature that model the different proxies for audit quality that we examine. As expected, this results in a slightly different set of control variables for each of our different dependent variables.
20. See Roose and Madrigal (2014).
21. See coverage in *Fortune* (Elkind, 2015), *Vanity Fair* (Seal, 2015), *The Washington Post* (Peterson, 2014) and *The New York Times* (Cieply and Barnes, 2014).
22. For example, see articles from *Business Insider* (Bort, 2014), *Going Concern* (Gonzalez, 2014) and *Accountancy Age.* (Warmoll, 2014).
23. Deloitte has declined to verify these data. However, media coverage and related media articles have not uncovered any incidents of anyone questioning the provenance (Deloitte), time period (2005), or authenticity of the data. For example: https://www.accountingtoday.com/news/deloitte-partner-salariesexposed-in-sony-data-hack. This provides some assurance that the data can be relied upon to perform a study such as the current one, but our findings should be interpreted with this caveat in mind.
24. There is ongoing debate in accounting, finance and economics about whether or not data from questionable sources (ex., Wikileaks, Panama Papers, etc.) should be used for academic purposes. On this matter we side with Gabriel J. Michael of Yale Law School who argues ". . .that we can and should use leaked information as a data source in scholarly research. First, the methodological, ethical and legal challenges related to the use of leaked information in research have been considered, concluding that none of these present serious obstacles (Michael, 2015)."
25. See www.census.gov/population/metro/ for more detail on MSAs.
26. The following is a description of the review process at Deloitte, verified by a manager-level employee at the firm: At least two times a year (mid-year and year end), every employee below the level of partner receives a performance evaluation and numerical rating for the work they perform specific to a certain client. This is typically provided by an audit employee's direct supervisor. The employee is then assigned a 1 to 5 numerical rating each year, with 1 being the highest and 5 being the lowest. A 3 rating is considered to be "meeting expectations". Our implicit assumption is that the evaluation scores are positively correlated with high quality job performance related to audit work, though we acknowledge that we cannot verify this. We further acknowledge that internal ratings may be subject to other biases (e.g. interpersonal relationships, office politics and length of relationship between employee and evaluator) and our analyses should be interpreted with the appropriate caveats in mind.

References

Aobdia, D., Lin, C.-J. and Petacchi, R. (2015), "Capital market consequences of audit partner quality", *The Accounting Review*, Vol. 90 No. 6, pp. 2143-2176.

Ashbaugh-Skaife, H., Collins, D., Kinney, W. and LaFond, R. (2008), "The effect of SOX internal control deficiencies and their remediation on accrual quality", *The Accounting Review*, Vol. 83 No. 1, pp. 217-250.

Balsam, S., Krishnan, J. and Young, J. (2003), "Auditor industry specialization and earnings quality", *Auditing: A Journal of Practice and Theory*, Vol. 22 No. 2, pp. 71-97.

Bamber, E.M., Watson, R.T. and Hill, M.C. (1996), "The effects of group support system technology on audit group decision making", *Auditing: A Journal of Practice and Theory*, Vol. 15 No. 1, pp. 122-134.

Bar-Yosef, S. and Sarath, B. (2005), "Auditor size, market segmentation and litigation patterns: a theoretical analysis", *Review of Accounting Studies*, Vol. 10 No. 1, pp. 59-92.

Beck, M., Francis, J. and Gunn, J. (2018), "Public company audits and city-specific labor characteristics", *Contemporary Accounting Research*, Vol. 35 No. 1, pp. 394-433.

Becker, C., DeFond, M., Jiambalvo, J. and Subramanyam, K. (1998), "The effect of audit quality on earnings management", *Contemporary Accounting Research*, Vol. 15 No. 1, pp. 1-21.

Bell, T.B., Doogar, R. and Solomon, I. (2008), "Audit labor usage and fees under business risk auditing", *Journal of Accounting Research*, Vol. 46 No. 4, pp. 729-760.

Bell, T.B., Landsman, W.R. and Shackelford, D.A. (2001), "Auditors' perceived business risk and audit fees: Analysis and evidence", *Journal of Accounting Research*, Vol. 39 No. 1, pp. 35-43.

Blum, E., Hatfield, R. and Houston, R. (2022), "The effect of staff auditor reputation on audit quality enhancing actions", *The Accounting Review*, Vol. 97 No. 1, pp. 75-97.

Bonner, S.E., Libby, R. and Nelson, M.W. (1996), "Using decision aids to improve auditors' conditional probability judgments", *The Accounting Review*, Vol. 71 No. 2, pp. 221-240.

Bourveau, T., Stice, D., Stice, H. and White, R. (2021), "H-1B visas and wages in accounting: evidence from Deloitte's payroll", Columbia University, Working Paper.

Bort, J. (2014), "Deloitte managers made huge $400,000+ salaries, hacked documents show", Business Insider, December 3rd.

Boskou, G., Kirkos, E. and Spathis, C. (2019), "Classifying internal audit quality using textual analysis: the case of auditor selection", *Managerial Auditing Journal*, Vol. 34 No. 8, pp. 924-950.

Butler, M., Leone, A. and Willenborg, M. (2004), "An empirical analysis of auditor reporting and its association with abnormal accruals", *Journal of Accounting and Economics*, Vol. 37 No. 2, pp. 139-165.

Campbell, J., Duchac, J., Shi, W. and Stice, D. (2022), "The association between stock liquidity and audit pricing", University of Georgia, Working Paper.

Caramanis, C. and Lennox, C. (2008), "Audit effort and earnings management", *Journal of Accounting and Economics*, Vol. 45 No. 1, pp. 116-138.

Carcello, J.V. and Neal, T.L. (2003), "Audit committee characteristics and auditor dismissals following 'new' going-concern reports", *The Accounting Review*, Vol. 78 No. 1, pp. 95-117.

Carpenter, T.D. (2007), "Audit team brainstorming, fraud risk identification and fraud risk assessment: Implications of SAS no. 99", *The Accounting Review*, Vol. 82 No. 5, pp. 1119-1140.

Causholli, M. and Knechel, W.R. (2012), "An examination of the credence attributes of an audit", *Accounting Horizons*, Vol. 26 No. 4, pp. 631-656.

Chan, D. (1999), "Low-Balling: and efficiency in a two-period specialization model of audit competition", *Contemporary Accounting Research*, Vol. 16 No. 4, pp. 609-642.

Chen, P.F., He, S., Ma, Z. and Stice, D. (2016), "The information role of audit opinions in debt contracting", *Journal of Accounting and Economics*, Vol. 61 No. 1, pp. 121-144.

Cheng, C.S.A., Wang, K. and Xu, Y. (2020), "The impact of revealing auditor partner quality: evidence from a long panel", *Review of Accounting Studies*, Vol. 25 No. 4, pp. 1475-1506.

Chin, C.L. and Chi, H.Y. (2009), "Reducing restatements with increased industry expertise", *Contemporary Accounting Research*, Vol. 26 No. 3, pp. 729-765.

Chung, D. and Lindsay, W. (1988), "The pricing of audit services: the Canadian perspective", *Contemporary Accounting Research*, Vol. 5 No. 1, pp. 19-46.

Cieply, M. and Barnes, B. (2014), "Sony cyber-attack, first a nuisance, swiftly grew into a firestorm", The New York Times, December 30th.

Datar, S., Feltham, G. and Hughes, J. (1991), "The role of audits and audit quality in valuing new issues", *Journal of Accounting and Economics*, Vol. 14 No. 1, pp. 3-49.

DeAngelo, L. (1981), "Auditor independence, 'low-balling' and disclosure regulation", *Journal of Accounting and Economics*, Vol. 3 No. 2, pp. 113-127.

DeFond, M. and Jiambalvo, J. (1993), "Factors related to auditor-client disagreements over income increasing accounting methods", *Contemporary Accounting Research*, Vol. 9 No. 2, pp. 415-431.

DeFond, M. and Zhang, J. (2014), "A review of archival auditing research", *Journal of Accounting and Economics*, Vol. 58 Nos 2/3, pp. 275-326, 2013 Conference Issue.

DeFond, M., Francis, J. and Wong, T.J. (2000), "Auditor industry specialization and market segmentation: evidence from Hong Kong", *Auditing: A Journal of Practice and Theory*, Vol. 19 No. 1, pp. 49-66.

Dopuch, N. and Simunic, D. (1982), "Competition in auditing and auditor reporting conservatism", *Contemporary Accounting Research*, Vol. 16 No. 1, pp. 135-165.

Dunn, K.A. and Mayhew, B.W. (2004), "Audit firm industry specialization and client disclosure quality", *Review of Accounting Studies*, Vol. 9 No. 1, pp. 35-58.

Durand, G. (2019), "The determinants of audit report lag: a meta-analysis", *Managerial Auditing Journal*, Vol. 34 No. 1, pp. 44-75.

Elkind, P. (2015), "Inside the hack of the century", Fortune, June 25th.

Ferguson, A., Francis, J.R. and Stokes, D.J. (2003), "The effects of firm-wide and office-level industry expertise on audit pricing", *The Accounting Review*, Vol. 78 No. 2, pp. 429-448.

Francis, J. (2004), "What do we know about audit quality?", *The British Accounting Review*, Vol. 36 No. 4, pp. 345-368.

Francis, J. (2011), "A framework for understanding and researching audit quality", *AUDITING: A Journal of Practice and Theory*, Vol. 30 No. 2, pp. 125-152.

Francis, J. and Wang, D. (2008), "The joint effect of investor protection and Big 4 audits on earnings quality around the world", *Contemporary Accounting Research*, Vol. 25 No. 1, pp. 157-191.

Francis, J. and Krishnan, J. (2002), "Evidence on accounting firm risk-management strategies before and after the private securities litigation reform act of 1995", *Asia-Pacific Journal of Accounting and Economics*, Vol. 9 No. 2, pp. 135-157.

Francis, J., Maydew, E. and Sparks, H. (1999), "The role of Big6 auditors in the credible reporting of accruals", *Auditing: A Journal of Practice and Theory*, Vol. 18 No. 2, pp. 17-34.

Francis, J. and Krishnan, J. (1999), "Accounting accruals and auditor reporting conservatism", *Contemporary Accounting Research*, Vol. 16 No. 1, pp. 135-165.

Francis, J., Reichelt, K. and Wang, D. (2005), "The pricing of national and city-specific reputations for industry expertise in the US audit market", *The Accounting Review*, Vol. 80 No. 1, pp. 113-136.

Frost, T., He, Z., Luo, X. and Stice, D. (2022), "Audit partner style and financial statement comparability: new evidence from the US Market", University of Hong Kong, Working Paper.

Gonzalez, A. (2014), "Sony hack also leaked Deloitte salaries, reveals gender gap", Going Concern, December 3rd.

Griffin, J., Kruger, S. and Maturana, G. (2019), "Personal infidelity and professional conduct in 4 settings", *Proceedings of the National Academy of Sciences*, Vol. 116 No. 33, pp. 16268-16273.

Gu, F. and Wang, W. (2005), "Intangible assets, information complexity and analysts' earnings forecasts", *Journal of Business Finance and Accounting*, Vol. 32 Nos 9/10, pp. 1673-1702.

Gul, F.A., Zhou, G. and Zhu, X. (2013), "Individual auditors affect audit quality? Evidence from archival data", *The Accounting Review*, Vol. 88 No. 6, pp. 1993-2023.

Hay, D.C., Knechel, W.R. and Wong, N. (2006), "Audit fees: a meta-analysis of the effect of supply and demand attributes", *Contemporary Accounting Research*, Vol. 23 No. 1, pp. 141-191.

He, X., Pittman, J., Rui, O.M. and Wu, D. (2017), "Do social ties between external auditors and audit committee members affect audit quality?", *The Accounting Review*, Vol. 92 No. 5, pp. 61-87.

Hoopes, J., Merkley, K., Pacelli, J. and Schroeder, J. (2018), "Audit personnel salaries and audit quality", *Review of Accounting Studies*, Vol. 23 No. 3, pp. 1096-1136.

Kao, M.F., Shiue, M.J. and Tseng, C.H. (2021), "Voluntary audit committees, auditor selection and audit quality: evidence from Taiwan", *Managerial Auditing Journal*, Vol. 36 No. 4, pp. 616-642.

Knechel, R., Niemi, L. and Zerni, M. (2013), "Empirical evidence on the implicit determinants of compensation in big 4 audit partnerships", *Journal of Accounting Research*, Vol. 51 No. 2, pp. 349-387.

Knechel, R., Vanstraelen, A. and Zerni, M. (2015), "Does the identify of engagement partners matter? An analysis of audit partner reporting decisions", *Contemporary Accounting Research*, Vol. 32 No. 4, pp. 1443-1478.

Knechel, W.R. and Sharma, D.S. (2012), "Auditor-provided non audit services and audit effectiveness and efficiency: evidence from pre- and post-SOX audit report lags", *Auditing: A Journal of Practice and Theory*, Vol. 31 No. 4, pp. 85-114.

Knechel, W.R., Krishnan, G.V., Pevzner, M., Shefchik, L.B. and Velury, U.K. (2012), "Audit quality: insights from the academic literature", *Auditing: A Journal of Practice and Theory*, Vol. 32 No. Supplement 1, pp. 385-421.

Knechel, W.R., Naiker, V. and Pacheco, G. (2007), "Does auditor industry specialization matter? Evidence from market reaction to auditor switches", *Auditing: A Journal of Practice and Theory*, Vol. 26 No. 1, pp. 19-45.

Krishnan, G. (2003a), "Does big 6 auditor industry expertise constrain earnings management?", *Accounting Horizons*, Vol. 17 No. s-1, pp. 1-16.

Krishnan, G. (2003b), "Audit quality and the pricing of discretionary accruals", *Auditing: A Journal of Practice and Theory*, Vol. 22 No. 1, pp. 109-126.

Lennox, C. and Pittman, J. (2010), "Big five audits and accounting fraud", *Contemporary Accounting Research*, Vol. 27 No. 1, pp. 209-247.

Lim, C.-Y. and Tan, H.-T. (2008), "Non-audit service fees and audit quality: the impact of auditor specialization", *Journal of Accounting Research*, Vol. 46 No. 1, pp. 199-246.

Lord, A.T. and DeZoort, F.T. (2001), "The impact of commitment and moral reasoning on auditors' responses to social influence pressure", *Accounting, Organizations and Society*, Vol. 26 No. 3, pp. 215-235.

Louwers, T.J. (1998), "The relation between going-concern opinions and the auditor's loss function", *Journal of Accounting Research*, Vol. 36 No. 1, pp. 143-156.

Mansor, T., Ariff, A. and Hashim, H. (2020), "Whistleblowing by auditors: the role of professional commitment and independence commitment", *Managerial Auditing Journal*, Vol. 35 No. 8, pp. 1033-1055.

Mayhew, B.W. and Wilkins, M.S. (2003), "Audit firm industry specialization as a differentiation strategy: evidence from fees charged to firms going public", *Auditing: A Journal of Practice and Theory*, Vol. 22 No. 2, pp. 33-52.

Messier, W.F. (1995), "Research in and development of audit decision aids", in Ashton, R.H. and Ashton, A.H. (Eds), *Judgment and Decision Making in Accounting and Auditing*, Cambridge University Press, Cambridge.

Michael, G.J. (2015), "Who's afraid of WikiLeaks? Missed opportunities in political science research", *Review of Policy Research*, Vol. 32 No. 2, pp. 175-199.

Minutti-Meza, M. (2013), "Does auditor industry specialization improve audit quality? ", *Journal of Accounting Research*, Vol. 51 No. 4, pp. 779-817.

Nelson, M.W. (2009), "A model and literature review of professional skepticism in auditing", *Auditing: A Journal of Practice and Theory*, Vol. 28 No. 2, pp. 1-34.

Nelson, M. and Tan, H. (2005), "Judgment and decision making research in auditing: a task, person and interpersonal interaction perspective", *Auditing: A Journal of Practice and Theory*, Vol. 24 No. Supplement, pp. 41-71.

Numan, W. and Willekens, M. (2012), "An empirical test of spatial competition in the audit market", *Journal of Accounting and Economics*, Vol. 53 Nos 1/2, pp. 450-465.

Peterson, A. (2014), "The Sony Pictures hack, explained", The Washington Post, December 18th.

Rajgopal, S., Srinivasan, S. and Zheng, X. (2015), "Measuring audit quality", Working Paper.

Reichelt, K.J. and Wang, D. (2010), "National and office-specific measures of auditor industry expertise and effects on audit quality", *Journal of Accounting Research*, Vol. 48 No. 3, pp. 647-686.

Roose, K. and Madrigal, A. (2014), "Sony pictures hack spreads to Deloitte: thousands of audit firm's salaries are leaked", Splinter News, December 13th.

Seal, M. (2015), "An exclusive look at Sony's Hacking Saga", Vanity Fair, March Edition.

Simunic, D.A. (1980), "The pricing of audit services: theory and evidence", *Journal of Accounting Research*, Vol. 18 No. 1, pp. 161-190.

Smith, K., Emerson, D. and Boster, C. (2018), "An examination of reduced audit quality practices within the beyond the role stress model", *Managerial Auditing Journal*, Vol. 33 Nos 8/9, pp. 736-759.

Teoh, S. and Wong, T.J. (1993), "Perceived auditor quality and the earnings response coefficient", *The Accounting Review*, Vol. 68 No. 2, pp. 346-366.

Vanstraelen, A. (2003), "Going-concern opinions, auditor switching and the self-fulfilling prophecy effect examined in the regulatory context of Belgium", *Journal of Accounting, Auditing and Finance*, Vol. 18 No. 2, pp. 231-254.

Warmoll, C. (2014), "Massive Sony pictures hack captures senior Deloitte staff salary details", Accountancy Age, December 5th.

Ye, K., Cheng, Y. and Gao, J. (2014), "How individual auditor characteristics impact the likelihood of audit failure: evidence from China", *Advances in Accounting*, Vol. 30 No. 2, pp. 394-401.

Zerni, M. (2012), "Audit partner specialization and audit fees: some evidence from Sweden", *Contemporary Accounting Research*, Vol. 29 No. 1, pp. 312-340.

Further reading

Altman, E. (1968), "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy", *The Journal of Finance*, Vol. 23 No. 4, pp. 589-609.

Beaver, W.H., McNichols, M.F. and Nelson, K.K. (2007), "An alternative interpretation of the discontinuity in earnings distributions", *Review of Accounting Studies*, Vol. 12 No. 4, pp. 525-556.

Blankley, A.I., Hurtt, D.N. and MacGregor, J.E. (2012), "Abnormal audit fees and restatements", *Auditing: A Journal of Practice and Theory*, Vol. 31 No. 1, pp. 79-96.

Burgstahler, D. and Dichev, I. (1997), "Earnings management to avoid earnings decreases and losses", *Journal of Accounting and Economics*, Vol. 24 No. 1, pp. 99-126.

DeFond, M., Erkens, D.H. and Zhang, J. (2017), "Do client characteristics really drive the Big N audit quality effect? New evidence from propensity score matching", *Management Science*, Vol. 63 No. 11, pp. 3628-3649.

Francis, J.R. and Yu, M.D. (2009), "Big 4 office size and audit quality", *The Accounting Review*, Vol. 84 No. 5, pp. 1521-1552.

Gul, F.A., Fung, S.Y.K. and Jaggi, B. (2009), "Earnings quality: some evidence on the role of auditor tenure and auditors' industry expertise", *Journal of Accounting and Economics*, Vol. 47 No. 3, pp. 265-287.

Hayn, C. (1995), "The information content of losses", *Journal of Accounting and Economics*, Vol. 20 No. 2, pp. 125-153.

Jorgensen, B., Li, J. and Sadka, G. (2012), "Earnings dispersion and aggregate stock returns", *Journal of Accounting and Economics*, Vol. 53 Nos 1/2, pp. 1-20.

Lobo, G.J. and Zhao, Y. (2013), "Relation between audit effort and financial report misstatements: evidence from quarterly and annual restatements", *The Accounting Review*, Vol. 88 No. 4, pp. 1385-1412.

White, R.M. (2016), "There and back again – the performance evaluation effects of going to and returning from part-time status", Working Paper.

Appendix

High Quality Audit Team	An indicator variable taking the value of one if each of an office's average rating for senior managers, managers and seniors is above the respective national median for each group and zero otherwise
High Quality SrMrg/Director	An indicator variable taking the value of one if an office's average rating for all senior managers is above the median office rating for senior managers for all offices and zero otherwise.
High Quality Manager	An indicator variable taking the value of one if an office's average rating for all managers is above the median office rating for managers for all offices and zero otherwise.
High Quality Senior	An indicator variable taking the value of one if an office's average rating for all seniors is above the median office rating for seniors for all offices and zero otherwise.
ABS(Accruals)	Absolute discretionary accruals are estimated following Butler *et al.* (2004), Minutti-Meza (2013) and Chen *et al.* (2016). (Denoted *Absolute Accruals* in Table 2 for clarity.)
Total Accruals	Total accruals as defined as income before extraordinary items less operating cash flow.
Z-Score	Altman Z score = 0.012 (workcap/AT) * 0.014 (Ret Earn/AT) * 0.033 (EBIT/AT) * 0.006 (MVE/BVdebt) * 0.999 (sale/at)
Assets	Total assets as reported in Compustat. In multivariate tests, the natural log of total assets is used.
Cash Flow	Operating cash flow divided by total assets.
Company Age	The total number of years the company appears in the Compustat database.
Current Ratio	Current assets divided by current liabilities.
Audit Fees	Total audit fees as reported in Audit Analytics. In multivariate tests, the natural log of total audit fees is used.
Recent Financing	An indicator variable taking the value of one if the client issued more than $10 million in stock or more than $1 million of debt in the current year and zero otherwise.
Foreign	An indicator variable taking the value of one if the client has foreign exchange income or loss and zero otherwise.
December Year End	An indicator variable taking the value of one if the client's fiscal year end occurs in the month of December and zero otherwise.
Going Concern	Indicator variable taking the value of one if the firm-year received a going-concern modified opinion in the current year and zero otherwise.
Herfindahl-Index	Herfindahl index calculated at the industry-MSA-year level using fees from public-company audits.
Internal Control Weakness	An indicator variable taking the value of one if the client reports an internal control weakness under SOX 302 or 404 and zero otherwise.
Initial Audit	An indicator variable taking the value of one if the auditor is in its first or second year of auditing the client and zero otherwise.
(Inv+AR)AT	Inventory plus accounts receivable scaled by total assets.
Leverage	Total liabilities divided by total assets.
Litigation	An indicator variable taking the value of 1 for clients in litigious industries based on four digit SIC and Francis *et al.* (1999).
Loss	An indicator variable taking the value of one if the client's income before extraordinary items was less than zero and zero otherwise.

(*continued*)

Table A1. Variable definitions

Merger	An indicator variable taking the value of one if the client has acquisition activity in the current year or prior two fiscal years and zero otherwise.
MTB	Market value divided by book value.
MVE	Market price of stock at end of year multiplied by the number of outstanding shares. In multivariate tests, the natural log of one plus this number is used.
Non Audit Services	An indicator variable taking the value of one if the client's auditor also collects nonaudit service fees from the client; zero otherwise.
Business Segments	The number of business segments reported by the client.
Restatement	Indicator variable taking the value of one if the current fiscal year financial statements (the year for which the individual evaluation are given) were later restated and zero otherwise.
ROA	Return on assets. Income before extraordinary items divided by total assets.
Sales Growth	The percentage change in sales from prior year to current year.
Specialist	An indicator variable taking the value of one if the incumbent auditor office has more than 30% of the MSA-two-digit-SIC market share; zero otherwise.
STDev Earnings	The standard deviation of income before extraordinary items for years t-1 through t-4 (inclusive).
Total Office Employees	The natural log of the total number of employees (excluding partners) in an office's audit practice.

Notes: *ROA*: Return on assets. Income before extraordinary items divided by total assets. *Sales Growth*: The percentage change in sales from prior year to current year. *Specialist*: An indicator variable taking the value of one if the incumbent auditor office has more than 30% of the MSA-two-digit-SIC market share; zero otherwise *STDev Earnings*: The standard deviation of income before extraordinary items for years t-1 through t-4 (inclusive) *Total Office Employees*: The nutural log of the total number of employees (excluding partners) in an office's audit practice

Table A1.

Corresponding author
Derrald Stice can be contacted at: dstice@hku.hk