Financial reporting quality and audit firms' past experiences of litigation

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**NANYANG
TECHNOLOGICAL
UNIVERSITY**

**Financial Reporting Quality and Audit Firms'
Past Experiences of Litigation**

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2012

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Abstract

This study investigates whether financial reporting quality is affected by an audit firm's experience of litigation in the recent past. I find that the likelihood of an accounting misstatement and the magnitudes of misstatements are significantly lower for non-Big 4 auditors who recently suffered high litigation compared with non-Big 4 auditors who did not. In addition, I find an improvement in financial reporting quality subsequent to Big 4 auditors' recent litigation experiences when the analysis is conducted at the audit office level. These results are consistent with my prediction that litigation has a disciplinary effect on auditors and leads to higher financial reporting quality.

I. Introduction

Numerous studies in the accounting literature examine the antecedents of litigation against auditors (e.g., Palmrose 1988; Carcello and Palmrose 1994; Lys and Watts 1994; Bonner et al. 1998; Heninger 2001; Palmrose and Scholz 2004). In contrast, the purpose of this study is to examine the *consequences* of litigation against audit firms. In particular, I am interested in whether auditors learn from their experiences of being sued and improve their behavior subsequently.

The idea that people change their behavior after they are prosecuted and punished is discussed in the literatures on law and criminology. For example, Andenaes (1966) notes that drivers who are fined for speeding are less likely to speed in the future compared with drivers who are not caught. Similarly, Galanter (1986) posits that the experience of going to court and being punished has a positive remedial benefit because the offender is deterred from committing the crime again due to the fear of being caught and punished. Likewise, I posit that auditors can learn from their experiences of being sued and this leads to higher financial reporting quality subsequently.

The experience of being punished will cause a rational economic agent to modify his future behavior if the experience signals new information to the agent that causes him to rationally update his beliefs. In the auditing context, I argue that an audit firm would update its beliefs after it experiences litigation for two reasons. First, the litigation experience can signal to the audit firm that its quality is lower than it had realized. For example, an audit partner's confidence in the competence and integrity of the audit staff may be shattered when the partner is sued due to the negligence or incompetence of employees. Thus, litigation can cause the partnership to re-evaluate the quality of their audits. This argument is based on the idea that

audit firms are imperfectly informed about the quality of their audits and that litigation is an informative signal that has a negative effect on an audit firm's perception of its own quality. Second, the judicial process is costly, time-consuming, and distracting to an audit firm's normal business operations. The experience of being sued may cause an audit firm to revise upward its belief about the probability of being sued in the future (holding audit quality constant). The audit firm may decide it does not want to go through the litigation experience again and accordingly the firm raises its preferred level of audit quality in order to avoid future litigation. According to these two arguments, the experience of being sued causes the audit firm to improve its quality in order to reach a pre-determined target or it upgrades its target level of quality. Both arguments lead to the same prediction, namely the audit firm improves its quality after it is sued.

Further, I expect that the experience of litigation has a stronger impact on the audit office that is sued than on the audit firm at the national level. This is particularly important for the large audit firms as they each have several hundred offices spanning the entire country but only a handful of those offices experience litigation. For the Big 4 auditors, the litigation experience of one office may have no influence on the audit quality of other offices, particularly when those other offices are located far away. In contrast, many of the non-Big 4 auditors have just a handful of offices that are located close to each other geographically. In such cases, the experience of litigation may lead to an improvement in audit quality in the office that was sued, and even in the other offices of the same audit firm. Therefore, I posit that the non-Big 4 auditors learn from their recent experience of being sued and they respond to these experiences by improving the quality of their audits. For the Big 4 auditors, I expect that such learning is more likely to occur at the audit office level rather than at the audit firm level.

The quality of audited financial statements depends on both managers' initial reporting decisions and the quality of the auditor's work. The joint nature of this financial reporting process implies a complementary relationship between an auditor and manager. For example, a dishonest manager has more incentive to intentionally misstate the accounts if the manager believes that the auditor is unlikely to find any misstatements. Conversely, a manager is more likely to prepare high quality financial statements if the manager believes that the auditor is high quality. Therefore, if managers anticipate an improvement in audit quality after their auditors are sued, there may be a concurrent improvement in the quality of managers' pre-audit financial reporting. Overall, because audit quality and high quality pre-audit reporting go hand in hand, I expect that the quality of the audited financial statements increases after auditors are sued. I use two measures of financial reporting quality: (1) the incidence of accounting misstatements in the audited financial statements, and (2) the magnitudes of those misstatements. If financial reporting improves after auditors experience high litigation, I expect to find fewer misstatements and smaller magnitudes of misstatements subsequent to the lawsuits.

To test my predictions, I identify 629 lawsuits that allege low quality financial reporting and that cite U.S. audit firms as defendants in the period 2001 to 2008. I measure each audit firm's experience of litigation during the previous three years and I investigate whether this experience has a subsequent impact on financial reporting quality. For example, I examine whether financial reporting quality in 2004 is associated with an audit firm's experience of litigation during the previous three years (2001 to 2003). My litigation measure is updated for each subsequent year up to the end of the sample period in 2008. For example, I examine

whether financial reporting quality in 2008 is associated with an audit firm's experience of litigation during the previous three years (2005 to 2007).¹

Consistent with my predictions, the results strongly support the prediction that financial reporting quality improves after the non-Big 4 audit firms are sued. In particular, I find that misstatements of the annual audited financial statements are less frequent and the magnitudes of the misstatements are significantly smaller for non-Big 4 auditors after they were sued in the preceding three years. These results are not mechanically driven by improved financial reporting at the companies that sued their auditors because those companies are excluded from the estimation samples. Rather, my findings suggest that litigation leads to higher financial reporting quality even at the clients that do *not* sue their auditor. Moreover, the results are robust to employing different methods to measure an audit firm's recent experience of litigation.

In contrast, I find no change in financial reporting quality at the *audit firm level* after Big 4 auditors are sued. To determine whether there is an improvement after audit offices are sued, I re-run the tests for Big 4 audit firms at the audit office level. The results indicate decreases in both the incidence and magnitudes of misstatements after Big 4 audit offices experience litigation in the recent past. Therefore, it appears that Big 4 audit offices respond to their recent experiences of litigation. Similar significant office-level results are obtained when the number of large audit firms is increased to include the top six audit firms or the top eight audit firms.

In supplementary analyses, I investigate alternative explanations for the finding that financial reporting quality is higher after auditors incur high litigation. One alternative explanation is that the results are driven by unobserved client characteristics. For example, an

¹ These three year windows have two main advantages: 1) auditors need a reasonable amount of time to respond to their prior litigation experiences, and 2) lawsuits are relatively rare in any given auditor-year. Although the choice of three years is somewhat *ad hoc*, I obtain very similar results using windows corresponding to the previous two years, four years, and five years.

auditor that has more risky clients in its portfolio is exposed to a higher litigation threat and this also incentivizes the auditor to supply higher quality audits. Therefore, unobserved client characteristics may cause a spurious positive relationship between the number of lawsuits experienced by an auditor and audit quality. If this alternative explanation is correct, I would expect to find the same relationship in the prior three year window as well as in the year subsequent to the lawsuit. On the other hand, if auditors modify their behavior only after they are sued, I would expect that financial reporting quality is higher in the subsequent year but not during the prior three year window. My results indicate that financial reporting quality is higher *only after* auditors are sued. This goes against the alternative explanation that unobserved client characteristics drive my results. Rather, it appears that auditors change their behavior only after they are sued.

A second alternative explanation is that auditors respond to their recent experiences of litigation by choosing less risky client portfolios. That is, even if there is no improvement in audit quality, it could be that auditors become more careful with respect to the clients they audit. Contrary to this alternative explanation, however, I find no evidence that auditors choose less risky clients after they incur high litigation. Moreover, my results continue to hold after dropping audit firm resignations and dismissals, which means that my findings are not attributable to changes in auditors' client portfolios.

Prior studies have shown that auditors charge higher audit fees when there is a greater threat of litigation (Pratt and Stice 1994; Seetharaman et al. 2002; Venkataraman et al. 2008). Likewise, it may be conjectured that auditors would charge higher audit fees after they are sued. On the other hand, auditors who are recently sued may find it difficult to justify audit fee increases to their clients. I evaluate these alternative arguments in another supplementary

analysis, where audit fees are regressed on an audit firm's recent experience of litigation. I find no significant relationship between audit fees and audit firms' recent experiences of litigation. Thus, it appears that auditors respond to their experiences of litigation by improving their audit quality and not by charging higher audit fees.

To my knowledge, this study is the first to examine the consequences of audit litigation. Specifically, I examine whether lawsuits have a remedial benefit by incentivizing auditors to supply higher quality audits subsequent to their being sued. In contrast, the existing literature has focused on the characteristics of clients and auditors that explain the incidence of lawsuits against auditors (Palmrose, 1988; Carcello and Palmrose, 1994; Heninger, 2001; Palmrose and Scholz, 2004).

The remainder of this paper is organized as follows. Section 2 discusses the prior literature and develops the predictions for large and small auditors. Section 3 presents the research design including a discussion of how I measure auditors' recent encounters with litigation. Section 4 presents the results and tests alternative explanations for the findings. Section 5 concludes.

II. Prior literature and hypothesis development

Prior studies in the audit literature examine the determinants of litigation against auditors. For example, Palmrose (1988) reports that non-Big 8 audit firms have higher litigation rates than Big 8 firms, suggesting that larger firms supply higher quality audits. Carcello and Palmrose (1994) find that modified audit reports issued prior to bankruptcy reduce litigation risk, while Lys and Watts (1994) show that an auditor is more likely to be sued if the client is bigger and represents a larger proportion of the auditor's revenues. Bonner et al. (1998) find that financial statement

frauds of a common variety or arising from fictitious transactions are more likely to lead to lawsuits against auditors. Further, the probability of a lawsuit against the auditor is higher if the client reports income-increasing abnormal accruals (Heninger 2001) or the client restates its accounts (Palmrose and Scholz 2004). While these studies provide important evidence on the determinants of litigation against auditors, they do not address the question as to whether litigation in the past leads to higher quality audits in the future.

A change in behavior subsequent to being punished is economically rational for an individual who learns from the experience. Such learning has been modeled analytically by Thakor (2010), who postulates that rational individuals update their beliefs based on their own personal experiences. He shows that a rational individual pays more attention to his own experiences than the experiences of others because personal experiences convey useful information about one's own characteristics, e.g., talent or skill. Personal experiences change human behavior because they convey new information to the individual about his or her optimal course of action in the future. While experience-based beliefs are consistent with rational Bayesian learning, there could also be a psychological aspect since people tend to overweight their most recent experiences (Tversky and Kahneman, 1974; Hogarth and Einhorn, 1992; Ashton and Ashton, 1988; Butt and Campbell, 1989; Pei, Reed and Koch, 1992; Asare, 1992). Thus, learning from past experiences is not necessarily rational (in the Bayesian sense) but it can be so. Consistent with these arguments, there is evidence that agents learn from their personal experiences and change their behaviors accordingly (Holt-Reynolds, 1992; De Houwer and Beekers, 2002; Roth and Erev, 1995; Erev and Roth, 1998; King and Schwartz, 1999).

In the auditing context, I predict that an audit firm will modify its behavior if it learns new information from the experience of being sued. An encounter with litigation can convey

new information in two ways. First, the experience of being sued can cause an auditor to update his belief about the likelihood of being sued again in future (conditional on audit quality remaining unchanged). If an auditor determines that he does not wish to be sued again, the auditor should rationally revise upwards his assessment of the optimal (i.e., desired) level of audit quality. Second, the experience of being sued can convey new information to an audit firm about the quality of audits being supplied to clients. For example, the lawsuit may reveal inadequacies in staff training or in the firm's quality control procedures. If the lawsuit convinces the audit firm that its actual audit quality is less than optimal, the firm is likely to respond by improving its quality subsequently (e.g., by providing better training for its staff or by emphasizing the importance of auditor independence to the firm's partners). According to these two arguments, I expect that audit quality will improve after auditors are sued.

There is some anecdotal evidence that audit firms do improve after they are sued. Following a series of lawsuits in the early 1970s, Peat Marwick Mitchell & Company (the predecessor firm of KPMG) took steps to improve the quality of its audits and to increase public confidence in its services. At that time, one of Peat Marwick's senior partners confessed to the *Wall Street Journal* that "We have a little bit of an image problem, and we'd better start doing something about it."² Peat Marwick engaged another Big Eight accounting firm, Arthur Young & Company, to audit its quality control procedures and thereby became the first public accounting firm to inaugurate a peer review process. Except for anecdotal examples such as this, I am unaware of any systematic evidence that audit firms really do alter their behavior after they are sued.

² See www.referenceforbusiness.com/history2/91/KPMG-International.html.

A change in audit quality can also impact managers' pre-audit financial reporting decisions. If clients anticipate that audit quality improves after auditors are sued, then they will be less likely to intentionally misstate their accounts and take more care to ensure that no accidental misstatements exist. Thus, the quality of pre-audit financial statements is likely to improve if clients anticipate an improvement in audit quality. This indirect effect works in the same direction as the direct effect of audit quality. That is, the quality of audited financial statements improves as a result of both higher audit quality *and* better pre-audit financial reporting decisions by managers.

In short, these arguments generate the prediction that financial reporting quality will improve after audit firms experience high rates of litigation in the recent past. However, there are at least two reasons why this may not happen. First, a lawsuit can occur due to a "one-off" audit failure, which would not necessarily indicate the presence of systematic problems at the audit firm. If audit failures are idiosyncratic rather than systematic, then there would be nothing to learn from the experience of being sued. Consequently, the audit firm would not change its behavior. Second, a lawsuit could be non-meritorious (Palmrose 1997), in which case it would not indicate that the audit firm is systematically providing low quality audits. Again, this means that the experience of being sued would not be perceived by the audit firm as being informative and consequently the audit firm would not see a need to improve its quality.

When an audit office conducts a substandard audit leading to a lawsuit, the impact on the result of the audit firm is likely to be a function of an audit firm's size. The Big 4 audit firms are composed of many offices that cover the entire country. In contrast, most of the non-Big 4 audit firms have just a handful of offices that are located close to each other. For the Big 4 auditors, it is less likely that litigation against one office would influence the behavior of other

offices of the same audit firm. In contrast, for the non-Big 4 auditors, it is more likely that a lawsuit suffered by one office would affect the behavior of other offices of the same firm.

Therefore, I predict that for the smaller audit firms, the experience of being sued is likely to convey new information that subsequently changes behavior at the firm level.³ Thus, I hypothesize that the non-Big 4 audit firms will improve after they are sued:

H₁: Financial reporting quality is higher (lower) after non-Big 4 audit firms experience high (low) litigation.

My hypothesis is stated in a two-sided way because non-Big 4 auditors could improve after they are recently sued or their quality could deteriorate if they are not sued recently.

Although the hypothesis (H₁) is made for non-Big 4 auditors alone, my empirical tests are conducted separately on both Big 4 and non-Big 4 auditors for the sake of completeness. In particular, I investigate whether misstatements of the annual audited financial statements become less frequent and smaller in magnitude after Big 4 and non-Big 4 audit firms experience high litigation.

In addition, I examine whether the experience of being sued has an effect at the audit office level. This is particularly important for the Big 4 audit firms as they have many offices that are located across the country. In contrast, the majority of the non-Big 4 firms have only a handful of offices and so the office-level analysis is similar to the firm-level analysis for the smaller audit firms.

³ I distinguish between Big 4 and non-Big 4 auditors because this is the most obvious way to partition the sample given the number of audits by these firms (see Table 1). However, it could be argued that the larger non-Big 4 auditors are likely to act like the Big 4 as they are bigger than the remaining smaller auditors. As shown in Table 1, Grant Thornton and BDO Seidman conduct 1,750 and 1,295 SEC audits during the sample period, respectively. In robustness tests, I add these two auditors to the Big 4 and rerun the tests separately for the 'Big 6' and 'non-Big 6' groups. My inferences are unchanged. They are also unchanged if I use the top 8 to designate whether an audit firm is classified as large or small.

I expect that an audit firm's experience of litigation would have a bigger impact on the office(s) that conducted the deficient audits than on offices that were not subject to litigation. Accordingly, I predict that the experience of litigation would affect audit quality in the office that was sued. Therefore, I propose my second hypothesis as below:

H₂: Financial reporting quality is higher (lower) after audit offices experience high (low) litigation.

III. Research design

Accounting quality and auditors' past experiences of litigation

I use the restatements file in the *Audit Analytics* database to identify restatements of annual audited financial statements. I focus specifically on misstatements of the annual financial statements rather than misstatements of quarterly results because the annual accounts are audited. The restatement of an audited financial statement provides *prima facie* evidence that the auditor failed to detect and prevent the misstatement. Accounting misstatements are of considerable concern to regulators, companies, and auditors. For example, the Securities and Exchange Commission (SEC) has used restatements to motivate and justify its initiatives aimed at preventing earnings management (Palmrose and Scholz 2004). Moreover, accounting misstatements often occur following a sustained period of within-GAAP earnings management (Ettredge et al. 2010).

I test H1 by estimating the following three models of accounting misstatements:

$$\begin{aligned} misstate_{jt} = & \alpha_0 + \alpha_1 litigation_{it-3,t-1} + \alpha_2 misstate_{jt-1} + \alpha_3 Inta_{jt} + \alpha_4 loss_{jt} + \alpha_5 M\&A_{jt} + \\ & \alpha_6 S404_{jt} + \alpha_7 S404 \times IC_{jt} + \alpha_8 BtM_{jt} + \alpha_9 Exchg_{jt} + \alpha_{10} UScli_{jt} + \alpha_{11} cli_litig_{it-3,t-1} + \\ & Industry\ effects + Year\ effects + e_{jt}. \end{aligned} \quad (1)$$

$$|netincome|/ta_{jt} = \alpha_0 + \alpha_1 litigation_{it-3,t-1} + \alpha_2 |netincome|/ta_{jt-1} + \alpha_3 lnta_{jt} + \alpha_4 loss_{jt} + \alpha_5 M\&A_{jt} + \alpha_6 S404_{jt} + \alpha_7 S404 \times IC_{jt} + \alpha_8 BtM_{jt} + \alpha_9 Exchg_{jt} + \alpha_{10} UScli_{jt} + \alpha_{11} cli_litig_{jt-3,t-1} + Industry\ effects + Year\ effects + e_{jt}. \quad (2)$$

$$|equity|/ta_{jt} = \alpha_0 + \alpha_1 litigation_{it-3,t-1} + \alpha_2 |equity|/ta_{jt-1} + \alpha_3 lnta_{jt} + \alpha_4 loss_{jt} + \alpha_5 M\&A_{jt} + \alpha_6 S404_{jt} + \alpha_7 S404 \times IC_{jt} + \alpha_8 BtM_{jt} + \alpha_9 Exchg_{jt} + \alpha_{10} UScli_{jt} + \alpha_{11} cli_litig_{jt-3,t-1} + Industry\ effects + Year\ effects + e_{jt}. \quad (3).$$

The dependent variable in Eq. (1) is $misstate_{jt}$, which equals one if company j 's audited financial report is misstated in year t , and zero otherwise. The dependent variables in Eqs. (2) and (3) measure the magnitudes of the misstatements: $|netincome|/ta_{jt}$ is the absolute misstatement of net income scaled by total assets; $|equity|/ta_{jt}$ is the absolute misstatement of stockholders' equity scaled by total assets.⁴

The treatment variable ($litigation_{it-3,t-1}$) measures audit firm i 's litigation experience in the previous three years, i.e., years $t-3$ to $t-1$. For example, $litigation_{it-3,t-1}$ in year 2004 is measured using audit firm i 's litigation experience in the period from 2001 to 2003. Similarly, $litigation_{it-3,t-1}$ in year 2005 is based on the auditor's litigation experience in the period from 2002 to 2004; and so forth. (I obtain similar results if I use windows of two, four, or five years instead of three years.) Under H1, I predict that the frequency of accounting misstatements is lower and the magnitudes of accounting misstatements are smaller after non-Big 4 audit firms experience high litigation. This generates the prediction that $a_1 < 0$ in Eqs. (1) to (3).

I measure an audit firm's recent litigation experience in four ways. First, I use an indicator variable ($aud_lit_{it-3,t-1}$) that equals one if audit firm i was sued during the previous three years, and zero otherwise. My second litigation variable ($nlitigation_{it-3,t-1}$) is the number of lawsuits against audit firm i during the previous three years. The third litigation variable

⁴ I follow Palmrose et al. (2004) by scaling the misstatement magnitudes by total assets. However, my results are robust to scaling by market values instead of total assets or to using the unscaled misstatement variables.

$(nlit/ncli_{it-3,t-1})$ is the number of lawsuits during the previous three years divided by the total number of SEC audits conducted by audit firm i over the same period. The scaling is introduced to control for the fact that audit firms tend to encounter more lawsuits if they have more SEC clients.

The fourth litigation variable controls for the number of SEC clients and client characteristics using a regression approach. Specifically, I estimate a litigation model that controls for the number of clients audited by the firm and the characteristics of audit firms' client portfolios. Further details about the litigation model and the independent variables in that model are given in the Appendix. Positive residuals from the litigation model indicate that audit firm i experienced abnormally high litigation given its size and its client characteristics. My fourth litigation variable ($aud_lit_high_{it-3,t-1}$) equals one if the residuals from the litigation model are positive, and zero otherwise. If financial reporting quality is higher after audit firms experience litigation, I expect the coefficients on $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$ to be negative in Eqs. (1) to (3).

One issue to resolve is that the companies who sue their auditors are likely to improve their financial reporting quality even if their auditors do not improve. To avoid this potential confound, I exclude all the companies that sue their auditors when I estimate Eqs. (1) to (3). For example, if Company A sues Auditor X, I drop Company A from the sample and test whether financial reporting quality improves for Auditor X's *other* clients. However, my inferences are unchanged if the companies that sue their auditors are instead retained in the sample.⁵

⁵ Auditors can be sued by both investors and their client companies. If company A sues auditor X then it is likely that A would not continue to be audited by X following the lawsuit. However, some companies do in fact retain their sued auditors. I avoid this potential confound by dropping these companies from the sample.

Following prior research, I control for various factors that affect the incidence and magnitudes of accounting misstatements. Companies sometimes misstate their annual accounts across consecutive years (Palmrose et al. 2004). Therefore, I control for persistence in misreporting by including lagged dependent variables ($misstate_{jt-1}$, $|netincome|/ta_{jt-1}$, and $|equity|/ta_{jt-1}$) in Eqs. (1) to (3). Companies are more likely to misstate their accounts if they are smaller and less profitable (Kinney and McDaniel 1989). I control for company size using the log of client total assets (lna_{jt}) and I control for profitability using a dummy variable for losses ($loss_{jt}$). Mergers and acquisitions can lead to complicated accounting issues and business integration problems, which can increase the incidence of misstatements (Kinney et al. 2004). I control for this using $M\&A_{jt}$, which equals one if company j is involved in a merger or acquisition in the most recent three years. Companies with weak internal controls over financial reporting are more likely to misstate their accounts (Ge and Lennox 2011). I control for this by including $S404_{jt}$ and $S404 \times IC_{jt}$ in Eqs. (1) to (3). The $S404_{jt}$ variable equals one if company j is subject to Section 404 of the Sarbanes-Oxley Act, and zero otherwise. IC_{jt} equals one if a material internal control weakness is disclosed for company j in year t , and zero otherwise. I control for the book-to-market ratio (BtM_{jt}) because misstatements are more common among companies that are perceived as having high growth opportunities (Povel et al. 2007). I control for whether the company is traded on a stock exchange ($Exchg_{jt}$) and whether the client is located in the U.S. ($UScli_{jt}$) because these client characteristics could also be associated with financial reporting quality. The estimation sample excludes any companies that sue their auditors but it does not exclude observations in which companies or their managements are sued. If a company or its management is sued, then this experience may lead to the company having better financial reporting in the future. I control for this by including a dummy variable that equals one if the

company or its management are sued ($cli_litig_{jt-3,t-1}$). On the other hand, there may be no association between the $cli_litig_{jt-3,t-1}$ variable and misstatements because many companies are sued for reasons that are unrelated to financial reporting (e.g., they are sued for wrongful termination of employee contracts).

Eqs. (1) to (3) include year indicator variables to control for any time-varying changes in the overall incidence of accounting misstatements. Controlling for year effects is important because a high-profile lawsuit could affect the behavior of *all* auditors in any given year, not just the auditor who was sued. In contrast, my objective is to determine how an audit firm responds to its *own* experience of litigation. To the extent that other audit firms respond to the litigation experiences of audit firm i , this would be subsumed in my year fixed effects. In short, my treatment variables ($aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$ and $aud_lit_high_{it-3,t-1}$) capture the impact of audit firm i 's *own* litigation experience on the quality of i 's audits, while the impact of i 's litigation experience on all other auditors is controlled through the inclusion of year fixed effects.

IV. Sample, descriptive statistics, and results

The sample

The sample period begins in 2001 because this is the year that lawsuits begin to be comprehensively covered in the *Audit Analytics* database. The sample ends in 2008 because I require a hold-out period of two years (2009-2010) in order to identify any subsequent restatements of accounts that were filed in the period up to 2008.⁶ I require that data are

⁶ A nice feature about accounting misstatements is that we have data on misstatements for the entire population of SEC registrants from the Audit Analytics database. This is important because many of the audit firms in the non-Big 4 sample are relatively small and, although their SEC clients are covered on Audit Analytics, many of their clients are not covered by COMPUSTAT. Alternative measures of

available from the *Audit Analytics* and *COMPUSTAT* databases for the period 2001-2008 in order to estimate Eqs. (1) to (3). This leaves me with a sample of 401 audit firms and 43,515 audit engagements.

A nice feature of the *Audit Analytics* litigation file is that it includes all lawsuits in which audit firms are named as defendants, including those arising from audits of non-SEC clients. Therefore, the coverage of the lawsuits is very comprehensive. Another nice feature is that the litigation file identifies the underlying reason for the lawsuit. This is necessary in order to distinguish between lawsuits that pertain to financial reporting matters versus lawsuits that audit firms encounter for other matters. This is important because sometimes audit firms are sued for reasons other than audit failure; for example, an audit firm might be sued by its employees for wrongful dismissal. Following Schmidt (2012), I use the coding in *Audit Analytics* to avoid including any lawsuits in my sample that are not related to financial reporting. My sample comprises 629 lawsuits against audit firms for matters relating to financial reporting.⁷

There are, however, two significant limitations of the litigation data in *Audit Analytics*. First, court case outcomes and settlements are unavailable for the vast majority of lawsuits. This is because lawsuits are often resolved privately without public disclosure of the agreed settlements or because some of the lawsuits are still ongoing. Thus, I am unable to distinguish between meritorious and non-meritorious lawsuits. To the extent that my four litigation

earnings quality (e.g., abnormal accruals) require data from *COMPUSTAT*. When I impose the requirement that data are available from *COMPUSTAT*, 6,887 of the non-Big 4 observations are lost (3,369 remain), while 6,581 of the Big 4 observations are lost (10,680 remain). Therefore, requiring data from *COMPUSTAT* would cause high sample attrition particularly for the non-Big 4 clients.

⁷ I count a lawsuit as being related to financial reporting issues if it is coded by *Audit Analytics* as one of the following: Accounting and Auditing Enforcement Release, Accounting malpractice, Class actions, Financial reporting, Fraud or truth in lending, Initial public offering, Mergers and acquisitions, Securities law, and Stockholders' suits.

variables capture non-meritorious lawsuits, the tests of H_1 will be biased against finding an improvement in financial reporting.

A second limitation is that, for many lawsuits, I cannot identify which audit office performed the allegedly negligent audit. This is for two reasons. First, the litigation file in the Audit Analytics database provides only the names of the defendants and plaintiffs. Unfortunately, the plaintiff's name often does not correspond to the name of the audit client because investors sometimes sue auditors in their own names rather than in the name of the company. Second, some of the lawsuits in my sample are for audits of entities that are not publicly traded, e.g., private companies, not-for-profit organizations. In such cases, even when I am able to identify the name of the auditee, I am still unable to locate the auditor office because the entity is not required to file with the SEC. In short, I am only able to identify the audit offices in the cases where auditors are sued for their audits of publicly traded companies and where the plaintiff is the company that was audited (rather than a group of investors).

Descriptive statistics

Panel A of Table 1 reports descriptive statistics on the number of SEC audits and the number of lawsuits against each audit firm in the sample. The Big 4 firms conduct 29,229 (67.2%) of the 43,515 audits. In total there are 629 lawsuits of which 505 (80.3%) are leveled against the Big 4. To provide some perspective on the litigation rates, I calculate for each auditor the ratio of the number of lawsuits divided by the number of SEC audits. The litigation rates are fairly similar among the Big 4 auditors (1.43% for Ernst & Young, 2.03% for PricewaterhouseCoopers, 1.52% for Deloitte & Touche, and 2.03% for KPMG). This makes sense given that the Big 4 have many offices which conduct a lot of audits and thus their litigation rates are close to the overall

population mean (1.45%). In contrast, the number of audit engagements and lawsuits are much smaller for the non-Big 4 auditors. There is considerable variation in the litigation rates of the non-Big 4 auditors, which range from 0.00% (i.e., no litigation) to 28.57% (i.e., two lawsuits and seven clients). Given that the non-Big 4 audit firms are relatively small and their litigation rates are more salient for them, I posit that these firms are more likely to learn from their litigation experiences at the audit firm level. Such learning is expected to result in improved financial reporting quality.

[INSERT TABLE 1 NEAR HERE]

As previously mentioned, I am only able to identify the audit office if the lawsuit involves a publicly traded company and the plaintiff sues the auditor in the name of the company. As shown in Panel B of Table 1, I am able to identify audit offices for 120 of the lawsuits in the initial sample of 629. Of these, only 15 lawsuits are against the non-Big 4 audit firms. Given this small number, I cannot conduct reliable tests at the audit office level for the non-Big 4 audit firms alone. However, I am able to conduct audit office level tests for the Big 4 auditors and for the full sample. Of the 120 litigation cases in which I can identify the office that performed the audit, 105 lawsuits are against the Big 4 audit firms. Panel B of Table 1 shows that there is considerable variation in litigation rates across audit offices (the litigation rates range from 0.00% to 12.50%). Therefore, there is considerable scope for auditors to learn from the experience of litigation at the audit office level.

Table 2 reports the incidence rates of lawsuits and accounting misstatements by year. The litigation frequency trends downward over the sample period, from a high of 2.22% in 2004 to a low of 0.47% in 2008 (Panel A). In total, there are 4,945 accounting misstatements and the frequency of misstatements also declines over time, from 17.88% in 2003 to 4.94% in 2008.

Overall, these trends in lawsuits and misstatements are consistent with an improvement in financial reporting over the sample period. I control for these yearly differences by including year fixed effects in all the regression models.⁸

[INSERT TABLE 2 NEAR HERE]

Table 3 provides descriptive statistics for the variables in Eqs. (1) to (3). The time period is 2004-2008 because I require three years of prior data in order to measure an auditor's experience of litigation in the recent past (i.e., $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$). Panel A of Table 3 reports descriptive statistics for the Big 4 sample whereas Panel B is for the non-Big 4 auditors. The mean value of the dependent variable ($misstate_{jt}$) is 0.090 for Big 4 clients (Panel A) and 0.092 for non-Big 4 clients (Panel B). There are 1,082 (803) Big 4 clients that have misstated numbers for net income (stockholders' equity). On the other hand, there are 333 (248) non-Big 4 clients that have misstated numbers for net income (stockholders' equity). Table 3 also reports descriptive statistics for company size, the book-to-market ratio, internal control weaknesses, lawsuits against clients, the proportion of clients that are from the U.S., and the proportion that are traded on a stock exchange.

[INSERT TABLE 3 NEAR HERE]

Main results

I test H_1 by estimating Eqs. (1) to (3). The dependent variables are: $misstate_{jt}$, $|netincome|/ta_{jt}$, and $|equity|/ta_{jt}$. The $misstate_{jt}$ variable indicates whether the audited financial statements of client j are misstated in year t , whereas $|netincome|/ta_{jt}$ and $|equity|/ta_{jt}$ indicate the absolute

⁸ Consistent with an improvement in financial reporting, the magnitudes of misstatements and the market reactions to misstatements have declined in recent years (see the 21st Annual ALI-ABA report prepared by *Audit Analytics*). Thus, misstatements are not only becoming rarer, they are also becoming less severe over time.

magnitudes of misstatements. The $misstate_{jt}$ model is estimated using logit whereas the $|netincome|/ta_{jt}$ and $|equity|/ta_{jt}$ models are estimated using tobit because the dependent variables are truncated (i.e., their values are non-missing only for the companies that misstate their accounts). Because there are repeated observations on both companies and audit firms, I control for the time-series dependence problem by adjusting the standard errors for two-way clustering at the level of the company and the audit firm. I also winsorize the continuous variables at the 1% and 99% percentiles in order to address the problem of outliers.

First, I test whether the incidence of misstatements is lower after the non-Big 4 audit firms experience litigation. The results from estimating Eq. (1) on the clients of non-Big 4 audit firms ($N = 10,256$) are shown in Table 4. Cols. (1) to (4) find significant negative coefficients on $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$ (z-stats. = -4.43, -7.32, -2.25 and -4.61, respectively). The results are found to be economically significant as well as statistically significant. After a non-Big 4 audit firm experiences litigation, the misstatement probability decreases by: 3.44% (as $aud_lit_{it-3,t-1}$ increases from 0 to 1), 1.79% (as $nlitigation_{it-3,t-1}$ increases by one standard deviation around the mean), 1.14% (as $nlit/ncli_{it-3,t-1}$ increases by one standard deviation around the mean) and 3.36% (as $aud_lit_high_{it-3,t-1}$ changes from 0 to 1). Thus, the frequency of accounting misstatements is significantly lower for the clients of non-Big 4 auditors who recently experienced high litigation, compared with the clients of non-Big 4 auditors who did not suffer high litigation.

[INSERT TABLE 4 NEAR HERE]

Not only are accounting misstatements less prevalent after litigation, but also the magnitudes of accounting misstatements are found to be significantly smaller. These results are shown in Table 5. Cols. (1) to (4) find significant negative coefficients on $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$ (z-stats. = -4.43, -7.32, -2.25 and -4.61, respectively).

$_{3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$ for the magnitudes of net income misstatements (t-stats. = -2.58, -4.21, -2.34 and -3.61, respectively). Similarly, Cols. (5) to (8) find significant negative coefficients on $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$ and $aud_lit_high_{it-3,t-1}$ for the magnitudes of stockholders' equity misstatements (t-stats. = -1.91, -2.46, -1.81 and -2.33, respectively). In dollar terms, the decreases in the absolute magnitudes of net income misstatements are: \$4.03 million (as $aud_lit_{it-3,t-1}$ changes from 0 to 1), \$1.83 million (as $nlitigation_{it-3,t-1}$ increases by one standard deviation around the mean), \$2.23 million (as $nlit/ncli_{it-3,t-1}$ increases by one standard deviation around the mean), and \$4.62 million (as $aud_lit_high_{it-3,t-1}$ increases from 0 to 1). For the misstatements of stockholders' equity, the corresponding dollar amounts are relatively small as they range from \$0.07 million to \$2.07 million in Cols. (5) to (8) of Table 5. Therefore, misstatements are significantly smaller for the clients of non-Big 4 audit firms who suffered high litigation during the previous three years.

[INSERT TABLE 5 NEAR HERE]

To sum up, the results in Table 4 and Table 5 show that both the incidence and the magnitudes of misstatements are lower after non-Big 4 auditors experience high litigation.⁹ Consistent with H_1 , these results suggest that litigation has a disciplinary effect on non-Big 4 auditors as their clients have higher financial reporting quality subsequently.

In untabulated sensitivity tests, I also estimate Eqs. (1) to (3) using just the 44 non-Big 4 auditors that experienced lawsuits during the sample period. The coefficients on three of the four litigation variables are significantly negative: $aud_lit_{it-3,t-1}$ (z-stats.= -1.74, -1.93 and -2.07), $nlitigation_{it-3,t-1}$ (z-stats.= -2.81, -2.35 and -1.66), $nlit/ncli_{it-3,t-1}$ (z-stats.= -0.40, -1.56 and -1.10) and

⁹ In untabulated tests, I obtain similar results when I use the mean of the residuals for each auditor instead of the $aud_lit_high_{it-3,t-1}$ dummy that indicates whether the mean of the residuals is positive or negative.

$aud_lit_high_{it-3,t-1}$ (z-stats.= -2.42, -2.95 and -2.07). Therefore, the restricted sample tests further support the conclusion that the non-Big 4 auditors who were recently sued exhibit an improvement in their quality subsequently.

The recent litigation experiences of Big 4 audit firms

In this section, I estimate Eqs. (1) to (3) on the sub-sample of Big 4 audit clients (N = 17,261). Each of the Big 4 audit firms experiences at least one lawsuit in every year of the sample period. Accordingly, the variable indicating the presence of a lawsuit during the previous three years ($aud_lit_{it-3,t-1}$) equals one in every year for the Big 4 auditors. Therefore, there is no time variation in the $aud_lit_{it-3,t-1}$ variable for the Big 4 audit firms and so it is redundant for the tests conducted at the audit firm level for the Big 4. The second and third treatment variables ($nlitigation_{it-3,t-1}$ and $nlit/ncli_{it-3,t-1}$) are defined in exactly the same way as they are in the non-Big 4 tests, i.e., $nlitigation_{it-3,t-1}$ equals the number of lawsuits against the audit firm and $nlit/ncli_{it-3,t-1}$ equals the number of lawsuits against the audit firm scaled by the number of SEC clients. Similar to the analysis conducted on the non-Big 4 audit firms, the fourth treatment variable ($aud_lit_high_{it-3,t-1}$) is constructed using the residuals from litigation models estimated on three-year rolling windows. However, these litigation models are estimated on the full sample rather than the Big 4 sample alone as there are only 12 auditor-year observations for the Big 4 firms.¹⁰

In untabulated results, I find insignificant coefficients on $nlitigation_{it-3,t-1}$ (z-stats.= 1.07, 0.59 and 0.56), $nlit/ncli_{it-3,t-1}$ (z-stats.= 0.64, 0.47 and 0.31) and $aud_lit_high_{it-3,t-1}$ (z-stats.= -0.18, 0.29 and 0.02) when Eqs. (1) to (3) are estimated on the Big 4 clients. Therefore, I find no evidence

¹⁰ As a robustness check, I examine whether this research design choice has any impact on the results previously obtained for the non-Big 4 audit firms. Specifically, the $aud_lit_high_{it-3,t-1}$ variable is re-calculated using the residuals from litigation models that are estimated on both Big 4 and non-Big 4 auditors. The coefficients on the updated $aud_lit_high_{it-3,t-1}$ variable remain negative and highly significant (z-stats. = -4.63 in Table 4; z-stats. = -3.41 and -2.17 in Table 5).

that financial reporting quality improves at the national level after the Big 4 auditors experience high litigation during the previous three years.

Next I examine whether there is evidence of an improvement in quality when the models for Big 4 auditors are estimated at the office level. Under H_2 , I expect to find an improvement in financial reporting quality among the offices that incur lawsuits. Given that the results already support H_1 for non-Big 4 firms, in this analysis I begin by focusing on just the offices of the Big 4 auditors.

Table 6 reports results for the incidence of accounting misstatements when Eq. (1) is estimated on the clients of Big 4 audit offices. All the litigation variables are the same as before, except they are defined at the audit office level rather than the audit firm level. Cols. (1) to (4) find negative coefficients on $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$ (z-stats. = -2.28, -2.85, -1.47 and -2.19, respectively). Therefore, the incidence of accounting misstatements is significantly lower subsequent to Big 4 audit offices' recent experiences of litigation.

[INSERT TABLE 6 NEAR HERE]

Table 7 reports results for the magnitudes of accounting misstatements when Eqs. (2) and (3) are estimated on the clients of Big 4 audit offices. I find significant negative coefficients on $aud_lit_{it-3,t-1}$ (z-stats.= -1.80 and -1.93), $nlitigation_{it-3,t-1}$ (z-stats.= -2.47 and -2.38), $nlit/ncli_{it-3,t-1}$ (z-stats.= -2.55 and -2.05) and $aud_lit_high_{it-3,t-1}$ (z-stats.= -1.68 and -1.78). Therefore, there is decrease in the magnitudes of misstatements after Big 4 audit offices experience litigation. To sum up, both the incidence and magnitudes tests indicate that there is an improvement in financial reporting quality at the office level.¹¹

¹¹ All my conclusions continue to hold when Eqs. (1) to (3) are estimated for the audit offices of the Big 6 (or Big 8) audit firms. There are negative coefficients on $aud_lit_{it-3,t-1}$ (z-stats.= -2.25, -1.78 and -2.02), $nlitigation_{it-3,t-1}$ (z-stats.= -2.81, -2.45 and -2.42), $nlit/ncli_{it-3,t-1}$ (z-stats.= -1.49, -2.30 and -2.20) and

[INSERT TABLE 7 NEAR HERE]

Unfortunately, the audit offices can be identified for only 15 of the 124 lawsuits against the non-Big 4 audit firms. Although this sample is too small to conduct reliable tests, I re-run Eqs. (1) to (3) at the audit office level for all the 401 audit firms in my sample. In total, these 401 audit firms have 893 audit offices. Consistent with the tabulated findings for the non-Big 4 audit firms and for the Big 4 audit offices, I find significant negative coefficients on all four of the litigation variables: $aud_lit_{it-3,t-1}$ (z-stats.= -2.67, -1.98 and -2.20), $nlitigation_{it-3,t-1}$ (z-stats.= -3.35, -2.67 and -2.59), $nlit/ncli_{it-3,t-1}$ (z-stats.= -1.74, -2.58 and -2.37) and $aud_lit_high_{it-3,t-1}$ (z-stats.= -2.57, -1.86 and -2.04). Again, this indicates that there is an improvement in financial reporting quality following litigation against the non-Big 4 audit firms and against the audit offices of Big 4 firms.

Two alternative explanations

In this section, I investigate two alternative explanations for my main findings. The first alternative explanation is that the results are driven by the unobserved characteristics of an audit firm's client portfolio rather than by an audit firm's actual experience of litigation. The second alternative explanation is that my findings are attributable to changes in the client portfolios of audit firms after they are sued.

Unobserved client characteristics

Audit firms that have risky clients are more likely to incur litigation and they also have stronger incentives to supply high quality audits. Therefore, it could be argued that my results are

$aud_lit_high_{it-3,t-1}$ (z-stats.= -2.16, -1.66 and -1.86) in the Big 6 office level tests. Likewise, the coefficients are consistently negative for Big 8 audit offices: $aud_lit_{it-3,t-1}$ (z-stats.= -2.19, -1.68 and -1.94), $nlitigation_{it-3,t-1}$ (z-stats.= -2.76, -2.37 and -2.35), $nlit/ncli_{it-3,t-1}$ (z-stats.= -1.47, -2.25 and -2.16) and $aud_lit_high_{it-3,t-1}$ (z-stats.= -2.11, -1.56 and -1.77).

capturing the riskiness of audit firms' client portfolios rather than the effect of an audit firm's recent experience of litigation. Although I have controlled for factors known to affect accounting misstatements, there could be other unobserved client characteristics that are associated with both the incidence of litigation and audit quality.

To test this alternative explanation, I examine whether the audit firms that incurred high litigation were already supplying high quality audits even *before* they were sued. Specifically, I examine the association between my treatment variables ($aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$) and misstatements during the rolling windows of the previous three years. To the extent that my treatment variables capture client risk, I would expect that they are negatively associated with misstatements in the previous three years *as well as* in the subsequent year. On the other hand, if my results reflect a change in the auditor's behavior subsequent to experiencing litigation, I would expect a significant negative association in the subsequent year but not in the previous three years. In other words, financial reporting quality would be higher only after the auditor experiences litigation and not before. Untabulated results show that my treatment variables ($aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$ and $aud_lit_high_{it-3,t-1}$) constructed at both the audit firm level and the audit office level are statistically insignificant during the rolling windows of the previous three years. This is inconsistent with the argument that my results are driven by unobserved client characteristics.

Changes in audit firms' client portfolios

A limitation of the preceding test is that the composition of audit firms' client portfolios may change after auditors are sued. In particular, auditors may switch to less risky clients that have

higher quality financial reporting after they are sued. To test whether audit firms' portfolios really do become less risky after audit firms suffer high litigation, I estimate Eq. (4):

$$\Delta Characteristic_{it} = \alpha_0 + \alpha_1 litigation_{it-3,t-1} + Year\ fixed\ effects + e_{it}. \quad (4)$$

Eq. (4) is estimated using five dependent variables that capture various characteristics of an audit firm's client portfolio. The first client portfolio characteristic is the proportion of audit firm i 's clients that operate in high litigation industries; the second is the proportion of audit firm i 's clients that are located in the U.S. rather than overseas; the third is the mean leverage of audit firm i 's clients; the fourth is the mean return on assets of audit firm i 's clients; the fifth is the proportion of audit firm i 's clients that report losses. For each of these five client characteristics I measure the change from year $t-1$ to year t ($\Delta Characteristic_{it}$) as the dependent variable. In untabulated results, I find that the four litigation variables ($aud_lit_{it-3,t-1}$, $n litigation_{it-3,t-1}$, $n lit/n cli_{it-3,t-1}$ or $aud_lit_high_{it-3,t-1}$) constructed at both the audit firm level and the audit office level are statistically insignificant in explaining these five types of changes in audit firms' client portfolios. Therefore, the evidence does not suggest that audit firms' client portfolios become less risky after auditors experience high litigation.

Auditors who incur high litigation may resign from clients that have low quality financial reporting. To examine whether this explains why I find an increase in financial reporting quality, I re-run all the models in Tables 4 to 7 after dropping the companies whose auditors resign. My inferences remain the same when these auditor change observations are dropped from the sample. My conclusions are unchanged if I also drop the companies that dismiss their auditors. Because my results hold even after dropping the companies that change their auditors, this does not support the alternative explanation that my results are attributable to changes in the composition of audit firms' client portfolios.

Does an auditor's recent experience of litigation affect audit fees?

My study focuses on whether auditors respond to their recent litigation experiences by improving their quality. However, another possible response could be that sued auditors charge higher audit fees. Prior studies suggest that auditors charge higher fees when they perceive a greater risk of being sued (Krishnan and Krishnan 1997; Shu 2000; Francis and Krishnan 2003; Bedard and Johnstone 2004). Therefore, auditors might increase their fees subsequent to experiencing litigation. On the other hand, it may be difficult for a recently sued auditor to justify higher audit fees to its clients and clients may object to paying higher audit fees to an audit firm that has recently been sued. Therefore, it is an open question whether the experience of being sued has any effect on audit fees.

In untabulated tests, I estimate audit fee models that have the natural log of audit fees for company j in year t as the dependent variable. I find that the coefficients on $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$, and $aud_lit_high_{it-3,t-1}$ are insignificant for the clients of non-Big 4 auditors as well as for the full sample at both the audit firm level and the audit office level. Therefore, it appears that auditors do not charge higher audit fees following their recent experiences of litigation.

V. Conclusions

Prior studies in the audit literature investigate the determinants of litigation against audit firms. My study is different because I argue that the experience of being sued can convey new information to an auditor that causes a change in the auditor's behavior. In particular, I predict that the experience of being sued motivates auditors to improve their quality subsequently.

Consistent with this prediction, the results indicate that misstatements of the audited financial statements are less likely to occur for non-Big 4 auditors who recently suffered high litigation. Moreover, the magnitudes of misstatements are significantly smaller for non-Big 4 clients whose auditors were recently sued. Thus, there is an apparent improvement in financial reporting quality after non-Big 4 auditors are sued. Although I find no improvement when the tests are conducted at the Big 4 audit firm level, I do find a significant improvement at the audit office level for the Big 4 offices that were responsible for the lawsuits. This is consistent with the Big 4 auditors relying on their own offices' recent litigation experiences when they infer the quality of their audits.

These findings are important because they further our understanding of the role of litigation in prompting audit firms to improve their quality. In particular, my findings indicate that auditors can learn from their experiences of being sued and that they improve their behavior subsequently.

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TABLE 1
Summary statistics on lawsuits against audit firms and audit offices (2001-2008).

<i>Panel A: Lawsuits against audit firms</i>			
Auditor	Number of SEC audits (1)	Number of lawsuits (2)	Col. (2) divided by Col. (1)
Ernst & Young	9,021	129	1.43%
PricewaterhouseCoopers	7,240	147	2.03%
Deloitte & Touche	6,824	104	1.52%
KPMG	6,144	125	2.03%
Grant Thornton	1,750	28	1.60%
BDO Seidman	1,295	36	2.78%
Crowe Chizek & Company	524	2	0.38%
McGladrey & Pullen	513	7	1.36%
BKD	262	1	0.38%
Moss Adams	244	1	0.41%
Sherb & Co	178	5	2.81%
JH Cohn	172	1	0.58%
Elliott Davis	153	1	0.65%
Marcum & Kliegman	147	1	0.68%
Ehrhardt Keefe Steiner & Hottman	124	1	0.81%
Amper Politziner & Mattia	120	3	2.50%
Kabani & Co	116	1	0.86%
Goldstein Golub Kessler	114	1	0.88%
Virchow Krause & Company	112	1	0.89%
Singer Lewak Greenbaum & Goldstein	106	1	0.94%
UHY	82	1	1.22%
Peterson Sullivan	80	1	1.25%
KBA Group	66	2	3.03%
Cherry Bekaert & Holland	64	2	3.13%
Hacker Johnson & Smith	54	1	1.85%
Haskell & White	50	1	2.00%
Epstein Weber & Conover	41	1	2.44%
Tanner & Co	40	2	5.00%
Comiskey & Company	38	1	2.63%
Salberg & Company	34	1	2.94%
Daszkal Bolton	31	1	3.23%
Tullius Taylor Sartain & Sartain	31	1	3.23%
Radin Glass & Co	29	1	3.45%
Mahoney Cohen & Co	27	1	3.70%
WithumSmith & Brown	25	1	4.00%
Clifton Gunderson	25	1	4.00%

TABLE 1 Panel A (cont.)
Summary statistics on lawsuits against audit firms.

Auditor	Number of SEC audits (1)	Number of lawsuits (2)	Col. (2) divided by Col. (1)
Beckstead & Watts	25	1	4.00%
Freed Maxick & Battaglia	24	1	4.17%
Tedder James Worden & Associates	22	1	4.55%
Killman Murrell & Company	19	1	5.26%
Moore Stephens Lovelace	17	2	11.76%
Weinick Sanders Leventhal & Co	16	1	6.25%
Brady Martz & Associates	11	1	9.09%
Reznick Group	11	1	9.09%
Haefele Flanagan & Co	10	1	10.00%
Scott McElveen	7	1	14.29%
Rubin Brown Gornstein & Company	7	2	28.57%
Armando C Ibarra	4	1	25.00%
353 audit firms that have zero lawsuits	7,465	0	0.00%
Total	43,515	629	1.45%

Panel B: Lawsuits against audit offices

Audit office	Number of SEC audits (1)	Number of lawsuits (2)	Col. (2) divided by Col. (1)
Ernst & Young - Boston	666	1	0.15%
Ernst & Young - Chicago	1,100	1	0.09%
Ernst & Young - Cincinnati	85	2	2.35%
Ernst & Young - Cleveland	201	1	0.50%
Ernst & Young - Columbus	61	2	3.28%
Ernst & Young - Dallas	275	1	0.36%
Ernst & Young - Houston	261	1	0.38%
Ernst & Young - Little Rock	18	2	11.11%
Ernst & Young - Memphis	55	1	1.82%
Ernst & Young - New York	677	3	0.44%
Ernst & Young - Orange County	79	1	1.27%
Ernst & Young - Philadelphia	218	1	0.46%
Ernst & Young - Pittsburgh	122	1	0.82%
Ernst & Young - Raleigh	65	1	1.54%
Ernst & Young - Salt Lake City	49	1	2.04%
Ernst & Young - San Francisco	102	1	0.98%
Ernst & Young - San Jose	320	2	0.63%
Ernst & Young - Tulsa	83	1	1.20%
PricewaterhouseCoopers - Austin	29	2	6.90%
PricewaterhouseCoopers - Boston	719	2	0.28%
PricewaterhouseCoopers - Chicago	304	2	0.66%
PricewaterhouseCoopers - Dallas	169	1	0.59%

TABLE 1 Panel B (cont.)
Summary statistics on lawsuits against audit offices.

Audit office	Number of SEC audits (1)	Number of lawsuits (2)	Col. (2) divided by Col. (1)
PricewaterhouseCoopers - Dayton	12	1	8.33%
PricewaterhouseCoopers - Detroit	76	1	1.32%
PricewaterhouseCoopers - Fort Worth	36	1	2.78%
PricewaterhouseCoopers - Greensboro	45	1	2.22%
PricewaterhouseCoopers - Houston	300	2	0.67%
PricewaterhouseCoopers - Los Angeles	285	2	0.70%
PricewaterhouseCoopers - New York	980	8	0.82%
PricewaterhouseCoopers - Phoenix	55	1	1.82%
PricewaterhouseCoopers - San Francisco	177	1	0.56%
PricewaterhouseCoopers - San Jose	681	5	0.73%
PricewaterhouseCoopers - San Juan	32	1	3.13%
PricewaterhouseCoopers - Tampa	62	1	1.61%
Deloitte & Touche - Baltimore	15	1	6.67%
Deloitte & Touche - Boston	764	1	0.13%
Deloitte & Touche - Charlotte	84	1	1.19%
Deloitte & Touche - Chicago	460	2	0.43%
Deloitte & Touche - Cincinnati	94	2	2.13%
Deloitte & Touche - Detroit	118	7	5.93%
Deloitte & Touche - Houston	256	2	0.78%
Deloitte & Touche - Milwaukee	170	1	0.59%
Deloitte & Touche - Nashville	34	1	2.94%
Deloitte & Touche - New York	708	4	0.56%
KPMG - Chicago	305	1	0.33%
KPMG - Detroit	32	4	12.50%
KPMG - Los Angeles	213	4	1.88%
KPMG - Milwaukee	23	2	8.70%
KPMG - Mountain View	270	2	0.74%
KPMG - Nashville	45	1	2.22%
KPMG - New York	520	6	1.15%
KPMG - Philadelphia	355	2	0.56%
KPMG - San Diego	114	2	1.75%
KPMG - San Francisco	159	2	1.26%
KPMG - Tampa	44	1	2.27%
Grant Thornton - Baltimore	38	2	5.26%
Grant Thornton - Philadelphia	160	2	0.63%
Grant Thornton - Seattle	35	1	2.86%
Grant Thornton - Vienna	42	3	7.14%
Marcum & Kliegman - New York	106	1	1.89%
Singer Lewak Greenbaum & Goldstein - Los Angeles	92	1	1.09%
Kabani & Co - Los Angeles	24	1	4.17%

TABLE 1 Panel B (cont.)
Summary statistics on lawsuits against audit offices.

Audit office	Number of SEC audits (1)	Number of lawsuits (2)	Col. (2) divided by Col. (1)
Sherb & Co - New York	101	2	1.98%
Weinick Sanders Leventhal & Co - New York	16	1	6.25%
Salberg & Company - Boca Raton	34	1	2.94%
828 audit offices that have zero lawsuits	29,685	0	0.00%
Total	43,515	120	0.28%

TABLE 2
Accounting misstatements and lawsuits by year (2001-2008).

<i>Panel A: Lawsuits against auditors</i>			
Year	Number of audit engagements	Number of lawsuits	Percentage of lawsuits
2001	4,459	51	1.14%
2002	6,311	60	0.95%
2003	5,228	115	2.20%
2004	4,558	101	2.22%
2005	4,951	102	2.06%
2006	5,550	114	2.05%
2007	6,470	58	0.90%
2008	5,988	28	0.47%
Total	43,515	629	1.45%
<i>Panel B: Accounting misstatements</i>			
Year	Number of audit engagements	Number of misstated financial reports	Percentage of misstated financial reports
2001	4,459	561	12.58%
2002	6,311	957	15.16%
2003	5,228	935	17.88%
2004	4,558	749	16.43%
2005	4,951	614	12.40%
2006	5,550	464	8.36%
2007	6,470	369	5.70%
2008	5,988	296	4.94%
Total	43,515	4,945	11.36%

TABLE 3
Descriptive statistics for the variables used in the accounting misstatement models.

<i>Panel A: Descriptive statistics for the Big 4 sample (2004-2008)</i>						
	Obs.	Mean	Min	Median	Max	S.D.
<i>misstate_{jt}</i>	17,261	0.090	0.000	0.000	1.000	0.286
$ netincome /ta_{jt}$	1,082	0.020	0.000	0.009	0.071	0.023
$ equity /ta_{jt}$	803	0.010	0.000	0.006	0.025	0.009
<i>UScli_{jt}</i>	17,261	0.987	0.000	1.000	1.000	0.114
<i>Exchg_{jt}</i>	17,261	0.981	0.000	1.000	1.000	0.136
<i>loss_{jt}</i>	17,261	0.243	0.000	0.000	1.000	0.429
<i>M&A_{jt}</i>	17,261	0.240	0.000	0.000	1.000	0.427
<i>cli_litig_{jt-3,t-1}</i>	17,261	0.304	0.000	0.000	1.000	0.460
<i>lnta_{jt}</i>	17,261	20.567	9.578	20.461	25.133	1.935
<i>BtM_{jt}</i>	17,261	0.465	-5.819	0.354	6.202	1.044
<i>S404_{jt}</i>	17,261	0.725	0.000	1.000	1.000	0.446
<i>S404×IC_{jt}</i>	17,261	0.052	0.000	0.000	1.000	0.222
<i>Panel B: Descriptive statistics for the non-Big 4 sample (2004-2008)</i>						
	Obs.	Mean	Min	Median	Max	S.D.
<i>misstate_{jt}</i>	10,256	0.092	0.000	0.000	1.000	0.289
$ netincome /ta_{jt}$	333	0.032	0.000	0.020	0.071	0.028
$ equity /ta_{jt}$	248	0.015	0.000	0.014	0.025	0.009
<i>UScli_{jt}</i>	10,256	0.938	0.000	1.000	1.000	0.242
<i>Exchg_{jt}</i>	10,256	0.601	0.000	1.000	1.000	0.490
<i>loss_{jt}</i>	10,256	0.511	0.000	1.000	1.000	0.500
<i>M&A_{jt}</i>	10,256	0.090	0.000	0.000	1.000	0.287
<i>cli_litig_{jt-3,t-1}</i>	10,256	0.084	0.000	0.000	1.000	0.277
<i>lnta_{jt}</i>	10,256	17.094	9.578	17.407	23.658	2.904
<i>BtM_{jt}</i>	10,256	0.245	-5.819	0.282	6.202	1.200
<i>S404_{jt}</i>	10,256	0.551	0.000	1.000	1.000	0.497
<i>S404×IC_{jt}</i>	10,256	0.099	0.000	0.000	1.000	0.299

The continuous variables are winsorized at the 1% and 99% percentiles to address the problem of outliers.

Variable definitions

misstate_{jt} = one if company *j* misstates its financial report in year *t*, zero otherwise. *big4_i* = one if audit firm *i* is a Big 4 audit firm, zero otherwise. $|netincome|/ta_{jt}$ = the absolute magnitude of the misstatement of net income divided by the total assets of company *j* in year *t*. $|equity|/ta_{jt}$ = the absolute magnitude of the misstatement of stockholders' equity divided by the total assets of company *j* in year *t*. *UScli_{jt}* = one if company *j* is a U.S. company in year *t*, zero otherwise.

TABLE 3 (cont.)

Descriptive statistics for the variables used in the accounting misstatement models.

$Exchg_{jt}$ = one if company j is traded on an exchange in year t , zero otherwise. $loss_{jt}$ = one if company j reports losses in year t , zero otherwise. $M\&A_{jt}$ = one if company j is involved in a merger or acquisition in the most recent three years (from year $t-2$ to year t), zero otherwise (Compustat SALE_FN). $cli_litig_{jt-3,t-1}$ = one if there is at least one lawsuit against company j or its managers in the period from year $t-3$ to $t-1$, zero otherwise. lna_{jt} = natural log of the total assets of company j in year t . BtM_{jt} = book value of equity divided by market value of equity for company j in year t . IC_{jt} = one if at least one material weakness is disclosed in company j 's internal control report for year t , zero otherwise. $S404_{jt}$ = one if company j reports under SOX Section 404 in year t , zero otherwise.

TABLE 4
Misstatement incidence and the recent litigation experiences of non-Big 4 audit firms.

$$misstate_{jt} = \alpha_0 + \alpha_1 litigation_{it-3,t-1} + \alpha_2 misstate_{jt-1} + \alpha_3 lnta_{jt} + \alpha_4 loss_{jt} + \alpha_5 M\&A_{jt} + \alpha_6 S404_{jt} + \alpha_7 S404 \times IC_{jt} + \alpha_8 BtM_{jt} + \alpha_9 Exchg_{jt} + \alpha_{10} UScli_{jt} + \alpha_{11} cli_litig_{jt-3,t-1} + Industry\ effects + Year\ effects + e_{jt}. \quad (1)$$

The models in Table 4 are estimated for the clients of non-Big 4 audit firms during the period 2004 to 2008. The dependent variable indicates whether company j misstates its financial report in year t ($misstate_{jt}$). The models are estimated using logistic regressions. The treatment variable ($litigation_{it-3,t-1}$) measures audit firm i 's litigation experiences in years $t-3$ to $t-1$. I use four alternative proxies for $litigation_{it-3,t-1}$: $aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$ and $aud_lit_high_{it-3,t-1}$. The $aud_lit_{it-3,t-1}$ variable in Col. (1) equals one if audit firm i suffered at least one lawsuit in the previous three years, zero otherwise. The $nlitigation_{it-3,t-1}$ variable in Col. (2) equals the number of lawsuits against audit firm i during the previous three years. The $nlit/ncli_{it-3,t-1}$ variable in Col. (3) equals the number of lawsuits against audit firm i during the previous three years divided by the number of SEC audits undertaken by audit firm i during the same period. The $aud_lit_high_{it-3,t-1}$ variable in Col. (4) equals one (zero) if audit firm i experienced abnormally high (low) litigation in the previous three years (see the Appendix for further details).

Dep. variable =	(1)	(2)	(3)	(4)
$aud_lit_{it-3,t-1}$	$misstate_{jt}$ -0.519*** (-4.43)			
$nlitigation_{it-3,t-1}$		-0.041*** (-7.32)		
$nlit/ncli_{it-3,t-1}$			-8.833** (-2.25)	
$aud_lit_high_{it-3,t-1}$				-0.526*** (-4.61)
$misstate_{jt-1}$	2.347*** (12.94)	2.342*** (13.27)	2.341*** (13.19)	2.348*** (13.20)
$lnta_{jt}$	0.057*** (2.68)	0.054*** (2.68)	0.041** (1.97)	0.049** (2.28)
$loss_{jt}$	0.091 (0.89)	0.109 (1.08)	0.107 (1.04)	0.116 (1.13)
$M\&A_{jt}$	0.183* (1.76)	0.190* (1.84)	0.148 (1.43)	0.153 (1.43)
$S404_{jt}$	-0.514*** (-4.69)	-0.483*** (-4.41)	-0.521*** (-4.73)	-0.513*** (-4.86)
$S404 \times IC_{jt}$	0.560*** (4.32)	0.535*** (4.12)	0.557*** (4.29)	0.556*** (4.23)
BtM_{jt}	-0.055* (-1.73)	-0.055* (-1.74)	-0.052 (-1.62)	-0.053* (-1.69)

TABLE 4 (cont.)
Misstatement incidence and the recent litigation experiences of non-Big 4 audit firms.

<i>Exchg_{jt}</i>	-0.045 (-0.57)	-0.061 (-0.74)	-0.091 (-1.11)	-0.079 (-0.96)
<i>UScli_{jt}</i>	-0.618*** (-4.38)	-0.632*** (-4.70)	-0.657*** (-4.73)	-0.650*** (-4.64)
<i>cli_litig_{jt-3,t-1}</i>	0.023 (0.18)	0.052 (0.41)	0.014 (0.11)	0.024 (0.19)
<i>Industry dummies?</i>	Yes	Yes	Yes	Yes
<i>Year dummies?</i>	Yes	Yes	Yes	Yes
No. of audits	10,256	10,256	10,256	10,256
Pseudo R-squared	17.31%	17.22%	16.99%	17.23%

*, **, *** = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors in columns (1) to (4) are adjusted for time-series dependence by clustering on each audit firm and company (z-statistics in parentheses).

Variable definitions

misstate_{jt} = one if company *j* misstates its financial report in year *t*, zero otherwise. *aud_lit_{it-3,t-1}* = one if audit firm *i* suffered at least one lawsuit in years *t-3* to *t-1*, zero otherwise. *nlitigation_{it-3,t-1}* = the number of lawsuits against audit firm *i* in years *t-3* to *t-1*. *nlit/ncli_{it-3,t-1}* = the number of lawsuits against audit firm *i* in years *t-3* to *t-1*, divided by the number of clients of audit firm *i* in years *t-3* to *t-1*. *aud_lit_high_{it-3,t-1}* = one if audit firm *i* experienced abnormally high litigation in years *t-3* to *t-1*, = zero otherwise. The litigation rate is abnormally high (low) if the mean value of the residual from a litigation model estimated in years *t-3* to *t-1* is positive (negative). The results from the litigation models are reported in the Appendix. *UScli_{jt}* = one if company *j* is a U.S. company in year *t*, zero otherwise. *Exchg_{jt}* = one if company *j* is traded on an exchange in year *t*, zero otherwise. *loss_{jt}* = one if company *j* reports losses in year *t*, zero otherwise. *M&A_{jt}* = one if company *j* is involved in a merger or acquisition in the most recent three years (from year *t-2* to year *t*), zero otherwise (Compustat SALE_FN). *cli_litig_{jt-3,t-1}* = one if there is at least one lawsuit against company *j* or its managers in the period from year *t-3* to *t-1*, zero otherwise. *Inta_{jt}* = natural log of the total assets of company *j* in year *t*. *BtM_{jt}* = book value of equity divided by market value of equity for company *j* in year *t*. *IC_{jt}* = one if at least one material weakness is disclosed in company *j*'s internal control report for year *t*, zero otherwise. *S404_{jt}* = one if company *j* reports under SOX Section 404 in year *t*, zero otherwise.

TABLE 5
Misstatement magnitudes and the recent litigation experiences of non-Big 4 audit firms.

$$|netincome|/ta_{jt} = \alpha_0 + \alpha_1 litigation_{it-3,t-1} + \alpha_2 |netincome|/ta_{jt-1} + \alpha_3 lnta_{jt} + \alpha_4 loss_{jt} + \alpha_5 M\&A_{jt} + \alpha_6 S404_{jt} + \alpha_7 S404 \times IC_{jt} + \alpha_8 BtM_{jt} + \alpha_9 Exchg_{jt} + \alpha_{10} UScli_{jt} + \alpha_{11} cli_litig_{jt-3,t-1} + Industry\ effects + Year\ effects + e_{jt}. \quad (2)$$

$$|equity|/ta_{jt} = \alpha_0 + \alpha_1 litigation_{it-3,t-1} + \alpha_2 |equity|/ta_{jt-1} + \alpha_3 lnta_{jt} + \alpha_4 loss_{jt} + \alpha_5 M\&A_{jt} + \alpha_6 S404_{jt} + \alpha_7 S404 \times IC_{jt} + \alpha_8 BtM_{jt} + \alpha_9 Exchg_{jt} + \alpha_{10} UScli_{jt} + \alpha_{11} cli_litig_{jt-3,t-1} + Industry\ effects + Year\ effects + e_{jt}. \quad (3)$$

The dependent variables indicate the absolute magnitudes of the misstatements of net income ($|netincome|/ta_{jt}$ in Cols. (1) to (4)) and stockholders' equity ($|equity|/ta_{jt}$ in Cols. (5) to (8)).

Dep. variable =	$(netincome /ta)_{jt}$				$(equity /ta)_{jt}$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>aud_lit</i> _{it-3,t-1}	-0.013*** (-2.58)				-0.005* (-1.91)			
<i>nlitigation</i> _{it-3,t-1}		-0.001*** (-4.21)				-0.001** (-2.46)		
<i>nlit/ncli</i> _{it-3,t-1}			-0.382** (-2.34)				-0.123* (-1.81)	
<i>aud_lit_high</i> _{it-3,t-1}				-0.015*** (-3.61)				-0.005** (-2.33)
$ netincome /ta_{jt-1}$	0.639*** (16.28)	0.640*** (16.39)	0.636*** (16.36)	0.637*** (16.17)				
$ equity /ta_{jt-1}$					0.513*** (14.31)	0.513*** (14.59)	0.511*** (14.56)	0.510*** (14.40)
<i>lnta</i> _{jt}	0.005*** (2.78)	0.005*** (2.93)	0.004*** (2.60)	0.004*** (2.67)	0.003*** (3.82)	0.003*** (4.00)	0.003*** (3.68)	0.003*** (3.78)
<i>loss</i> _{jt}	-0.003 (-0.66)	-0.002 (-0.48)	-0.002 (-0.47)	-0.002 (-0.43)	-0.002 (-1.04)	-0.002 (-0.88)	-0.002 (-0.88)	-0.002 (-0.84)

TABLE 5 (cont.)
Misstatement magnitudes and the recent litigation experiences of non-Big 4 audit firms.

$M\&A_{jt}$	0.014*** (2.87)	0.014*** (2.96)	0.013*** (2.87)	0.013*** (2.78)	0.008*** (3.05)	0.008*** (3.11)	0.008*** (3.06)	0.008*** (3.00)
$S404_{jt}$	-0.018*** (-4.30)	-0.017*** (-4.19)	-0.018*** (-4.30)	-0.018*** (-4.16)	-0.007*** (-2.84)	-0.006*** (-2.75)	-0.007*** (-2.84)	-0.007*** (-2.79)
$S404 \times IC_{jt}$	0.023*** (4.37)	0.023*** (4.34)	0.023*** (4.38)	0.023*** (4.24)	0.008*** (2.76)	0.008*** (2.70)	0.008*** (2.76)	0.008*** (2.69)
BtM_{jt}	-0.001 (-0.32)	-0.001 (-0.26)	-0.001 (-0.06)	-0.001 (-0.29)	-0.001 (-0.72)	-0.001 (-0.70)	-0.001 (-0.47)	-0.001 (-0.67)
$Exchg_{jt}$	0.056*** (5.53)	0.055*** (5.38)	0.056*** (5.36)	0.056*** (5.34)	0.027*** (4.76)	0.026*** (4.69)	0.026*** (4.65)	0.026*** (4.63)
$UScli_{jt}$	0.007 (0.78)	0.006 (0.64)	0.006 (0.62)	0.005 (0.60)	0.004 (0.82)	0.003 (0.69)	0.003 (0.65)	0.003 (0.66)
$cli_litig_{jt-3,t-1}$	0.004 (0.88)	0.005 (0.98)	0.005 (0.90)	0.005 (0.93)	0.001 (0.24)	0.001 (0.32)	0.001 (0.28)	0.001 (0.30)
<i>Industry dummies?</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year dummies?</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of audits	10,256	10,256	10,256	10,256	10,256	10,256	10,256	10,256
Pseudo R-squared	56.04%	55.98%	55.99%	56.18%	75.39%	75.21%	75.10%	75.44%

*, **, *** = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors in columns (1) to (8) are adjusted for time-series dependence by clustering on each audit firm and company (z-statistics in parentheses).

Variable definitions

$|netincome|/ta_{jt}$ = the absolute magnitude of the misstatement of net income divided by the total assets of company j in year t .
 $|equity|/ta_{jt}$ = the absolute magnitude of the misstatement of stockholders' equity divided by the total assets of company j in year t .
See Table 4 for the definitions of all the other variables.

TABLE 6
Misstatement incidence and the recent litigation experiences of Big 4 audit offices.

In Table 6 Eq. (1) is estimated for the clients of Big 4 audit offices during the period 2004 to 2008. The four litigation variables ($aud_lit_{it-3,t-1}$, $nlitigation_{it-3,t-1}$, $nlit/ncli_{it-3,t-1}$ and $aud_lit_high_{it-3,t-1}$) are defined at the audit office level rather than the audit firm level.

Dep. variable =	(1)	(2)	(3)	(4)
$misstate_{jt}$	$misstate_{jt}$	$misstate_{jt}$	$misstate_{jt}$	$misstate_{jt}$
$aud_lit_{it-3,t-1}$	-0.295** (-2.28)			
$nlitigation_{it-3,t-1}$		-0.204*** (-2.85)		
$nlit/ncli_{it-3,t-1}$			-6.488 (-1.47)	
$aud_lit_high_{it-3,t-1}$				-0.286** (-2.19)
$misstate_{jt-1}$	3.928*** (38.78)	3.923*** (38.80)	3.930*** (38.67)	3.929*** (38.78)
lna_{jt}	0.056** (2.37)	0.058** (2.40)	0.054** (2.30)	0.056** (2.36)
$loss_{jt}$	0.105 (0.99)	0.115 (1.10)	0.098 (0.93)	0.105 (1.00)
$M\&A_{jt}$	-0.070 (-0.89)	-0.070 (-0.89)	-0.070 (-0.90)	-0.070 (-0.89)
$S404_{jt}$	-0.374*** (-3.75)	-0.367*** (-3.64)	-0.367*** (-3.69)	-0.374*** (-3.76)
$S404 \times IC_{jt}$	-0.408*** (-3.12)	-0.411*** (-3.11)	-0.406*** (-3.12)	-0.407*** (-3.10)
BtM_{jt}	-0.037 (-0.96)	-0.035 (-0.92)	-0.039 (-0.98)	-0.037 (-0.95)
$Exchg_{jt}$	-0.116 (-0.46)	-0.118 (-0.47)	-0.133 (-0.52)	-0.117 (-0.46)
$UScli_{jt}$	0.134 (0.55)	0.088 (0.32)	0.200 (0.80)	0.134 (0.55)
$cli_litig_{it-3,t-1}$	0.031 (0.37)	0.033 (0.38)	0.030 (0.35)	0.032 (0.37)
Industry dummies?	Yes	Yes	Yes	Yes
Year dummies?	Yes	Yes	Yes	Yes
No. of audit offices	296	296	296	296
No. of audits	17,261	17,261	17,261	17,261

TABLE 6 (cont.)
Misstatement incidence and the recent litigation experiences of Big 4 audit offices.

Pseudo R-squared	39.05%	39.10%	38.97%	39.04%
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*, **, *** = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors in columns (1) to (4) are adjusted for time-series dependence by clustering on each audit office and company (z-statistics in parentheses).

Variable definitions

See Table 4 for the definitions of all the variables.

TABLE 7
Misstatement magnitudes and the recent litigation experiences of Big 4 audit offices.

In Table 7 Eqs. (2) and (3) are estimated for the clients of Big 4 audit offices during the period 2004 to 2008.

Dep. variable =	$(netincome /ta)_{jt}$				$(equity /ta)_{jt}$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$aud_lit_{it-3,t-1}$	-0.003* (-1.80)				-0.002* (-1.93)			
$nlitigation_{it-3,t-1}$		-0.003** (-2.47)				-0.001** (-2.38)		
$nlit/ncli_{it-3,t-1}$			-0.169** (-2.55)				-0.063** (-2.05)	
$aud_lit_high_{it-3,t-1}$				-0.003* (-1.68)				-0.002* (-1.78)
$ netincome /ta_{jt-1}$	1.621*** (38.03)	1.618*** (37.91)	1.620*** (37.88)	1.622*** (38.02)				
$ equity /ta_{jt-1}$					2.036*** (31.30)	2.033*** (31.13)	2.039*** (30.79)	2.037*** (31.22)
lna_{jt}	0.001*** (3.42)	0.001*** (3.44)	0.001*** (3.43)	0.001*** (3.41)	0.001*** (3.12)	0.001*** (3.16)	0.001*** (3.11)	0.001*** (3.11)
$loss_{jt}$	0.001 (0.18)	0.001 (0.25)	0.001 (0.14)	0.001 (0.18)	0.001 (1.33)	0.001 (1.41)	0.001 (1.27)	0.001 (1.32)
$M\&A_{jt}$	-0.002 (-1.51)	-0.002 (-1.50)	-0.002 (-1.49)	-0.002 (-1.51)	-0.001 (-0.27)	-0.001 (-0.25)	-0.001 (-0.28)	-0.001 (-0.27)
$S404_{jt}$	-0.004*** (-2.68)	-0.004*** (-2.65)	-0.004*** (-2.59)	-0.004*** (-2.67)	-0.002** (-1.97)	-0.002* (-1.93)	-0.002* (-1.91)	-0.002* (-1.96)
$S404 \times IC_{jt}$	0.005** (2.23)	0.005** (2.22)	0.005** (2.26)	0.005** (2.23)	0.002** (2.00)	0.002** (2.00)	0.002** (2.04)	0.002** (2.00)

TABLE 7 (cont.)
Misstatement magnitudes and the recent litigation experiences of Big 4 audit offices.

<i>BtM_{jt}</i>	-0.001 (-0.89)	-0.001 (-0.89)	-0.001 (-0.93)	-0.001 (-0.89)	-0.001 (-1.13)	-0.001 (-1.12)	-0.001 (-1.15)	-0.001 (-1.13)
<i>Exchg_{jt}</i>	0.007 (0.98)	0.007 (0.98)	0.007 (0.95)	0.007 (0.98)	0.003 (0.71)	0.002 (0.70)	0.002 (0.66)	0.002 (0.70)
<i>UScli_{jt}</i>	0.001 (0.09)	0.001 (0.04)	0.001 (0.19)	0.001 (0.10)	-0.001 (-0.63)	-0.001 (-0.64)	-0.001 (-0.45)	-0.001 (-0.61)
<i>cli_litig_{jt-3,t-1}</i>	-0.001 (-0.17)	-0.001 (-0.18)	-0.001 (-0.19)	-0.001 (-0.17)	0.001 (0.70)	0.001 (0.69)	0.001 (0.65)	0.001 (0.69)
<i>Industry dummies?</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year dummies?</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of audit offices	296	296	296	296	296	296	296	296
No. of audits	17,261	17,261	17,261	17,261	17,261	17,261	17,261	17,261
Pseudo R-squared	63.37%	63.00%	63.16%	63.43%	84.53%	85.13%	83.98%	84.29%

*, **, *** = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors in columns (1) to (8) are adjusted for time-series dependence by clustering on each audit office and company (z-statistics in parentheses).

Variable definitions

See Table 4 for the definitions of all the variables.

APPENDIX

The Appendix presents the results from a model that predicts how many lawsuits an audit firm is expected to encounter given the audit firm's size and the characteristics of its client portfolio. The residuals from the model indicate whether the audit firm experienced abnormally high litigation (positive residuals) or abnormally low litigation (negative residuals).

The litigation model is shown in Eq. (5):

$$nlitigation_{it} = \alpha_0 + \alpha_1 lnncli_{it} + \alpha_2 mlna_{it} + \alpha_3 \%Exchg_{it} + \alpha_4 \%loss_{it} + \alpha_5 \%UScli_{it} + \alpha_6 \%bankruptcy_{it} + \alpha_7 \%Goingcon_{it} + \alpha_8 mgrowth_{it} + Industry\ effects + Year\ dummies + e_{it}. \quad (5)$$

The dependent variable ($nlitigation_{it}$) equals the number of lawsuits against audit firm i in year t . The models are estimated using negative binomial regression rather than ordinary least squares because the dependent variable (the number of lawsuits) is a discrete count data variable (Rock et al. 2001). The residuals from Eq. (5) are used to identify the unexpected (i.e., abnormal) number of lawsuits incurred in each audit firm-year.

Eq. (5) is estimated using the audit firm year as the unit of observation. This is different from prior studies that investigate the association between audit engagement characteristics and litigation at the client level. Eq. (5) controls for audit firm size using the log of the number of clients of audit firm i in year t ($lnncli_{it}$) (I take logs to reduce the skewness in this variable). The remaining variables control for client portfolio characteristics that could affect an audit firm's exposure to litigation. Larger clients are more likely to sue their auditors, possibly because they have more resources to pay plaintiffs and their attorneys (Lys and Watts 1994; Carcello and Palmrose 1994; Dunbar et al. 1995; Heninger 2001). I control for client size using the mean value of the log of total assets for all of audit firm i 's clients in year t ($mlna_{it}$). I control for the proportion of audit firm i 's clients that are listed on a stock exchange ($\%Exchg_{it}$) and I

control for differences in litigation risk between U.S. and foreign clients using $\%UScli_{it}$, which equals the proportion of i 's clients that are U.S. companies. Companies that perform poorly are more likely to sue their auditors (Bonner et al. 1998; Palmrose and Scholz 2004) and I control for this using $\%loss_{it}$, which is the proportion of i 's clients that report losses. Client bankruptcy is a common predictor of lawsuits against auditors (Bonner et al. 1998; Carcello and Parlrmose 1994; Lys and Watts 1994; Palmrose 1987; St. Pierre and Anderson 1984). I control for this using $\%bankruptcy_{it}$, which is the proportion of audit firm i 's clients that go bankrupt. Following Carcello and Palmrose (1994) and Hall and Stice (1991), I also control for going concern opinions ($\%Goingcon_{it}$) and the growth in sales revenue ($mgrowth_{it}$). Finally, I control for industry effects (i.e., the proportion of i 's clients that belong to each industry sector) and I include indicator variables for each year. The year dummies control for any time-varying changes in the incidence of lawsuits.¹²

Eq. (5) is estimated for the non-Big 4 auditors using three-year rolling windows: 2001-2003, 2002-2004, 2003-2005, 2004-2006, 2005-2007. The results are reported in Table A. The lawsuit models have pseudo R^2 s ranging from 26.43% to 37.69%, indicating that they have reasonable explanatory power. The $lnncli_{it}$ coefficients are positive and highly significant across the five rolling regressions, indicating that audit firms encounter more lawsuits if they audit more SEC registrants. Results for the other independent variables are generally insignificant.

My primary interest is in the residuals from these litigation models as they are used to define the values of the $aud_lit_high_{it-3,t-1}$ treatment variable. For example, positive residuals from the model estimated over the period 2001-2003 would imply that an audit firm in 2004 had

¹² The inferences remain unchanged if I include in Eq. (4) a control variable for the proportion of audit firm i 's clients that issue misstated accounts. In another untabulated test, I obtain similar results when I control for the mean value of total accruals divided by total assets. I do not include the accruals measure in my main tests because it results in significant data attrition due to missing observations.

experienced abnormally high litigation in the previous three years (i.e., $aud_lit_high_{it-3,t-1} = 1$ in 2004). Similarly, negative residuals from this model would imply that an audit firm in 2004 had experienced abnormally low litigation in the previous three years ($aud_lit_high_{it-3,t-1} = 0$ in 2004). The values of $aud_lit_high_{it-3,t-1}$ in the years 2005, 2006, 2007, and 2008 are obtained from the three year rolling windows corresponding to 2002-2004, 2003-2005, 2004-2006, and 2005-2007 respectively (see Table A).

TABLE A
Determinants of the number of lawsuits against non-Big 4 audit firms.

$$nlitigation_{it} = \alpha_0 + \alpha_1 lnncli_{it} + \alpha_2 mlna_{it} + \alpha_3 \%Exchg_{it} + \alpha_4 \%loss_{it} + \alpha_5 \%UScli_{it} + \alpha_6 \%bankruptcy_{it} + \alpha_7 \%Goingcon_{it} + \alpha_8 mgrowth_{it} + \text{Industry effects} + \text{Year dummies} + e_{it}. \quad (5)$$

The litigation models are estimated using negative binomial regression because the dependent variable ($nlitigation_{it}$) is a discrete count data variable. The residuals from Eq. (4) are used to define the treatment and control groups in the following year. For example, residuals from the litigation model estimated for the period 2001 to 2003 are used to define the $aud_lit_high_{it-3,t-1}$ variable for the year 2004. Positive residuals imply that audit firm i experienced abnormally high litigation (treatment group, $aud_lit_high_{it-3,t-1} = 1$), whereas negative residuals imply abnormally low litigation (control group, $aud_lit_high_{it-3,t-1} = 0$).

	(1)	(2)	(3)	(4)	(5)
Sample period	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007
$lnncli_{it}$	1.219*** (9.07)	1.172*** (8.26)	1.352*** (7.51)	1.575*** (9.81)	1.695*** (10.19)
$mlna_{it}$	0.026 (0.08)	0.041 (0.20)	0.102 (0.55)	-0.081 (-0.46)	-0.305* (-1.83)
$\%Exchg_{it}$	1.479 (1.05)	0.047 (0.07)	-0.750 (-0.91)	-0.870 (-0.88)	0.890 (0.64)
$\%loss_{it}$	-0.463 (-0.24)	-0.627 (-0.57)	-0.318 (-0.26)	1.151 (0.84)	3.138* (1.87)
$\%UScli_{it}$	-1.914 (-1.02)	0.454 (0.31)	0.675 (0.48)	1.371 (0.81)	-0.567 (-0.38)
$\%bankruptcy_{it}$	1.871 (0.39)	-5.570 (-0.59)	-8.767 (-0.60)	-47.615*** (-2.82)	-55.095*** (-2.80)
$\%Goingcon_{it}$	0.108 (0.06)	0.442 (0.42)	-0.083 (-0.06)	-1.991 (-1.33)	-4.617*** (-4.06)
$mgrowth_{it}$	0.018 (0.52)	0.012 (0.28)	-0.030 (-0.66)	-0.001 (-0.03)	0.034 (1.25)
Industry effects?	Yes	Yes	Yes	Yes	Yes
Year dummy variables?	Yes	Yes	Yes	Yes	Yes

TABLE A (cont.)
Determinants of the number of lawsuits against non-Big 4 audit firms.

No. of audit firm years	722	891	944	975	972
Pseudo R-squared	35.54%	26.43%	29.73%	31.15%	37.69%

*, **, *** = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors are adjusted for time-series dependence by clustering on each audit firm (z-statistics in parentheses).

Variable definitions

$nlitigation_{it}$ = number of lawsuits against audit firm i in year t . $lnncli_{it}$ = the log of the total number of clients of audit firm i in year t . $mlnta_{it}$ = mean value of the log of total assets for all of audit firm i 's clients in year t . $\%Exchg_{it}$ = the proportion of audit firm i 's clients in year t that are traded on exchanges. $\%loss_{it}$ = the proportion of audit firm i 's clients in year t that report losses. $\%UScli_{it}$ = the proportion of audit firm i 's clients in year t that are U.S. companies. $\%bankruptcy_{it}$ = the proportion of audit firm i 's clients in year t that went bankrupt. $\%Goingcon_{it}$ = the proportion of audit firm i 's clients in year t that received going concern opinions. $mgrowth_{it}$ = mean value of the growth of sales revenue from year $t-1$ to year t for all of audit firm i 's clients.