

**Financial reporting quality and audit firms'  
past experiences of litigation \***

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# Financial reporting quality and audit firms' past experiences of litigation

**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 abnormally high litigation compared with non-Big 4 auditors who did not. This is consistent with my prediction that litigation has a disciplinary effect on small auditors and leads to higher financial reporting quality at their clients.

## I. INTRODUCTION

Civil litigation plays various economic roles in society. First, the judicial process punishes people who have committed wrong and compensates plaintiffs who suffered from the wrongdoing by transferring wealth from the guilty party (Galanter 1986). Second, the threat of being punished deters people from committing wrongful acts in the first place (Friedman 1989; Hansen 1980). A third role is that the experience of being punished motivates people to improve their behavior subsequently (Andenaes 1966; Galanter 1986). It is this third role that motivates the analysis of this study. Specifically, I investigate whether auditors' experiences of litigation in the recent past will lead to subsequent improvements in audit quality and thus enhance the quality of financial reporting at their clients.

There are two reasons that audit firms would improve their quality after they are unexpectedly sued. 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 signal to the audit firm that its quality is not as high as the partners had previously believed. This argument is based on the idea that audit firms are imperfectly informed about the quality of their audits and, thus, 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 the audit firm's normal business operations. Thus, an audit firm may respond to the experience of being sued by raising its preferred level of audit quality. 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 experiences an abnormally high rate of litigation.

I do not necessarily expect, however, that their recent litigation experiences have the same effects on all auditors. Rather, my predictions are different between the Big 4 and non-Big 4 auditors. The Big 4 auditors have already accumulated a wealth of litigation experience due to the fact that they have operated for many years and have many publicly traded clients. Thus, I expect that the Big 4 audit firms are already well informed about the risks of being sued and they would learn relatively little from their encounters with litigation in the recent past. In addition, the Big 4 auditors have sophisticated quality control systems, implying that they would have accurate perceptions of their own quality and do not need to rely on their experiences of litigation to infer the quality of their audits. Moreover, the deep pockets of Big 4 audit firms can attract non-meritorious lawsuits that do not necessarily signal low quality (Dye 1993; Palmrose 1997). Therefore, a Big 4 firm is less likely to draw the inference that it needs to improve its quality after it is sued. In short, I expect that Big 4 auditors are unlikely to change their behavior after they suffer litigation.

In contrast, I expect that lawsuits do affect the subsequent behavior of smaller audit firms. Because small audit firms have few public clients and short histories, they have fewer experiences of being sued and therefore they are likely to have less accurate prior beliefs about the risks of litigation. Thus, litigation is likely to be an informative signal that affects a small audit firm's choice of audit quality. Further, the non-Big 4 audit firms are less likely to be the targets of deep pockets actions and so a non-Big 4 audit firm is more likely to conclude that it can reduce the likelihood of being sued in the future by improving its quality. In short, I posit

that the non-Big 4 auditors react to their experiences of being sued and they respond by improving the quality of their audits.

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 audit quality improves after auditors are sued I would expect an 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 audit firms experience unexpectedly high litigation, I would expect to find fewer misstatements and smaller magnitudes of misstatements subsequent to the lawsuits.

To test my predictions, I identify 629 U.S. lawsuits in the period 2001 to 2008 that allege low quality financial reporting and that cite the auditors as defendants. 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 the audit firm's experience of litigation during the previous three years (2001 to 2003). My litigation measure is then updated for each subsequent year until I reach the end of my sample period in 2008. For example in 2008,

I examine whether financial reporting quality is associated with the audit firm's experience of litigation during the previous three years (2005 to 2007).<sup>1</sup> To identify whether the number of lawsuits in each three year window is unexpectedly high or low, I estimate the residuals from a litigation model that captures the 'normal' rate of litigation for each audit firm. I use these residuals from the rolling windows to measure the audit firm's unexpected experience of litigation in the prior three years. I then test whether financial reporting quality - measured as the inverse of accounting misstatements - improves subsequent to an audit firm experiencing an abnormally high rate of litigation.

Consistent with my predictions, I find no change in financial reporting quality after Big 4 auditors experience high litigation. On the other hand, the results strongly support the prediction that financial reporting quality improves after non-Big 4 auditors encounter high litigation. 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 who previously experienced abnormally high litigation. 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 when I examine financial reporting quality. Rather, my findings suggest that litigation leads to higher financial reporting quality even at the clients that do *not* sue their auditor.

In supplementary analyses, I investigate alternative explanations for the finding that financial reporting quality is higher after non-Big 4 auditors incur high litigation. One alternative explanation is that financial reporting quality is driven by the *ex ante* threat of

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<sup>1</sup> 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.

litigation rather than by the auditor's experience of litigation. A high litigation threat can lead to a high frequency of lawsuits and at the same time it can incentivize auditors to supply high quality audits. If this alternative explanation is correct, I would expect higher financial reporting quality for non-Big 4 auditors in both the prior three year window and in the subsequent year. In contrast, if the non-Big 4 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* non-Big 4 auditors are sued. This goes against the alternative explanation that abnormally high litigation is picking up a high *ex ante* threat of being sued. Rather, it seems that non-Big 4 auditors are changing their behavior in response to their experiences of litigation in the recent past.

A second alternative explanation is that non-Big 4 auditors respond to their recent experiences of litigation by choosing less risky client portfolios. Thus, even if there is no improvement in audit quality, it could be that non-Big 4 auditors react by becoming more careful with respect to the clients they audit. Contrary to this alternative explanation, however, I find no evidence that non-Big 4 audit firms choose less risky client portfolios 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 audit firms' client portfolios.

In another supplementary analysis, I investigate whether audit firms change their fees in response to their past experiences of litigation. Prior studies have shown that audit firms charge higher audit fees when there is a higher litigation threat (Pratt and Stice 1994; Seetharaman et al. 2002; Venkataraman et al. 2008). Therefore, auditors may 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. Consistent with the latter argument, I find no significant change in audit fees after the experience of high litigation. Overall, my results suggest that non-Big 4 auditors respond to their experiences of litigation by improving their audit quality and not by charging higher audit fees.

This paper makes two contributions to the literature. First, Palmrose and Scholz (2004) call for research regarding the impact of litigation on audit quality. I respond to this call by examining whether an audit firm's experience of litigation in the recent past leads to better financial reporting in the future. The study is important because it shows that non-Big 4 audit firms do not keep the same level of quality over time; rather, their quality changes in response to lawsuits in the recent past. In contrast, financial reporting quality does not change in response to the recent litigation experiences of Big 4 auditors.

Second, prior studies examine how the *ex ante* risk of litigation affects audit quality. For example, Geiger et al. (2006) use the passing of the Private Securities Litigation Reform Act to measure an economy-wide change in *ex ante* risk, while Venkataraman et al. (2008) exploit the IPO setting to measure cross-sectional variation in litigation risk across clients. The evidence from these studies suggests that a high *ex ante* threat of litigation deters low quality auditing. My study is different because I argue that small audit firms respond to their own recent experiences of litigation and these responses affect financial reporting quality subsequently. In short, I focus on the *ex post* consequences of actually being sued, whereas prior studies examine the *ex ante* threat of being sued.

The remainder of this paper is organized as follows. Section 2 discusses the prior literature and develops different 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

Early 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) provide evidence 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 auditing in the future.

Litigation has two potential deterrence effects. First, the *ex ante* threat of being sued can deter auditors from supplying low quality audits in the first place. Second, the experience of being sued can cause auditors to improve their quality *ex post*. The extant literature focuses on the first of these, i.e., the *ex ante* threat of litigation. For example, Geiger et al. (2006) show that auditors issue going-concern (GC) opinions less frequently after the Private Securities Litigation Reform Act (1995). They argue that auditors are less likely to issue GC opinions because the Act

lowers the expected costs of being sued. Venkataraman et al. (2008) take a different approach as they measure the cross-sectional variation in *ex ante* litigation risk. Using the IPO setting, their results indicate that audit quality is higher when the risk of being sued is greater. In addition, international studies find that ownership concentration, the cost of equity, and audit pricing are affected by differences in *ex ante* litigation risk across countries (Khurana and Raman 2004; Guedhami and Pittman 2006; Choi et al. 2008; Francis and Wang 2008; Choi et al. 2009).

My study is different because I focus on the *ex post* consequences of litigation rather than the *ex ante* threat. In particular, I investigate whether auditors change their behavior *after* they are sued. One advantage of this approach is that it is relatively easy to identify audit firms' past experiences of litigation whereas their perceptions of the *ex ante* risk of litigation cannot be directly observed.

The idea that people respond to their recent experiences of punishment is discussed in the literatures on law and criminology. Galanter (1986) posits that the experience of going to court and being punished has a preventive benefit because the offender is deterred by the fear of being caught again. In other words, the experience of being punished has an *ex post* deterrent effect that is incremental to the *ex ante* threat that exists even before the wrongdoing occurs. In an early discussion of *ex post* deterrence, 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. He argues that drivers respond *ex post* to their recent experiences of being punished.

*Ex post* changes in behavior are economically rational to the extent that individuals are imperfectly informed and thus can learn from their experiences of being punished. For example, a driver will choose to speed if he believes that he has the ability to evade detection by the police. Through Bayesian learning, this belief becomes stronger over time if the driver

repeatedly speeds without being caught. Once caught, however, the driver rationally revises downwards his beliefs about the likelihood of evading being caught in the future. In other words, the driver who is caught speeding concludes that the prospect of being punished is higher than he had previously thought. In short, the experience of being punished in the past can lead to better behavior in the future because the experience conveys new information to imperfectly informed agents and therefore changes their behavior. This rational learning is modeled analytically by Thakor (2010), who postulates that individuals form 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.

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 et al. 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 plenty of evidence that agents learn from their personal experiences and change their behaviors subsequently (Holt-Reynolds 1992; De Houwer and Beckers 2002; Roth and Erev 1995; Erev and Roth 1998; King and Schwartz 1999).

I predict that an audit firm will modify its behavior if it learns new information from the experience of being sued. Litigation can convey new information to the auditor about either its optimal quality or its actual quality. An audit firm will revise upwards its optimal (i.e., desired) level of audit quality if the auditor learns that the probability of being sued is higher than it had previously believed. The experience of being sued can also convey new information to the

audit firm that its actual quality is lower than it had realized. For example, the lawsuit may reveal inadequacies in staff training or in the firm's quality control procedures. Once the audit firm recognizes 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). Thus, I expect that audit quality will improve after the experience of litigation if the audit firm revises upwards its desired level of quality or if the audit firm realizes that its audit quality is worse than it had previously believed.

There is some anecdotal evidence that audit firms do change their behavior after they are sued. Following a series of lawsuits in the early 1970s, Peat Marwick Mitchell & Company 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."<sup>2</sup> 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 like this, I am unaware of any systematic evidence that audit firms really do alter their behavior after they are sued.

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

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<sup>2</sup> See [www.referenceforbusiness.com/history2/91/KPMG-International.html](http://www.referenceforbusiness.com/history2/91/KPMG-International.html).

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 may be no need for the audit firm to raise its quality when auditing other clients that were not involved in the litigation. Second, a lawsuit could be non-meritorious in which case it would not indicate that the audit firm is systematically providing low quality audits (Palmrose 1997). Thus, an audit firm may not perceive that there is a need to improve its quality even after it is sued.

Further, the extent to which auditors change their behavior following litigation is likely to depend on the size of the audit firm. I argue that the Big 4 auditors are less likely to change their behavior than are the non-Big 4 auditors. The Big 4 have lots of accumulated experiences in litigation because they audit many more public companies than do the small auditors. This can be seen from Table 1, which reports the total number of lawsuits against auditors during the sample period (2001-2008). Among the Big 4, the number of lawsuits ranges from 104 for Deloitte & Touche to 147 for PricewaterhouseCoopers. The Big 4 auditors encounter approximately 16 lawsuits per year, implying that they are familiar with the experience of being sued.

[INSERT TABLE 1 NEAR HERE]

In contrast, the non-Big 4 auditors have far fewer clients and so they encounter fewer lawsuits. As shown in Table 1, there are 353 non-Big 4 audit firms that are not sued at all

during the eight year sample period. There are 33 non-Big 4 audit firms that experience one lawsuit, 6 suffer two lawsuits, and 5 are sued three or more times. These statistics reflect the fact that non-Big 4 auditors have far fewer public company clients than do the Big 4 and so they are rarely sued.

Because the Big 4 auditors have lots of prior experiences of litigation, I expect that they already have an accurate understanding of the risks of litigation. Therefore, the Big 4 auditors are unlikely to change their behavior in response to litigation in the recent past. In contrast, the small auditors are rarely sued. This means that the non-Big 4 auditors are less likely to have well-calibrated beliefs about the likelihood of being sued or the need to improve their quality. For these types of auditors, the experience of being sued is likely to convey new information that subsequently changes their behavior.<sup>3</sup> Thus, I hypothesize that non-Big 4 auditors are likely to improve their quality after they are sued:

*H<sub>1</sub>: Financial reporting quality is higher after non-Big 4 audit firms experience high litigation.*

Although I do not make the same prediction for Big 4 auditors, I conduct the same tests on both Big 4 and non-Big 4 auditors. In particular, I investigate whether misstatements of the annual audited financial statements become less frequent and smaller in magnitude after auditors experience high litigation.

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<sup>3</sup> 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 also have a fair amount of litigation experience. As shown in Table 1, Grant Thornton and BDO Seidman are relatively experienced in litigation as they incur 28 and 36 lawsuits during my sample period. 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 if I use the Big 6 and non-Big 6 designation to partition the sample. They are also unchanged if I use the top 8 auditors. As shown in Table 1, all of the auditors outside of the top 8 have relatively few clients and therefore are rarely sued.

### III. RESEARCH DESIGN

#### Accounting quality and auditors' past experiences of litigation

I use the restatements file in the *Audit Analytics* database to identify misstatements of annual audited financial statements. I focus specifically on restatements of the annual financial statements rather than restatements of quarterly results because the annual accounts are audited. The restatement of a previously audited financial statement provides *prima facie* evidence that the auditor failed to detect and prevent the misstatement that existed in the audited accounts. 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 models of accounting misstatements:

$$\begin{aligned} \text{misstate}_{jt} = & \alpha_0 + \alpha_1 \text{aud\_lit\_high}_{it} + \alpha_2 \text{misstate}_{j,t-1} + \alpha_3 \text{Inta}_{jt} + \alpha_4 \text{loss}_{jt} + \alpha_5 \text{M\&A}_{jt} + \alpha_6 \text{S404}_{jt} + \alpha_7 \\ & \text{S404} \times \text{IC}_{jt} + \alpha_8 \text{BtM}_{jt} + \alpha_9 \text{Exchg}_{jt} + \alpha_{10} \text{UScli}_{jt} + \alpha_{11} \text{cli\_litig}_{jt} + \text{Industry effects} + \\ & \text{Year effects} + e_{jt}. \end{aligned} \quad (1)$$

$$\begin{aligned} |\text{netincome}|/\text{ta}_{jt} = & \alpha_0 + \alpha_1 \text{aud\_lit\_high}_{it} + \alpha_2 |\text{netincome}|/\text{ta}_{j,t-1} + \alpha_3 \text{Inta}_{jt} + \alpha_4 \text{loss}_{jt} + \alpha_5 \text{M\&A}_{jt} + \alpha_6 \\ & \text{S404}_{jt} + \alpha_7 \text{S404} \times \text{IC}_{jt} + \alpha_8 \text{BtM}_{jt} + \alpha_9 \text{Exchg}_{jt} + \alpha_{10} \text{UScli}_{jt} + \alpha_{11} \text{cli\_litig}_{jt} + \text{Industry effects} + \\ & \text{Year effects} + e_{jt}. \end{aligned} \quad (2)$$

$$\begin{aligned} |\text{equity}|/\text{ta}_{jt} = & \alpha_0 + \alpha_1 \text{aud\_lit\_high}_{it} + \alpha_2 |\text{equity}|/\text{ta}_{j,t-1} + \alpha_3 \text{Inta}_{jt} + \alpha_4 \text{loss}_{jt} + \alpha_5 \text{M\&A}_{jt} + \alpha_6 \text{S404}_{jt} + \\ & \alpha_7 \text{S404} \times \text{IC}_{jt} + \alpha_8 \text{BtM}_{jt} + \alpha_9 \text{Exchg}_{jt} + \alpha_{10} \text{UScli}_{jt} + \alpha_{11} \text{cli\_litig}_{jt} + \text{Industry effects} + \\ & \text{Year effects} + e_{jt}. \end{aligned} \quad (3)$$

The dependent variable in Eq. (1) indicates the incidence of accounting misstatements. The *misstate<sub>jt</sub>* dummy variable 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 misstatements:  $|\text{netincome}|/\text{ta}_{jt}$  is the absolute misstatement of net income scaled by total assets;

$|equity|/ta_{it}$  is the absolute misstatement of stockholders' equity scaled by total assets.<sup>4</sup> (In additional analyses, I modify Eqs. (1) to (3) to investigate the signs of the misstatements rather than their absolute magnitudes, i.e., I examine overstatements and understatements separately.)

The treatment variable ( $aud\_lit\_high_{it}$ ) equals one if audit firm  $i$  experienced abnormally high litigation in the previous three years, i.e., years  $t-3$  to  $t-1$ . The  $aud\_lit\_high_{it}$  variable equals zero if the audit firm did not experience abnormally high litigation during the previous three years. For example,  $aud\_lit\_high_{it}$  in year 2004 is measured using audit firm  $i$ 's litigation history in the period from 2001 to 2003. Similarly,  $aud\_lit\_high_{it}$  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.) If financial reporting quality is higher after audit firms experience litigation, I expect fewer misstatements and any misstatements that occur are likely to be smaller in magnitude. This generates the prediction that  $\alpha_1$  is negative in Eqs. (1) to (3).

One issue to resolve is whether an audit firm's recent experience of litigation should be coded as being high ( $aud\_lit\_high_{it} = 1$ ) or low ( $aud\_lit\_high_{it} = 0$ ). Clearly, the raw number of lawsuits would be an unsatisfactory measure because audit firms with more clients tend to incur more litigation (see Table 1). I address this issue in the following section, which provides detailed information about the construction of the  $aud\_lit\_high_{it}$  variable. Another issue to be confronted 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

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<sup>4</sup> 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 variables.

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.<sup>5</sup>

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 the company is subject to SOX Section 404, 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.

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<sup>5</sup> If company A sues auditor X then it is likely that A would not continue to be audited by X following the lawsuit. However, a small number of companies do in fact retain their sued auditors. I avoid this potential confound by dropping these companies from the sample.

( $UScli_{jt}$ ) because these client characteristics could also be associated with financial reporting quality.

The estimation sample excludes any companies that sue their auditors but does not exclude companies or managers who are sued. If a company's 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 ( $cli\_litig_{jt}$ ). On the other hand, there may be no association between the  $cli\_litig_{jt}$  variable and misstatements because many companies are sued for reasons that are unrelated to financial reporting (e.g., they are sued due to wrongful termination of employee contracts).

I 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 my objective is to determine how an audit firm responds to its *own* experience of litigation. For example, a large lawsuit occurring in the year 200X could affect the behavior of *all* auditors in the market, not just the auditor who was sued. 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. My treatment variable ( $aud\_lit\_high_{it}$ ) captures the impact of audit firm  $i$ 's *own* litigation experience on the quality of  $i$ 's audits. The impact of  $i$ 's litigation experience on all other auditors is controlled through the inclusion of year fixed effects.

### **The audit firm's recent experience of litigation**

Prior studies investigate whether audit quality is affected by the *ex ante* threat of litigation, whereas I focus on the audit firm's experience of litigation in the recent past. It is therefore important to ensure that my measure of the audit firm's litigation experience is empirically

distinct from the *ex ante* threat of liability. I control for the *ex ante* threat by estimating a model that predicts the expected number of lawsuits incurred by each audit firm, conditional on the characteristics of the auditor and its clients. The *ex ante* threat of litigation is then the expected number of lawsuits predicted by the model. The residual from the model captures the number of lawsuits experienced by the audit firm beyond what would have been expected *ex ante*. My measure of the audit firm's abnormal litigation experience is, by construction, orthogonal to the *ex ante* threat. Thus, my *ex post* measure of the audit firm's litigation experience is empirically distinct from the *ex ante* threat of being sued.

The litigation model is shown in Eq. (4):

$$nlitigation_{it} = \alpha_0 + \alpha_1 \lnncli_{it} + \alpha_2 big4_i + \alpha_3 mlnta_{it} + \alpha_4 \%Exchg_{it} + \alpha_5 \%loss_{it} + \alpha_6 \%UScli_{it} + \alpha_7 \%bankruptcy_{it} + \alpha_8 \%Goingcon_{it} + \alpha_9 mgrowth_{it} + Industry\ effects + Year\ dummies + e_{it}. \quad (4)$$

The dependent variable ( $nlitigation_{it}$ ) equals the number of lawsuits against audit firm  $i$  in year  $t$ . This is a count data variable that takes non-negative discrete values, so I estimate Eq. (4) using negative binomial regression rather than ordinary least squares (Rock et al. 2001). My model is different from prior studies on audit litigation because Eq. (4) is estimated at the level of the audit firm year. In contrast, prior studies examine audit engagement characteristics that are associated with litigation and so their models are estimated at the level of the company year. Eq. (4) controls for audit engagement characteristics that affect litigation but these characteristics are measured at the portfolio level, i.e., the audit firm year. Therefore, the results from Eq. (4) cannot be directly compared with the findings reported in prior research.

Audit firm size is particularly relevant in explaining the expected number of lawsuits because – as shown in Table 1 – auditors with more clients tend to encounter more lawsuits. I control for auditor 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). I also include a dummy variable,  $big4_i$ , which

equals one if audit firm  $i$  is one of the Big 4, and zero otherwise. The sign on  $big4_i$  could be negative because Big 4 auditors have higher quality and are therefore less likely to be sued (Palmrose 1988), or the sign could be positive if Big 4 auditors are more likely to be sued due to their deeper pockets (Dye 1993). The remaining variables control for client characteristics that affect an audit firm's litigation risk. 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  $t$  ( $mlnta_{it}$ ). 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 Palmrose 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.<sup>6</sup>

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<sup>6</sup> I intentionally do not include measures of financial reporting quality such as accounting misstatements as independent variables in Eq. (4). I exclude these variables because, instead of capturing the *ex ante* risk of litigation, they likely explain the audit firm's unexpected experience of litigation, which is the construct

The primary reason for estimating Eq. (4) is to obtain the residual term, which captures the number of lawsuits experienced by the audit firm beyond what would have been expected *ex ante* given the characteristics of the audit firm and its client portfolio. A positive (negative) residual implies that the audit firm experienced abnormally high (low) litigation. Thus,  $aud\_lit\_high_{it}$  equals one (zero) if the residuals from Eq. (4) are positive (negative). (In untabulated tests, I obtain similar results when I use the continuous measure of the residuals rather than a dummy variable.)

#### 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 period of two years to identify any subsequent restatements of previously issued audited financial statements. I require that data are available from the *Audit Analytics* and *COMPUSTAT* databases for the period 2001-2008 in order to estimate Eqs. (1) to (4). This leaves me with a sample of 401 audit firms, 629 lawsuits against the audit firms for matters relating to financial reporting, 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 lawsuits data are very comprehensive. Another nice feature is that the litigation file identifies the underlying reason for the lawsuit. This is important because the database

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I intend to capture in the residual term. Nevertheless, 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.

includes lawsuits pertaining to matters outside of financial reporting, e.g., labor law. Sometimes audit firms are named as defendants for reasons other than audit failure, for example an audit firm might be sued by its employees for wrongful dismissal. Using the coding in *Audit Analytics*, I avoid including such lawsuits in my sample because I focus on lawsuits that are related to financial reporting *and* that have auditors as defendants.<sup>7</sup>

There are, however, two significant limitations of the litigation data. 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 and 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 litigation measure captures 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, some lawsuits involve non-SEC clients. In such cases, *Audit Analytics* identifies the name of the audit

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<sup>7</sup> 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. I find that auditors are often cited as defendants in such lawsuits. I do not count a lawsuit as being related to financial reporting issues if it is coded by *Audit Analytics* as one of the following: Administrative law, Agriculture law, Americans with disabilities, Antitrust and trade regulation, Bankruptcy, Banks and banking, Civil rights, Collective action, Commerce ICC rates, Commercial contracts, Commercial fraud, Communications and media, Constitutional, Construction law, Consumer credit, Contract - recovery/enforcement, Contract product liability, Contract - marine, Copyright law, Derivative, Director and officer liability, Disability law, Distributor and franchise, Education law, Employment and employee benefits law, Energy law, Entertainment, sports and leisure law, Environmental law, Fair Housing Act, Fair labor standards, First amendment and free speech, Forfeit / penalty - airlines and other, Government contracts, Health and healthcare law, Immigration and naturalization law, Insurance law, International law, Internet law, Labor law, Legal malpractice, Libel and slander, Marine - other, Medicare Act, Miscellaneous, Motion to compel, Multi district litigation, Natural resources law, Negotiable instrument, Other contract, Other property damage, Other statutory actions, Patent law, Personal injury, Personal property, Prisoner rights, Product liability, Professional liability, Property damage, Real estate, Rent lease, RICO, Science & Technology law, State reapportionment, Stock options backdating, Suretyship, Tax, Torts to land, Trademark law, and Voting. I find that auditors are rarely cited as defendants in such lawsuits.

firm from court documents but the location of the audit office is typically not revealed. Second, although the litigation file in *Audit Analytics* reveals the names of all plaintiffs and defendants, these names do not always reveal the entity that was audited. Because the litigation file identifies all lawsuits in which audit *firms* are cited as defendants but I am not able to identify many of the audit offices that conducted the audits, my analysis is at the level of the audit firm rather than at the level of the audit office.

### **Descriptive statistics**

Table 1 reports descriptive statistics on the number of SEC audits and the number of lawsuits against each auditor 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 incidence of litigation, 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). The similarity in litigation rates makes sense given that the Big 4 have many clients and thus their litigation rates are close to the overall population mean (1.45%). This also means that - among the Big 4 audit firms - the residuals from the litigation model are likely to capture random variation in litigation rates rather than systematic differences in audit quality. Accordingly, I posit that Big 4 auditors are unlikely to respond to their recent experiences of litigation.

In contrast, there is considerable cross-sectional variation in the litigation experiences of non-Big 4 auditors. The litigation rates of non-Big 4 auditors range from 0.00% (i.e., no litigation) to 28.57% (i.e., two lawsuits and seven clients). This high variation means that the residuals

from the litigation model likely capture unanticipated differences in quality among the non-Big 4 audit firms. Therefore, I posit that the non-Big 4 auditors can learn new information from the experience of being sued and change their behavior subsequently.

Table 2 reports the incidence rates of lawsuits and accounting misstatements in each 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 general trends by including year indicators in Eqs. (1) to (4).<sup>8</sup>

[INSERT TABLE 2 NEAR HERE]

Table 3 provides descriptive statistics for the variables that are used in the models of accounting misstatements (Eqs. (1) to (3)). The time period is 2004-2008 because I require three prior years of lawsuit data in order to measure the auditor's experience of litigation in the recent past. 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 1,078 (806) Big 4 clients that have misstated numbers for net income (stockholders' equity). On the other hand, there are 334 (245) non-Big 4 clients that have misstated numbers for net income (stockholders' equity). Table 3 also provides descriptive statistics for company size, the book-to-market ratio,

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

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**

The Appendix reports results for the litigation models (Eq. (4)) which are estimated on the three year rolling windows. The models have pseudo R<sup>2</sup>s ranging from 38.96% to 50.16%, indicating that they have reasonable explanatory power. My primary interest is in the residuals from these models as they are used to construct the treatment variable (*aud\_lit\_high<sub>it</sub>*), which indicates whether audit firm *i* encountered abnormally high litigation during the previous three years.

I examine financial reporting quality during each subsequent year (2004-2008) by estimating the models of accounting misstatements in Eqs. (1) to (3). The dependent variables are: *misstate<sub>jt</sub>*,  $|netincome|/ta_{jt}$ , and  $|equity|/ta_{jt}$ . The *misstate<sub>jt</sub>* 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 magnitudes of misstatements.<sup>9</sup> The *misstate<sub>jt</sub>* 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., the 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 all the continuous variables at the 1% and 99% percentiles in order to address the problem of outliers.

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<sup>9</sup> All my inferences remain the same if I divide the magnitudes measures by market capitalization instead of total assets.

I first estimate Eqs. (1) to (3) on the sub-sample of Big 4 audit clients (N = 17,261). In untabulated results, I find insignificant coefficients on *aud\_lit\_high<sub>it</sub>* (z-stats. = -0.18, 0.26, 0.11). Therefore, the evidence does not indicate that financial reporting quality is significantly higher for the Big 4 auditors who experienced high litigation during the previous three years.<sup>10</sup>

Next, I test whether financial reporting quality is higher after the non-Big 4 audit firms experience high litigation. I estimate Eqs. (1) to (3) on the clients of non-Big 4 audit firms (N = 10,256) and the results are shown in Table 4. Col. (1) finds a highly significant negative coefficient on *aud\_lit\_high<sub>it</sub>* (z-stat. = -4.66). Thus, the frequency of accounting misstatements is significantly lower for the clients of non-Big 4 auditors who were recently subject to high litigation. Not only are misstatements less prevalent after litigation, but also their magnitudes are significantly lower. The results in Cols (2) and (3) show significant negative coefficients on *aud\_lit\_high<sub>it</sub>* for misstatements of net income and stockholders' equity (t-stats. = -2.86 and -2.22, respectively).<sup>11</sup> Therefore, misstatements are significantly smaller for the clients of non-Big 4 audit firms who suffered abnormally high litigation during the previous three years. Consistent with H<sub>1</sub>, these results suggest that litigation has a disciplinary effect on non-Big 4 auditors as their clients have higher financial reporting quality subsequently.

[INSERT TABLE 4 NEAR HERE]

### **Overstatements versus understatements**

This section reports results for accounting overstatements and understatements separately. The motivation for this analysis is that auditors are more likely to be sued when clients overstate

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<sup>10</sup> My inferences remain the same if I use a continuous measure of the Big 4 auditors' recent experiences of litigation (i.e., I use the mean of the residuals for each auditor instead of the *aud\_lit\_high<sub>it</sub>* dummy that indicates whether the mean of the residuals is positive or negative).

<sup>11</sup> The majority of small audit firms experience zero lawsuits during my sample period (see Table 1), so as a robustness test I replace *aud\_lit\_high<sub>i</sub>* with an indicator variable that equals one if audit firm *i* is sued at least once during the experience period, and zero if the audit firm is not sued. The findings from this untabulated test are similar to the results reported in Table 4.

rather than understate their net income and stockholders' equity (St. Pierre and Anderson 1984; Kellogg 1984). Thus, auditors have asymmetric loss functions with respect to overstatements and understatements (Hillegeist 1999; Kinney and Martin 1994; Caramanis and Lennox 2008).

I first estimate a multinomial logit model in which the dependent variable indicates one of three possible outcomes: (1) overstatement, (2) understatement, and (3) no misstatement. If auditors respond to litigation by becoming relatively more sensitive to overstatements than understatements, then the *aud\_lit\_high<sub>it</sub>* coefficients are expected to be significantly more negative for overstatements. On the other hand, if the experience of being sued causes auditors to work harder in order to prevent both overstatements and understatements, I expect significant negative coefficients on *aud\_lit\_high<sub>it</sub>* for both types of misstatement and the coefficients are not expected to be significantly different from each other.

Cols. (1) and (2) of Table 5 report the results for the multinomial models of overstatements and understatements respectively, where the no misstatement observations are used as the benchmark comparison group. The coefficients on *aud\_lit\_high<sub>it</sub>* are found to be significantly negative for both overstatements (z-stat. = -4.20) and understatements (z-stat. = -2.52). Therefore, both types of misstatements are less common after non-Big 4 auditors suffer abnormally high litigation. In addition, I find no significant difference in the coefficients on *aud\_lit\_high<sub>it</sub>* between the models for overstatements and understatements ( $\chi^2 = 0.15$ ). Thus, non-Big 4 audit firms are equally likely to prevent overstatements and understatements after they are sued.<sup>12</sup>

[INSERT TABLE 5 NEAR HERE]

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<sup>12</sup> In untabulated results, I continue to find insignificant *aud\_lit\_high<sub>it</sub>* coefficients when the models in Table 5 are estimated on the clients of Big 4 auditors.

The results for the magnitudes of overstatements and understatements are shown in Cols. (3) to (6) of Table 5. The overstatements and understatements of net income are reported in Cols. (3) and (4) while the misstatements of stockholders' equity are shown in Cols. (5) and (6). The coefficients on *aud\_lit\_high<sub>it</sub>* are significantly negative for both overstatements and understatements of net income (z-stats. = -2.30, -1.83 in Cols. (3) and (4)). The *aud\_lit\_high<sub>it</sub>* coefficients are also significantly negative for overstatements and understatements of stockholders' equity (z-stats. = -1.65, -2.57 in Cols. (5) and (6)).

Overall, the results in Table 5 show that the frequency and magnitudes of both overstatements and understatements are lower for non-Big 4 auditors who suffered high litigation during the previous three years. This suggests that litigation motivates non-Big 4 audit firms to exert more effort in detecting and preventing overstatements and understatements in the audited financial statements.

### **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 *ex ante* threat of litigation rather than by the auditor'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.<sup>13</sup>

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<sup>13</sup> The Sarbanes Oxley Act (2002) resulted in large increases in audit fees and clients that experienced fee increases are more likely to change their auditors as a result (Ettredge et al. 2007). Moreover, there is evidence that auditors shed the riskier clients in their portfolios in order to manage their portfolio risk (Johnstone and Bedard 2004).

### *The ex ante threat of litigation*

As explained in the research design section, I orthogonalize the audit firm's recent experience of litigation against the expected number of lawsuits in order to ensure that my treatment variable captures the auditor's actual experience of being sued rather than the predictable threat of being sued. The success of this approach hinges, however, on the reliability of the litigation model (Eq. (4)). Although the model has reasonable explanatory power and controls for many characteristics of audit firms' client portfolios, it may not control for all factors that are relevant to the auditor's expected risk of litigation. To the extent that some relevant factors are omitted, the residuals could partly capture the *ex ante* threat of being sued.

To determine whether this is the case, I examine the association between  $aud\_lit\_high_{it}$  and misstatements during the rolling windows of the previous three years. To the extent that  $aud\_lit\_high_{it}$  captures the *ex ante* threat of litigation, I would expect that it is negatively associated with misstatements in the previous three years. This is because a high threat of litigation would lead to higher audit quality during the previous three year period *as well as* in the subsequent year. On the other hand, if  $aud\_lit\_high_{it}$  is correctly specified, I would expect a significant negative association in the subsequent year but not in the prior period when auditors experience high/low litigation. In other words, financial reporting quality would be higher only after the auditor experiences litigation and not before.

Untabulated results show that  $aud\_lit\_high_{it}$  is statistically insignificant during the rolling windows of the previous three years. These findings run counter to the argument that the  $aud\_lit\_high_{it}$  variable captures an *ex ante* threat of litigation that exists during both the prior three year rolling window and the subsequent year.

### *Client portfolio characteristics*

Another alternative explanation for my results is that auditors adjust their client portfolios in response to their experiences of litigation. In particular, auditors who incur high litigation may switch to less risky clients that have higher quality financial reporting. To test whether audit firms' portfolios become less risky after they experience abnormally high litigation, I estimate Eq. (5) using various client portfolio characteristics as the dependent variables:

$$Characteristic_{it} = \alpha_0 + \alpha_1 aud\_lit\_high_{it} + u_i + d_t + e_{it}. \quad (5)$$

Eq. (5) is estimated using five alternative dependent variables that capture different characteristics of the audit firm's client portfolio. I measure client litigation risk using  $\%lithigh_{it}$  (the proportion of audit firm  $i$ 's clients that operate in high litigation industries),  $\%UScli_{it}$  (the proportion of audit firm  $i$ 's clients that are located in the U.S.), and  $LEVERAGE_{it}$  (the mean value of leverage for audit firm  $i$ 's clients). I measure client profitability using  $ROA_{it}$  (the mean return on assets for audit firm  $i$ 's clients) and  $\%loss_{it}$  (the proportion of audit firm  $i$ 's clients that report losses). These five dependent variables are all measured at the level of the audit firm year. Eq. (5) includes auditor fixed effects ( $u_i$ ) to control for auditor characteristics that remain constant over time. The year fixed effects ( $d_t$ ) control for any time-varying factors that affect auditors' client portfolios.

In all five models, untabulated results indicate that the coefficients on  $aud\_lit\_high_{it}$  are statistically insignificant in Eq. (5). 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 and 5 after dropping the companies whose

auditors resigned. My inferences remain the same when these auditor change observations are dropped from the sample. My conclusions are also unaffected if I drop both companies whose auditors resign and 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 audit firms' client portfolios.

### **How does the auditor's 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 audit fee increases to its clients. Therefore, it is an open question whether the experience of being sued has any effect on audit fees. In untabulated tests, I estimate alternative fee models that have the natural log of audit fees for company  $j$  in year  $t$  as the dependent variable. I find that the  $aud\_lit\_high_{it}$  coefficient is consistently insignificant for the clients of non-Big 4 auditors as well as for the full sample. Therefore, it appears that auditors do not charge higher audit fees in response to their recent experiences of litigation.

## V. CONCLUSIONS

Litigation against auditors can result in higher audit quality in two ways. First, the *ex ante* threat of being sued can deter auditors from supplying low quality audits. Thus, prior studies in the audit literature investigate how auditors behave in the presence of a high *ex ante* risk of litigation. My study is different because I argue that the experience of being sued can convey new information to the auditor that causes a change in their behavior *ex post*. In particular, I predict that the experience of being sued motivates auditors to improve their quality. An advantage of my study is that an audit firm's past experience of litigation can be readily measured, whereas an audit firm's perception of the *ex ante* risk of litigation is more difficult to identify.

The results indicate that misstatements of the audited financial statements are less likely to occur during the period after non-Big 4 auditors suffer 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. The results are different for Big 4 auditors as there is no significant improvement in financial reporting for their clients. This is consistent with the Big 4 auditors not relying on their recent litigation experiences when they infer the quality of their audits. That is, the experience of being sued does not seem to convey new information that causes a change in the behavior of Big 4 auditors.

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 are able to learn from their experiences of being sued and modify their behavior subsequently. However, such learning appears to be confined to the smaller audit firms that

rarely experience litigation because they have relatively few clients. For these types of auditors, there appears to be more scope for litigation to convey new information and therefore change their behavior.

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

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	6,821	104	1.52%
KPMG	6,147	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 & Company	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%
Beckstead & Watts	25	1	4.00%

**TABLE 1 (cont.)**  
**Summary statistics on lawsuits against audit firms (2001-2008).**

Auditor	Number of SEC audits (1)	Number of lawsuits (2)	Col. (2) / Col. (1)
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%
<b>Total</b>	<b>43,515</b>	<b>629</b>	<b>1.45%</b>

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

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*Panel A: Lawsuits against auditors*

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%

  

*Panel B: Accounting misstatements*

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%

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**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<sub>jt</sub></i>	17,261	0.090	0.000	0.000	1.000	0.286
$ netincome /ta_{jt}$	1,078	0.020	0.000	0.009	0.073	0.024
$ equity /ta_{jt}$	806	0.009	0.000	0.006	0.025	0.009
<i>UScli<sub>jt</sub></i>	17,261	0.987	0.000	1.000	1.000	0.114
<i>Exchg<sub>jt</sub></i>	17,261	0.981	0.000	1.000	1.000	0.136
<i>loss<sub>jt</sub></i>	17,261	0.243	0.000	0.000	1.000	0.429
<i>M&amp;A<sub>jt</sub></i>	17,261	0.240	0.000	0.000	1.000	0.427
<i>cli_litig<sub>jt</sub></i>	17,261	0.304	0.000	0.000	1.000	0.460
<i>Inta<sub>jt</sub></i>	17,261	20.567	9.578	20.461	25.133	1.935
<i>BtM<sub>jt</sub></i>	17,261	0.465	-5.819	0.354	6.202	1.044
<i>S404<sub>jt</sub></i>	17,261	0.725	0.000	1.000	1.000	0.446
<i>S404×IC<sub>jt</sub></i>	17,261	0.052	0.000	0.000	1.000	0.223
<i>Panel B: Descriptive statistics for the non-Big 4 sample (2004-2008)</i>						
	Obs.	Mean	Min	Median	Max	S.D.
<i>misstate<sub>jt</sub></i>	10,256	0.092	0.000	0.000	1.000	0.289
$ netincome /ta_{jt}$	334	0.032	0.000	0.020	0.073	0.029
$ equity /ta_{jt}$	245	0.014	0.000	0.014	0.025	0.009
<i>UScli<sub>jt</sub></i>	10,256	0.938	0.000	1.000	1.000	0.242
<i>Exchg<sub>jt</sub></i>	10,256	0.601	0.000	1.000	1.000	0.490
<i>loss<sub>jt</sub></i>	10,256	0.511	0.000	1.000	1.000	0.500
<i>M&amp;A<sub>jt</sub></i>	10,256	0.090	0.000	0.000	1.000	0.287
<i>cli_litig<sub>jt</sub></i>	10,256	0.084	0.000	0.000	1.000	0.277
<i>Inta<sub>jt</sub></i>	10,256	17.094	9.578	17.407	23.658	2.904
<i>BtM<sub>jt</sub></i>	10,256	0.245	-5.819	0.282	6.202	1.200
<i>S404<sub>jt</sub></i>	10,256	0.551	0.000	1.000	1.000	0.497
<i>S404×IC<sub>jt</sub></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<sub>jt</sub>* = one if company *j* misstates its financial report in year *t*, zero otherwise. *big4<sub>i</sub>* = 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<sub>jt</sub>* = 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).  $cli\_litig_{jt}$  = 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

Accounting misstatements and the recent litigation experiences of non-Big 4 audit firms.

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

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

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

The dependent variable in Col. (1) indicates whether company *j* misstates its financial report in year *t* (*misstate<sub>jt</sub>*). The dependent variables in Col. (2) and (3) indicate the absolute magnitudes of the misstatements of net income (*|netincome|/ta<sub>jt</sub>*) and stockholders' equity (*|equity|/ta<sub>jt</sub>*). Col. (1) is estimated using logistic regression whereas Cols. (2) and (3) are estimated using tobit because the dependent variables are truncated. The models are estimated for the clients of non-Big 4 audit firms during the period 2004 to 2008.

Dep. variable =	(1)	(2)	(3)
<i>aud_lit_high<sub>it</sub></i>	<b>-0.516***</b> (-4.66)	<b>-0.016***</b> (-2.86)	<b>-0.006**</b> (-2.22)
<i>misstate<sub>jt-1</sub></i>	2.342*** (13.14)		
<i> netincome /ta<sub>jt-1</sub></i>		0.0003*** (16.83)	
<i> equity /ta<sub>jt-1</sub></i>			0.0003*** (14.26)
<i>lnta<sub>jt</sub></i>	0.051** (2.41)	0.006*** (2.72)	0.003*** (3.78)
<i>loss<sub>jt</sub></i>	0.114 (1.12)	0.002 (0.33)	-0.000 (-0.03)
<i>M&amp;A<sub>jt</sub></i>	0.161 (1.54)	0.013* (1.82)	0.008** (2.56)
<i>S404<sub>jt</sub></i>	-0.512*** (-4.88)	-0.022*** (-3.97)	-0.008*** (-2.76)
<i>S404×IC<sub>jt</sub></i>	0.551*** (4.19)	0.031*** (3.79)	0.011*** (3.18)
<i>BtM<sub>jt</sub></i>	-0.054* (-1.72)	-0.001 (-0.75)	-0.001 (-1.05)

TABLE 4 (cont.)

Accounting misstatements and the recent litigation experiences of non-Big 4 audit firms.

<i>Exchg<sub>jt</sub></i>	-0.071 (-0.87)	0.069*** (5.44)	0.030*** (4.16)
<i>UScli<sub>jt</sub></i>	-0.643*** (-4.59)	0.011 (0.90)	0.003 (0.55)
<i>cli_litig<sub>jt</sub></i>	0.027 (0.22)	0.009 (1.42)	0.003 (0.82)
<i>Industry dummies?</i>	Yes	Yes	Yes
<i>Year dummies?</i>	Yes	Yes	Yes
No. of audits	10,256	10,256	10,256
(Pseudo) R-squared	17.24%	32.30%	47.87%

\*, \*\*, \*\*\* = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors in columns (1) to (3) are adjusted for time-series dependence by clustering on each audit firm and company (z-statistics in parentheses).

Variable definitions

*misstate<sub>jt</sub>* = one if company *j* misstates its financial report in year *t*, 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*. *aud\_lit\_high<sub>it</sub>* = one if audit firm *i* experiences abnormally high litigation in years *t-3* to *t-1*, = zero if audit firm *i* experiences abnormally low litigation in years *t-3* to *t-1*. 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<sub>jt</sub>* = one if company *j* is a U.S. company in year *t*, zero otherwise. *Exchg<sub>jt</sub>* = one if company *j* is traded on an exchange in year *t*, zero otherwise. *loss<sub>jt</sub>* = one if company *j* reports losses in year *t*, zero otherwise. *M&A<sub>jt</sub>* = 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<sub>jt</sub>* = 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. *ln<sub>ta<sub>jt</sub></sub>* = natural log of the total assets of company *j* in year *t*. *BtM<sub>jt</sub>* = book value of equity divided by market value of equity for company *j* in year *t*. *IC<sub>jt</sub>* = one if at least one material weakness is disclosed in company *j*'s internal control report for year *t*, zero otherwise. *S404<sub>jt</sub>* = one if company *j* reports under SOX Section 404 in year *t*, zero otherwise.

**TABLE 5**  
**Overstatements, understatements, and the recent litigation experiences of non-Big 4 audit firms.**

The multinomial logit models in Cols. (1) and (2) indicate whether the company's accounts are overstated or understated (the benchmark comparison is to companies whose accounts are not misstated). The tobit models in Cols. (3)-(6) indicate the magnitudes of the overstatements and understatements. The models are estimated for clients of non-Big 4 auditors from 2004 to 2008.

	Multinomial models of misstatement incidence (benchmark = no misstatement)		Tobit models of misstatement magnitudes			
	Overstated	Understated	<u>Net income</u>		<u>Stockholders' equity</u>	
			Overstated	Understated	Overstated	Understated
	(1)	(2)	(3)	(4)	(5)	(6)
<i>aud_lit_high<sub>it</sub></i>	<b>-0.502***</b> (-4.20)	<b>-0.599**</b> (-2.52)	<b>-0.025**</b> (-2.30)	<b>-0.002*</b> (-1.83)	<b>-0.008*</b> (-1.65)	<b>-0.002**</b> (-2.57)
<i>lagged misstatements</i>	1.790*** (14.91)	2.400*** (9.39)	0.001*** (16.61)	0.001 (1.42)	0.001*** (14.16)	0.057*** (11.77)
<i>ln<sub>it</sub></i>	0.045* (1.88)	0.151*** (3.06)	0.009** (2.03)	0.001*** (2.79)	0.004** (2.48)	0.001*** (3.37)
<i>loss<sub>it</sub></i>	0.107 (0.98)	0.164 (0.89)	0.004 (0.37)	0.000 (0.23)	-0.000 (-0.07)	0.000 (0.52)
<i>M&amp;A<sub>it</sub></i>	0.200* (1.80)	-0.088 (-0.27)	0.028** (2.30)	-0.001 (-0.54)	0.015*** (2.96)	-0.000 (-0.16)
<i>S404<sub>it</sub></i>	<b>-0.614***</b> (-4.64)	<b>-0.282</b> (-1.17)	<b>-0.041***</b> (-4.15)	<b>-0.001</b> (-0.81)	<b>-0.015***</b> (-2.82)	<b>-0.001</b> (-0.73)
<i>S404×IC<sub>it</sub></i>	0.632*** (4.95)	0.519 (1.59)	0.049*** (3.54)	0.004** (2.36)	0.018*** (2.82)	0.002* (1.92)
<i>BtM<sub>it</sub></i>	-0.061* (-1.89)	-0.067 (-1.14)	-0.001 (-0.31)	-0.001** (-2.18)	-0.000 (-0.25)	-0.000*** (-2.62)
<i>Exchg<sub>it</sub></i>	-0.116 (-1.37)	-0.034 (-0.13)	0.099*** (4.65)	0.015*** (3.90)	0.044*** (3.46)	0.006*** (3.21)
<i>UScli<sub>it</sub></i>	<b>-0.671***</b> (-4.62)	<b>-0.402</b> (-1.09)	0.024 (1.19)	-0.002 (-0.48)	0.006 (0.61)	-0.000 (-0.14)
<i>cli_litig<sub>it</sub></i>	0.160 (1.30)	-0.390 (-0.83)	0.027** (2.39)	-0.006* (-1.78)	0.011** (1.98)	-0.002 (-1.44)
<i>Industry dummies?</i>		Yes	Yes	Yes	Yes	Yes
<i>Year dummies?</i>		Yes	Yes	Yes	Yes	Yes

**TABLE 5 (cont.)**  
**Overstatements, understatements, and the recent litigation experiences of non-Big 4 audit firms.**

No. of audit firms	397	397	397	397	397
No. of audits	10,256	10,256	10,256	10,256	10,256
Pseudo R <sup>2</sup>	15.31%	24.88%	47.25%	33.32%	60.41%

\*, \*\*, \*\*\* = statistically significant at the 10%, 5%, 1% level (two-tailed). The standard errors in columns (1) & (2) are adjusted for time-series dependence by clustering on each audit firm (z-statistics in parentheses). The standard errors in columns (3) to (6) are adjusted for time-series dependence by clustering on each audit firm and each company (z-statistics in parentheses).

Variable definitions

$misstate_{jt}$  = one if company  $j$  misstates its financial report in year  $t$ , 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  $t$ .  $aud\_lit\_high_{it}$  = one if audit firm  $i$  experiences abnormally high litigation in years  $t-3$  to  $t-1$ , = zero if audit firm  $i$  experiences abnormally low litigation in years  $t-3$  to  $t-1$ . 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).  $cli\_litig_{jt}$  = 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.

## APPENDIX

The Appendix presents the results for the litigation model in Eq. (4):

$$nlitigation_{it} = \alpha_0 + \alpha_1 lnncli_{it} + \alpha_2 big4_i + \alpha_3 mlnta_{it} + \alpha_4 \%Exchg_{it} + \alpha_5 \%loss_{it} + \alpha_6 \%UScli_{it} + \alpha_7 \%bankruptcy_{it} + \alpha_8 \%Goingcon_{it} + \alpha_9 mgrowth_{it} + Industry\ effects + Year\ dummies + e_{it}. \quad (4)$$

The dependent variable ( $nlitigation_{it}$ ) equals the number of lawsuits against audit firm  $i$  in year  $t$ .

Eq. (4) is estimated using negative binomial regression rather than ordinary least squares because the dependent variable is a discrete count data variable (Rock et al. 2001). The litigation models are estimated using the audit firm year as the unit of observation because my objective is to determine the expected number of lawsuits incurred in each audit firm-year. This is different from prior studies that investigate the association between audit engagement characteristics and litigation against auditors.

Table A reports the results from estimating Eq. (4) on each of the three-year rolling windows: 2001-2003, 2002-2004, 2003-2005, 2004-2006, 2005-2008. The  $lnncli_{it}$  coefficients are positive and highly significant across the five regressions, indicating that audit firms encounter more lawsuits if they audit more companies. The significant positive coefficient on  $big4_i$  indicates that the Big 4 audit firms are more likely to be sued. Results for the other independent variables are generally insignificant.

The residuals from Eq. (4) are used to define the treatment variable in the following year. For example, residuals from the litigation model estimated for the period 2001 to 2003 are used to define the  $aud\_lit\_high_{it}$  variable for the year 2004. Positive residuals in 2001-2003 imply that an audit firm in 2004 experienced abnormally high litigation in the previous three years ( $aud\_lit\_high_{it} = 1$  in 2004). Similarly, negative residuals imply that the auditor experienced abnormally low litigation in the previous three years (control group,  $aud\_lit\_high_{it} = 0$ ).

**TABLE A**  
**Determinants of the number of lawsuits against audit firms.**

$$nlitigation_{it} = \alpha_0 + \alpha_1 lnncli_{it} + \alpha_2 big4_i + \alpha_3 mlnta_{it} + \alpha_4 \%Exchg_{it} + \alpha_5 \%loss_{it} + \alpha_6 \%UScli_{it} + \alpha_7 \%bankruptcy_{it} + \alpha_8 \%Goingcon_{it} + \alpha_9 mgrowth_{it} + Industry\ effects + Year\ dummies + e_{it}. \quad (4)$$

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  $aud\_lit\_high_{it}$  variable for the year 2004. Positive residuals imply that audit firm  $i$  experienced abnormally high litigation (treatment group,  $aud\_lit\_high_{it} = 1$ ), whereas negative residuals imply abnormally low litigation (control group,  $aud\_lit\_high_{it} = 0$ ).

	(1)	(2)	(3)	(4)	(5)
Sample period	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007
$lnncli_{it}$	1.168*** (9.08)	1.135*** (8.37)	1.355*** (8.24)	1.527*** (9.55)	1.657*** (10.00)
$big4_i$	0.987** (1.97)	1.108* (1.92)	0.893** (1.99)	1.352*** (3.74)	1.803*** (6.73)
$mlnta_{it}$	0.239 (0.89)	0.234 (1.27)	0.194 (1.11)	-0.087 (-0.51)	-0.317* (-1.94)
$\%Exchg_{it}$	1.705 (1.20)	-0.256 (-0.33)	-1.149 (-1.39)	-0.961 (-0.98)	0.836 (0.62)
$\%loss_{it}$	-0.448 (-0.28)	-0.161 (-0.17)	-0.087 (-0.08)	1.006 (0.72)	2.990* (1.79)
$\%UScli_{it}$	-2.503 (-1.57)	-0.240 (-0.19)	0.257 (0.19)	1.413 (0.82)	-0.662 (-0.44)
$\%bankruptcy_{it}$	-12.207 (-0.40)	-12.024 (-0.70)	-11.264 (-0.62)	-35.921** (-2.12)	-36.475* (-1.82)
$\%Goingcon_{it}$	0.819 (0.49)	0.548 (0.57)	-0.285 (-0.23)	-2.120 (-1.47)	-4.702*** (-4.21)
$mgrowth_{it}$	0.008 (0.21)	0.009 (0.21)	-0.032 (-0.65)	-0.005 (-0.14)	0.037 (1.41)

**TABLE A (cont.)**  
**Determinants of the number of lawsuits against audit firms.**

<i>Industry effects?</i>	Yes	Yes	Yes	Yes	Yes
<i>Year dummy variables?</i>	Yes	Yes	Yes	Yes	Yes
No. of audit firm years	734	903	956	987	984
Pseudo R-squared	50.16%	40.75%	40.25%	38.96%	44.16%

\*, \*\*, \*\*\* = 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  $t$ .  $big4_i$  = one if audit firm  $i$  is one of the Big 4 audit firms, zero otherwise.  $mlnta_{it}$  = 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.