



# The effect of SOX on small auditor exits and audit quality<sup>☆</sup>

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## ABSTRACT

We find that over six hundred auditors with fewer than 100 SEC clients exit the market following SOX. Compared to the non-exiting auditors, the exiting auditors are lower quality, where quality is gauged by: (1) avoidance of AICPA peer reviews and failure to comply with PCAOB rules, and (2) severity of the peer review and inspection reports. In addition, clients of exiting auditors receive higher quality auditing from successor auditors, as captured by a greater likelihood of receiving going concern opinions. Our results suggest that the PCAOB inspections improve audit quality by incentivizing low quality auditors to exit the market.

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## 1. Introduction

In an effort to improve audit quality in the US capital markets, the Sarbanes-Oxley Act of 2002 (SOX) instituted numerous changes that impact the structure of the audit market and the quality of audit services. The primary purpose of this study is to test how these structural changes affect the quality of audits provided by small audit firms. The audits of small firms (i.e., those with fewer than 100 clients) are inherently important to regulators because they comprise 34% of US public companies and 97% of all audit firms in 2008. However, little is known about cross-sectional differences in audit quality within the small auditor segment since most studies compare the quality of Big N and non-Big N auditors, with non-Big N auditors being treated as a homogenous group.

Our first major finding is that the passage of SOX coincides with a large reduction in the number of small audit firms operating in the market. Of the 1,233 small audit firms that were active during 2001–2008, 607 exited the market, a reduction of nearly 50%. The majority of these exits occur in 2002–2004, coinciding with passage of SOX, the advent of PCAOB registrations, and the beginning of inspections. This reduction is large even after deleting audit firms whose clients have “gone dark.” The presence of fewer small auditors coincides with a doubling of the average number of clients per small audit firm. Thus, we document a significant shift in the composition of the market for small auditors after the

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adoption of SOX. In contrast to the drop in small audit firms, Arthur Andersen is the sole large or medium-sized audit firm to exit the market over this period.

The large reduction in the number of small auditors is consistent with SOX and the new PCAOB enforcement environment imposing costs on small auditors that incentivize them to exit the market. SOX imposes higher costs on all public company auditors by increasing regulatory scrutiny, demanding stricter compliance with auditing standards, and by raising the penalties for auditor misconduct. However, these costs are likely to be proportionally higher for small auditors because there is a fixed cost component of complying with the stricter regulatory standards demanded by the PCAOB. Small auditors, who have a smaller audit fee base, are less able to recover these fixed costs through higher fees and still remain competitive.

In addition, we argue that SOX imposes proportionally higher costs on low quality auditors for several reasons. One is that PCAOB inspections are more likely to uncover misconduct among low quality auditors. This exposes low quality auditors to costly penalties, including large fines and being barred from public practice. In addition, the PCAOB routinely notifies the SEC and the Justice Department of regulatory and criminal violations perpetrated by errant auditors (PCAOB, 2008). The PCAOB registration process is also incrementally more costly for lower quality auditors. Registration requires auditors to make detailed disclosures of their quality control practices and past misconduct, which is apt to draw unwanted regulatory attention to low quality auditors. Taken together, these arguments suggest that low quality auditors are more likely to find it cost beneficial, at the margin, to exit the market for public company audits in response to the new regulatory environment implemented under SOX. Thus, our investigation tests whether the small auditors that exited the market following the passage of SOX tended to be lower quality, and whether their departure is associated with an improvement in audit quality.

We begin by examining whether the exiting audit firms are less likely to have been peer reviewed by the AICPA or inspected by the PCAOB. This test is motivated by the fact that many small auditors of public companies do not receive AICPA peer reviews, or fail to register with the PCAOB, thereby avoiding PCAOB inspections.<sup>1</sup> For the exiting auditors who are peer reviewed or inspected, we then examine whether their peer review or inspection reports are more likely to disclose deficiencies and weaknesses. We examine the content of the peer review and inspection reports because prior literature suggests that unfavorable reports are associated with poor audit quality (i.e., Hilary and Lennox, 2005; Casterella et al., 2009; Gunny and Zhang, 2009).

We find that compared to the non-exiting small audit firms, the exiting auditors are less likely to have undergone an AICPA peer review or a PCAOB inspection. Importantly, the auditors that avoid PCAOB inspections do so by failing to register with the PCAOB, which is a violation of SEC requirements. Moreover, the exiting firms are more likely to receive peer review and inspection reports that contain a larger number of reported weaknesses and deficiencies in virtually all categories we investigate. Importantly, these findings continue to hold after controlling for a variety of factors, including clients who de-register with the SEC (e.g., the clients that “go dark”), audit firm mergers, and “mismatches” in auditor-client size (Shu, 2000). Overall, these findings are consistent with small low quality auditors exiting the market in response to the stricter enforcement environment that followed the passage of SOX.

While the above evidence is consistent with lower quality auditors exiting the market, it does not necessarily follow that audit quality improves after their exodus. The exodus of low quality auditors may not improve audit quality for at least two reasons. First, doubling the average number of clients may overwhelm the non-exiting audit firms, thereby reducing their audit quality. Audit quality may also decline if the newly appointed successor audit firm knows less about the client than the exiting audit firm. Second, if the clients of the exiting auditors demand low quality auditing, they may simply switch to a non-exiting auditor of the same low quality in which case the quality of their audits would not improve. Thus, our next set of tests examine whether the audit quality provided to the clients of the exiting auditors improves under the successor auditors.

Following prior research (e.g., Craswell et al., 2002; DeFond et al., 2002), we use going-concern modified (GC) audit opinions to surrogate for the auditor's propensity to both detect and report problems related to the client's financial condition. The auditor's decision to issue a GC is particularly salient for the small audit firms in our analysis since they issue GC opinions in 48% of the client-years in our sample. The auditor's assessment of whether the client has going-concern problems is somewhat subjective and not merely the result of following a mechanical set of rules. This suggests that auditors have to exercise significant professional judgment and use their discretion when deciding whether it is appropriate to issue a GC opinion. This subjectivity makes it easier for lower quality auditors to yield to client pressure to inappropriately issue clean audit opinions. Thus, as with prior research, we assume that lower quality auditors are less likely to issue GC opinions. Our analysis finds that successor auditors are more likely than exiting auditors to issue GC opinions to the clients of the exiting auditors. This is consistent with the clients of exiting auditors receiving higher quality auditing from their successor auditors, and thus an increase in audit quality for the clients of the exiting auditors.

<sup>1</sup> In September 2007 the SEC charged 39 audit firms with unlawfully auditing public clients without being registered with the PCAOB. In the press release, Linda Chatman Thomsen, director of the SEC's Enforcement Division, states:

*“The Commission is committed to ensuring compliance with the regulatory framework Congress established for auditors of public companies. When these auditors failed to register with the PCAOB, they violated one of the key requirements of Sarbanes-Oxley and evaded the PCAOB's oversight authority. The actions we take today protect investors and will deter future violations of Sarbanes-Oxley's registration provision.” Securities and Exchange Commission (2007).*

Finally, we perform additional analyses to assess whether the decline in small auditors is due primarily to supply side effects, whereby the low quality auditors are incentivized to exit the market; or demand side effects, whereby clients are incentivized to avoid low quality auditors. This analysis consists of examining the incidence of auditor resignations and client defections. We find strong evidence that supply side effects, in general, are relatively more important than demand side effects. In addition, we find that our results are robust to several sensitivity tests. In particular, our results with respect to GC opinions are robust to controlling for financial shocks that may trigger the issuance of GC opinions and controlling for whether the GC opinion precedes or follows a PCAOB inspection (because Gramling et al. (2011) finds that auditors are more likely to issue GC opinions following PCAOB inspections).

Our findings make several important contributions to the literature. First, the results suggest that SOX dramatically changes the structure of the market for small auditors by reducing the number of audit firms and significantly increasing audit firm size and client concentration. Rather than shrink the market for small auditors, regulators apparently intended to expand the available set of public company audit firms outside of the Big 4 following the collapse of Arthur Andersen.<sup>2</sup> Regulators also intended the newly instituted PCAOB inspections to remedially improve audit quality by identifying and rectifying audit firms' deficiencies. In contrast, our findings are consistent with SOX improving audit quality through incentivizing the lower quality audit firms to exit the market. Specifically, SOX imposed proportionally higher costs on low quality audit firms, making it relatively more cost beneficial for them to exit the market.

Second, our work complements two concurrent working papers that test whether audit firms supply higher quality audits after they are inspected by the PCAOB (Carcello and Mastrolia, 2008; Gramling et al., 2011). These studies assess whether the PCAOB inspections fulfill their intended remedial role by changing the level of audit quality. Their research design compares audit quality for a given audit firm in the periods before versus after a PCAOB inspection. For example, Gramling et al. (2011) compares the frequency of GC opinions in the periods before and after PCAOB inspections and concludes that non-Big 4 auditors are more likely to issue GC opinions after PCAOB inspections that disclose auditor deficiencies. Thus, they study the effects of the PCAOB inspections for the small auditors that remain in the market. In contrast, we investigate a very different channel through which the introduction of PCAOB registrations and inspections improved audit quality, namely incentivizing auditors to exit the market. Because most of the auditors that exited the market in our sample did so before being inspected, they are not in the sample examined in Gramling et al. (2011). Thus, while our work complements these studies, the motivation for our analysis, our empirical tests, and our findings are much different.

Third, our study contributes to a wider literature on the consequences of SOX. One line of investigation that somewhat parallels our study finds that SOX incentivizes SEC registrants to de-register, often referred to as "going dark" (Engel et al., 2007; Leuz et al., 2008; Hostak et al., 2008; Piotroski and Srinivasan, 2008). Our findings suggest that by imposing relatively higher costs on lower quality auditors, SOX also incentivizes lower quality auditors to stop auditing SEC registrants, and that the audit firm exits are not explained by client firms de-registering from the SEC. A characteristic our study shares with the "going dark" literature is that we analyze relatively small public companies. Thus, we also contribute to a large and wide-ranging literature that examines a variety of issues related to smaller public companies. For example, Gao et al. (2009) examine whether public companies with market float of \$75 million or less manage the size of their float after SOX; Louis (2005) examines acquisition premiums for clients of non-Big 4 auditors; and Weber and Willenborg (2003) examine the audit opinions of "micro-cap" IPOs.

We acknowledge, however, that our conclusions depend on the reliability of our audit quality measures. In particular, we expect lower quality auditors to be more likely to avoid AICPA peer reviews or fail to register with the PCAOB, and that they are more likely to receive unfavorable review or inspection reports. In addition, we assume that lower quality auditors are more likely to yield to client pressure by issuing fewer GC opinions. However, we emphasize that our conclusions are not based on any single audit quality proxy but are instead based on multiple proxies and we take some comfort in the consistency of the results.

The remainder of the paper is organized as follows. Section 2 discusses the impact of SOX on the structure of the audit market and the potential consequences for audit quality. In Section 3, we compare the exiting and non-exiting auditors with respect to their participation in the AICPA peer review program and compliance with PCAOB registration requirements and the reports that they receive from peer reviewers and PCAOB inspectors. Section 4 tests whether the exiting firms supply lower quality audits than their successors, as measured by the non-issuance of going-concern opinions. Section 5 reports robustness tests, while Section 6 presents our conclusions.

## 2. The impact of SOX and PCAOB enforcement on audit market structure

The PCAOB inspections instituted under SOX impose higher costs on all public company auditors by increasing regulatory scrutiny, requiring stricter compliance with auditing standards, and by subjecting auditors to higher penalties for misconduct. Ostensibly, the PCAOB intends its inspections to play a remedial role in reforming the audit markets by identifying and rectifying poor quality auditing practices. As summarized in the PCAOB's annual report: "The overall objective of the Board's enforcement program is to promote improvements in the quality of public company auditing by taking *remedial* and

<sup>2</sup> SEC Chairman Christopher Cox laments that "...there are modest steps the SEC and AICPA can take together to support competition and choice in the market for smaller public company auditing services."

disciplinary measures...” and “This remediation process is a cornerstone of the PCAOB’s supervisory model of oversight” (emphasis added, PCAOB, 2003, 2007). However, while the primary goal of the PCAOB’s enforcement program is to help auditors increase the quality of the services they provide, it may impose relatively higher costs on some audit firms. Specifically, SOX is likely to impose greater costs on smaller auditors, particularly those that provide low quality audits.

### 2.1. The impact of PCAOB enforcement on small auditors

Small auditors are likely to incur proportionally higher costs after SOX for several reasons. One is that there is likely to be a fixed cost component of more stringent compliance with the high standards of auditor conduct required under SOX. One mechanism through which high auditing standards are enforced is PCAOB inspections, which have a reputation for rigorously enforcing strict compliance with auditing standards (Farrell and Shabad, 2005). Stricter compliance requires auditors to invest in a variety of practice areas that are closely monitored by the PCAOB, such as procedures for client acceptance and retention, partner compensation and review, auditor independence, and staff training. Since small auditors have relatively fewer clients, fewer partners and fewer staff, these investments are proportionally higher for small auditors when compared with large auditors. Fewer clients also mean that small auditors are less able to pass the additional costs to their clients and still remain competitive. Thus, the fixed costs of stricter compliance increase the likelihood that small auditors will find it cost beneficial to cease auditing public companies after SOX.

The PCAOB inspections will also impose additional costs on auditors if the inspections are indiscriminate in criticizing auditor conduct, as some claim. In particular, PCAOB inspectors have been criticized for rebuking auditors over trivial and inconsequential audit weaknesses, and of second-guessing the judgment of well-intentioned auditors.<sup>3</sup> This makes it relatively more cost beneficial for small auditors, who are likely to have relatively fewer public clients, to exit the market for public companies irrespective of their quality. Another reason SOX imposes relatively higher costs for small auditors is that PCAOB inspectors examine a much larger proportion of small auditor clients. Lennox and Pittman (2010) report that inspectors examine an average of 92% of engagements for auditors with two or three clients, compared with 22% of engagements for auditors with between 11 and 99 clients. Because PCAOB inspections have a disruptive impact on auditors’ normal activities (Daugherty and Tervo, 2008), examining a higher proportion of their clients imposes a relatively greater cost on small auditors. In addition, examining a relatively larger sample of audit engagements for smaller auditors means that PCAOB inspectors are more likely to uncover unintentional errors, increasing the chance that the inspections will result in costly penalties.

### 2.2. The impact of PCAOB enforcement on low quality auditors

The new PCAOB enforcement environment is likely to impose proportionally higher costs on low quality auditors for several reasons. One is that low quality auditors are subject to greater scrutiny and harsher penalties as a result of the PCAOB inspections. As noted earlier, the PCAOB inspectors have a reputation for demanding stricter compliance with high standards of auditor conduct. This means that the PCAOB inspections are more likely to uncover audit failures among low quality auditors. In addition, unlike the peer reviewers, the PCAOB inspectors are able to institute disciplinary proceedings against errant auditors, and notify the SEC and the Justice Department of regulatory and criminal violations (PCAOB, 2008).<sup>4</sup> Thus, PCAOB inspections are also more likely to impose higher penalties on lower quality auditors.

Another reason low quality auditors are likely to incur higher costs is that PCAOB registration and compliance is incrementally more costly for low quality auditors. Public company audit firms are required to register with the PCAOB and the registration application requires auditors to submit a Form 1, which discloses the auditor’s quality control policies and any criminal, civil or disciplinary actions or proceedings pending against the auditor. These disclosures are likely to draw unwanted regulatory attention to low quality auditors (i.e., those with poor quality control practices and/or with pending enforcement actions). Thus, the PCAOB application process imposes greater costs on low quality auditors, which means that low quality auditors would find it more cost beneficial to exit the market in order to avoid having to register with the PCAOB. In addition, the PCAOB application requires the auditor to pay a fee, that is nonrefundable even if the application is denied or its registration is later revoked by the PCAOB. This further dissuades low quality auditors to register with the PCAOB because low quality auditors are more likely to have their applications denied or later revoked. Thus, at the margin, it is more cost beneficial for lower quality auditors to exit the market for public company audits.

### 2.3. Changes in audit quality after SOX

A significant reduction in the number of small audit firms potentially impacts audit quality by changing the structure of the audit market. Reducing the number of audit firms, *ceteris paribus*, increases the number of clients per audit firm. But it

<sup>3</sup> As lamented in Farrell and Shabad (2005), “...no issue is too small to be the subject of PCAOB scrutiny.”

<sup>4</sup> These penalties can be quite costly. For example, during 2007, the PCAOB reported the settlement of nine disciplinary proceedings against five audit firms and 10 associated persons, with penalties that included a \$1 million fine, the censuring of several audit firms, and the barring of several individuals from practicing public accounting (PCAOB, 2007).

is difficult to predict whether an increase in the size of the average audit firm is likely to increase or decrease audit quality. Theoretical and empirical research finds that larger auditors, as captured by membership among the Big N, tend to provide higher quality audits (e.g., DeAngelo, 1981). Increasing the average size of small audit firms may therefore enhance audit quality. However, if auditors have difficulties servicing the rapid increase in clients – due to factors such as human resource constraints – an increase in the average size of small audit firms may damage audit quality. Thus, it is ultimately an empirical question whether an increase in client concentration in the market for small auditors improves or erodes audit quality.

In addition to the above factors, SOX introduces a variety of changes unrelated to PCAOB inspections that are likely to influence the demand for audit quality. SOX requires managers to sign off on the veracity of the financial statements and holds them personally accountable should the financial reports prove unreliable. SOX also imposes significantly greater criminal penalties, and requires the managers of restating firms to forfeit bonuses related to overstatements. Requirements for greater management accountability in financial reporting, and increased criminal and financial penalties for misreporting, are likely to increase management's demand for higher quality auditors after SOX, thereby pressuring lower quality small audit firms to exit the market. Thus, we emphasize that it is not just the implementation of the PCAOB inspection regime that is expected to influence the shift in audit quality, but rather a variety of factors that are likely to impact the market demand and supply of audit quality.

### 3. Are the exiting auditors low quality?

#### 3.1. Exiting audit firms and new entrants

Our sample is taken from the audit opinion file in the Audit Analytics database, which covers the audit reports of all SEC registrants from 2001 through 2008. The file contains 120,441 audit engagements, of which 33,533 (27.8%) are performed by auditors with fewer than 100 clients. We choose 100 clients as our cutoff for small auditors because this is the threshold used by the PCAOB.<sup>5</sup> Our analysis focuses on smaller auditors because no large audit firms except for Arthur Andersen exited the market during our sample period.

We classify an audit firm as exiting the market if it no longer audits any SEC registrants and is not registered with the PCAOB at the end of our sample period. (Inactive auditors often maintain their PCAOB registration in anticipation of engaging SEC clients in the future, implying that they have not actually exited the market.) We carefully avoid classifying audit firm name changes as exits and entries using information from the PCAOB's list of audit firm name changes. We supplement this by reviewing all instances in which the company's auditor changes its name and checking the location of the office that signed the report.<sup>6</sup> We classify an audit firm as entering the market if it becomes newly active during our sample period and remains registered with the PCAOB in 2008.

In our sample, there are 1,233 small audit firms (< 100 clients), of which 607 (49%) exit the market during the period of our analysis (Panel A, Table 1).<sup>7</sup> In contrast, Panel B reports that only 197 audit firms enter the market. Since the number of exits far exceeds the number of new entrants, the total number of small audit firms drops significantly, causing the mean number of audit engagements per audit firm to increase from 4.56 in 2001 to 10.59 in 2008. That is, the reduction in small audit firms reduces the number of auditors by approximately one-half, while more than doubling the number of clients per audit firm.

Panel C reports the number of small audit firm exits in each year. Most exits coincide with the passage of SOX (2002) and the introduction of PCAOB registrations (2003) and inspections (2004). Specifically, 115 firms cease to be active in 2002, 139 in 2003, and 140 in 2004.<sup>8</sup> The number then declines sharply over time such that only 33 firms cease activity in 2008. The 96 exits that coincide with all of the auditor's clients de-registering are also concentrated during the first three years, with 44 in 2002, 26 in 2003, and 12 in 2004. The large number of client de-registrations in these three years is explained by the ending of the so-called dot-com bubble, and the propensity of clients to "go dark" or de-list following the passage of SOX (Engel et al., 2007; Leuz et al., 2008; Hostak et al., 2008; Piotroski and Srinivasan, 2008). Because the loss of clients may help explain why some auditors exit the market, we include a control variable ( $\%CLIENT\_DEREG_i$ ) in our

<sup>5</sup> The PCAOB conducts annual inspections of audit firms with 100 or more clients and triennial inspections of audit firms with less than 100 clients. We also perform sensitivity tests that define small audit firms as those with fewer than 10 clients because 95% of the audit firms with fewer than 100 clients have fewer than 10 clients. As reported in our robustness tests in Section 5 our inferences are identical using this alternative specification.

<sup>6</sup> The change in name is often due to partners leaving or joining the firm or an abbreviation of the firm's name. Such cases are obvious from a visual comparison of the two names (e.g., Bagell Josephs & Co becomes Bagell Josephs Levine; Lopez, Blevins Bork & Associates becomes LBB & Associates).

<sup>7</sup> Exiting does not necessarily mean the audit firm ceases operations, it just means it ceases to audit public clients. When a firm leaves the SEC market, it can continue to audit companies that are not SEC registrants and it can provide non-audit services (such as tax services) to all types of clients. However, data are not publicly available on private clients.

<sup>8</sup> Panel C shows that 312 small audit firms cease doing audits during 2002–2004, whereas Read et al. (2004) report only 47 audit firms as exiting between 2002 and 2003. The number of exits reported in Read et al. (2004) is much smaller because they identify their sample from auditor change 8-K filings that self-report the reason for the auditor change. This understates the number of exits because there is no legal requirement to disclose the reason for an auditor change and this information is often not disclosed in the Form 8-K. In addition, small audit firms commonly fail to file 8-K's following an auditor change (Ettredge et al., forthcoming). Thus, the 8-K data do not reliably reveal all instances in which audit firms exit. Importantly, unlike our study, Read et al. (2004) also do not report evidence on the quality of the exiting auditors.

**Table 1**  
Descriptive statistics on the exit and entry of small audit firms.

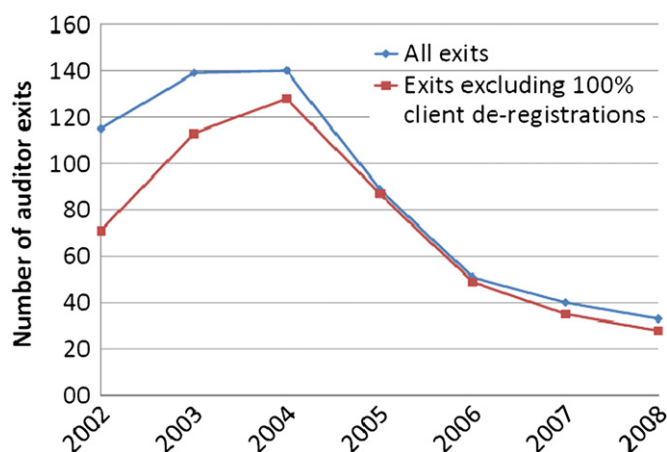
Panel A: Exiting audit firms				
		Number of audit firms		
Small audit firms that are inactive and not registered with the PCAOB at the end of 2008 ( $EXIT_i=1$ )		607		
Remaining small audit firms ( $EXIT_i=0$ )		626		
Total number of small audit firms (2001–2008)		1,233		
Panel B: Entering audit firms				
		Number of audit firms		
Firms that are inactive in 2001 and are registered with the PCAOB at the end of 2008 ( $ENTRY_i=1$ )		197		
Remaining small audit firms ( $ENTRY_i=0$ )		1,036		
Total number of small audit firms (2001–2008)		1,233		
Panel C: Timing of audit firm exits				
Year that the exiting audit firm ceases to be active	Number of audit firms that cease activity		Total	
	Clients do not de-register	All clients de-register		
2002	71	44	115	
2003	113	26	139	
2004	128	12	140	
2005	87	2	89	
2006	49	2	51	
2007	35	5	40	
2008	28	5	33	
Total number of small audit firms that exit the market ( $EXIT_i=1$ )	511	96	607	
Panel D: Timing of audit firm entries				
Year that the entering firm first becomes active	Entering firms			
2002	45			
2003	33			
2004	30			
2005	15			
2006	26			
2007	29			
2008	19			
Total number of small audit firms that enter the market ( $ENTRY_i=1$ )	197			
Panel E: The sizes of small audit firms ( $SIZE_i$ )				
The $SIZE_i$ variable equals the total number of audits by audit firm $i$ divided by the number of years that the firm is active				
	Total	1 client	2–10 clients	11–99 clients
Exiting firms	607	391	196	20
Remaining firms	626	243	306	77
All small audit firms	1,233	634	502	97

regression analysis that measures the percentage of audit firm  $i$ 's clients that deregister from the SEC.<sup>9</sup> Fig. 1 graphically illustrates the 607 auditor exits before and after excluding the 96 audit firms whose clients all de-register from the SEC.

Panel D reports the number of new entrants in each year, where the time of entry is coded by identifying the year that the firm issues its first audit opinion to a SEC client. Unlike exits, we find no distinct pattern in the number of entrants over time, suggesting that SOX did not trigger a large change in the number of entrants. A comparison of Panels C and D indicates that the largest gap between the number of exits and entries occurs around the adoption of SOX (in 2002), the PCAOB registration requirement (which began in 2003), and the advent of PCAOB inspections (in 2004). Specifically, in 2002 there are 45 entries and 115 exits, in 2003 there are 33 entries and 139 exits, and in 2004 there are 30 entries and 140 exits. While exits continue to outpace entries during 2005–2008, the gap narrows considerably. In 2005 there are 15 entrants and 89 exits, in 2006 there are 26 entrants and 51 exits, in 2007 there are 29 entrants and 40 exits, and in 2008 there are 19 entrants and 33 exits. Thus, Panels C and D indicate a disproportionately large number of small audit firm exits, compared to entrants, around events related to greater regulatory monitoring of audit firms.<sup>10</sup>

<sup>9</sup> We also perform sensitivity tests that include a dummy for the 96 audit firms who lose all of their clients, and that delete these 96 firms. As reported in our robustness tests in Section 5, our inferences are identical with these alternative specifications.

<sup>10</sup> SOX was passed in 2002 and the exits closer to that date are most likely to be attributable to the new regulatory regime. However, it is also reasonable to expect audit firms to continue exiting in 2005–2008 as a result of SOX for two reasons. First, many small auditors did not receive their first triennial inspections until 2007 or 2008, and we later provide evidence suggesting that unfavorable reports from these auditors' initial inspections



**Fig. 1.** The number of small audit firms exiting the SEC market in each year, before and after excluding audit firms that lose 100% of their clients because they de-list with the SEC.

Panel E presents the size distribution of the small audit firms that exit the market and those that remain. The majority of audit firms have just one client while there are 97 auditors that have more than ten but fewer than 100 clients. Of the 634 single client auditors, 61.7% exit the market while 38.3% remain; and of the 97 firms that have more than ten clients, only 20.6% exit the market. Since most of the exiting audit firms have only one client, we compare the characteristics of the exiting and remaining clients of the one-client audit firms for the clients with data available on Compustat. In untabulated analysis we find that while the existing clients are significantly smaller than the remaining clients, there is no significant difference in the frequency of losses, the return on assets, the current ratio, or leverage across the two groups. In addition, the industry distributions of the two groups are similar. Thus, this comparison does not suggest that the single client auditors exit as a result of major differences in the characteristics of their clients.

### 3.2. Small auditors' avoidance of AICPA peer reviews and PCAOB inspections

As previously discussed, low quality auditors are more likely to find it cost beneficial to exit the market for public company audits. Thus, the analysis in the remainder of this section tests whether the exiting auditors tend to be lower quality. We expect auditors that avoid AICPA peer reviews or who fail to properly register with the PCAOB, to be avoiding regulatory scrutiny, and hence to be lower quality auditors. In particular, the failure of a public company auditor to register with the PCAOB is *prima facie* evidence that the audit firm has violated SEC requirements.

Table 2 presents descriptive information on the reports issued to audit firms that participate in the AICPA peer review program and that register with the PCAOB. Through the end of 2003 and before the initiation of PCAOB inspections in 2004, all members of the AICPA who audited SEC clients are required to join the SEC Practice Section (SECPS), which requires these audit firms to be peer reviewed every three years. Because peer reviews are required for AICPA members, audit firms can avoid peer reviews during this period by not joining the AICPA. Panel A of Table 2 reports that 1,064 firms are active during the AICPA peer review regime, in the period prior to PCAOB inspections (2001–2003). We find that 746 of these firms have at least one peer review over this time period, consistent with these auditors being members of the AICPA and subjecting themselves to the peer review program. However, we also find that 318 audit firms that are active over this period do not have a single AICPA peer review. One explanation is that these firms purposely avoid being peer reviewed by not joining the AICPA.<sup>11</sup> Thus, in our multivariate tests that explain auditor exits we use the absence of a review (i.e.,  $REVIEW=0$ ) as a surrogate for the audit firm's aversion to regulatory scrutiny.

Panel B of Table 2 analyzes the peer review findings for the 746 audit firms in our sample that are reviewed. Peer reviewers document their findings in reports that are made publicly available on the AICPA website. Reviewers issue one of three types of opinion: unmodified, modified, or adverse. An unmodified opinion is issued if the reviewer does not find serious deficiencies at the audit firm. If serious deficiencies are found, the reviewer issues either a modified or adverse opinion depending on the severity and pervasiveness of the weaknesses. In addition, the reviewer issues a letter that contains comments detailing the nature of any 'significant' weaknesses, which are deemed by the reviewer as being less serious than those found in modified and adverse reports. The three left columns in Panel B report that of the 746 audit firms that are peer reviewed, 394 (52.8%) receive clean reports. That is, the opinion is unmodified and the reviewer

(footnote continued)

triggered some of the exits. Second, a firm could choose to delay its exit given that there is a three-year period between inspections for firms with less than 100 clients. Therefore, it is reasonable to expect that SOX causes auditors to exit during 2005–2008.

<sup>11</sup> We are unable to obtain AICPA membership records during the period of our analysis.

**Table 2**

Participation in the peer review program and compliance with the PCAOB registration requirement.

Panel A: Participation in the peer review program (2001–2003)									
The sample consists of 1,064 small auditors that audit at least one SEC registrant in the period 2001–2003									
							Number		% of auditors
Audit firms that were peer reviewed ( $REVIEWED_i=1$ )							746		70.1
Audit firms that were not peer reviewed ( $REVIEWED_i=0$ )							318		29.9
Total							1,064		
Panel B: The reports issued to 746 auditors that participated in the peer review program ( $REVIEWED_i=1$ )									
Total deficiencies	No.	% of auditors	Engagement deficiencies	No.	% of auditors	Quality control deficiencies	No.	% of auditors	
0	394	52.8	0	414	55.5	0	566	75.9	
1	164	22.0	1	187	25.1	1	125	16.8	
2	89	11.9	2	89	11.9	2	36	4.8	
3	48	6.4	3	42	5.6	3	15	2.0	
4	28	3.8	4	10	1.3	4	4	0.5	
5	16	2.1	5	4	0.5	5	0	0.0	
6	2	0.3	6	0	0.0	6	0	0.0	
7	1	0.1	7	0	0.0	7	0	0.0	
8	2	0.3	8	0	0.0	8	0	0.0	
9	2	0.3	9	0	0.0	9	0	0.0	
Total	746		Total	746		Total	746		
Report type	No.	% of auditors							
Unmodified	713	95.6							
Modified	27	3.6							
Adverse	6	0.8							
Total	746								
Panel C: Compliance with the PCAOB registration requirement (2003–2008)									
The sample consists of 945 small auditors that audit at least one SEC registrant in the period 2003 to 2008									
							No.		% of auditors
Auditors charged with failing to comply with the PCAOB registration requirement ( $NON\_COMPLY_i=1$ )							41		4.3
Auditors not charged with failing to comply with the PCAOB registration requirement ( $NON\_COMPLY_i=0$ )							904		95.7
Total							945		
Panel D: The reports issued to 517 auditors that complied with the registration requirement and were inspected by the PCAOB									
Engagement deficiencies	No.	% of auditors	Types of engagement deficiencies	No.	% of auditors				
0	295	57.1	Failure to perform and document a procedure ( $P\&D_i=1$ )	109	21.1				
1	113	21.9	Failure to identify or address an accounting error ( $ERROR_i=1$ )	46	8.9				
2	56	10.8	Failure to conduct a test or to evaluate an assertion ( $NO\_TEST_i=1$ )	64	12.4				
3	33	6.4	Inadequate procedure ( $INADEQUATE_i=1$ )	99	19.1				
4	13	2.5	"Pervasive" failures ( $PERVASIVE_i=1$ )	7	1.4				
5	3	0.6	Total	325					
6	1	0.2							
7	1	0.2							
8	2	0.4							
Total	517								
Panel E: Participation in the peer review program (2001–2003) and compliance with the PCAOB registration requirement (2003–2008)									
The sample consists of 776 small firms that audit at least one SEC registrant in the period 2001 to 2003 and in the period 2003 to 2008									
						Peer reviewed ( $REVIEWED_i=1$ )	Not peer reviewed ( $REVIEWED_i=0$ )	Totals	
In compliance with the registration requirement ( $NON\_COMPLY_i=0$ )						622	98.7%	115	78.8%
Did not comply with the registration requirement ( $NON\_COMPLY_i=1$ )						8	1.3%	31	21.2%
Total						630		146	776
Test of no association between $NON\_COMPLY_i$ and $REVIEWED_i$ : Chi-square=98.9; $p$ -value < 0.001									

indicates that there are no significant weaknesses. Nearly one half of the audit firms receive peer review reports disclosing one or more weaknesses. The three left columns further indicate that there are 164 auditors (22.0%) with one weakness, 89 (11.9%) with two weaknesses, 48 (6.4%) with three weaknesses, 28 (3.8%) with four weaknesses, and 23 (3.1%) with five or more weaknesses.

Peer review reports classify weaknesses as either engagement or quality control deficiencies, and the remaining columns in Panel B of Table 2 separately analyze each type. Examples of audit engagement deficiencies include: failing to



conduct adequate substantive tests for financial statement items, failing to conduct sufficient tests of internal controls, failing to document adequately the results of the tests, and lack of sufficient audit planning. Examples of deficiencies in the audit firm's quality control systems include: inadequate safeguards to protect auditor independence, inadequate training of personnel, poor controls over client acceptance and continuation decisions, and lack of monitoring within the audit firm. Panel B indicates that engagement deficiencies are more common in our sample than quality control deficiencies. Specifically, only 414 reports (55.5%) indicate no engagement deficiencies, while 566 reports (75.9%) indicate no quality control deficiencies; 332 reports (44.5%) indicate at least one engagement deficiency and 180 reports (24.1%) indicate at least one quality control deficiency.

The bottom of Panel B of Table 2 summarizes the number and percentage of review reports that contain unmodified, modified, and adverse opinions. Most opinions are unmodified, which means that if they contain deficiencies, they are deemed to be significant rather than serious. Specifically, 713 reports (95.6%) contain unmodified opinions, 27 (3.6%) contain modified opinions, and just 6 (0.8%) contain adverse opinions.

As of October 23, 2003, all auditors of public companies must register with the PCAOB and these registrants are named on the PCAOB website. Of our sample audit firms, 945 are active between 2003 and 2008 and thus should be registered with the PCAOB. Panel C of Table 2, however, reports that 41 of our sample firms fail to register with the PCAOB (i.e.,  $NON\_COMPLY_i=1$ ). In 2007 the SEC charged 39 of these firms with failing to comply with the registration requirement (SEC, 2007). Two additional firms are charged with failure to register according to enforcement actions reported on the PCAOB website. Thus, in our multivariate tests that explain auditor exits, we use  $NON\_COMPLY_i=1$  to proxy for the audit firm's aversion to regulatory scrutiny.

Panel D of Table 2 reports information on the contents of the PCAOB inspection reports, and indicates that 517 audit firms in our sample have been inspected by the PCAOB. This is a smaller number of auditors than are in the market prior to the inspections because many audit firms exit before being inspected by the PCAOB. Unlike peer review reports, PCAOB inspection reports do not provide an overall evaluative summary of audit firm quality, and PCAOB inspectors disclose only the deficiencies uncovered in audit engagements. Any deficiencies in an audit firm's system of quality control are redacted in the portion of the PCAOB report that is made public, and thus not available for our analysis. Panel D of Table 2 reports that of 517 audit firms that are inspected, 295 (57.1%) receive reports disclosing no engagement performance weaknesses, 113 (21.9%) disclose one weakness, 56 (10.8%) disclose two weaknesses, 33 (6.4%) disclose three weaknesses, and 20 (3.9%) disclose four or more weaknesses.

To facilitate a more detailed analysis of these engagement performance weaknesses, we classify them into five categories, reflecting the nature of the findings in the PCAOB inspectors' reports. Descriptive statistics for the five categories are reported in Panel D of Table 2. The most common type of deficiency is a failure to perform and document a specific procedure ( $P\&D_i=1$  for 109 auditors). There are 46 reports where the inspectors disclose that the auditors fail to detect and correct accounting errors or issue the wrong types of opinions on the financial statements ( $ERROR_i=1$ ). In 64 cases, the PCAOB inspectors state that the audit firm fails to perform a necessary procedure or fails to evaluate a management assertion ( $NO\_TEST_i=1$ ). In 99 reports, the inspectors comment that the audit firm's procedure or evaluation is inadequate ( $INADEQUATE_i=1$ ). Finally, there are 7 audit firms whose engagements are found to contain pervasive failures.

Our final analysis in Table 2 examines whether the auditors who are not peer reviewed are also less likely to register with the PCAOB (in violation of SEC regulations). The motivation for this analysis is to provide evidence on whether the absence of a peer review is likely to result from these auditors avoiding regulatory scrutiny. Specifically, if auditors choose not to be peer reviewed in order to avoid regulatory scrutiny then auditors without peer reviews are also less likely to register with the PCAOB. Panel E of Table 2 presents a chi-square test of the association between audit firms that do not receive AICPA peer reviews and their failure to register with the PCAOB. This analysis finds a strong positive association between auditors of public companies that do not receive peer reviews and auditors that fail to comply with the PCAOB registration requirement ( $p < 0.001$ ). This suggests that both variables ( $REVIEWED_i$  and  $NON\_COMPLY_i$ ) are reasonable proxies for the same underlying construct, namely the audit firm's avoidance of regulatory scrutiny.

### 3.3. The quality of exiting auditors

We conduct several multivariate tests to assess whether the exiting auditors are lower quality when compared with the small auditors that remain in the market. We first examine whether the exiting audit firms are less likely to voluntarily undergo an AICPA peer review or more likely not to register with the PCAOB and thereby avoid inspection. As stated previously, the absence of an AICPA review or failure to register with the PCAOB is consistent with the auditor avoiding regulatory scrutiny. We also investigate the contents of the peer review and inspection reports for the audit firms that are reviewed or inspected. These contents provide information on the weaknesses and deficiencies uncovered during the peer reviews and inspections. As noted in the prior section, these reports include information about a variety of factors that are likely to be associated with the auditor's quality. Importantly, prior literature suggests that unfavorable reports are associated with poor audit quality (i.e., Hilary and Lennox, 2005; Casterella et al., 2009; Gunny and Zhang, 2009).<sup>12</sup>

<sup>12</sup> We also note, however, that an unpublished working paper (Anantharaman, 2007) finds evidence suggesting that peer review reports lack objectivity.

Because the peer review reports are quite different from the inspections, we perform separate analyses for 2001–2003 (the period during which auditors can voluntarily receive an AICPA peer review), and for 2004–2008 (the period during which public company auditors are required to register with the PCAOB and undergo inspections).

We analyze the reasons for audit firm exits during 2001–2003 by estimating the following regression:

$$\begin{aligned} EXIT_i = & \beta_0 + \beta_1(REVIEWED_i) + \beta_2(REVIEWED_i \times PR\_WEAK_i) + \beta_3(REVIEWED_i \times WEAK\_ENGAGE_i) \\ & + \beta_4(REVIEWED_i \times WEAK\_QC_i) + \beta_5(REVIEWED_i \times MOD\_ADV_i) + \beta_6(REVIEWED_i \times \Delta PR\_MKTSH_i) \\ & + \beta_7(AUDITOR\_SIZE_i) + \beta_8(\%CLIENT\_DEREG_i) + \beta_9(MISMATCH_i) + \varepsilon \end{aligned} \quad (1)$$

where

$EXIT_i$	one if audit firm $i$ exits the market and zero otherwise;
$REVIEWED_i$	one if audit firm $i$ was peer reviewed and zero otherwise;
$PR\_WEAK_i$	the number of weaknesses disclosed in audit firm $i$ 's peer review report;
$WEAK\_ENGAGE_i$	the number of engagement performance deficiencies disclosed in audit firm $i$ 's peer review report;
$WEAK\_QC_i$	the number of quality control deficiencies disclosed in audit firm $i$ 's peer review report;
$MOD\_ADV_i$	one if the peer review report issued to audit firm $i$ was modified or adverse and zero if unmodified;
$\Delta PR\_MKTSH_i$	the change in audit firm $i$ 's market share during the twelve months following the issuance of its peer review report. Following Hilary and Lennox (2005) and Lennox and Pittman (2010), the change in market share is measured as the log of (one plus) the number of clients gained minus the log of (one plus) the number of clients lost;
$AUDITOR\_SIZE_i$	the total number of audits performed by audit firm $i$ divided by the number of years that the firm is active in the market;
$\%CLIENT\_DEREG_i$	the percentage of audit firm $i$ 's clients that de-register from the SEC;
$MISMATCH_i$	the percentage of audit firm $i$ 's clients that switch to larger audit firms ( $> 100$ clients) during the sample period.

The  $REVIEWED_i$  variable tests whether the rate of exit is higher among firms that are not reviewed. A negative coefficient on  $REVIEWED_i$  is consistent with auditors being more likely to exit during the period 2001–2003 if they are averse to regulatory scrutiny. We also expect lower quality firms to receive less favorable peer review reports. We use four variables to capture the content of the reports:  $PR\_WEAK_i$  indicates the total number of weaknesses disclosed in the report;  $WEAK\_ENGAGE_i$  indicates the number of engagement weaknesses;  $WEAK\_QC_i$  indicates the number of quality control weaknesses; and  $MOD\_ADV_i$  indicates whether the auditor received a modified or adverse review opinion.<sup>13</sup> We interact these terms with a dummy variable capturing whether the firm is peer reviewed ( $REVIEWED_i$ ) because there are no reports for the non-reviewed auditors. Both engagement weaknesses and quality control weaknesses indicate lower quality auditors. Thus, if exiting auditors are lower quality, we expect positive coefficients on all four of the interaction terms.

We also include several control variables. We control for the change in the audit firm's market share during the twelve months following the issuance of its peer review ( $REVIEWED_i \times \Delta PR\_MKTSH_i$ ) because audit firms are more likely to exit if they lose SEC clients and because Hilary and Lennox (2005) find a drop in market share among firms that receive review reports with relatively more weaknesses. Thus, we wish to control for the drop in market share as an alternative explanation for finding significance on our variables that capture the audit deficiencies disclosed in the peer review reports. We control for audit firm size ( $AUDITOR\_SIZE_i$ ) because smaller auditors are less able to bear the fixed costs that are associated with SOX compliance. Thus, we expect a negative coefficient on ( $AUDITOR\_SIZE_i$ ).<sup>14</sup> We control for the percentage of clients that de-register from the SEC ( $\%CLIENT\_DEREG_i$ ) because auditors who lose their clients from de-registration have greater incentives to exit. We identify SEC de-registrations by tracking the company's coverage in the Audit Analytics opinion file because the coverage ends when the company ceases to be registered. Finally, we include a control variable ( $MISMATCH_i$ ) that equals the percentage of an audit firm  $i$ 's clients that switch to larger auditors ( $> 100$  clients). This variable is included because Shu (2000) finds that mismatches in auditor-client size are important in explaining auditor resignations. If auditor-client mismatches also help explain why small audit firms exit the market, we expect a positive coefficient on  $MISMATCH_i$ .

We analyze the reasons for audit firm exits during 2004–2008 by estimating the following regression:

$$\begin{aligned} EXIT_i = & \beta_0 + \beta_1(NON\_COMPLY_i) + \beta_2(INSPECTED_i) + \beta_3(INSPECTED_i \times PCAOB\_WEAK_i) \\ & + \beta_4(INSPECTED_i \times P\&D_i) + \beta_5(INSPECTED_i \times ERROR_i) + \beta_6(INSPECTED_i \times NO\_TEST_i) \\ & + \beta_7(INSPECTED_i \times INADEQUATE_i) + \beta_8(INSPECTED_i \times PERVASIVE_i) + \beta_9(INSPECTED_i \times \Delta PCAOB\_MKTSH_i) \\ & + \beta_{10}(AUDITOR\_SIZE_i) + \beta_{11}(\%CLIENT\_DEREG_i) + \beta_{12}(MISMATCH_i) + \varepsilon \end{aligned} \quad (2)$$

<sup>13</sup> We combine the adverse and modified opinions into a single group because there are only six adverse reports (Panel B, Table 2).

<sup>14</sup> We also perform sensitivity tests that measure auditor size based on total client assets and total audit fees rather than the number of clients. As reported in our robustness tests in Section 5 our findings are identical with these alternative specifications.

where

$EXIT_i$	one if audit firm $i$ exits the market and zero otherwise;
$NON\_COMPLY_i$	one if audit firm $i$ was charged with not complying with the PCAOB registration requirement and zero otherwise;
$INSPECTED_i$	one if audit firm $i$ was inspected by the PCAOB and zero otherwise;
$PCAOB\_WEAK_i$	the number of engagement weaknesses disclosed in audit firm $i$ 's PCAOB inspection report;
$P\&D_i$	one if the PCAOB inspection report states that audit firm $i$ failed to "perform and document" an audit procedure and zero otherwise;
$ERROR_i$	one if the PCAOB inspection report states that audit firm $i$ failed to identify or address an accounting error and zero otherwise;
$NO\_TEST_i$	one if the PCAOB inspection report states that audit firm $i$ failed to conduct a necessary test or failed to evaluate management assertions and zero otherwise;
$INADEQUATE_i$	one if the PCAOB inspection report states that audit firm $i$ performed an inadequate procedure and zero otherwise;
$PERVASIVE_i$	one if the PCAOB inspection report of audit firm $i$ states that there were "pervasive" failures to plan, document, and perform required audit procedures and zero otherwise;
$\Delta PCAOB\_MKTSH_i$	the change in audit firm $i$ 's market share during the twelve months following the issuance of its PCAOB inspection report. Consistent with Eq. (1), the change in market share is measured as the log of (one plus) the number of clients gained minus the log of (one plus) the number of clients lost; All remaining variables are as defined in Eq. (1).

The  $NON\_COMPLY_i$  variable tests whether exits are more frequent among auditors that fail to register with the PCAOB. A positive coefficient on this variable is consistent with the exiting firms being averse to regulatory scrutiny. As in Eq. (1), we also expect lower quality firms to receive less favorable inspection reports. We interact the number of weaknesses disclosed in the PCAOB inspection reports ( $PCAOB\_WEAK_i$ ) with a dummy variable capturing whether the audit firms are inspected ( $INSPECTED_i$ ) because there are no reports for firms that are not inspected. We also include interactions with variables that capture the five types of engagement deficiencies presented in Table 2, Panel D (i.e.,  $P\&D_i$ ,  $ERROR_i$ ,  $NO\_TEST_i$ ,  $INADEQUATE_i$ , and  $PERVASIVE_i$ ). If exiting auditors are lower quality, we expect positive coefficients on these interaction terms. Eq. (2) also includes the same control variables as Eq. (1).

### 3.4. Multivariate results

Panel A of Table 3 presents the results from estimating Eq. (1), and Panel B presents the results from estimating Eq. (2). The results in Panel A report that during 2001–2003, the exiting auditors are less likely to be peer reviewed, as indicated by the highly significant negative coefficients on  $REVIEWED_i$ . The reports of auditors that are peer reviewed during this period disclose significantly more total weaknesses ( $REVIEWED_i \times PR\_WEAK_i$ ), more engagement weaknesses ( $REVIEWED_i \times ENGAGE_i$ ), more quality control weaknesses ( $REVIEWED_i \times QC_i$ ), and these auditors are more likely to receive modified or adverse opinions ( $REVIEWED_i \times MOD\_ADV_i$ ). These results are consistent with the exiting auditing firms during 2001–2003 being relatively low quality auditors when compared to the non-exiting audit firms.

As expected, the control variables in columns 1–5 of Panel A indicate that the exiting auditors are significantly smaller ( $AUDITOR\_SIZE_i$ )<sup>15</sup>; that the reviewed auditors are more likely to exit if they lose market share during the twelve months following their peer reviews ( $REVIEWED_i \times \Delta PR\_MKTSH_i$ ); and that the clients of exiting auditors are more likely to de-register from the SEC ( $\%CLIENT\_DEREG_i$ ). However, we do not find that auditor-client mismatch is significantly associated with auditor exits ( $MISMATCH_i$ ).

The results in Panel B of Table 3 report that during 2004–2008, the exiting auditors are more likely to fail to register with the PCAOB, as indicated by the highly significant positive coefficient on  $NON\_COMPLY_i$  (z-stat.=4.87). Panel B also indicates that the inspected auditors are more likely to exit if their reports disclose significantly more weaknesses in total ( $INSPECTED_i \times PCAOB\_WEAK_i$ ), as well as more weaknesses for failing to perform and document procedures ( $INSPECTED_i \times P\&D_i$ ), identify accounting errors ( $INSPECTED_i \times ERROR_i$ ), and conduct tests ( $INSPECTED_i \times NO\_TEST_i$ ), and more failures that are considered pervasive ( $INSPECTED_i \times PERVASIVE_i$ ). We do not, however, find a significant association with weaknesses related to inadequate procedures ( $INSPECTED_i \times INADEQUATE_i$ ). This is consistent with inadequate procedures being not particularly serious, especially when compared with the other weaknesses identified. For example, performing an inadequate procedure is arguably less serious than failing to perform a test altogether ( $P\&D_i$  or  $NO\_TEST_i$ ), or failing to identify an accounting error ( $ERROR_i$ ).

Consistent with our findings in Panel A of Table 3, these results indicate that exiting auditing firms during 2004–2008 are relatively low quality when compared with the non-exiting audit firms. The control variables also find that auditors with

<sup>15</sup> As a robustness check we replace the continuous  $AUDITOR\_SIZE_i$  variable with dummy variables indicating whether the auditor has just one client or more than ten clients. Results are very similar to those tabulated except that the results become insignificant for  $\%CLIENT\_DEREG_i$  and  $REVIEWED_i \times MOD\_ADV_i$ .

**Table 3**

AICPA peer review reports and PCAOB registrations for small audit firms that exit.

The dependent variable is  $EXIT_i$  in each regression. The models are estimated using logistic regression with standard errors that are robust to heteroskedasticity (z-statistics are shown in parentheses).

Panel A: AICPA peer review reports for small audit firms that exit							
The sample consists of 1,064 small firms that audit at least one SEC registrant in the period 2001 to 2003							
	(1)	(2)	(3)	(4)	(5)		
$REVIEWED_i$	-2.26 (-11.04)***	-2.45 (-11.55)***	-2.47 (-11.62)***	-2.35 (-11.28)***	-2.30 (-11.22)***		
$REVIEWED_i \times PR\_WEAK_i$		0.18 (2.88)***					
$REVIEWED_i \times WEAK\_ENGAGE_i$			0.27 (3.35)***				
$REVIEWED_i \times WEAK\_QC_i$				0.21 (1.94)*			
$REVIEWED_i \times MOD\_ADV_i$					0.68 (1.79)*		
$REVIEWED_i \times \Delta PR\_MKTSH_i$		-0.59 (-3.48)***	-0.62 (-3.72)***	-0.63 (-3.63)***	-0.61 (-3.52)***		
$AUDITOR\_SIZE_i$	-0.10 (-4.74)***	-0.10 (-4.89)***	-0.10 (-4.96)***	-0.10 (-4.84)***	-0.10 (-4.82)***		
$\%CLIENT\_DEREG_i$	0.68 (2.49)**	0.72 (2.58)**	0.73 (2.63)**	0.70 (2.55)**	0.70 (2.53)**		
$MISMATCH_i$	0.50 (0.93)	0.49 (0.89)	0.48 (0.88)	0.45 (0.82)	0.49 (0.91)		
Intercept	2.17 (10.17)***	2.17 (10.19)***	2.17 (10.20)***	2.17 (10.19)***	2.16 (10.18)***		
Total obs.	1,064	1,064	1,064	1,064	1,064		
Exiting audit firms	569	569	569	569	569		
Non-exiting audit firms	495	495	495	495	495		
Pseudo $R^2$ (%)	22.82	24.54	24.62	24.10	24.07		
Panel B: PCAOB registrations and inspections for small audit firms that exit (do not exit)							
The sample consists of 945 small firms that audit at least one SEC registrant in the period 2003 to 2008							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$NON\_COMPLY_i$	2.49 (4.87)***						
$INSPECTED_i$		-3.02 (-15.34)***	-3.40 (-14.51)***	-2.77 (-14.49)***	-2.68 (-14.17)***	-2.59 (-13.89)***	-2.65 (-14.55)***
$INSPECTED_i \times PCAOB\_WEAK_i$		0.51 (4.75)***					
$INSPECTED_i \times P\&D_i$			2.22 (7.51)***				
$INSPECTED_i \times ERROR_i$				1.38 (3.72)***			
$INSPECTED_i \times NO\_TEST_i$					0.62 (1.69)*		
$INSPECTED_i \times INADEQUATE_i$						-0.10 (-0.27)	
$INSPECTED_i \times PERVASIVE_i$							1.73 (2.21)**
$INSPECTED_i \times \Delta PCAOB\_MKTSH_i$		-0.35 (-1.56)	-0.54 (-2.08)**	-0.61 (-2.83)***	-0.59 (-2.78)***	-0.64 (-2.89)***	-0.63 (-2.80)***
$AUDITOR\_SIZE_i$	-0.08 (-4.34)***	-0.07 (-3.99)***	-0.05 (-4.07)***	-0.06 (-4.22)***	-0.06 (-4.12)***	-0.05 (-3.97)***	-0.05 (-4.09)***
$\%CLIENT\_DEREG_i$	0.25 (0.77)	-0.78 (-2.36)**	-0.81 (-2.47)**	-0.75 (-2.30)**	-0.73 (-2.24)**	-0.72 (-2.23)**	-0.74 (-2.28)**
$MISMATCH_i$	2.15 (2.96)***	1.12 (1.16)	1.30 (1.22)	0.97 (1.11)	1.13 (1.22)	1.13 (1.21)	1.16 (1.23)
Intercept	-0.28 (-2.19)**	1.17 (7.83)***	1.10 (7.64)***	1.11 (7.73)***	1.10 (7.66)***	1.08 (7.59)***	1.09 (7.64)***
Total obs.	945	945	945	945	945	945	945
Exiting audit firms	353	353	353	353	353	353	353
Non-exiting audit firms	592	592	592	592	592	592	592
Pseudo $R^2$ (%)	9.78	33.07	30.11	29.29	28.54	28.35	28.67

\*\*\*, \*\*, \* = statistically significant at the 1%, 5%, 10% levels (two-tailed), respectively.

$EXIT_i$  = one if audit firm  $i$  exits the market; = zero otherwise.  $REVIEWED_i$  = one if audit firm  $i$  was peer reviewed; = zero otherwise.  $PR\_WEAK_i$  = the total number of deficiencies disclosed in audit firm  $i$ 's peer review report.  $WEAK\_ENGAGE_i$  = the number of engagement performance deficiencies disclosed in audit firm  $i$ 's peer review report.  $WEAK\_QC_i$  = the number of quality control deficiencies disclosed in audit firm  $i$ 's peer review report.  $MOD\_ADV_i$  = one if the peer review report issued to audit firm  $i$  was modified or adverse; = zero if unmodified.  $\Delta PR\_MKTSH_i$  = the change in audit firm  $i$ 's market share during the twelve months following the issuance of its peer review report.  $AUDITOR\_SIZE_i$  = the total number of audits performed by audit firm  $i$  divided by the number of years that the firm is active in the market.  $\%CLIENT\_DEREG_i$  = the percentage of audit firm  $i$ 's clients that de-register from the SEC.  $MISMATCH_i$  = the percentage of audit firm  $i$ 's clients that switch to larger audit firms (> 100 clients) during the sample period.  $NON\_COMPLY_i$  = one if audit firm  $i$  was charged with not complying with the PCAOB registration requirement and zero otherwise.  $INSPECTED_i$  = one if audit firm  $i$  was inspected by the PCAOB; = zero otherwise.  $PCAOB\_WEAK_i$  = the total number of deficiencies disclosed in audit firm  $i$ 's PCAOB report.  $P\&D_i$  = one if the PCAOB inspection report states that audit firm  $i$  failed to "perform and document" an audit procedure; = zero otherwise.  $ERROR_i$  = one if the PCAOB inspection report states that audit firm  $i$  failed to identify or address an accounting error; = zero otherwise.  $NO\_TEST_i$  = one if the PCAOB inspection report states that audit firm  $i$  failed to conduct a necessary test or failed to evaluate management assertions; = zero otherwise.  $INADEQUATE_i$  = one if the PCAOB inspection report states that audit firm  $i$  performed an inadequate procedure; = zero otherwise.  $PERVASIVE_i$  = one if the PCAOB inspection report of audit firm  $i$  states that there were "pervasive" failures to plan, document, and perform required audit procedures; = zero otherwise.  $\Delta PCAOB\_MKTSH_i$  = the change in audit firm  $i$ 's market share during the twelve months following the issuance of its PCAOB inspection report.

no weaknesses in their inspection reports are less likely to exit (*INSPECTED*), holding the auditor's market share constant (i.e.,  $\Delta\text{PCAOB\_MKTSH}_i=0$ ). In addition, the control variables found to be significant in Panel A of Table 3, are generally significant in Panel B.

Overall, the evidence in this section is consistent with the exiting audit firms supplying lower quality audits relative to the firms that remain in the market.<sup>16</sup> However, it does not provide direct evidence on whether audit quality improves following the exit of the small auditors. In the next section we test whether audit quality increases as a result of lower quality auditors exiting the market.

#### 4. Does audit quality improve after auditors exit the market?

##### 4.1. Research design

We use going-concern audit opinions to test whether audit quality improves for the clients of the exiting auditors under the successor auditors. Following prior research, we assume that a going-concern opinion (GC) is issued if the auditor has both discovered and reported a problem with the client's financial condition. We test whether exiting firms are less likely to issue GC opinions by estimating the coefficients in the following model:

$$GC_{jt} = \beta_0 + \beta_1(EXIT_{jt}) + \beta_2(PRE\_EXIT_{jt}) + \beta_3(AUDITOR\_SIZE_{jt}) + \beta_4(ENTRY_{jt}) + \beta_5(POST\_ENTRY_{jt}) + \beta_6(CLIENT\_DEREG_{jt}) + \beta_7(OLD_{jt}) + \beta_8(NEW_{jt}) + \beta_9(LTA_{jt}) + \beta_{10}(REPORT\_LAG_{jt}) + \beta_{11}(CURRENT_{jt}) + \beta_{12}(LEVERAGE_{jt}) + \sum \beta(YEAR\_DUMMIES) + \varepsilon \quad (3)$$

where

$GC_{jt}$	one if company $j$ receives a going-concern audit opinion in year $t$ and zero otherwise;
$EXIT_{jt}$	one if company $j$ is audited in year $t$ by a firm that exits the market or by the successor firm and zero otherwise;
$PRE\_EXIT_{jt}$	one if company $j$ is audited in year $t$ by a firm that exits the market and zero otherwise;
$AUDITOR\_SIZE_{jt}$	the total number of audits performed by company $j$ 's audit firm in year $t$ ;
$ENTRY_{jt}$	one if company $j$ is audited in year $t$ by a firm that enters the market or by the predecessor firm and zero otherwise;
$POST\_ENTRY_{jt}$	one if company $j$ is audited in year $t$ by a firm that enters the market and zero otherwise;
$CLIENT\_DEREG_{jt}$	one if company $j$ issues its final financial statements in year $t$ before becoming de-registered from the SEC and zero otherwise;
$OLD_{jt}$	one if the audit is performed by an outgoing audit firm and zero if the audit is by a firm that will be retained in the following year;
$NEW_{jt}$	one if the audit is performed by a newly appointed audit firm and zero if the audit is by a retained incumbent firm;
$LTA_{jt}$	log of total assets for company $j$ in year $t$ ;
$LOSS_{jt}$	one if company $j$ reports a loss in year $t$ and zero otherwise;
$REPORT\_LAG_{jt}$	number of days from the fiscal year-end to the auditor's signature date;
$CURRENT_{jt}$	current assets divided by current liabilities;
$LEVERAGE_{jt}$	total liabilities divided by total assets;
$YEAR\_DUMMIES$	dummy variables capturing each year in our analysis.

Our primary variable of interest is  $PRE\_EXIT_{jt}$ , which captures the difference in GC rates between the exiting audit firms and their successor audit firms, for the clients of the exiting audit firms. To explain the interpretation of the coefficient on  $PRE\_EXIT_{jt}$ , we present a hypothetical example. Suppose that Client Co. is audited by auditor X in the period before X exits the market. After X exits, Client Co. is audited by successor auditor S. The  $EXIT_{jt}$  variable is coded one when Client Co. is audited by either X or S, and coded zero for all non-exiting clients. The  $PRE\_EXIT_{jt}$  variable equals one during the period when Client Co. is audited by X, and zero otherwise. Thus, the coefficient on  $PRE\_EXIT_{jt}$  ( $\beta_2$ ) captures the difference in GC rates between the exiting and successor audit firms for the clients of the exiting audit firms. If audit quality is lower among the exiting auditors than their successors, we expect the exiting auditors are less likely to issue GC opinions (i.e.,  $\beta_2 < 0$ ). The  $EXIT_{jt}$  variable controls for the characteristics of clients that are first audited by the exiting audit firms and then audited by the successor audit firms.

We include auditor size ( $AUDITOR\_SIZE_{jt}$ ) because we expect smaller auditors to provide lower quality audits (DeAngelo, 1981). In addition, one reason audit quality may improve following the exodus of small auditors is that their successor firms are likely to be larger. In other words, if we find a significantly negative coefficient on  $PRE\_EXIT_{jt}$ , it may partially be explained by the difference in size between exiting and successor auditors. We evaluate this explanation by

<sup>16</sup> In untabulated tests we find no significant difference in audit quality between the firms that enter the market and the firms that do not enter. Therefore, for the sake of brevity, our focus is on the firms that exit the market rather than the firms that enter.

comparing the coefficient on  $PRE\_EXIT_{jt}$  in the GC regression before and after including auditor size as an independent variable. We expect larger negative coefficients for  $PRE\_EXIT_{jt}$  in the models that do not control for auditor size if size is a channel through which the audit firm departures improve audit quality.

We control for whether the company de-registers from the SEC ( $CLIENT\_DEREG_{jt}$ ) because de-registrations may be triggered by financial distress which increases the likelihood of a GC opinion. We also include variables to capture newly entering auditors since the successor auditors can also be new entrants. The  $ENTRY_{jt}$  and  $POST\_ENTRY_{jt}$  variables are analogous to  $EXIT_{jt}$  and  $PRE\_EXIT_{jt}$  except that the comparison is between new entrants and their predecessors rather than exiting auditors and their successors. For example, suppose Client Co. is first audited by audit firm P, then new auditor E enters the market for the first time, succeeding P in auditing Client Co. The  $ENTRY_{jt}$  variable equals one when Client Co. is audited by either P (the predecessor auditor), or E (the entering auditor), and zero otherwise. The  $POST\_ENTRY_{jt}$  variable equals one when Client Co. is audited by E, and zero otherwise. The  $POST\_ENTRY_{jt}$  variable therefore captures the difference in GC rates between the entering audit firms and their predecessors. While we do not have signed predictions for the coefficients on  $ENTRY_{jt}$  and  $POST\_ENTRY_{jt}$  we include these variables as controls in case they are omitted correlated variables.

A potential alternative explanation for finding significant coefficients on  $PRE\_EXIT_{jt}$  and  $POST\_ENTRY_{jt}$  is that these variables pick up the effects of auditor changes. An auditor change occurs every time a client leaves an exiting auditor or engages a new entrant. To control for this potential confound we include the variable  $NEW_{jt}$ , which equals one if the audit is performed by a newly appointed audit firm and zero otherwise; and  $OLD_{jt}$ , which equals one if the audit is performed by a predecessor audit firm and zero otherwise. A newly appointed audit firm who is suspicious about the motive for an auditor change may be more likely to issue a GC opinion. If so, we will find a positive coefficient on  $NEW_{jt}$ . Prior research finds that GC rates are abnormally high in the year prior to a change of auditor (e.g., Chow and Rice, 1982), so we expect a positive coefficient on  $OLD_{jt}$ .

Importantly, we also include  $YEAR\_DUMMIES$ , which control for any economy-wide temporal changes in the issuance of going concern opinions over the period of our analysis. This is an important control in our setting because SOX may have incentivized auditors to become more conservative and increase their tendency to issue GC opinions over the period of our analysis. We also include several control variables commonly used in the literature on GC opinions, including the log of client total assets ( $LTA_{jt}$ ), a dummy capturing losses ( $LOSS_{jt}$ ), the report lag ( $REPORT\_LAG_{jt}$ ), the current ratio ( $CURRENT_{jt}$ ), and  $LEVERAGE_{jt}$ .

#### 4.2. Univariate tests

Table 4 provides descriptive statistics on the issuance of GC opinions in our sample. Panel A indicates that the GC rate is 48.44% for the small audit firms, 14.84% for the medium-sized audit firms, and 3.31% for the Big N firms. The GC rates of small audit firms are considerably higher because their clients are, on average, in poorer financial health. The relatively high GC rate for small firms increases the power of our tests because the going-concern reporting decision is highly salient for these audit firms.

Panel B reports univariate tests of whether the exiting firms are less likely than their successors to issue GC opinions. If the exiting firms are lower quality we expect their GC rates to be significantly lower. The results in Panel B strongly support this prediction. The GC rate is 52.58% for the exiting firms, compared with 61.24% for their successor firms. The difference is large and statistically significant ( $t$ -stat. = -8.38).

Panel C compares the GC rates for the entering audit firms and their predecessors. The GC rate is 61.66% for the entering audit firms, compared with 63.50% for their predecessor audit firms, and the difference is insignificant. This suggests that entering audit firms do not provide higher quality audits compared with their predecessors.

Panel D reports the GC rates for all small audit firm observations after partitioning by the  $EXIT_{jt}$  and  $ENTRY_{jt}$  variables. GC rates are much higher for the exiting and successor firms, compared with the clients of all other small audit firms (56.88% versus 45.30%,  $t$ -stat. = 18.98). Similarly, the GC rates are much higher for the newly entering auditors and their predecessor firms, compared with the clients of all other small firms (62.43% versus 45.37%,  $t$ -stat. = 24.23). These results are consistent with the exiting and entering audit firms having clients that are in relatively poor financial condition. We control for this clientele effect by including  $EXIT_{jt}$  and  $ENTRY_{jt}$  as independent variables in the multivariate GC model (equation 3).

#### 4.3. Multivariate tests

Table 5 presents the results of estimating equation (3) for the clients of small audit firms. We begin in columns (1) and (2) by looking at our variables of interest, along with year dummy variables ( $N = 33,533$ ). The sample drops to 26,456 in columns 3 and 4 because we require data in consecutive years in order to construct the  $OLD_{jt}$  and  $NEW_{jt}$  variables. In columns 5 and 6 we include additional control variables from the Audit Analytics database, dropping the sample to 15,239; and in columns 7 and 8 we include variables from Compustat, lowering the sample to 9,177.

All eight models find that the coefficient on  $PRE\_EXIT_{jt}$  is significantly negative, consistent with exiting auditors being less likely to issue GC opinions when compared with their successors. This is consistent with our univariate tests in Panel B of Table 4, and corroborates the Table 3 evidence that the exiting auditors are relatively low quality. We also find that the coefficient on auditor size ( $AUDITOR\_SIZE_{jt}$ ) is significantly positive in all of the regressions in which it is included. This is consistent with the arguments in DeAngelo (1981) that smaller audit firms offer lower quality audits compared with larger firms. Interestingly, the control for auditor size reduces the magnitude of the negative coefficient on  $PRE\_EXIT_{jt}$ . Thus, a

**Table 4**  
Univariate tests of the auditor's propensity to issue going-concern opinions.

	No. of audits	% GC opinions
<i>Panel A: Base rate for going-concern opinions issued by all audit firms</i>		
Small audit firms	33,533	48.44
Medium-sized audit firms	13,792	14.84
Big N audit firms	73,116	3.31
<i>Panel B: Going-concern rates for exiting audit firms and their successors (<math>EXIT_{jt}=1</math>)</i>		
Exiting firms ( $PRE\_EXIT_{jt}=1$ )	4,580	52.58
Successor firms ( $PRE\_EXIT_{jt}=0$ )	4,528	61.24
Total	9,108	
Test for significant difference in GC rates: $t$ -stat. = $-8.38^{***}$ .		
<i>Panel C: Going-concern rates for entering audit firms and their predecessors (<math>ENTRY_{jt}=1</math>)</i>		
Entering firms ( $POST\_ENTRY_{jt}=1$ )	3,500	61.66
Predecessor firms ( $POST\_ENTRY_{jt}=0$ )	2,540	63.50
Total	6,040	
Test for significant difference in GC rates: $t$ -stat. = $-1.46$ .		
<i>Panel D: Going-concern rates for the clients of all small audit firms</i>		
Exiting and successor firms ( $EXIT_{jt}=1$ )	9,108	56.88
Other small firms ( $EXIT_{jt}=0$ )	24,425	45.30
Total	33,533	
Test for significant difference in GC rates: $t$ -stat. = $18.98^{***}$		
Entering and predecessor firms ( $ENTRY_{jt}=1$ )	6,040	62.43
Other small firms ( $ENTRY_{jt}=0$ )	27,493	45.37
Total	33,533	
Test for significant difference in GC rates: $t$ -stat. = $24.23^{***}$		

\*\*\*=statistically significant at the 1% level (two-tailed).

$EXIT_{jt}$ =one if company  $j$  is audited in year  $t$  by a firm that exits the market or by the successor firm; =zero otherwise.  $PRE\_EXIT_{jt}$ =one if company  $j$  is audited in year  $t$  by a firm that exits the market; =zero otherwise.  $ENTRY_{jt}$ =one if company  $j$  is audited in year  $t$  by a firm that enters the market or by the predecessor firm; =zero otherwise.  $POST\_ENTRY_{jt}$ =one if company  $j$  is audited in year  $t$  by a firm that enters the market; =zero otherwise.

partial explanation for our finding that exiting auditors are less likely to issue GC opinions is that the exiting firms tend to be smaller than the auditors that remain in the market (as documented in Table 3) and the smaller auditors are less likely to issue GC opinions (as shown in Table 5). Thus, one reason audit quality improves is that clients switch from smaller (lower quality) exiting firms to larger (higher quality) successor firms.<sup>17</sup>

We also find that the coefficient on  $EXIT_{jt}$  is significantly positive in each regression, consistent with the exiting audit firms having clients that are in poorer financial health. The coefficient on  $POST\_ENTRY_{jt}$  is insignificant, implying that the entering audit firms are no more likely than their predecessors to issue GC opinions. The coefficient on  $ENTRY_{jt}$  is not significant once we include the additional control variables in columns 5 through 8.

The coefficients on the control variables are also generally significant in the expected directions. The  $CLIENT\_DEREG_{jt}$  variable has positive coefficients indicating that auditors are more likely to issue GC opinions in the final year prior to a client's de-registration from the SEC. This is consistent with companies de-registering when they become financially distressed as reflected in the auditor's issuance of a GC opinion. The coefficient on the dummy variable capturing the last year with the outgoing auditor ( $OLD_{jt}$ ) is significantly positive in all of the models in which it is included, but the coefficient on the dummy capturing the new auditor ( $NEW_{jt}$ ) is not significant once we include all of the control variables. This is consistent with outgoing auditors, but not incoming auditors, being more likely to issue GC opinions. The coefficients on client size ( $LTA_{jt}$ ), the dummy for losses ( $LOSS_{jt}$ ), the reporting lag ( $REPORT\_LAG_{jt}$ ), the current ratio ( $CURRENT_{jt}$ ), and leverage ( $LEVERAGE_{jt}$ ) are all significant in the expected direction.

In summary, the analysis in Table 5 finds that exiting audit firms are significantly less likely to report going-concern problems when compared with their successors. This is consistent with the evidence in Table 3 that the exiting firms are lower quality.

<sup>17</sup> As a robustness check we replace the continuous  $AUDITOR\_SIZE_i$  variable with dummy variables indicating whether the auditor has just one client or more than ten clients. The results are virtually identical to those tabulated.

**Table 5**

Multivariate tests of the auditor's propensity to issue going-concern opinions.

The dependent variable is  $GC_{jt}$ . The models are estimated using logistic regression with standard errors that are robust to heteroskedasticity and clustered on each company ( $z$ -statistics are shown in parentheses).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$EXIT_{jt}$	0.61 (9.93)***	0.57 (9.20)***	0.60 (9.42)***	0.56 (8.69)***	0.36 (3.96)***	0.34 (3.68)***	0.32 (2.44)**	0.30 (2.29)**
$PRE\_EXIT_{jt}$	-0.38 (-6.11)***	-0.22 (-3.47)***	-0.54 (-7.45)***	-0.38 (-5.11)***	-0.58 (-4.52)***	-0.48 (-3.65)***	-0.56 (-3.03)***	-0.49 (-2.58)***
$AUDITOR\_SIZE_{jt}$		0.01 (11.81)***		0.01 (9.81)***		0.01 (3.76)***		0.01 (1.73)*
$ENTRY_{jt}$	0.75 (9.96)***	0.76 (10.13)***	0.67 (8.05)***	0.68 (8.14)***	0.13 (1.09)	0.12 (1.01)	-0.01 (-0.04)	-0.02 (-0.09)
$POST\_ENTRY_{jt}$	-0.12 (-1.50)	-0.04 (-0.57)	-0.12 (-1.40)	-0.05 (-0.55)	-0.14 (-1.02)	-0.07 (-0.54)	-0.21 (-1.03)	-0.16 (-0.78)
$CLIENT\_DEREG_{jt}$	0.60 (18.41)***	0.61 (18.42)***	0.76 (19.52)***	0.77 (19.66)***	1.00 (9.91)***	1.00 (9.94)***	1.04 (6.68)***	1.03 (6.61)***
$OLD_{jt}$			0.67 (18.26)***	0.68 (18.50)***	0.26 (4.03)***	0.27 (4.12)***	0.22 (2.16)**	0.22 (2.20)**
$NEW_{jt}$			0.24 (7.71)***	0.24 (7.77)***	0.18 (3.29)***	0.18 (3.32)***	0.06 (0.79)	0.06 (0.77)
$LTA_{jt}$					-0.53 (-23.87)***	-0.53 (-23.82)***	-0.58 (-17.83)***	-0.58 (-17.97)***
$LOSS_{jt}$					1.98 (27.11)***	1.98 (26.95)***	1.90 (18.34)***	1.89 (18.20)***
$REPORT\_LAG_{jt}$					0.001 (2.74)***	0.001 (2.87)***	0.002 (2.58)***	0.002 (2.65)***
$CURRENT_{jt}$							-0.10 (-5.43)***	-0.10 (-5.45)***
$LEVERAGE_{jt}$							0.34 (3.27)***	0.34 (3.27)***
$YEAR\_DUMMIES?$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$N$	33,533	33,509	26,456	26,456	15,239	15,239	9,177	9,177
Pseudo $R^2$ (%)	2.92	3.38	4.39	5.14	42.89	43.04	47.22	47.27

\*\*\*, \*\*, \* = statistically significant at the 1%, 5%, 10% levels (two-tailed), respectively.

$GC_{jt}$  = one if company  $j$  receives a going-concern opinion in year  $t$ ; = zero otherwise.  $EXIT_{jt}$  = one if company  $j$  is audited in year  $t$  by a firm that exits the market or by the successor firm; = zero otherwise.  $PRE\_EXIT_{jt}$  = one if company  $j$  is audited in year  $t$  by a firm that exits the market; = zero otherwise.  $ENTRY_{jt}$  = one if company  $j$  is audited in year  $t$  by a firm that enters the market or by the predecessor firm; = zero otherwise.  $POST\_ENTRY_{jt}$  = one if company  $j$  is audited in year  $t$  by a firm that enters the market; = zero otherwise.  $AUDITOR\_SIZE_{jt}$  = the total number of audits performed by company  $j$ 's audit firm in year  $t$ .  $CLIENT\_DEREG_{jt}$  = one if company  $j$  issues its final financial statements in year  $t$  and the company subsequently becomes de-registered from the SEC; = zero otherwise.  $OLD_{jt}$  = one if the audit is performed by an outgoing audit firm; = zero if the audit is by a firm that will be retained in the following year.  $NEW_{jt}$  = one if the audit is performed by a newly appointed audit firm; = zero if the audit is by a retained incumbent firm.  $LTA_{jt}$  = log of total assets for company  $j$  in year  $t$ .  $LOSS_{jt}$  = one if company  $j$  reports a loss in year  $t$ ; = zero otherwise.  $REPORT\_LAG_{jt}$  = number of days from the fiscal year-end to the auditor's signature date.  $CURRENT_{jt}$  = current assets divided by current liabilities.  $LEVERAGE_{jt}$  = total liabilities divided by total assets.



#### 4.4. Supply-side versus demand-side effects

A variety of SOX-related changes provide incentives for clients to avoid low quality audit firms. For example, SOX requires managers to sign off on the veracity of the financial statements and it imposes greater penalties on managers that misreport. This may result in a stronger demand for high quality audits, causing clients to shift away from lower quality auditors. SOX-related changes also provide incentives for low quality audit firms to withdraw from the SEC market. For example, SOX requires audit firms to register with the PCAOB and undergo inspections. Thus, SOX likely reduces the supply of low quality auditors at the same time as it increases the demand by clients for high quality audits. Our results likely reflect both the increase in the demand for audit quality as well as the reduction in supply of low quality auditors. For our purposes, these shifts in demand and supply result in the same outcome, i.e., lower quality auditors exit the market.

If audit firm exits are mainly driven by a stronger client demand for high quality audits, then we expect a relatively high frequency of clients dismissing the low quality auditors that exit the market. On the other hand, if audit firm exits are mainly driven by a decline in supply of low quality auditors, then we expect a relatively high frequency of resignations among the exiting auditors. Thus, we compare the percentage of auditor changes that are attributable to resignations versus dismissals. If our  $EXIT_i$  variable is primarily capturing the supply-side effects of SOX then we expect a positive association between the  $EXIT_i$  variable and the fraction of auditor changes that are attributable to resignations rather than dismissals.

Using the auditor changes file in Audit Analytics we find that 878 of the 1,233 small audit firms in our sample experience at least one auditor change in the period 2001–2008. Of these 878 auditors, 416 firms exit the market whereas 462 firms do not. Auditor changes are unrecorded for 191 exiting audit firms because many small companies fail to file an 8-K disclosing the auditor change (Ettredge et al., forthcoming). For each auditor, we construct a variable ( $\%RESIGN_i$ ) that equals the number of resignations divided by the total number of auditor changes in which the outgoing auditor is firm  $i$ .

In untabulated analysis we find that the mean value of  $\%RESIGN_i$  is 44.3% among the exiting audit firms and 34.6% among the non-exiting audit firms, and the difference is highly significant ( $t$ -stat.=4.04). This suggests that our  $EXIT_i$  variable at least partially captures a supply side phenomenon in which the exiting audit firms resign from their clients. Overall, our analysis of auditor resignations and client dismissals suggests that the exiting audit firms are more likely to resign from their clients than the non-exiting audit firms, consistent with a supply side effect explaining the large exodus of audit firms. However, we cannot rule out the possibility that there is also an increase in the demand for audit quality following SOX.

### 5. Sensitivity tests

#### 5.1. Clients that de-register

As shown in Panel C of Table 1, there are 96 exiting audit firms that become inactive in the same year that they lose all their clients through SEC de-registration. To ensure that client de-registrations do not drive our results we re-estimate all of the models after dropping these 96 audit firms. The results are qualitatively unchanged. In another sensitivity test, we replace the  $\%CLIENT_DEREG_i$  variable in Table 3 with a dummy variable that is coded one if the audit firm loses all of its clients through de-registration from the SEC, and zero otherwise. This dummy variable controls for the fact that an audit firm ceases to be active if it loses all of its clients. Replacing  $\%CLIENT_DEREG_i$  with the dummy variable again yields results that are qualitatively unchanged.

#### 5.2. Voluntary and involuntary exits

Thirteen of the exiting auditors have their applications denied by the PCAOB and another four have their registrations revoked. Because these exits are not voluntary, our argument that SOX made it less cost-beneficial to audit public companies may not explain why these auditors leave the market. We therefore re-estimate the regression models after dropping these 17 auditors, and find that our results are qualitatively unchanged. Thus, our results are not driven by the inclusion of audit firms that exit involuntarily.

#### 5.3. Audit firms that exit through being acquired

Some audit firms exit through being acquired by other auditing firms and it is unclear how such exits affect audit quality. On one hand, merged firms are larger and larger audit firms have stronger incentives to supply high quality audits (DeAngelo, 1981). Consistent with this argument, Chan and Wu (2011) provide compelling evidence that audit firm mergers lead to higher quality auditing in China. On the other hand, the employees of the exiting firm may continue to perform sub-standard audits for the clients that they audited before the merger took place.

To gauge the effect of audit firm mergers on our results, we re-estimate all our models after dropping mergers from the estimation samples. We identify audit firm mergers and acquisitions from the Public Accounting Report (PAR), which

publishes all merger and acquisition transactions that involve auditors of public companies. We verify the completeness of this data by comparing to the audit firm acquisitions disclosed in companies' 8-K filings when there is a change of auditor. We also perform an extensive search for mergers and acquisitions using the PCAOB's list of audit firm name changes since mergers often result in name changes. Of the 607 audit firms that exit the market (Panel A of Table 1), we find that 79 are acquired by another auditor. After dropping these firms from our analysis, our results remain qualitatively unchanged. Thus, our results are not driven by firms that exit through merger.

#### 5.4. Analyzing the smallest audit firms

The exiting audit firms are typically very small since 95% of them have fewer than ten SEC clients (see Panel E, Table 1). This suggests that our cut-off for small audit firms (i.e., less than 100 clients) may be too large to really capture the typical exiting firm. Therefore, we re-run the regressions after dropping all the auditors that have ten or more SEC clients. The significance levels in this smaller estimation sample are qualitatively unchanged except that the  $REVIEWED_i \times MOD\_ADV_i$  variable is no longer significant in Column (3) of Table 3. Therefore, our main findings are generally robust when we restrict the sample to the very small audit firms.

#### 5.5. Audit firm size

In the tabulated tests we rely on the number of SEC audits to measure audit firm size because assets and fees data are not available for many of the companies in our sample. In sensitivity tests, we use alternative audit firm size variables that reflect both the number of SEC engagements and the size of those engagements. We first replace the missing values for clients' total assets and audit fees with zero. The first alternative measure of audit firm size equals the log of (one plus) the aggregate assets audited by firm  $i$ . The second measure is the same except we use aggregate audit fees rather than aggregate assets. Our primary results remain qualitatively unchanged when we use these two alternative constructs for audit firm size.

#### 5.6. Auditors who are active for less than three years

Because peer reviews are required just once every three years, it is conceivable that some of the 318 auditors coded as not receiving a peer review (i.e.,  $REVIEWED_i=0$ ) may have intended to be reviewed but had simply not been in the market for long enough to receive their first peer review. However, 70 of these 318 audit firms were active for all three years (2001–2003) during the AICPA regime and are still not reviewed. Thus, these 70 audit firms were unambiguously avoiding a peer review by the AICPA. Therefore, we rerun our analysis in Table 3, Panel A after coding only these 70 firms as  $REVIEWED_i=0$ . The revised results in Col. (1) of Table 3 continue to indicate a highly significant and negative association between  $REVIEWED_i$  and the audit firm's decision to exit the market. The conclusions for our other variables are also unchanged.

#### 5.7. The effects of changes in company performance on GC opinions

A potential limitation of our analysis in Table 5 is that the auditor's decision to issue a GC opinion may be associated with shocks to company performance that are not captured in our model, which only controls for levels of client performance. Therefore, we rerun the GC regression in Table 5 after adding variables to capture changes in: company size ( $\Delta LTA_{jt}$ ), profitability ( $\Delta ROA_{jt}$ ), the current ratio ( $\Delta CURRENT_{jt}$ ), and leverage ( $\Delta LEVERAGE_{jt}$ ). While including these variables reduces our sample size, we continue to find significant negative coefficients on  $PRE\_EXIT_{jt}$ . In addition, the change variables are generally insignificant.

#### 5.8. The effects of PCAOB inspections on GC opinions

Gramling et al. (2011) finds that non-Big 4 auditors are more likely to issue GC opinions after they receive PCAOB inspection reports that disclose deficiencies. Thus, to test whether our findings with respect to GC opinions are driven by the effects of PCAOB inspections, we re-run the analysis in Table 5 after including variables that capture: (1) whether the audit occurs within three years following a PCAOB inspection ( $POST\_INSPECTION_{jt}$ ), (2) whether the audit occurs within three years prior to a PCAOB inspection ( $PRE\_INSPECTION_{jt}$ ), and (3) each of these terms interacted with  $PCAOB\_WEAK_{jt}$  (i.e., the number of weaknesses reported in the inspection report). We continue to find significant negative coefficients on  $PRE\_EXIT_{jt}$  after including these new variables.

#### 5.9. The effects of litigation risk on auditor exits

Shu (2000) finds that auditor resignations are related to litigation risk. Therefore, we re-run our analysis in Table 3, Panels A and B, after including six litigation risk factors found significant in Shu (2000), measured at the audit firm level: membership in industries that have high litigation risk ( $\%HI\_RISK_i$ ), client size ( $CLIENT\_SIZE_i$ ), losses ( $\%LOSS_i$ ), profitability

( $ROA_i$ ), the ratio of inventory to total assets ( $INV\_RATIO_i$ ), the ratio of receivables to total assets, ( $REC\_RATIO_i$ ), and sales growth ( $SALES\_GROWTH_i$ ).<sup>18</sup> Our primary results remain qualitatively unchanged after including these variables. The coefficients on the litigation variables are insignificant, suggesting that litigation risk is not a factor that explains why many small auditors exit the market. Thus, litigation risk does not explain the exits in our sample even though it is an important factor in the resignations setting examined in Shu (2000). We note, however, that this is not surprising given the difference between resignations and exits. Specifically, an exit involves the auditor choosing to abandon the SEC market entirely whereas resignations include auditors who selectively avoid high-risk clients while remaining in the market for public company audits.

## 6. Conclusions

We document that following the passage of SOX, the number of audit firms with fewer than one hundred clients falls by approximately one-half, and client concentration among these auditors more than doubles. The primary objective of this study is to test whether this large structural change in the market for small auditors impacts audit quality. We find that the exiting audit firms are more likely to receive unfavorable peer review or inspection reports, and have a greater likelihood of avoiding peer reviews and inspections. This is consistent with the exiting auditing firms being lower quality suppliers.

We gather corroborating evidence on whether audit quality has improved for the clients of the exiting auditors by comparing the propensity of the exiting firms and their successors to issue GC opinions. We find that the successor auditors are more likely than the exiting auditors to issue GC audit opinions to the clients of the exiting auditors. This is consistent with the exiting firms providing lower quality audits than their successors. We conclude that while the PCAOB inspections are intended to improve audit quality primarily through the remediation of poor audit practices, they also improve audit quality by incentivizing the lower quality auditors to exit the market.

We acknowledge that our conclusions are dependent on the reliability of our proxies for audit quality. In particular, we assume that low quality auditing is captured by the audit firm's avoidance of AICPA peer reviews or failure to register with the PCAOB, and that lower quality auditors are more likely to have reported weaknesses when they are reviewed or inspected. We also assume that lower quality auditors are more likely to yield to client pressure by issuing fewer GC opinions.

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<sup>18</sup> Unlike Shu (2000), we do not include market based measures of litigation risk because the vast majority of our sample companies are not covered on CRSP.

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