

Auditor Industry Specialization and Audit Fees Surrounding Section 404 Implementation

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Abstract

The enactment of the Sarbanes-Oxley Act (SOX) of 2002 and Auditing Standard No. 2 substantially increased the reporting requirements for SEC registrants by mandating that management and the auditor to report on the internal controls over financial reporting. Prior research suggests that industry specialization enables auditors to more effectively perform the audit function, which could lead to cost efficiencies in complying with the complex reporting requirements imposed by SOX. In this study, we investigated the association between auditor industry specialization and audit fees surrounding Section 404 implementation. Using a sample of 1,006 industrial firms over the 2003 – 2005 reporting periods, we found that auditor industry specialization is negatively related to the change in audit fees during the first year of SOX compliance (2003 – 2004). We also found that there was no significant cost savings associated with auditor industry specialization in the second year of SOX compliance (2004 – 2005). These results suggest that industry specific expertise may enable auditors to adapt more proficiently to new regulatory and accounting standards, but that such efficiencies are likely to be most pronounced during the initial transition or implementation year.

Key Words: Audit fees; auditor industry specialization; SOX.

I. INTRODUCTION

Section 404 of the Sarbanes-Oxley Act (SOX) of 2002 (U.S. House of Representatives 2002) requires SEC registrants to report on the effectiveness of the internal controls over financial reporting and auditors to attest to the validity of these reports. SEC registrants and others have voiced numerous complaints about the internal control reporting requirements, and much of the debate is centered on the considerable increase in audit fees (ABA 2005; Donaldson 2005; EY 2005; FEI 2005). We use the unique environment created by SOX to examine the association between auditor industry specialization and audit fees for firms subject to the requirements of Section 404. Specifically, we investigate if efficiencies afforded companies by auditors' industry specialization constrained the substantial increase in audit fees in the first year of SOX implementation.

Over the past two decades large audit firms have increasingly focused on particular industry segments by investing time and resources into developing industry-specific expertise. Research has found that auditor industry specialization has a positive influence on a diverse set of audit quality issues, including auditors' error detection ability (Owhoso et al. 2002), SEC enforcement actions (Carcello and Nagy 2002), and clients' earnings quality and earnings response coefficients (Balsam et al. 2003). As such, auditors with greater industry specialization would likely react differently to the heightened audit requirements imposed by SOX than other auditors. For example, auditors with more industry expertise can be expected to more efficiently implement the audit procedures for internal controls, and in turn, reduce the substantial cost associated with Section 404 compliance.

The purpose of this paper is to provide empirical evidence about the association between audit fees and auditor industry specialization during the transition period related to Section 404

compliance. Empirical evidence about audit fees related to SOX is particularly important given the public policy concerns about the purported impact of these costs on SEC registrants. For example, in reaction to compliance costs and other concerns, the SEC recently adopted Auditing Standard No. 5 (AS 5), a comprehensive pronouncement designed to provide auditors guidance on how to more effectively identify internal control weakness during financial statement audits, and, at the same time, eliminate costly procedures that are unnecessary (PCAOB 2007). The extent to which efficiency can be gained through the match between client characteristics and auditor expertise during regulatory or other significant transitions is important to capital market participants.

Using a sample of 1,006 industrial firms that were subject to SOX, we found that auditor industry specialization is negatively related to the change in audit fees during 2003 – 2004, the first year of Section 404 compliance. This finding is consistent with the argument that industry specific expertise enabled auditors to adapt more proficiently to the requirements of SOX and PCAOB auditing standards, and that these efficiencies were passed on to clients in the form of lower audit fees.

We also found that the efficiency associated with industry specialization did not persist past the first year of SOX compliance. That is, there was no significant cost savings associated with auditor industry specialization during 2004 – 2005. This finding suggests that the effect of industry specialization on auditors' ability to implement new standards and regulations is likely to be most pronounced during the initial transition or implementation year.

These findings provide regulators, managers, and auditors evidence that there was significant cost savings associated with auditor industry specialization during initial SOX adoption. Given the substantial and seemingly endless supply of new accounting regulation on

the horizon (e.g., fair value accounting; IFRS convergence), these results may inform companies decisions about the hiring of auditors and the selection of audit clients in these uncertain times.

The remainder of this paper is organized as follows. The next section provides background and develops the research hypotheses. The method section follows with a description of the sample and the details of the research design. This is followed by our results and the paper concludes with a discussion of the findings and their implications.

II. BACKGROUND AND HYPOTHESIS

Auditor Industry Specialization

Industry specialists are auditors whose training and experience are largely concentrated in a particular industry (Solomon et al. 1999). Experimental research suggests that auditors with industry specific knowledge are more likely to possess a comprehensive understanding of a company's characteristics, which enhances their abilities and methods for error detection (Maletta and Wright 1996; Owosho et al. 2002). For instance, Solomon et al. (1999) report that industry specialist auditors have more complete knowledge of non-errors and non-error frequencies than non-industry specialists and Wright and Bedard (2000) find that auditors with high levels of domain specific experience generate more plausible error hypotheses than auditors with low levels of domain specific experience. Hammersley (2005) also provides evidence that industry specialist auditors develop more complete problem representations than non-industry specialists resulting in more effective misstatement identification. In addition, Taylor (2000) finds that banking industry specialist auditors' inherent risk assessments differ from those of non-specialists during accounts receivable evaluations.

Support for the benefits of industry expertise is also found in archival research that associates auditor industry specialization with various proxies for audit quality. For example, Gramling et al. (2001) find a positive association between auditor industry specialization and the ability of client earnings to predict future cash flows. Balsam et al. (2003) find that industry specialist clients have lower levels of discretionary accruals and higher earnings response coefficients than companies that engage non-specialist auditors. Similarly, Krishnan (2003) finds that clients of industry specialist auditors have lower levels of discretionary accruals, suggesting that industry specialization might help mitigate the use of accruals-based earnings management tactics. Carcello and Nagy (2002) also find that clients of industry specialist auditors are less likely to be involved in SEC enforcement actions.

Studies using Australian or Hong Kong data (Craswell et al. 1995; DeFond et al. 2000; Ferguson et al. 2003) document an industry specialist audit fee premium. While Palmrose (1986) and Pearson and Trompeter (1994) find no evidence of an industry specialist premium in the U.S.A., the samples in these two studies are narrowly focused on regulated industries. Casterella et al. (2004) suggest that industry specialization can lead to a fee premium for smaller U.S. companies but the greater bargaining power of larger firms can offset such a premium effect. Casterella et al. (2004) find evidence of an audit fee premium only in the small company segment of the market using survey data, and Huang et al. (2007) replicate this finding using audit fee data for fiscal years 2000 and 2001. Additionally, Francis et al. (2005) find evidence of an audit fee premium in the U.S. based on city-level (as opposed to national) industry specialization.

The market for audit services has witnessed many significant changes in recent years, most notably the enactment of SOX. Prior studies have been primarily concerned with

determining whether industry specialization can provide superior quality audits or if there is a potential added cost associated with engaging an industry specialist auditor. The following section takes a different tact to audit fee research by arguing that the substantial increase in audit fees associated with SOX compliance could have been mitigated for firms that hired auditors with greater industry-specific expertise.

Audit Fees and Section 404

Prior to Section 404, auditors were only required to understand the internal controls of the client. If the auditor decided not to rely on internal controls of the client (to reduce the extent of substantive testing), no further tests of internal controls were necessary. SOX changed the auditors' responsibilities related to the internal controls of the client. Section 404(a) of SOX requires the SEC to prescribe rules requiring that each annual report filed with the SEC under the 1934 *Securities Exchange Act* shall "contain an internal control report, which shall--

- (1) state the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting; and
- (2) contain an assessment, as of the end of the most recent fiscal year of the issuer, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting."

In addition, section 404(b) specifies that

"With respect to the internal control assessment required by subsection (a), each registered public accounting firm that prepares or issues the audit report for the issuer shall attest to, and report on, the assessment made by the management of the issuer. ...Any such attestation shall not be the subject of a separate engagement."

Subsequently, in 2004 the PCAOB issued Auditing Standard No. 2 in 2004 (AS No. 2; PCAOB 2004), which required auditors to perform their own independent assessment related to internal controls over financial reporting and issue a report based on such assessment.

Thus, SOX itself and the subsequent implementation of SOX by the SEC and the PCAOB imposed many new requirements related to clients' internal controls on auditors. In light of such regulatory changes, each of the Big 4 audit firms noted that audit processes and procedures have been significantly transformed in the post-SOX period (SEC 2005). In particular, the new internal control related requirements of Section 404 of SOX have made public company audits much more complex. For example, the CEO of Ernst and Young noted that "the effort required by the audits of internal control under 404 and AS2 is substantially greater than the effort traditionally required for consideration of internal control solely in connection with audits of financial statements" (EY 2005).

Many SEC registrants and business associations have complained about the costs associated with the internal control reporting requirement and some have called for the revision (if not repeal) of Section 404 of SOX (e.g., ABA 2005; AEA 2005; FEI 2005; Microsoft 2005). While there are many cost elements associated with Section 404, the magnitude of audit fees in the post-SOX period has been a primary target of critics of Section 404. At the *Roundtable on Implementation of Internal Control Reporting Provisions* convened by the SEC in April 2005, participants noted that audit fees constituted a significant part of total costs associated with Section 404 and the CEOs of the Big 4 firms acknowledged significant criticism from their clients and others about the substantial increases in audit fees.¹

The implementation of SOX presented a variety of challenges for auditing firms that required auditors to quickly adapt to new regulations. As noted by each of the Big 4, there was a substantial initial year investment along with a steep learning curve associated with SOX. PWC

¹ For example, the CEO of Ernst & Young noted that "much of the debate regarding the high costs of 404 implementation seems to be centered on audit fees" (EY 2005) while the U.S. Chamber of Commerce (2006) stated, in the context of discussing various costs related to Section 404, that "there are outside auditor costs, which receive the most public attention."

(2005) noted that during the first year of SOX implementation “external auditors were learning, interpreting, and applying Section 404 and AS No. 2 on a real-time basis.” The enhanced ability afforded by industry specialization may have enabled auditors to adapt more quickly to the new and more demanding audit environment. Quicker adaptation to this environment would likely result in a smaller increase in the amount of time to both plan and execute the audit which may be observed in smaller increases to client fees during the initial SOX implementation year.

In summary, we posit that auditor industry specialization increases auditors’ efficiency, and that this efficiency will be most evident in the first year of Section 404 implementation. That is, industry specialization likely enabled auditors to adapt more effectively and efficiently to the changes required by SOX, and effectively reduced the steep learning curve associated with Section 404 compliance. Therefore, we predict that the enhanced efficiency gained from auditor industry specialization was passed down to clients in the form a cost savings during in the initial year of SOX implementation. The following hypothesis formalizes this expectation:

H1: The increase in audit fees during the initial year of SOX implementation is negatively associated with the level of auditor industry specialization.

Theory and evidence also suggest that while auditor industry specialization will likely reduce the increase in audit fees for the first year of SOX implementation, this efficiency may not persist in future periods. In submissions to the SEC, the Big 4 firms noted in early 2005 that the second year Section 404 audit costs should come down for a variety of reasons, including the learning curve effect (e.g., Ernst & Young 2005; PWC 2005). For example, PWC (2005) noted that “the efforts and resource requirements in the first year of applying Section 404 (“year one”) were extraordinary...we believe that the learning curve and resource requirements in the initial year of adoption represent a non-recurring investment that will be leveraged in the future.”

Thus, the extensive documentation related work performed during the first year of a Section 404 audit would likely not have to be fully replicated during subsequent audits.

Second, AS No. 2 was issued by the PCAOB in March 2004 and was then approved by the SEC in June 2004. The timing of this standard resulted in considerable uncertainty for the auditors during the execution of the fiscal 2004 audit. For instance, EY (2005) noted “complicating the effort was the need for recalibrating the project and performing rework as the requirements of the SEC and particularly of the PCAOB became known or better understood...only then, subsequent to AS 2 being issued, did auditors have the opportunity to actively start identifying implementation issues and seeking answers to their questions from the PCAOB staff.” Much of the uncertainty related to the standards was resolved late in 2004, so the second year audit is much less likely to be affected by uncertainty related to the relevant standards. PWC (2005) noted that “The second and subsequent times through any new undertaking of this magnitude generally yield efficiencies, and thus reduced costs.”

Third, during the first-year *Roundtable* and on other occasions in 2005, both the SEC and the PCAOB actively encouraged the integration of the Section 404 audit and the financial statement audit. Such integration can be expected to result in improved audit efficiency and lower costs. EY (2005) noted in its statement to the SEC that

“we believe a key factor affecting audit fees going forward is the opportunity to perform a truly ‘integrated audit’ as contemplated by AS2, enabling auditors generally to place a greater degree of reliance on the results of their testing of internal controls in determining the nature, extent, and timing of their substantive audit procedures for financial statement accounts.”

Similarly, KPMG (2005) noted in its statement that

“the steep learning curve, the timing of rulemaking and related guidance, as well as the uncertainty as to what the findings would be, made it all but impossible to achieve the desired efficiencies in the integration of our internal control audit and financial statement audit. We are confident that in year two we will make substantial progress in truly

integrating the audit. ... Our integrated audit methodology will allow us to better leverage this knowledge in determining the nature, timing, and extent of our substantive audit procedures.”

Thus, many of the reasons audit fees were expected to decrease in 2005 are associated with auditors gaining a better understanding of SOX requirements and adjusting to the large learning curve associated with the initial year implementation.

Following our argument that auditor industry specialization should have an advantage in the initial year implementation, after the first year, auditors that lack industry specific expertise should begin “catching up” with those firms with industry specialization. In other words, the efficiency afforded by industry specialization may not persist beyond the initial year of SOX implementation. Therefore, we predict that the change in audit fees in the second year of SOX implementation was not affected by the level of auditor industry specialization. This expectation is stated in the following hypothesis:

H2: The change in audit fees during the second year of SOX implementation is not associated with the level of auditor industry specialization.

III. METHOD

Data Collection

We began with 5,979 firms with Big 4 auditors listed in the *Audit Analytics* database for fiscal years 2003 – 2005. We restricted our analyses to industrial firms because financial institutions have different reporting requirements that could influence the results (Castrella et al. 2004). Thus, we deleted 2,762 non-industrial firms (i.e., SIC Codes > 6000). In addition, given the time pressures on auditors and clients and that detailed guidance from the PCAOB regarding the implementation of Section 404 and AS No. 2 was available only in the second half of 2004, we deleted 1,197 firms that do not have fiscal year ends between December 25 to December 31

(Raghunandan and Rama 2006).² Finally, we deleted 582 firms with missing financial statement data, 361 firms that did not have data across all three years, and 71 firms that changed auditors during the study window. Thus, our final sample consisted of 1,006 firms with data for fiscal years 2003, 2004, and 2005.

Research Design

First-year SOX Implementation (H1)

Hypothesis 1 examines whether auditor industry specialization reduced the change in audit fees from 2003 to 2004, the first year of SOX implementation. We used the change in audit fees (rather than the level of audit fees) in the following regression model because it better isolates the increase in fees associated with SOX implementation.

$$\Delta AuditFee_{03-04} = \beta_0 + \beta_1 Ln(ASSETS) + \beta_2 \Delta SIZE + \beta_3 \Delta LIQ + \beta_4 \Delta DEBTASSET + \beta_5 MW + \beta_6 SPEC + \varepsilon \quad (1)$$

where:

- $\Delta AuditFee_{03-04}$ = change in total audit fees from *Audit Analytics* (2004 Audit fees less 2003 Audit fees);
- $Ln(ASSETS)$ = natural logarithm of total assets (Compustat #6);
- $\Delta SIZE$ = change in firm size (Compustat #6)(2004 Total assets less 2003 Total assets);
- ΔLIQ = change in liquidity (Compustat #4 / Compustat #5)(2004 Liquidity less 2003 Liquidity);
- $\Delta DEBTASSET$ = change in debt to asset ratio (Compustat #181 / Compustat #6) (2004 Debt to Asset Ratio less 2003 Debt to Asset Ratio);
- MW = 1 if there is a material weakness disclosure in the audit report in 2004 and 0 otherwise; and
- $SPEC$ = Auditor weighted market share (market share * portfolio share) (Neal and Riley 2004).

² For example, it may not be appropriate to compare three firms, with fiscal year ends of 7/31/2001, 12/31/2001, and 5/31/2002, all as part of the same fiscal year.

Auditor industry specialization has been operationalized in extant research using two main approaches that proxy for a firm's commitment to gaining specific knowledge and audit technologies within a given industry (Neal and Riley 2004). Auditor *market share* captures within-industry differentiation across competing audit firms and is estimated by dividing the total sales of each auditor's clients in a particular industry by total industry sales. Auditor *portfolio share* captures within-audit firm differentiation across industries and is estimated as an auditor's client sales in each industry divided by the auditor's firm-wide client sales. Neal and Riley (2004) suggest the market and portfolio share measures act as complements in understanding auditor industry specialization, and should be measured accordingly. For instance, audit quality may be affected by the attributes captured in each metric because auditors may perform above average in areas where they have differentiated themselves from their competitors (market share) and/or devoted considerable firm resources to industry specific training and technologies (portfolio share) (Neal and Riley 2004). Following Neal and Riley (2004), we used *weighted market share* (Market share * Portfolio share) to estimate auditor industry specialization (*SPEC*).

The control variables in the model were selected based on prior audit fee studies and to account for the significant changes to a firm's operations that would most likely impact the amount of time and resources required to complete the audit. For example, we included the following variables that proxy for client size, complexity, and risk that lead to higher audit fees: *Ln(ASSETS)*, *SIZE*, *LIQ*, and *DEBTASSET* (Simunic 1980; Whisenant et al. 2003; Francis and Wang 2005; Raghunandan and Rama 2006).³ In addition, we included a variable to capture the

³ Early testing also included control variables used in prior studies to explain audit fees: (1) change in assets in receivables and inventory; (2) if firm changed from having or not having foreign operations; (3) change in the square root of number of business segments reported on *Compustat*; (4) change in ROA; (5) if the audit report is modified for going concern opinion in either 2003 or 2004; and (6) firm industry. Results (not shown) indicate that none of these variables had a significant effect on the change in audit fees for this sample or on the significance or directionality the auditor industry specialization variable.

presence of a material weakness (*MW*) in internal controls because this creates significant additional work for auditors and leads to higher audit fees (Raghunandan and Rama 2006).⁴

Second-year SOX Implementation (H2)

Hypothesis 2 addresses whether efficiencies afforded by auditor industry specialization persist in the second year of SOX implementation. To test this hypothesis, we used the following regression to explain the change in audit fees from 2004 to 2005.

$$\Delta AuditFee_{04-05} = \beta_0 + \beta_1 Ln(ASSETS) + \beta_2 \Delta SIZE + \beta_3 ALIQ + \beta_4 ADEBTASSET + \beta_5 POSAMW + \beta_6 NEGAMW + \beta_7 SPEC + \varepsilon \quad (2)$$

where:

$$\begin{aligned} \Delta AuditFee_{04-05} &= \text{change in total audit fees from } \textit{Audit Analytics} \text{ (2005 Audit fees less 2004 Audit fees);} \\ POSAMW &= 1 \text{ if the firm had material weakness in 2004 but not in 2005, and 0 otherwise; and} \\ NEGAMW &= 1 \text{ if the firm did not have a material weakness in 2004 but had one in 2005, and 0 otherwise} \end{aligned}$$

The remaining variables are defined in Equation (1), but are based on 2004 – 2005 data.

Because disclosures about the presence of a material weakness (*MW*) in internal controls became available for two years in 2005, we include two indicator variables to capture whether a change in the internal control report affects audit fees. If firms that had a material weakness in 2004 effectively addressed the issues and were issued a clean opinion in 2005, we expected *POSAMW* to be negatively associated with the change in audit fees. On the other hand, if firms that did not have a material weakness identified in 2004 and were issued a material weakness report in 2005, we expected *NEGAMW* to be positively associated with the change in audit fees.

⁴ For example, the presence of a material weakness could increase (1) testing and changes in the audit program, (2) partner time related to discussions with client management, and (3) documentation related to the decision to classify a weakness as a material weakness as opposed to a significant deficiency (which does not require disclosure in SEC filings). Such additional work can be expected to lead to higher audit fees.

The relations between all the other independent variables and audit fees are expected to be the same as for Equation (1).

IV. RESULTS

H1 – First-year SOX Implementation

Table 3 presents descriptive statistics for the variables in 2003 and 2004. The average total audit fees were \$1.60 million in 2003 compared to \$2.82 million in 2004. A paired-samples t-test reveals this is a significant increase in audit fees for the initial year of SOX implementation ($t = 20.91$, $p < 0.001$). Within each firm, total audit fees increased an average of \$0.71 million from 2003 to 2004.

Hypothesis 1 posited that auditor industry specialization would reduce the increased change in audit fees from 2003 to 2004, the first year of SOX implementation. Table 4 presents the regression results testing this prediction. The overall regression model is significant ($F = 17.59$, $p < 0.001$) and the coefficients of all the control variables are in the expected directions and significant at traditional levels. As predicted in H1, *SPEC* had a significant negative effect on the change in audit fees from 2003 to 2004 ($t = -3.25$, $p < 0.01$). This result supports our hypothesis that the enhanced knowledge and abilities of auditors with industry specialization may have allowed them to more cost efficiently implement changes associated with SOX than other auditors.

[Please insert Tables 1 & 2 about here]

H2 – Second-year SOX Implementation

Table 3 also presents descriptive statistics for the variables over 2004 – 2005. The average total audit fees decreased from \$2.82 million in 2004 to \$2.69 million in 2005. A paired-samples t-test indicates that this is a significant decrease in audit fees for second year of SOX implementation ($t = 3.37$, $p = 0.001$). Within each firm, total audit fees decreased an average of \$0.008 million from 2004 to 2005.

Hypothesis 2 posited that auditor industry specialization would not have an effect on the change in audit fees from 2004 to 2005, the second year of SOX implementation. Table 5 presents the regression results testing this prediction. The overall regression model is significant ($F = 7.34$, $p < 0.001$) and the coefficients of all the financial control variables are in the expected directions and significant at traditional levels, except for *ADEBTASSET* ($t = 0.52$, $p = .606$). As predicted in H2, *SPEC* is not significantly related to the change in audit fees from 2004 to 2005 ($t = -0.10$, $p = 0.92$). Also as expected, *NEGAMW* had a significant positive effect on the change in audit fees. That is, we found that firms that were issued their first report indicating a material weakness in internal controls in 2005 paid significantly higher audit fees. The results of this analysis support our hypothesis that the cost savings afforded to firms with auditors that specialize in their industry does not persist beyond the first year of SOX implementation.

[Please insert Table 3 about here]

Sensitivity Analyses

We conducted a series of sensitivity tests to test the robustness of our results. To evaluate whether decisions about the measurement of *SPEC* affects our results, we re-estimated both models using two alternative measures of auditor industry specialization. First, we re-

estimated auditor industry specialization as a continuous variable using audit fees rather than sales data ($SPEC_{Fees}$). These results (not-tabulated) show that $SPEC_{Fees}$ has a significant negative effect on the increase in audit fees during the 2003-2004 period ($t = -1.96, p = 0.05$), but that this effect is not significant for the 2004-2005 period ($t = -0.61, p = 0.54$).

Second, much of the auditor industry specialization literature categorically labels audit firms as either specialists or non-specialists (e.g. Balsam et al. 2003; Krishnan 2003). Therefore, we re-estimated auditor industry specialization following Neal and Riley's (2004) approach for dichotomizing the $SPEC$ variable and classified auditors as specialists or non-specialists. We found that $SPEC_{Cat}$ has a significant negative association with the increase in audit fees during the 2003-2004 period ($t = -1.71, p = 0.09$). That is, firms with auditors classified as specialists paid lower audit fees than firms with non-specialist auditors. Again, this specialization effect on audit fees is not significant at traditional levels for the 2004-2005 period ($t = -1.23, p = 0.22$). Collectively, these supplemental analyses provide support our hypotheses and indicate that the observed effects are not likely due to decisions about variable measurement.

SUMMARY AND CONCLUSIONS

This paper investigated the effect of auditor industry specialization on audit fees surrounding the implementation of Section 404 of SOX. This investigation led to two primary findings. First, auditor industry specialization constrained the significant increase in audit fees that occurred during the first year of SOX implementation. This finding is consistent with the argument that the knowledge and abilities obtained by auditors through industry specialization allowed them to more cost efficiently implement the changes to audit practices and procedures associated with SOX than other auditors. This finding adds to existing audit research (e.g.,

Balsam et al. 2003; Casterella et al. 2004; Huang et al. 2007) by documenting that auditor industry specialization reduced the cost burden of SOX during the first year of implementation, and that industry expertise could lead to efficiencies in adapting to other new accounting standards and regulations.

The second primary finding is that the cost efficiency associated with auditor industry specialization during SOX implementation did not persist in the second of Section 404 compliance. That is, there was no significant cost savings associated with auditors that specialize in their clients industry. This finding is consistent with the notion that auditors which lacked industry specific expertise effectively “caught up” to those firms with industry specialization on the SOX learning curve and were able to handle the Section 404 audit requirements in the second year without having to pass on additional costs to their clients.

As with any study of this type, our results are subject to several common limitations, including model specification and the difficulty in using surrogate measures (i.e., market and portfolio share calculations) to represent audit firms’ industry specific expertise. While we test for the effects of including additional control variables and alternative proxies for auditor industry specialization, results for specific audit firms within certain geographical markets may be different than the averages of the firms.

Notwithstanding these limitations, our findings suggest that auditor industry specialization can provide real cost efficiencies to clients during transition periods of new or modified accounting standards, but the effect of these efficiencies is likely to be most pronounced during the initial implementation year. However, the increasing amount and complexity of new U.S. accounting standards (e.g., fair value accounting) and focus on convergence with International Financial Reporting Standards suggest that efficiencies

associated with auditor industry specialization could result in cost savings to clients over multiple periods. Thus, the level of auditor industry specialization could play a critical role in companies' decisions about hiring auditors and audit firms' decisions about client selection and retention. Future research will need to investigate whether the documented cost efficiency of auditor industry specialization surrounding SOX implementation occurs for other significant regulatory or accounting policy changes. Conducting such explorations will be intellectually challenging, yet highly useful given the importance and consideration that is given to the costs of implementing new standards by regulators, managers, auditors, and the capital markets.

References

- American Bankers' Association (ABA). 2005 Comments submitted to the SEC Roundtable on Implementation of Internal Control Reporting Provisions. Washington, D.C. SEC. Available at: <http://www.sec.gov/spotlight/soxcomp/soxcomp-brunner.pdf>
- American Electronics Association (AEA). 2005. *Sarbanes-Oxley Section 404: The "Section" of the Unintended Consequences and its Impact on Small Business*. Washington, D.C.: AEA.
- Balsam, S., J. Krishnan, and J. S. Yang. 2003. Auditor industry specialization and earnings quality. *Auditing: A Journal of Practice and Theory* 22 (September): 71-97.
- Bryan-Low, C. 2003. Accounting firms aim to dispel cloud of corporate fraud. *Wall Street Journal* (May 27): C1.
- Carcello, J., and A. Nagy. 2002. Auditor industry specialization and fraudulent financial reporting. *Symposium on Auditing Problems*. University of Kansas: Lawrence, KS.
- Casterella, J., J. Francis, B. Lewis, and P. Walker. 2004. Auditor industry specialization, client bargaining power, and audit pricing. *Auditing: A Journal of Practice and Theory* 23 (March): 123-141.
- Craswell, A., J. Francis, and S. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20 (December): 297-322.
- DeFond, M., and J. Francis. 2005. Audit research after Sarbanes-Oxley. *Auditing: A Journal of Practice and Theory* 24 (Supplement): 5-30.
- _____, J. Francis, and T. Wong. 2000. Auditor industry specialization and market segmentation: Evidence from Hong Kong. *Auditing: A Journal of Practice & Theory* 19 (Spring): 49-66.
- Donaldson, W. 2005. *Testimony: Concerning the Impact of the Sarbanes-Oxley Act*. U.S. House of Representatives, Committee on Financial Services. Washington, D.C.: Government Printing Office.
- Ernst & Young (EY). 2005. Comments submitted to the SEC's Roundtable on Implementation of Internal Control Reporting Provisions. *Implementation of Sarbanes-Oxley Internal Control Provisions*. Available at: <http://www.sec.gov/spotlight/soxcomp/soxcomp-turley.pdf>
- Ferguson, A., J. Francis, and D. Stokes. 2003. The effects of firm-wide and office-level industry expertise on audit pricing. *The Accounting Review* 78 (April): 429-448.

- Financial Executives Institute (FEI). 2005. Comments on the Committee on Corporate Reporting, Submitted to the SEC Roundtable on Implementation of Internal Control Reporting Provisions. Washington, D.C.: SEC. Available at: <http://www.sec.gov/spotlight/soxcomp/soxcomp-brod.pdf>
- Francis, J., and D. Wang. 2005. Impact of the SEC's public fee disclosure requirement on subsequent period fees and implications for market efficiency. *Auditing: A Journal of Practice and Theory* (Supplement): 145-160.
- _____, K. Reichelt, and D. Wang. 2005. The pricing of national and city-specific reputations for industry expertise in the U.S. audit market. *The Accounting Review* 80 (January): 113-136.
- Glater, J. D. 2003. Pricewaterhouse taking a stand, and a big risk. *New York Times* (January 1): C1.
- Gramling, A. A., V. E. Johnson, and K. I. Khurana. 2001. Audit firm industry specialization and financial reporting quality - Working paper, Georgia State University.
- Hammersley, J. (2006). Pattern identification and industry-specialist auditors. *The Accounting Review* 81 (2): 309-336.
- Hindo, B., and I. Sager. 2003. Audit clients get the heave-ho. *Business Week* (December 1): 7.
- Huang, H-W., L-L. Liu, K. Raghunandan, and D. V. Rama. Auditor industry specialization, client bargaining power, and audit fees: Further evidence. *Auditing: A Journal of Practice and Theory* 26 (1): 147-158.
- Krishnan, G. V. 2003. Does big 6 auditor industry expertise constrain earnings management? *Accounting Horizons* 17 (supplement): 1-16.
- KPMG. 2005. *Sarbanes-Oxley Section 404: Summary of key points from submissions to the SEC*. KPMG: Hong Kong.
- Maletta, M., and A. Wright. 1996. Audit evidence planning: An examination of industry error characteristics. *Auditing: A Journal of Practice and Theory* 15 (1): 71-86.
- Mayhew, B., and M. Wilkins. 2003. Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public. *Auditing: A Journal of Practice and Theory* 22 (September): 33-52.
- Microsoft, Inc. 2005. Comments submitted to the SEC's Roundtable on Implementation of Internal Control Reporting Provisions. Washington, D.C.: SEC. Available at: <http://www.sec.gov/news/press/4-497/microsoft033105.pdf>

- Neal, T. L., and R. R. Riley Jr. 2004. Auditor industry specialist research design. *Auditing: A Journal of Practice and Theory* 23 (2): 169-177.
- Owhoso, V., W. Messier, and J. Lynch. 2002. Error detection by industry-specialized teams during sequential audit review. *Journal of Accounting Research* 40 (June): 883-900.
- Palmrose, Z-V. 1986. Audit fees and auditor size: Further evidence. *Journal of Accounting Research* 24 (Spring): 97-110.
- Pearson, T., and G. Trompeter. 1994. Competition in the market for audit services: The effect of supplier concentration on audit fees. *Contemporary Accounting Research* 11: 115-135.
- Plitch, P., and L. Wei. 2004. Auditor-client breakups rise, while disclosure often lags. *Wall Street Journal* (August 3): C3.
- Pricewaterhouse Coopers (PWC). 2005. Comments submitted to the SEC's Roundtable on Implementation of Internal Control Reporting Provisions. Available at: <http://www.sec.gov/spotlight/soxcomp/soxcomp-stauffer.pdf>
- Public Company Accounting Oversight Board (PCAOB). 2004. *An Audit of Internal Control Over Financial Reporting Performed In Conjunction with an Audit of Financial Statements*. Auditing Standard No. 2. Washington, D.C.: PCAOB.
- _____. 2007. PCAOB's new audit standard for internal control over financial reporting is approved by the SEC. July 25, 2007. Available at: http://www.pcaobus.org/News_and_Events/News/2007/07-25.aspx
- Raghunandan, K., and D. Rama. 2006. SOX Section 404 material weakness disclosures and audit fees. *Auditing: A Journal of Practice and Theory* 25 (1): 99-114.
- Securities and Exchange Commission. 2005. Spotlight on Implementation of Internal Control Reporting Provisions. Washington, D.C.: SEC. Available at: <http://www.sec.gov/spotlight/soxcomp.htm>
- Shu, S. 2000. Auditor resignations: Clientele effects and legal liability. *Journal of Accounting & Economics* 29 (April): 173-206.
- Simunic, D., and M. Stein. 1987. *Product differentiation in auditing: Auditor choice in the market for unseasoned new issues*. The Canadian Certified General Accountants' Research Foundation: Vancouver, Canada.
- Solomon, I., M. D. Shields, and O. R. Whittington. 1999. What do industry-specialist auditors know? *Journal of Accounting Research* 37 (1): 191-208.
- Taub, S. 2004. Big 4 seen shedding small clients. *CFO* (September 21): 1.

- Taylor, M. 2000. Bounded rationality, uncertainty, and competence: The effects of industry specialization on auditors inherent risk assessments and confidence judgments. *Contemporary Accounting Research* 17 (Winter): 693-712.
- U.S. House of Representatives. 2002. The Sarbanes-Oxley Act of 2002. Public Law 107-204 [H. R. 3763]. Washington, D.C.: Government Printing Office.
- Whisenant, S., K. Raghunandan, and S. Sankaraguruswamy. 2003. Joint determination of audit and non-audit fees. *Journal of Accounting Research* (September): 721-744.
- Wright, A., and J. C. Bedard. 2000. Decision processes in audit evidential planning: A multistage investigation. *Auditing: A Journal of Practice and Theory* 19 (1): 123-143.

TABLE 1
Descriptive Statistics
(n = 1006)

Panel A: Descriptive statistics for years 2003 – 2005

Variable	2003		2004		2005	
	Mean	StdDev	Mean	StdDev	Mean	StdDev
Audit Fees (\$ M)	1.60	2.58	2.82	4.11	2.69	3.58
Ln(ASSETS)	6.82	1.69	6.94	1.65	7.03	1.65
Total Assets (\$ M)	3,675.41	7,401.06	3,935.50	7,734.79	4,214.38	8,163.34
LIQ	2.87	2.75	2.73	2.92	2.60	2.13
DEBTASSET	0.52	0.27	.052	0.26	0.53	0.26
MW	-	-	0.13	0.34	0.07	0.26
SPEC	0.01	0.02	0.01	0.01	0.01	0.02

Panel B: Descriptive statistics for the paired changes between 2003-2004 and 2004-2005.

Variable	2003 – 2004		2004 – 2005	
	Mean	StdDev	Mean	StdDev
Δ Audit Fees (\$ M)	0.713	0.400	(0.008)	0.299
Δ Total Assets (\$ M)	260.086	944.884	7.04	1.651
Δ LIQ	(0.142)	2.292	(0.127)	2.165
Δ DEBTASSET	(0.004)	0.113	0.010	0.104
MW	0.130	0.336	-	-
POS Δ MW	-	-	0.041	0.198
NEG Δ MW	-	-	0.097	0.297

Variable Definitions:

- Δ AuditFee = change in total audit fees from *Audit Analytics* (Yr 2 Audit fees less Yr 1 Audit fees);
- Ln(ASSETS) = natural logarithm of total assets (Compustat #6);
- Δ SIZE = change in firm size (Compustat #6)(Yr 2 Total assets less Yr 1 Total assets);
- Δ LIQ = change in liquidity (Compustat #4 / Compustat #5)(Yr 2 Liquidity less Yr 1 Liquidity);
- Δ DEBTASSET = change in debt to asset ratio (Compustat #181 / Compustat #6) (Yr 2 Debt to Asset Ratio less Yr 1 Debt to Asset Ratio);
- MW = 1 if there is a material weakness disclosure in the audit report in, and 0 otherwise;
- SPEC = Auditor weighted market share (market share * portfolio share) (Neal and Riley 2004);
- POS Δ MW = 1 if the firm had material weakness in 2004 but not in 2005, and 0 otherwise; and
- NEG Δ MW = 1 if the firm did not have a material weakness in 2004 but had one in 2005, and 0 otherwise.

TABLE 2
Audit Fee Results for 2003 – 2004
(n = 1006)

$$\Delta AuditFee_{03-04} = \beta_0 + \beta_1 Ln(ASSETS) + \beta_2 \Delta SIZE + \beta_3 \Delta LIQ + \beta_4 \Delta DEBTASSET + \beta_5 MW + \beta_6 SPEC + \varepsilon$$

Variable	Expected sign	Coefficient	t	p-value
Intercept		1.14	20.86	0.000
Ln(ASSETS)	+	-0.06	-7.58	0.000
Δ SIZE	+	3.63 ^{10^-005}	2.65	0.008
Δ LIQ	+	0.01	1.86	0.063
Δ DEBTASSET	+	0.28	2.54	0.011
MW	+	0.11	3.11	0.002
SPEC	-	-2.56	-3.25	0.001

F = 17.59, $p < .001$

Adj.R² = 0.096

See table 1 for variable definitions

TABLE 3
Audit Fee Results for 2004 – 2005
(n = 1006)

$$\Delta AuditFee_{04-05} = \beta_0 + \beta_0 + \beta_1 Ln(ASSETS) + \beta_2 \Delta SIZE + \beta_3 \Delta LIQ + \beta_4 \Delta DEBTASSET + \beta_5 POS\Delta MW + \beta_6 NEG\Delta MW + \beta_7 SPEC + \varepsilon$$

Variable	Expected sign	Coefficient	t	p-value
Intercept		0.051	1.19	0.235
Ln(ASSETS)	+	-0.01	-1.87	0.063
$\Delta SIZE$	+	$4.54^{10^{-005}}$	5.10	0.000
ΔLIQ	+	-0.01	-2.54	0.011
$\Delta DEBTASSET$	+	0.05	0.52	0.606
$POS\Delta MW$	-	0.01	-0.18	0.855
$NEG\Delta MW$	+	0.19	4.42	0.000
SPEC	-	-0.06	-0.10	0.919

F = 7.34, $p < .001$

Adj. $R^2 = 0.049$

See table 1 for variable definitions