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Auditor Industry Specialization, Auditor Changes, and Accounting Restatements

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SYNOPSIS: The increasing occurrence of accounting restatements has drawn considerable attention from regulators, audit firms, and corporate boards concerning audit and financial statement quality. Research suggests that auditor industry specialization is associated with improved error detection and greater financial statement quality. We examine the impact of auditor industry specialization on a sample of restatement and nonrestatement firms and find that auditor industry specialization is negatively associated with the likelihood of accounting restatement. In addition, focusing on the subset of restatement firms, we find that auditor industry specialization reduces the likelihood of issuing restatements affecting core operating accounts, suggesting that industry specialization adds value in auditing a particularly critical area of the firms' continuing operations. Finally, we find changing from a nonspecialist to a specialist auditor increases the likelihood of restatement, and changing from a specialist to a nonspecialist reduces the likelihood of restatement. Our findings are consistent with industry specialization enhancing auditors' role in improving the quality of the financial reporting process, particularly related to the core operations of their clients.

Keywords: audit quality; auditor industry specialization; financial restatements.

Data Availability: All data are available from public sources.

INTRODUCTION

Accounting restatements are central to the public policy debate concerning the quality of externally reported financial statements. Trust in the capital markets depends on the level of confidence investors place in financial statements when making investment decisions. The incidence of accounting restatements has substantially increased in recent years, rising to a record 1,876 restatements in 2006 (Reilly 2007). This increase has drawn substantial public scrutiny of auditors' roles in ensuring the quality of financial statements, compromising investor confidence in the financial reporting process. The Securities and Exchange Commission (SEC)

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considers accounting restatements “the most visible indicator of improper accounting” (Schroeder 2001) and Congressional interest spurred the General Accounting Office’s (2002) report on the proliferation, potential causes, and implications of accounting restatements.

The underlying causes for the increase in accounting restatements have been debated in boardrooms, the business press, and academic research. Studies suggest that capital market pressures motivate managers to adopt more aggressive accounting policies that lead to restatements (e.g., Richardson et al. 2002). External auditors play a critical role in the financial reporting process by providing an objective review of financial statements, which can deter management from engaging in overly aggressive accounting practices that could lead to lower quality financial statements. Research suggests that industry specialization appears to enhance auditors’ error detection (Maletta and Wright 1996; Owoso et al. 2002) and mitigate the use of accruals-based earnings management (Balsam et al. 2003; Krishnan 2003a). These studies indicate that auditor industry specialization plays an important role in enhancing audit and financial reporting quality.

Following this stream of research, we posit that firms engaging auditors with greater industry specialization should have a lower likelihood of issuing an accounting restatement. To gain a more detailed understanding of this relationship, we also examine the effect that auditor industry specialization has on the type of accounts affected for those firms that were required to restate. Restatements in core operating accounts are likely to have a more profound effect on the perception of the firm’s permanent earnings as compared with noncore accounts because the estimation of permanent earnings is a critical part of valuation and investment analyses (Ou and Penman 1989; Penman 2007). Research also indicates that auditor changes are associated with an increased incidence of restatements (Lazer et al. 2004). We build on this research and examine the extent to which changing from an industry nonspecialist auditor to a specialist (or *vice versa*) impacts the likelihood of restatement.

To examine the relationship between auditor industry specialization and the likelihood of restatement, we gathered data on 456 firms that restated annual financial statements between 1998 and 2003 along with a matched sample of nonrestating firms. Our results indicate a significant negative association between auditor industry specialization and the likelihood of restatement. We also find that greater industry specialization decreases the likelihood of restatements impacting core operating accounts. Finally, we find the likelihood of restatement increases when companies change from a nonspecialist to a specialist auditor, and decreases when changing from a specialist to a nonspecialist.

Our research contributes to the existing literature in at least three ways. First, we document the importance of auditor industry specialization in reducing the likelihood of accounting restatements with a large sample of accounting restatements over a six-year period. This suggests that recent shifts by the Big 4 auditing firms in the direction of greater industry specialization could result in improved financial reporting quality (Balsam et al. 2003). Second, we also contribute to the literature by examining industry specialization within the context of restatement account type. Prior research on industry specialization either tests the effects on operating-based accounts such as accruals (Balsam et al. 2003; Krishnan 2003a) or relies on errors seeded within operating related accounts (Hammersley 2006; Owoso et al. 2002; Solomon et al. 1999). An underlying assumption of this stream of research is that industry specialist auditors primarily bring value to tasks associated with a firm’s core operations. While this assumption appears logical, we are not aware of any published research that examines whether the specialist auditor’s primary expertise manifests itself in monitoring and attesting to the area of a firm’s principal recurring operations. Our results indicate that in instances where firms are required to restate, the likelihood that they will restate a core operating account is negatively associated with the level of auditor industry specialization. This finding suggests that the superior skills of industry specialists are particularly discernible with respect to core operating accounts. These results also suggest that the credibility

that capital market participants attribute to financial statements of companies with industry specialist auditors (Balsam et al. 2003) may not extend uniformly across all aspects of the financial statements, but may rather be concentrated in the operating accounts.

Finally, we extend prior research that indicates switching auditors increases the likelihood of restatement (Lazer et al. 2004) by demonstrating that changing auditors between specialization classifications within the Big N accounting firms differentially affects the likelihood of restatement. Although research to date has primarily focused on the specialization of the engagement auditor (Balsam et al. 2003; Dunn and Mayhew 2004; Krishnan 2003a; Krishnan 2005), our findings demonstrate that following an auditor change, the specialization of the successor auditor is also an important factor in determining the likelihood of previous financial statements being restated. Taken together with prior empirical findings (Balsam et al. 2003; Krishnan 2003a; Carcello and Nagy 2004; Stanley and DeZoort 2007), our study is consistent with a growing body of evidence that indicates the major auditing firms' push toward industry specialization can provide explicit capital market benefits by increasing the quality of the audit and, correspondingly, increasing the quality of corporate financial statements.

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

HYPOTHESES DEVELOPMENT

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). Support for this theory 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 nonspecialist auditors. Similarly, Krishnan (2003a) 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.

Research also associates auditor industry specialization with less fraudulent financial reporting. Carcello and Nagy (2004) find that clients of industry specialist auditors are less likely to be involved in SEC enforcement actions and that this association is weaker for large clients than for small clients, indicating client characteristics may moderate the effect of industry specialization on audit quality. Several studies also investigate the relationship between auditor industry specialization and other aspects of financial reporting quality. For instance, Dunn and Mayhew (2004) find that companies with industry specialist auditors are ranked by financial analysts as having higher disclosure quality than companies with nonspecialist auditors. Additionally, Krishnan (2005) examines the association between industry specialization and the speed with which bad news regarding future cash flows is recognized in earnings. He finds that clients who engage industry specialist auditors reflect bad news more promptly than clients who engage nonspecialists.

In summary, extant research suggests that auditor industry specialization increases the quality of certain aspects of the financial statements by imposing greater audit expertise on the financial

reporting process. In this study, we extend this research by examining the influence of industry specialization on the likelihood of accounting restatements. We also explore whether industry specialization has a greater impact on the likelihood of restatements affecting core operating accounts, and examine the effect of changing to an auditor with a different level of industry specialization on the likelihood of accounting restatements.

Accounting Restatements

Accounting restatements provide an interesting and relevant domain in which to examine the influence of auditor industry specialization because one of the primary antecedents of accounting restatements is a failure by the external auditor to detect a misstatement prior to the issuance of the financial statements (Eilifsen and Messier 2000). Restatements “provide more direct evidence that the auditor failed to either detect or report an accounting treatment that is inconsistent with GAAP” than other common proxies for audit quality such as accrual-based metrics (DeFond and Francis 2005).

Several recent studies investigate the impact of financial reporting quality and audit quality on accounting restatements. With a sample of restatements occurring between 1988–2001, Richardson et al. (2002) provide evidence that larger operating and investing accruals are positively associated with earnings restatements. Additionally, the authors group all firms into ten equal-sized portfolios based on their level of total accruals and find that the highest concentration of restatements occurs in the portfolio with the highest level of total accruals. Desai et al. (2006) provide complementary support for the accruals-restatement relation by demonstrating that short sellers accumulate positions in restatement firms several months in advance of the restatement announcement and subsequently unwind the positions following the announcements. In particular, they find the largest increases in short interests for firms with the highest levels of accruals. Finally, Stanley and DeZoort (2007) investigate the relationship between financial restatements, audit tenure, and proxies for auditor industry expertise and independence. They find the likelihood of restatement is negatively related to both auditor industry specialization and independence for short-tenure (≤ 3 years) auditors, but not long-tenure (≥ 5 years) auditors. Our research complements and extends their findings by providing a more thorough and direct investigation of the relationship between auditor specialization and restatements.

A related stream of research associates corporate governance, audit committee, and chief financial officer (CFO) characteristics with the incidence of restatements. Agrawal and Chadha (2005) find that the likelihood of restatement is lower for firms with audit committees that have an independent director with financial expertise. Abbott et al. (2004) find that firms with audit committees with at least one financial expert are also negatively associated with the occurrence of restatements. Similarly, Aier et al. (2005) document a lower likelihood of restatement for firms with CFOs that have greater financial expertise.

In summary, research suggests that greater industry expertise of the parties involved in the financial reporting process reduces the likelihood of accounting restatements. Given that the time and resources devoted to developing industry-specific expertise affords auditors greater knowledge about the unique characteristics of a particular industry, we posit that auditor industry specialization enhances auditors’ ability to detect and minimize earnings management and unintentional accounting errors before financial statements are issued. Thus, we predict that auditor industry specialization is negatively associated with the incidence of accounting restatements.

H1: Auditor industry specialization is negatively associated with the likelihood of accounting restatement.

Restatement Account Type

Although our first hypothesis predicts that auditor industry specialization decreases the likelihood of accounting restatements, the expansive nature and complexity of the financial reporting process suggests that restatements will still occur despite investments by auditors and companies in industry specific expertise. Therefore, we expand our inquiry to examine the effect of auditor industry specialization on the type of accounts restated for the subset of firms that issue restatements.

Palmrose and Scholz (2004) investigate the specific circumstances of 334 accounting restatements during 1995–1999 and find that restating firms experience an average decrease in net income of 137 percent. However, this figure varied greatly depending on the type and number of account groups affected by the restatement. Restatements involving core accounts (e.g., revenue, cost of goods sold, and operating expenses) resulted in an average *decrease* in net income of 246 percent, while those involving noncore accounts (e.g., nonoperating expenses, special items) resulted in a 35 percent *increase* in net income. Additionally, Palmrose et al. (2004) show that core account restatements have significantly lower average cumulative abnormal returns following the announcement date than those restatements affecting only noncore accounts (13 percent versus 4 percent). Together, these results indicate that while restatements can dramatically impact the financial statements, restatements of core operating accounts are associated with more negative financial statement implications and market reactions than restatements of noncore accounts.

Consistent with the reasoning supporting H1 that the advantages amassed from investments in industry expertise reduce the likelihood of restatements in general, we argue that such expertise is likely to be most effective in identifying issues affecting core operating accounts. That is, the benefit of auditor industry specialization on reducing accounting restatements is likely to manifest itself more in areas affecting core operating accounts than in the noncore accounts. Based on this reasoning, we predict a negative association between auditor industry specialization and the likelihood of core account restatements.

H2: Auditor industry specialization is negatively associated with the likelihood of core account restatement.

Auditor Changes and Restatements

Support for our first two hypotheses would suggest that auditor industry specialization reduces the likelihood of accounting restatements, particularly restatements affecting core operating accounts. The first two hypotheses, however, focus on the specialization of the engagement auditor. The possibility exists that when a firm changes auditors, the successor auditor may play an important role in determining the need for restatement. Generally, when a client switches audit firms, the successor auditor is not subject to litigation arising from the financial statements audited by the predecessor audit firm. However, the successor auditor may be subject to litigation to the extent that prior misstatements are not corrected (Lys and Watts 1994). Lazer et al. (2004) find that firms with new auditors experience a greater incidence of quarterly restatements and argue that successor auditors use restatements as a mechanism to manage litigation risk. Their analyses, however, do not investigate the relative industry specialization of the predecessor and successor auditors.

While the decision to accept a new client is multifaceted, one dimension of the client acceptance/retention decision is the creation and maintenance of industry-specialized client

portfolios. Nagy and Cenker (2006) provide evidence that auditor industry specialization is negatively associated with auditor resignations, consistent with the conjecture that audit firms value clients that help them maintain certain industry specializations. Thus, audit firms may be more willing to accept a new client if (1) it increases the firm's specialization portfolio and/or (2) the firm can potentially mitigate certain client-specific risk factors by requiring the restatement of previously issued financial statements (Lazer et al. 2004).

Consistent with H1 and H2, auditors with industry specializations would be expected to employ their enhanced knowledge and skills through the use of more stringent and pointed audit procedures when performing first-year audits for new clients. In the case of a client that switches from a nonindustry specialist auditor to an industry specialist, the knowledge and expertise of the industry specialist auditor could be particularly revealing with respect to potential errors or other inaccuracies in previously issued financial statements. On the other hand, when a client switches from an industry specialist auditor to a nonindustry specialist, the new auditor is less likely to uncover material errors within prior financial statements than was the previous auditor. This reasoning leads to the following related hypotheses:

H3a: Changing from a nonspecialist auditor to a specialist auditor is positively associated with the likelihood of accounting restatement.

H3b: Changing from an industry specialist auditor to a nonspecialist auditor is negatively associated with the likelihood of accounting restatement.

METHOD

Sample Description

The initial sample for this study consisted of 986 companies that restated their annual financial statements during 1998–2003. This sample was identified through two sources. First, we used the GAO (2002) report to identify all companies announcing restatements between January 1997 and June 2002. The GAO report includes the company name, ticker, restatement announcement date, and to whom the restatement is attributed (e.g., auditor, restating company, SEC, or some other entity). Second, we conducted keyword searches for restatements in the Lexis-Nexis News Library between July 2002 and 2004. We ultimately collected data on all firms that restated at least one annual financial statement during the study window and were listed on one of the three major stock exchanges (NYSE, AMEX, or NASDAQ). The sample was limited to annual restatements to control for potential variation in the degree of audit scrutiny between quarterly and annual reports (Abbott et al. 2004).¹

Using a combination of restatement announcements and 10-K reports, information was gathered on both the type and number of account groups affected by the restatement. We eliminated all restatements caused by routine events such as mergers and acquisitions, discontinued operations, and stock splits. Any additional retroactive restatements required by GAAP for accounting changes were also eliminated. Finally, we removed all companies that announced a restatement but did not ultimately restate their financial statements (Palmrose and Scholz 2004). These steps reduced the sample by 134 restatements, leaving a subtotal of 852 firms. We then eliminated the 135 companies not audited by Big N auditors to isolate the effect of industry specialization.² Prior

¹ A rule requiring timely interim reviews was adopted by the SEC in 1999. However, a quarterly review does not contain the rigor of the formal audit process; therefore, we included only annual restatements.

² For the years 1998 to 2001, Big N refers to the Big 5 audit firms and to the Big 4 for the years thereafter. Furthermore, Eisenberg and Macey (2004) find that the Big 5 accounting firms did not differ with regard to restatement frequency during the period 1997 to 2001, which indicates that general audit quality was relatively constant across the Big 5 firms.

research finds that Big N audit firms provide higher quality audits because of more specialized training and the use of more sophisticated technologies to aid in the detection of errors and/or earnings management (Becker et al. 1998; Krishnan 2003b).

Consistent with prior research (Abbott et al. 2004; Aier et al. 2005; Kinney et al. 2004), each restatement firm was matched with a control firm that did not restate its financial statements during the study window. For each restating company, we located companies with the same two-digit SIC code, listed on the same stock exchange, and with a market value of equity in the matched restatement year within 30 percent of the restatement firm (Abbott et al. 2004). We then selected the company with the closest market value of equity to the restatement firm.³ Independent samples t-tests indicate the restatement firms and control firms do not differ with regard to market value of equity ($p = 0.871$) or annual earnings performance ($p = 0.225$). Eliminating financial institutions and restatement firms with missing Compustat data, no matching control firm, or no audit committee quality data resulted in a final sample of 456 restatement firms. Panel A of Table 1 presents the sample selection process⁴ while Panel B portrays a moderately wide dispersion across two-digit industry SIC codes. The most commonly represented industry is Business Services (SIC 73).⁵ Finally, Panel C illustrates a reasonably well-distributed restatement sample across the years with a small amount of clustering in the years 2000 and 2001.

Research Design

Accounting Restatements and Industry Specialization (H1)

We estimate the following conditional logistic regression model to test our first hypothesis that auditor industry specialization reduces the likelihood of accounting restatement:

$$\begin{aligned} REST = & \beta_1 AUDSPEC_t + \beta_2 LEV_t + \beta_3 FIN_t + \beta_4 EPR_t + \beta_5 BTM_t + \beta_6 ACC_t + \beta_7 EXANTE_t \\ & + \beta_8 EPSGWTH_t + \beta_9 ACSIZE_t + \beta_{10} ACIND_t + \beta_{11} ACFE_t + \beta_{12} ACMEET_t + \beta_{13} SIZE_t \\ & + \beta_{14} ROA_t + \beta_{15} MA_t + \beta_{16} COAGE_t + \varepsilon \end{aligned} \quad (1)$$

where:

$REST = 1$ if financial statements were restated, 0 otherwise;

$AUDSPEC =$ auditor weighted market share (market share * portfolio share; Neal and Riley 2004);

$LEV =$ short term debt (Compustat #34) plus long-term debt (Compustat #9) divided by total assets (Compustat #6);

$FIN =$ sum of additional cash raised from issuance of long-term debt (Compustat #9), common stock (Compustat #108) and preferred stock (Compustat #111) deflated by total assets (Compustat #6);

$EPR =$ income from continuing operations (Compustat #178) divided by market capitalization at the end of the year (Compustat #25 * Compustat #199);

³ If the match firm with the closest market value of equity (MVE) to the restatement firm was missing necessary data, that match firm was dropped from the analysis, and the match firm with the next closest MVE to the restatement firm was chosen.

⁴ The number of annual restatements we collected depends on the year the need for restatement was identified. Because our restatement announcement collection period ended in December 2004, it is conceivable that a number of firms announced restatements subsequent to December 2004 that affect periods prior to December 2003. These plausible observations are not included in our sample.

⁵ The Business Services industry (SIC 73) represents 26.5 percent of the restatement sample. To ensure this industry does not drive the overall results, we removed firms in the sample from SIC 73 and reran the analyses. Our primary inferences and general results remained unchanged.

TABLE 1
Sample Selection and Description

Panel A: Restatement Sample Selection

	Number	%
Total Number of Annual Restatements Identified between 1998 and 2003	986	100.0
Less: Restatements for technical reasons not amounting to misstatements	(111)	(11.3)
Less: Companies that did not eventually restate	(23)	(2.3)
Less: Companies with Non-Big N auditor or auditor not identifiable	(135)	(13.7)
Less: Companies with missing data in Compustat	(210)	(21.3)
Less: Companies with no control firm located within 30% MVE	(22)	(2.2)
Less: Companies for which audit committee quality data was not available	(26)	(2.6)
Less: Financial Institutions	(3)	(0.3)
Total Restatement Firm Sample	456	46.3

Panel B: Restatement Sample Observations by Two-Digit SIC Code

10: Metal Mining	4	48: Communications	22
12: Coal Mining	1	49: Electric, Gas, and Sanitary Serv.	16
13: Oil and Gas Extraction	11	50: Wholesale: Durable Goods	14
21: Tobacco Products	11	51: Wholesale: Nondurable Goods	10
23: Apparel and Other Fabric Prod.	3	53: General Merchandise Stores	1
26: Paper Products	9	54: Food Stores	4
27: Printing and Publishing	2	55: Auto Dealers and Gas Stations	1
28: Chemical and Allied Products	33	56: Apparel and Accessory Stores	8
29: Petroleum Refining	1	57: Home Furnishings and Equip.	4
30: Rubber and Misc. Plastic Products	4	58: Eating and Drinking Est.	18
33: Primary Metals	4	59: Misc. Retail	9

(continued on next page)

TABLE 1 (continued)

34: Fabricated Metals	5	72: Personal Services	1
35: Industrial Machinery, Computers	40	73: Business Services	121
36: Electronic Equipment	14	78: Motion Pictures	2
37: Transportation Equipment	5	79: Amusement Parks	13
38: Measuring, Analyzing Inst.	29	80: Health Services	2
39: Misc. Manufacturing Industries	2	82: Educational Services	2
44: Water Transportation	1	83: Social Services	2
45: Transportation by Air	5	87: Engineering, Accounting, Research, and Mgmt Services	19
47: Transportation Services	3	Total	456

Panel C: Restatement Sample by Observation Year

1998	55
1999	68
2000	92
2001	106
2002	80
2003	55
Total	456

- BTM* = book value of equity (Compustat #60) divided by market capitalization at the end of the fiscal year (Compustat #25 * Compustat #199);
- ACC* = change in noncash working capital plus change in noncurrent operating assets plus change in net financial assets, scaled by total assets (Richardson et al. 2002);
- EXANTE* = 1 if firm's free cash flow is < -0.1 , and 0 otherwise where free cash flow is net income (Compustat #172) less accruals (defined above) divided by average of last three years capital expenditures (Compustat #128);
- EPGWTH* = number of consecutive quarters of EPS growth for two years prior to restatement;
- ACSIZE* = number of audit committee members;
- ACIND* = percentage of audit committee members that are independent. Independence is defined as exclusion of current and former employees, relatives of management, and persons receiving compensation from the company (except directors' fees) (Abbott et al. 2004);
- ACFE* = percentage of audit committee members that are financial experts. A financial expert is defined as a person who has been or is a CPA, investment banker, or venture capitalist, served as CFO or controller, or has held a senior management position (CEO, President, EVP, SVP, or VP) with financial responsibilities (Abbott et al. 2004);
- ACMEET* = number of audit committee meetings during the year;
- SIZE* = log of total assets (Compustat #6) in the year of restatement;
- ROA* = return on assets in the year of restatement;
- MA* = 1 if firm underwent a merger or acquisition (Compustat Footnote #1); and
- COAGE* = number of years a firm has been listed on Compustat.

Auditor industry specialization. Prior research operationalizes auditor industry specialization 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. The market share and portfolio share measures are calculated using all firms audited by the Big 5 audit firms for the period 1998 to 2001 and the Big 4 audit firms for 2002 to 2003. Two-digit SIC codes are used to identify industry categories.

Neal and Riley (2004) suggest the market and portfolio share measures act as complements, and that auditor industry specialization 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 (i.e., market share) and/or devoted considerable firm resources to industry-specific training and technologies (i.e., portfolio share) (Neal and Riley 2004). Thus, following Neal and Riley (2004) we use auditors' *weighted market share* (Market share * Portfolio share) as the estimate of auditor industry specialization (*AUDSPEC*). For example, if a firm has a market share of 30 percent and a portfolio share of 1 percent, the weighted market share would be 0.003. Given the measurement variation in prior research, we perform additional sensitivity analyses to evaluate the robustness of our results to alternative measures of auditor industry specialization.

Control variables. Based on prior research examining restatements (Richardson et al. 2002; Abbott et al. 2004; Aier et al. 2005), we include 15 control variables in our analyses. The primary

underlying rationale for selecting these control variables is that firms that are more likely to engage in earnings management are also more likely to issue accounting restatements (Richardson et al. 2002; Callen et al. 2004). Following this literature, we include control variables that proxy for the presence of debt covenants, the need for external capital, the desire to continue a string of earnings increases, the level of discretionary accruals, firm growth, and audit committee quality.

Prior research suggests debt agreements containing accounting-based covenants (e.g., interest coverage, liquidity ratios) provide managers with incentives to make financial reporting decisions that reduce the likelihood of violating such agreements (Dechow and Skinner 2000; Dichev and Skinner 2002; Richardson et al. 2002). Research also suggests firms that violate their debt covenants attempt to avoid this problem by making significantly more discretionary accrual adjustments in the year preceding the violation (DeFond and Jiambalvo 1994). Thus, managers with high outstanding levels of debt have greater incentives to engage in behavior that may result in restatements. Therefore, we include leverage (*LEV*) as a proxy for debt covenant pressure.⁶ We expect *LEV* to be positively associated with the likelihood of restatement.

Prior research also suggests that the cost of capital contains a risk premium for earnings variability (Collins and Kothari 1989; Barth et al. 1995), providing management with an incentive to reduce capital costs via earnings management that could result in a restatement. Richardson et al. (2002) compare restatement with nonrestatement firms and find that restatement firms attract significantly more external financing. Thus, following Richardson et al. (2002), we control for the amount of financing raised (*FIN*) from the sale of long-term debt, common, and preferred stock (deflated by average total assets), and whether there is a need for future external financing (*EXANTE*). *EXANTE* is an indicator variable equal to 1 if the firm's free cash flow is less than negative 0.1, where free cash flow is calculated as the difference between earnings and total accruals divided by the average of capital expenditures over the previous three years (Richardson et al. 2002). We anticipate that both *FIN* and *EXANTE* will be positively associated with the likelihood of restatement.

Similarly, firms trading at considerable multiples of earnings and book value can feel pressure to manipulate earnings to meet certain growth targets. Richardson et al. (2002) find that earnings-price and book-to-market ratios are negatively associated with restatements. Thus, we control for both the earnings-price ratio (*EPR*) and book-to-market ratio (*BTM*) and expect both variables to have a negative relationship with the occurrence of restatements.

Numerous studies also associate various accrual metrics with both earnings management and earnings quality (e.g., Dechow et al. 1996; Francis and Krishnan 1999; Bartov et al. 2000; Marquardt and Wiedman 2004). Specific to restatements, Richardson et al. (2002) find that three types of accruals—noncash working capital, net noncurrent operating assets, and net financial assets—are positively associated with earnings restatements. Thus, following Richardson et al. (2002), we control for the total change in each type of accruals scaled by total assets (*ACC*) and expect it to be positively associated with the likelihood of restatement.

Prior research also indicates that firms have incentives to engage in earnings management to refrain from breaking consistent earnings strings. For example, Myers et al. (2007) find evidence that managers attempt to increase earnings per share when failing to do so would result in the break of consistent earnings increases. Richardson et al. (2002) also find constant strings of earnings growth are positively associated with the likelihood of restatements. Thus, we control for

⁶ Dichev and Skinner (2002) recognize that leverage can be a noisy proxy for closeness to debt covenants but nevertheless represents a commonly used metric. Richardson et al. (2002) find leverage to be significantly higher for restatement firms when partitioning the firms by industry-adjusted characteristics.

the number of consecutive quarters (up to eight) of earnings increases preceding the restatement year (*EPSGWTH*) and expect it to be positively related to the likelihood of restatement.

We also include four control variables that proxy for audit committee quality. Prior research indicates certain audit committee characteristics are associated with financial statement or audit quality. For example, Zhang et al. (2007) provide evidence that firms with audit committees comprising members with less financial expertise have a greater likelihood of internal control weaknesses. Abbott et al. (2004) find that firms with audit committees that have greater independence and activity level are less likely to issue restatements. Lin et al. (2006) also find that audit committee size is related to likelihood of restatement, while audit committee independence, financial expertise, activity, and stock ownership are not. Following both Krishnan (2005) and Zhang et al. (2007) we add four variables to our model to control for audit committee quality: *ACSIZE* is the size of the audit committee; *ACIND* is the percentage of audit committee members that are independent; *ACFE* is the percentage of audit committee members that are financial experts; and *ACMEET* is the number of audit committee meetings.⁷ We expect these four variables to be negatively related to the likelihood of restatement.

We also include firm size (*SIZE*) in our model, measured as the natural log of total assets. Larger firms may possibly be subject to closer scrutiny by regulatory agencies and, correspondingly, by the auditing staff (Balsam et al. 2003; Richardson et al. 2002). Conversely, restatements may be less likely because larger firms have better internal controls. However, we do not predict the direction of the association of company size with the likelihood of restatement because evidence suggests the negative relationship between auditor industry specialization and fraudulent financial reporting is weaker for larger firms (Carcello and Nagy 2004). We investigate this relationship in more detail in our sensitivity analyses. Firm performance measured as return on assets (*ROA*) is included in the model because better performing firms have fewer incentives to manage earnings (Ferguson et al. 2004). Thus, we expect *ROA* to be negatively associated with the likelihood of restatement. Although we eliminate firms from the sample that expressly attributed their restatements solely to mergers or acquisitions, we control for the occurrence of a merger or acquisition (*MA*) in the remaining sample because merger and acquisition related items are one of the most common causes of noncore restatements (Palmrose and Scholz 2004). Last, we include company age (*COAGE*), measured as the number of years the firm is listed on Compustat, because it is a broad proxy that may be correlated with size and auditor tenure and may also be related to internal control strength, which would reduce the likelihood of a restatement.

Core Account Restatements and Industry Specialization (H2)

We investigate the relationship between auditor industry specialization and incidence of core account restatements by examining the type of restatements (core versus noncore) contained in our sample of restatement firms ($n = 456$).⁸ The same variables that are useful in explaining why a firm should restate its financial statements should also be useful in explaining core account restatements. Specifically, we reestimate Equation (1) as a standard logistic regression model with *CORE* as the dependent variable, where *CORE* is an indicator variable equal to 1 if one or more of the restatement adjustments include revenue, costs of sales, operating expenses, and reclassifications between these accounts (Palmrose and Scholz 2004). Core account restatements involve accounts that affect normal recurring operating activities (e.g., revenue and cost of goods sold), whereas noncore restatements involve adjustments to accounts reflecting nonnormal operations

⁷ All audit committee variables were gathered from information available in proxy statements, annual reports, and executive professional biographies.

⁸ The breakdown for this sample is 311 core restatements and 145 noncore restatements.

(e.g., asset impairments and restructurings) that are inherently more transitory in nature (Penman 2007).⁹

Auditor Switching and Restatements (H3)

To test our third hypothesis regarding the effect of auditor changes on accounting restatements, we add three indicator variables to Equation (1) and reestimate the conditional logistic model. The three variables indicate whether an auditor change occurred after the restatement period but prior to the restatement announcement date, signifying that the new auditor was likely key in prompting the restatement.¹⁰ *SPEC_NON* is an indicator variable equal to 1 if a firm changed from an industry specialist to a nonspecialist auditor, *NON_SPEC* is an indicator variable equal to 1 if a firm changed from a nonspecialist to a specialist auditor, *NO_SPECCHG* is an indicator variable equal to 1 if a firm changed auditors within the same specialization classification.

We follow Neal and Riley's (2004) cutoff approach to classify auditors as specialists or nonspecialists, which requires estimation of a specialization cutoff value for the weighted market share measure (*AUDSPEC*). Consistent with the theory that each audit firm would be expected to hold approximately a proportionate share of the market (i.e., $1/N_{\text{firms}}$) in the absence of any discernible specialization (Palmrose 1986), we set the specialization cutoff for market share to be a market share of at least 20 percent greater than an even industry distribution among the existing firms (i.e., $1/N_{\text{firms}} * 1.20$).¹¹ Additionally, based on the theory that without specialization an audit firm's portfolio share is expected to be distributed evenly over the number of available industries (i.e., $1/N_{\text{industries}}$), we designate an auditor as an industry specialist if the auditor's portfolio share was greater than $1/N_{\text{industries}}$ (Krishnan 2001). As such, the portfolio share cutoff values for our sample are $1/61$ during the Big 5 regime and $1/62$ during the Big 4 regime. Following Neal and Riley (2004), we calculate the weighted market share cutoff by multiplying the market share and portfolio share cutoffs (i.e., $[(1/N_{\text{firms}} * 1.20) * 1/N_{\text{industries}}]$).¹²

RESULTS

Descriptive Statistics and Univariate Results

Panel A of Table 2 presents the means, medians, and standard deviations for the study variables. Univariate tests reveal that auditor industry specialization (*AUDSPEC*) is significantly higher for the control firms (mean=0.011) than for the restatement firms (mean=0.010; $p < 0.01$). Specifically, the average market share (*MSHARE*) for the control firms (mean = 28

⁹ The classification of restatements as either core or noncore involves a reasonable level of professional judgment, but considerable care was taken to insure the accuracy of the classifications. The coder used a two-step classification system that required separate judgments regarding the type of restatement and account groups affected. The core/noncore classifications were reconciled with the account group data and any inconsistencies were reevaluated. As an additional verification, a second coder evaluated a random sample of the restatement classifications and was in agreement with the core/noncore classifications. Subsequent sensitivity analysis evaluates the robustness of our results to this classification decision.

¹⁰ Data on auditor switch dates were obtained from 8-K reports and compared with the restatement announcement dates. This insured that the auditor switch took place prior to the restatement announcement date. Firms that filed the 8-K indicating a change of auditors subsequent to the restatement announcement date were no longer counted as auditor changes. We also collected data on restatement attribution (management, auditor, or SEC) and found no relationship with the likelihood of restatement, the interaction with auditor industry specialization, or the variables for auditor change.

¹¹ Because our sample spans the Big 5 (i.e., 1998–2001) and Big 4 (i.e., 2002–2003) accounting firm regimes, we set the cutoffs for industry specialization to be at least 24 percent ($1/5 * 1.20$) for the Big 5 regime and at least 30 percent ($1/4 * 1.20$) for the Big 4 regime.

¹² Specifically, we designate audit firms as industry specialists when their weighted market share exceeds 0.003934 ($0.24 * 1/61$) for 1998–2001 and 0.004839 ($0.30 * 1/62$) for 2002–2003.

TABLE 2
Univariate Results

Panel A: Descriptive Statistics

Variable	Restatement Firms (n = 456)			Control Firms (n = 456)			Diff. in Means	t-statistic
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
<i>MSHARE</i>	0.250	0.216	0.128	0.279	0.272	0.134	-0.029	-3.44***
<i>PSHARE</i>	0.034	0.030	0.028	0.037	0.032	0.030	-0.003	-1.44
<i>AUDSPEC</i>	0.010	0.006	0.010	0.011	0.008	0.012	-0.001	-2.58***
<i>LEV</i>	0.236	0.214	0.216	0.216	0.201	0.197	0.020	1.46
<i>FIN</i>	0.191	0.078	0.340	0.113	0.028	0.229	0.078	4.09***
<i>EPR</i>	0.001	0.069	0.403	-0.018	0.069	0.437	0.019	0.65
<i>BTM</i>	0.633	0.478	0.797	0.817	0.604	1.047	-0.184	-2.99***
<i>ACC</i>	0.001	0.021	0.461	-0.102	-0.018	0.375	0.103	3.71***
<i>EXANTE</i>	0.344	0.000	0.476	0.228	0.000	0.420	0.116	3.91***
<i>EPSGWTH</i>	0.881	0.000	1.217	0.633	0.000	0.996	0.248	3.36***
<i>ACSIZE</i>	3.429	3.000	1.127	3.379	3.000	1.079	0.050	0.66
<i>ACIND</i>	0.953	1.000	0.161	0.934	1.000	0.187	0.019	1.68*
<i>ACFE</i>	0.314	0.333	0.225	0.339	0.333	0.257	-0.025	-1.57
<i>ACMEET</i>	4.721	4.000	3.118	4.364	4.000	2.708	0.357	1.85*
<i>SIZE</i>	6.257	6.154	1.862	6.430	6.338	1.699	-0.173	-1.46
<i>ROA</i>	-0.076	0.020	0.417	-0.111	0.021	0.453	0.035	1.21
<i>COAGE</i>	17.276	10.500	15.113	17.645	10.000	15.568	-0.369	-0.36
<i>MA</i>	0.272	0.000	0.445	0.237	0.000	0.426	0.035	1.22

Panel B: Variable Definitions

- MSHARE* = auditor market share: auditor's total client sales in a particular industry divided by total industry sales;
- PSHARE* = auditor portfolio share: auditor's total client sales in a particular industry divided by auditor's firm-wide client sales;
- AUDSPEC* = weighted auditor market share based on client sales (*MSHARE* * *PSHARE*; Neal and Riley 2004);
- LEV* = total debt deflated by total assets; short term debt (Compustat #34) plus long-term debt (Compustat #9) divided by total assets (Compustat #6);
- FIN* = sum of additional cash raised from issuance of long-term debt (Compustat #9), common stock (Compustat #108), and preferred stock (Compustat #111) deflated by total assets (Compustat #6);
- EPR* = income from continuing operations (Compustat #178) divided by market capitalization at the end of the year (Compustat #25 * Compustat #199);
- BTM* = book value of equity (Compustat #60) divided by market capitalization at the end of the fiscal year (Compustat #25 * Compustat #199);

(continued on next page)

TABLE 2 (continued)

<i>ACC</i>	=	change in noncash working capital plus change in noncurrent operating assets plus change in net financial assets, scaled by total assets (Richardson et al. 2002);
<i>EXANTE</i>	=	indicator variable equal to 1 if firm's free cash flow is < -0.1 , and 0 otherwise where free cash flow is net income (Compustat #172) less accruals (defined above) divided by average of last three years capital expenditures (Compustat #128);
<i>EPSGWTH</i>	=	number of consecutive quarters of EPS growth for two years prior to restatement;
<i>ACSIZE</i>	=	number of audit committee members;
<i>ACIND</i>	=	percentage of audit committee members who are independent. Independence is defined as exclusion of current and former employees, relatives of management, and persons receiving compensation from the company (except directors' fees) (Abbott et al. 2004);
<i>ACFE</i>	=	percentage of audit committee members that are financial experts. A financial expert is defined as a person who has been or is a CPA, investment banker, or venture capitalist, served as CFO or controller, or has held a senior management position (CEO, President, EVP, SVP, or VP) with financial responsibilities (Abbott et al. 2004);
<i>ACMEET</i>	=	number of audit committee meetings during the year;
<i>SIZE</i>	=	log of total assets (Compustat #6) in the year of restatement;
<i>ROA</i>	=	return on assets in the year of restatement;
<i>MA</i>	=	1 if firm underwent merger or acquisition (Compustat footnote #1); and
<i>COAGE</i>	=	number of years firm listed on Compustat.

*, **, *** Significant at p-value < 0.10 , 0.05 , and 0.01 , respectively. (All tests are two-tailed.)

percent) is significantly higher than the average market share of the restatement firms (mean = 25 percent; $p < 0.01$), but no significant difference is seen between the average portfolio share (*PSHARE*) for the control (mean = 3.7 percent) and restatement firms (mean = 3.4 percent; $p > 0.10$). These results are consistent with Neal and Riley's (2004) assertion that portfolio share specialization lacks variation when firms are matched on size and industry. The means for several of the financial control variables—*FIN*, *BTM*, *ACC*, *EXANTE*, and *EPSGWTH*—are significantly different between the control and restatement firms in the expected directions (all p-values < 0.01). Also as expected, no significant differences are seen between the control and restatement firms with respect to *LEV*, *SIZE*, *ROA*, *COAGE*, and *MA*, suggesting that the matching procedure is successful, and the sample is suitable to test our hypotheses.

Table 3 displays the Pearson correlations between the independent variables. The correlation results reveal significant associations between *AUDSPEC* and many of the control variables. In particular, the correlation between *AUDSPEC* and *SIZE* is 0.27 ($p < 0.01$). Since Carcello and Nagy (2004) document that the negative association between auditor industry specialization and fraudulent financial reporting is weaker for larger clients, we explore this issue in our sensitivity analysis. Nevertheless, the bivariate correlations do not indicate the presence of any conditions that should negatively affect our analyses.

TABLE 3
Pearson Correlations^a

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AUDSPEC	1															
LEV	2	0.17														
FIN	3	-0.07	0.11													
EPR	4	-0.05	0.09	0.04												
BTM	5	-0.02	-0.01	-0.06	0.01											
ACC	6	-0.05	-0.08	0.11	0.45	-0.04										
EXANTE	7	-0.01	-0.24	0.13	-0.30	-0.06	0.02									
EPGWTH	8	-0.06	-0.01	-0.04	0.01	-0.07	0.02	-0.01								
ACMEM	9	0.18	0.15	-0.07	0.10	-0.10	0.02	-0.17	-0.04							
ACIND	10	0.02	0.01	0.02	-0.03	0.02	-0.02	0.04	0.15	0.04						
ACFE	11	0.01	-0.06	-0.03	0.04	0.01	-0.03	-0.08	-0.06	-0.02	0.21					
ACMEET	12	0.16	-0.01	-0.08	-0.06	-0.03	-0.09	0.00	0.00	0.19	0.18	0.14				
SIZE	13	0.27	0.33	-0.12	0.18	-0.07	0.02	-0.21	-0.02	0.43	0.06	0.03	0.28			
ROA	14	-0.03	-0.03	-0.07	0.59	-0.02	0.76	-0.33	0.05	0.12	-0.04	-0.01	-0.30	0.16		
COAGE	15	0.19	0.21	-0.12	0.19	-0.13	0.04	-0.25	-0.06	0.48	0.09	0.06	0.12	0.51	0.18	
MA	16	0.01	0.05	0.12	-0.01	-0.09	0.09	0.17	-0.06	-0.04	0.00	-0.02	-0.03	-0.01	-0.04	

^a Bold text indicates significance at the 0.05 level or better, two-tailed.
See Table 2 for variable definitions.

Multivariate Results

H1: Accounting Restatements and Industry Specialization

Our first hypothesis examines the effect of auditor industry specialization on the likelihood of accounting restatement. Table 4 shows the overall conditional logistic regression model is highly significant ($\chi^2 = 70.43$, $p < 0.001$) and seven of the 15 control variables are significant in the expected direction (all p -values < 0.05). Most importantly, as predicted in H1, *AUDSPEC* is negatively associated with the likelihood of accounting restatements ($p = 0.005$). These results suggest that the enhanced knowledge and skills of auditors with greater industry specialization appear to benefit companies through a reduced likelihood of accounting restatement.

H2: Core Account Restatements and Industry Specialization

Our second hypothesis examines whether auditor industry specialization influences the type of accounts (i.e., core versus noncore) that are adjusted when a restatement occurs. Table 5 presents the results of the logistic regression analysis on the subset of restating firms and indicates that

TABLE 4
Conditional Logistic Regression
Accounting Restatements on Auditor Industry Specialization (H1)

$$\begin{aligned} REST = & \beta_1 AUDSPEC_i + \beta_2 LEV_i + \beta_3 FIN_i + \beta_4 EPR_i + \beta_5 BTM_i + \beta_6 ACC_i + \beta_7 EXANTE_i \\ & + \beta_8 EPSGWTH_i + \beta_9 ACMEM_i + \beta_{10} ACIND_i + \beta_{11} ACFE_i + \beta_{12} ACMEET_i + \beta_{13} SIZE_i \\ & + \beta_{14} ROA_i + \beta_{15} COAGE_i + \beta_{16} MA_i + \varepsilon \end{aligned}$$

Independent Variable		Coefficient Estimate	Wald χ^2	p-value ^a
<i>AUDSPEC</i> (-)	H1	-27.27	6.49	0.005
<i>LEV</i> (+)		1.65	8.09	0.002
<i>FIN</i> (+)		1.01	7.89	0.003
<i>EPR</i> (-)		0.05	0.03	0.436
<i>BTM</i> (-)		-0.17	1.24	0.133
<i>ACC</i> (+)		1.22	5.72	0.008
<i>EXANTE</i> (+)		0.65	7.85	0.003
<i>EPSGWTH</i> (+)		0.16	4.99	0.013
<i>ACMEM</i> (-)		0.07	0.73	0.197
<i>ACIND</i> (-)		0.27	0.38	0.270
<i>ACFE</i> (-)		-0.57	2.75	0.049
<i>ACMEET</i> (-)		0.08	6.02	0.007
<i>SIZE</i> (-/+)		-0.36	5.57	0.009
<i>ROA</i> (-)		-0.15	0.13	0.359
<i>COAGE</i> (-/+)		-0.01	0.38	0.269
<i>MA</i> (-/+)		0.10	0.36	0.275

Model $\chi^2 = 70.43$, $p < 0.001$. Pseudo $R^2 = 0.20$. $n = 456$ matched pairs.

^a All p -values are one-tailed.

Variable Definitions:

REST = 1 if financial restatement is present, 0 otherwise.

All of the independent variables are defined in Table 2.

TABLE 5
Logistic Regression
Core Accounting Restatements on Auditor Industry Specialization (H2)

$$\begin{aligned} CORE = & \alpha + \beta_1 AUDSPEC_i + \beta_2 LEV_i + \beta_3 FIN_i + \beta_4 EPR_i + \beta_5 BTM_i + \beta_6 ACC_i + \beta_7 EXANTE_i \\ & + \beta_8 EPSGWTH_i + \beta_9 ACMEM_i + \beta_{10} ACIND_i + \beta_{11} ACFE_i + \beta_{12} ACMEET_i + \beta_{13} SIZE_i \\ & + \beta_{14} ROA_i + \beta_{15} COAGE_i + \beta_{16} MA_i + \varepsilon \end{aligned}$$

Independent Variable		Coefficient Estimate	Wald χ^2	p-value ^a
Intercept		1.10	2.28	0.066
<i>AUDSPEC</i> (-)	H2	-25.09	5.65	0.009
<i>LEV</i> (+)		0.84	2.09	0.074
<i>FIN</i> (+)		-0.94	8.31	0.002
<i>EPR</i> (-)		0.11	0.15	0.351
<i>BTM</i> (-)		-0.03	0.05	0.411
<i>ACC</i> (+)		0.41	0.89	0.172
<i>EXANTE</i> (+)		-0.40	2.23	0.068
<i>EPSGWTH</i> (+)		0.05	0.25	0.310
<i>ACMEM</i> (-)		-0.01	0.01	0.472
<i>ACIND</i> (-)		0.66	0.99	0.160
<i>ACFE</i> (-)		-0.06	0.01	0.452
<i>ACMEET</i> (-)		-0.02	0.36	0.274
<i>SIZE</i> (-/+)		-0.11	2.11	0.073
<i>ROA</i> (-)		-0.01	0.00	0.498
<i>COAGE</i> (-/+)		0.01	1.24	0.132
<i>MA</i> (-/+)		0.28	1.26	0.131

Model $\chi^2 = 25.32$, $p = 0.032$. Max-rescaled $R^2 = 0.08$. $n = 456$.

^a All p-values are one-tailed.

Variable Definitions:

CORE = 1 if financial restatement affected a core account, and 0 otherwise; core accounts include revenue, cost of goods sold, and operating expenses.

All of the independent variables are defined in Table 2.

AUDSPEC is negatively associated with the incidence of a core account restatement ($p = 0.009$). This finding supports our second hypothesis and is consistent with the argument that the beneficial effects of auditor industry specialization are most clearly evident with respect to clients' core operations. This finding is particularly salient given that most valuation and investment models incorporate some form of operating income in developing their estimates of future earnings.

H3: Auditor Switching and Restatements

Our third hypothesis examines whether a change to or from an industry specialist auditor affects the likelihood of restatement. Results from the conditional logistic analysis for H3 are provided in Table 6. Consistent with H3a, *NON_SPEC* is positively associated with the issuance of an accounting restatement ($p = 0.003$). Furthermore, as predicted in H3b, *SPEC_NON* is

TABLE 6
Conditional Logistic Regression
Accounting Restatements on Auditor Industry Specialization Change (H3)

$$\begin{aligned} REST = & \beta_1 NON_SPEC + \beta_2 SPEC_NON + \beta_3 NO_SPECCHG + \beta_4 AUDSPEC_t + \beta_5 LEV_t \\ & + \beta_6 FIN_t + \beta_7 EPR_t + \beta_8 BTM_t + \beta_9 ACC_t + \beta_{10} EXANTE_t + \beta_{11} EPSGWTH_t + \beta_{12} ACMEM_t \\ & + \beta_{13} ACIND_t + \beta_{14} ACFE_t + \beta_{15} ACMEET_t + \beta_{16} SIZE_t + \beta_{17} ROA_t + \beta_{18} COAGE_t + \beta_{19} MA_t + \varepsilon \end{aligned}$$

Independent Variable		Coefficient Estimate	Wald χ^2	p-value ^a
<i>NON_SPEC</i> (+)	H3a	0.77	7.31	0.003
<i>SPEC_NON</i> (-)	H3b	-0.76	6.79	0.005
<i>NO_SPECCHG</i>		-0.33	2.07	0.075
<i>AUDSPEC</i> (-)		-27.04	6.05	0.007
<i>LEV</i> (+)		1.74	8.44	0.002
<i>FIN</i> (+)		1.04	7.93	0.002
<i>EPR</i> (-)		0.04	0.02	0.441
<i>BTM</i> (-)		-0.10	0.43	0.254
<i>ACC</i> (+)		1.12	4.63	0.016
<i>EXANTE</i> (+)		0.71	8.08	0.002
<i>EPSGWTH</i> (+)		0.15	3.85	0.025
<i>ACMEM</i> (-)		0.07	0.67	0.207
<i>ACIND</i> (-)		0.13	0.09	0.384
<i>ACFE</i> (-)		-0.49	1.96	0.081
<i>ACMEET</i> (-)		0.09	6.11	0.004
<i>SIZE</i> (-/+)		-0.38	5.77	0.008
<i>ROA</i> (-)		-0.03	0.01	0.474
<i>COAGE</i> (-/+)		-0.01	0.32	0.285
<i>MA</i> (-/+)		0.08	0.18	0.334

Model $\chi^2 = 79.96$, $p < 0.001$. Pseudo $R^2 = 0.20$. $n = 912$ (456 matched pairs).

^a All p-values are one-tailed.

Variable Definitions:

REST = 1 if financial restatement is present, 0 otherwise;

SPEC_NON = 1 if a firm changed from an industry specialist to a nonspecialists, and 0 otherwise;

NON_SPEC = 1 if a firm changed from a nonspecialist to an industry specialist, and 0 otherwise; and

NO_SPECCHG = 1 if a firm changed from one industry specialist to another industry specialist, and 0 otherwise.

All other independent variables are defined in Table 2.

negatively associated with the likelihood of restatement ($p = 0.005$). Also of note from Table 6, *NO_SPECCHG* is negative and marginally significant ($p = 0.075$). These results are consistent with the theory that when companies change auditors, there is a *greater* likelihood of restatement when switching from a nonspecialist to a specialist and a *lower* likelihood of restatement when switching from a specialist to a nonspecialist. However, it also appears that a switch in auditors that does not result in a specialization change is marginally associated with a decrease in the likelihood of restatement.

Sensitivity and Additional Analysis

We conduct a series of sensitivity analyses to test the robustness of the results supporting our hypotheses. To evaluate whether decisions about the measurement of *AUDSPEC* affects our results, we reestimate Equation (1) using four alternative measures of auditor industry specialization (two continuous and two dichotomous). Table 7 presents the results of these analyses. First, following Neal and Riley's (2004) weighted market share approach, we reestimate industry specialization as a continuous variable using audit fees (*FEESPEC*) rather than client sales data for years 2000–2003.¹³ The results show that *FEESPEC* is inversely related to the likelihood of restatement ($p < 0.01$), which is consistent with our primary results. Second, Neal and Riley (2004) suggest that the portfolio share approach may lack variation when using a matched sample research design. Thus, we reestimate industry specialization based solely on market share (*MSHARE*) using sales data for the entire study window, and find that *MSHARE* is negatively associated with the likelihood of restatement ($p < 0.01$), which helps to further reinforce our previous findings.

Third, the auditor industry specialization literature often labels audit firms categorically as either specialists or nonspecialists (e.g., Balsam et al. 2003; Krishnan 2003a). Therefore, we reestimate Equation (1) with *AUDSPEC* dichotomized into specialist and nonspecialist classifications (*AUDSPEC_YN*) based on the weighted market share cutoff values utilized previously to test H3. Consistent with our primary results, we find that *AUDSPEC_YN* is negatively associated with the likelihood of restatement ($p < 0.05$). Lastly, we reestimate Equation (1) with *MSHARE* dichotomized into specialist or nonspecialist classifications (*MSHARE_YN*) based on the market share cutoff values we previously calculated to test H3. Again, we find *MSHARE_YN* to be negatively associated with the likelihood of accounting restatement ($p < 0.01$). In summary, all measures of industry specialization yield inferentially similar results and provide substantial support to our conjecture that auditor industry specialization is negatively associated with the likelihood of an accounting restatement.¹⁴

Stanley and DeZoort (2007) report that the tenure of the auditor influences the relationship between auditor industry specialization and restatements. Specifically, they find a negative relation between industry specialization and restatements for short-tenure (≤ 3 years) auditors, but not long-tenure (≥ 5 years) auditors. We examine the influence of auditor tenure (*TEN*) on our results using an interaction term between auditor industry specialization (*AUDSPEC*) and a continuous (years of auditor-client relationship) measure of tenure (*TEN*AUDSPEC*). The results (nontabulated) indicate the interaction term (*TEN*AUDSPEC*) is not significantly related to the likelihood of restatement ($p = 0.226$). Importantly, the strength of the *AUDSPEC* variable remains qualitatively similar.

We also evaluate whether client size affects the relationship between auditor industry specialization and the incidence of accounting restatements. Carcello and Nagy (2004) find that the association between industry specialist auditors and fraudulent financial reporting is weaker for larger clients. To investigate this effect for restatements, we add an interactive variable (*SIZE*AUDSPEC*) to Equation (1). Results (not tabulated) reveal a marginally significant positive coefficient for *SIZE*AUDSPEC* ($p < 0.10$). To further examine this relationship, we split the paired sample into small and large-size firms based on the median size of the restating firm. Results (not tabulated) indicate that *AUDSPEC* is significant ($p < 0.001$) for the small-firm

¹³ Audit fee data were not publicly available prior to 2000 (data source is *Audit Analytics*).

¹⁴ We also use the dichotomous market share measure—*MSHARE_YN*—to test whether measurement differences affect the auditor specialization change (H3) results. Results (not tabulated) are qualitatively similar using this alternative approach for classifying auditors as industry specialists or nonspecialists.

TABLE 7
Conditional Logistic Regression
Accounting Restatements on Different Measures of Auditor Industry Specialization

Variable	Continuous Measures Coefficients (t-statistics)		Dichotomous Measures Coefficients (t-statistics)	
	<i>FEESPEC</i> ^a	<i>MSHARE</i>	<i>AUDSPEC_YN</i>	<i>MSHARE_YN</i>
<i>FEESPEC</i> (-)	-30.52***			
<i>MSHARE</i> (-)		-1.60***		
<i>AUDSPEC_YN</i> (-)			-0.52**	
<i>MSHARE_YN</i> (-)				-0.45***
<i>LEV</i> (+)	1.73***	1.62***	1.65***	1.57***
<i>FIN</i> (+)	1.42***	0.99***	1.02***	1.00***
<i>EPR</i> (-)	0.07	0.08	0.08	0.08
<i>BTM</i> (-)	-0.17	-0.17	-0.16	-0.16
<i>ACC</i> (+)	0.84*	1.19***	1.20***	1.11***
<i>EXANTE</i> (+)	0.64***	0.68***	0.69***	0.71***
<i>EPGWTH</i> (+)	0.20***	0.16***	0.17***	0.16**
<i>ACMEM</i> (-)	0.05	0.08	0.06	0.09
<i>ACIND</i> (-)	1.19*	0.16	0.25	0.25
<i>ACFE</i> (-)	-1.08***	-0.62**	-0.63**	-0.64**
<i>ACMEET</i> (-)	0.11***	0.08***	0.08***	0.08***
<i>SIZE</i> (-/+)	-0.31**	-0.36***	-0.37***	-0.37***
<i>ROA</i> (-)	0.09	-0.13	-0.11	-0.09
<i>COAGE</i> (-/+)	-0.01	-0.01	-0.01	-0.01
<i>MA</i> (-/+)	0.14	0.09	0.11	0.10
Pseudo R ²	0.24	0.20	0.20	0.20
Model χ^2	59.10	70.89	69.91	71.45
n	666	912	912	912

*, **, *** Significant at p-value <0.10, 0.05, and 0.01 respectively; all tests are one-tailed.

^a Fee data is not available prior to 2000. Thus, our analysis reflects data for 2000–2003.

Variable Definitions:

FEESPEC = weighted market share based on audit fees (*MSHARE* * *PSHARE*);

MSHARE = auditor market share: auditor's total client sales in a particular industry divided by total industry sales;
AUDSPEC_YN = 1 if auditor is an industry specialist based on the specialization cutoffs determined for the weighted market share measure, and 0 otherwise; and

MSHARE_YN = 1 if auditor is an industry specialist based on the specialization cutoffs determined for the market share measure, and 0 otherwise.

All other independent variables are defined in Table 2.

sample, but not for the large-firm sample ($p = 0.31$). These results support the findings of Carcello and Nagy (2004) that industry specialization is particularly important for smaller firms, but less

important for larger firms. Examination of this issue in further detail could prove to be an interesting avenue for future research.

We also conduct a sensitivity test regarding the categorization of core and noncore accounts. Recall that firms that restated at least one core account were classified as *CORE* in the restatement subsample even if they also restated a noncore account. We assess whether our results are sensitive to this dichotomization method and exclude the 69 firms with restatements that affect both core and noncore accounts. We then test the subset of restatements that affected *either* a core or a noncore account. The results (not tabulated) indicate that *AUDSPEC* is significantly negatively ($p = 0.02$) associated with the likelihood of core account restatements.

Our final two sensitivity tests relate to the variable definitions for audit committee independence and financial expertise. In the primary tests of our hypotheses, both audit committee independence and audit committee financial expertise are measured using continuous variables (i.e., the percentage of independent committee members and the percentage of committee members with financial expertise). To help ensure our tests are consistent with prior research that utilized dichotomous classifications to examine these variables, as well as the regulatory requirements related to financial expertise, we retested our hypotheses using the dichotomous measures.¹⁵ The results for all three hypotheses remain essentially identical with precision close to 0.001 for p -values. These results provide further corroboration of our primary findings.

SUMMARY AND CONCLUSIONS

We examine the relationship between auditor industry specialization and accounting restatements. Our results provide empirical evidence consistent with the conjecture that industry specialization improves audit quality by reducing the likelihood of accounting restatements. Furthermore, we find for the subsample of restating firms that auditor industry specialization decreases the likelihood of restatements affecting core operating accounts. Last, we find that switching from a nonspecialist to a specialist auditor increases the likelihood of restatement, whereas changing from a specialist to a nonspecialist decreases the likelihood of restatement.

These findings contribute to the extant literature and have useful implications for the accounting profession. Our results demonstrate that the degree of auditor industry specialization makes a practical difference in the quality of financial statements, as proxied by accounting restatements. Reducing the likelihood of restatement provides a direct benefit to companies by mitigating the negative capital market repercussions associated with these events (GAO 2002; Palmrose et al. 2004). This improvement in financial statement quality also affects the efficiency and effectiveness of our capital market system to the extent that it can increase investor confidence in corporate financial reports and the role the auditing profession plays in the financial reporting process. Future research could examine the extent to which management characteristics influence the decision to hire an auditor with more or less industry expertise (see Aier et al. 2005).

Our findings also provide evidence indicating that auditor industry specialization appears to reduce the gravity of restatements by reducing restatements to core accounts, which in most cases have a more substantial effect on the perceived permanent earnings of the firm as compared with the noncore accounts (Palmrose and Scholz 2004). Restatements of core accounts are typically considered more severe because they directly affect estimates about future earnings from ongoing operations that are often used in firm valuation and investment analyses. A reduction in the incidence of core account restatements should contribute to improving the accuracy and effective-

¹⁵ Audit committee independence is coded as 1 if all members of the audit committee are independent and 0 otherwise; audit committee financial expertise is coded as 1 if at least one member of the audit committee is a financial expert, and 0 otherwise.

ness of any analyses associated with the value of the firm. Furthermore, our results suggest the benefits of industry expertise are primarily focused in firms' recurring operations rather than uniformly throughout the financial statements. Although behavioral accounting research examining auditor industry specialization generally focuses on operating accounts, we are not aware of any other archival study that empirically demonstrates this relationship.

Our results also provide empirical evidence that the effect of switching from a nonindustry specialist to a specialist increases the likelihood of an accounting restatement, but that switching from a specialist to a nonspecialist decreases the probability of a restatement. This finding is consistent with the theory that industry specialization enhances audit quality and that industry specialists may identify potential misstatements former nonindustry specialists may have overlooked. While most research in industry specialization focuses on the engagement auditor, our findings also highlight the importance of both predecessor and successor auditors in determining financial statement quality.

Our research explores various aspects of the effects of auditor industry specialization on restatements, but a variety of additional topics remain to be investigated in this area. One potential topic for future research is to examine the extent to which local office industry specialization affects restatements. Another facet to explore is the relationship between industry specialists and nonspecialists with respect to misstated annual versus quarterly statements. Finally, research indicates that when Big N auditors drop risky clients, other Big N auditors are willing to take them on as clients (Landsman et al. 2006). Incoming auditors may be willing to take on riskier clients if the risk can be at least partially mitigated by requiring prior period restatements (Lazer et al. 2004). Future research could examine whether this finding is more pronounced when the successor auditor is an industry specialist whose client-acceptance decision was at least partially compelled by the need to develop industry-specialized client portfolios (Nagy and Cenko 2006).

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