

## **Auditor Resignations and Auditor Industry Specialization**

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# **Auditor Resignations and Auditor Industry Specialization**

## **Summary**

The increase of Big 4 auditor resignations in the newly regulated auditing environment creates a rich setting to examine audit risk effects on the client portfolio decisions of audit firms. We estimate a logistic regression to examine the relation between auditor resignations and auditor industry specialization (a significant component of audit risk). We find a negative relation between auditor industry specialization, at both the national and local level, and auditor resignations. This finding suggests that audit firms value industry expertise, thereby lowering audit risk by aligning their client portfolios based, in part, on industry specialization at both the local and national level.

**Keywords:** auditor resignations; auditor industry specialization; audit quality.

**Data Availability:** The data are from public sources and are available upon written request.

## INTRODUCTION

Academic research provides evidence that auditor portfolio decisions are associated with the litigation and audit risk of clients. The research, however, is limited as to the effect that auditor industry specialization (a significant component of audit risk) has on the auditor resignation/retention decision. Standard setters and quasi-regulatory bodies have long suggested that industry expertise results in higher quality audits (e.g., AU 311 AICPA 1999; Panel on Audit Effectiveness 2000), and there is evidence that accounting firms emphasize industry specialization (Hogan and Jeter 1999; Bell et al. 2005).<sup>1</sup> We add to this research by empirically examining the relation between auditor resignations and auditor industry specialization.

The increase of Big 4 auditor resignations in the newly regulated auditing environment creates a rich setting to examine audit risk effects on client portfolio decisions of audit firms.<sup>2</sup> We estimate a logistic regression using auditor resignations and non-resignations from the 2004-2005 time period. We find a negative relation between auditor industry specialization (at both the national and local level) and auditor resignations. This finding suggests that audit firms value industry expertise (lower audit risk) at both the local and national levels, and indicates that audit firms are aligning their client portfolios, in part on industry specialization at both the local and national level.

The remainder of this paper is organized as follows. The next section discusses prior research relating to auditor resignations and auditor specialization. We then develop our

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<sup>1</sup> All of the Big 4 accounting firms publicly recognize industry expertise as an important component of quality services. For example, Ernst & Young's website states that "in-depth industry knowledge is key to bringing each client the best services for a specific situation (EY 2006)." Likewise, PwC asserts that "the depth of our industry expertise, like our international perspective, is an attribute that our clients value highly. We invest significant resources in building and sharing such expertise (PwC 2006)." Per their websites, KPMG and Deloitte make similar claims.

<sup>2</sup> Rama and Read (2006) find that the number of SEC audit client resignations by the Big 4 increased from 103 in 2001 to 140 in 2003 even while the total number of SEC registrant clients for the Big 4 declined from 2001 to 2003.

hypothesis based upon the prior research. The following sections present the statistical model and variables measurement. Further sections discuss our sample selection and results. The last section contains a summary and conclusion of our findings along with a discussion of the study's limitations and opportunities for future research.

## **PRIOR RESEARCH**

Prior research on auditor resignations has examined the effect that various audit risk and litigation risk factors have on the resignation decision. Krishnan and Krishnan (1997) provide evidence of a positive relation between litigation risk and auditor resignation. Shu (2000) finds auditor resignation to be positively related to increased legal risk, and to the occurrence of clientele mismatch. She further demonstrates that resignations from clientele mismatches are likely driven by changes in auditor (supply-side) characteristics. Johnstone and Bedard (2004) provide evidence that a specific audit firm sheds riskier clients in its portfolio, and that audit risk factors are more important in audit portfolio management decisions than are financial risk factors. Ettredge et al. (2006) examine auditor-client realignments (dismissals and resignations) in the post-Sarbanes-Oxley Act period. They find that companies that pay higher fees tend to dismiss their auditors, and that auditors tend to resign from companies that pay relatively lower fees. Hertz (2006) finds a relation between auditor resignation and various risk characteristics including reported internal control deficiencies or material weaknesses, long auditor tenure, net loss, company growth, and auditor busy period. Lee et al. (2004) provide evidence that audit committee and board of director independence are both negatively associated with the likelihood of an auditor resignation.

Several auditor resignation studies include an auditor specialization (i.e., market share) control variable in their models (Ettredge et al. 2006; Hertz 2006; Lee et al. 2004). However,

none of these studies specifically examine the auditor specialization and auditor resignation relationship, and include resignations of all types in their samples. In addition, auditor specialization is measured only at the national level for each of these studies. In an effort to limit confounding effects, we exclude all resignations in which the auditor disclosed a specific issue (e.g., internal controls, audit fee disputes) in the Form 8-k. The remaining sample of ‘clean’ resignations allows for a less noisy examination of the auditor specialization effect on the resignation decision. Further, we measure auditor specialization at both the national and the local office level.

Prior research provides evidence of a positive association between auditor specialization and audit quality. Specifically, companies having an industry expert auditor have lower abnormal accruals (Balsam et al. 2003; Krishnan 2003), higher valued earnings surprises (Balsam et al. 2003), and lower incidents of fraud (Carcello and Nagy 2004). In addition, Craswell et al. (1995) use Australian data and find audit specialists demand a fee premium. Ferguson and Stokes (2002), however, use Australian data and find that the fee premium does not exist in a more recent time period than that used in the Ferguson and Stokes (2002) study. DeFond et al. (2000) use Hong Kong data and find fee premiums for Big 6 industry specialists. These studies measure industry specialization at the firm wide (national) level.

There has been some recent research focusing on auditor specialization effects at the local (city) level. Ferguson et al. (2003) and Francis et al. (2005) provide evidence that both national-level and office-level industry leadership drive audit fee premiums. In addition, Francis et al. (2006) provide evidence that companies with city-specific auditor specialists have lower abnormal accruals and are less likely to meet or beat forecasted earnings targets. The authors find that national industry leaders (alone) are not significantly different from non-leaders. Consistent

with this research, we measure the effects of auditor specialization at both the local and national levels.

### **HYPOTHESIS DEVELOPMENT**

Prior research identifies two primary reasons for auditor resignations: litigation risk, and clientele mismatch (Shu 2000; Johnstone and Bedard 2004). Litigation risk involves both out-of-pocket costs and damage to the firm's reputation. The auditing profession finds itself "the target of a difficult litigation and regulatory enforcement environment, where business losses by a client can result in lawsuits, and a single indictment – even without a conviction – can result in the destruction of thousands of jobs (U.S. Chamber of Commerce 2006)." Indeed, litigation resulted in the demise of both Andersen (fourth largest accounting firm) and Laventhol and Horwath (seventh largest accounting firm). Audit firms effectively mitigate litigation risk by actively managing their client portfolios. That is, auditors consider the risk of litigation associated with the audit engagement when making client retention and acceptance decisions.

A significant component of the second explanation for auditor resignation, clientele mismatch, is auditor industry expertise (specialization). Audit firms seek competitive advantages and build their reputation through clientele specialization (Johnson and Lys 1990). In order to maintain or protect their expertise status, we expect an audit firm to favor dropping a client from a non-expertise industry over one from an expertise industry, *ceteris paribus*. In addition, the level of industry expertise directly affects audit risk. The nature, extent, and timing of planning and thus the considerations of both audit risk and materiality vary with the size and complexity of the entity, the auditor's experience with the entity, and his or her knowledge of the entity's business (AU 311 AICPA 1999). In summary, after controlling for litigation risk effects, we expect auditors to retain industry expertise clients over non-industry expertise clients in order to

maintain their expertise status and to lower audit risk. This leads to our hypothesis in the alternative form:

**H1:** Auditor resignations are negatively associated with auditor industry specialization, *ceteris paribus*.

We extend this hypothesis by measuring the effects of auditor industry specialization at both national and local levels. We estimate three logistic regressions to examine the effects of national, local, and both national and local specialization on the auditor resignation decision. By measuring industry specialization at different levels, this analysis provides insight into how the audit firms value industry specialization when making portfolio decisions. That is, do the audit firms consider local industry specialization, national industry specialization, or a combination of both when making a client resignation/retention decision?

## METHOD

We test the relation between auditor resignations and industry specialization using the following logistic regression model:

$$RES = \beta_0 + \beta_1 SPEC + \beta_2 ROA + \beta_3 LEV + \beta_4 LOSS + \beta_5 GROWTH + \beta_6 SIZE + \beta_7 AUDFEE + \beta_8 NAS + \beta_9 GC + \beta_{10} TENS\text{SHORT} + \beta_{11} TEN\text{LONG} + \beta_{12} BUSY + \beta_{13-43} IND + \varepsilon$$

where:

*RES* = 1 if the auditor resigned from the audit engagement in 2004 or 2005 and had no issues listed in the Form 8-k, 0 otherwise;

*SPEC* = 1 if the percentage of industry audit fees received by the auditor is greater than or equal to 25 percent of the industry's market, 0 otherwise. We measure industry market share at both the local and national levels;

*ROA* = return on assets (net income before extraordinary items divided by total assets);

*LEV* = ratio of debt to total assets;  
*LOSS* = 1 if net income is negative, 0 otherwise;  
*GROWTH* = percent increase in sales from the prior year;  
*SIZE* = log of total sales;  
*AUDFEE* = audit service fee as a percent of total assets;  
*NAS* = non-audit service fees as a percent of total fees paid to the auditor;  
*GC* = 1 if a going concern audit report was issued, 0 otherwise;  
*TENSHORT* = 1 if the auditor audited the firm 3 years or less, 0 otherwise;  
*TENLONG* = 1 if the auditor audited the firm 9 years or more, 0 otherwise;  
*BUSY* = 1 if the fiscal year end is in December, January, February or March, 0 otherwise;  
*IND* = dummy variables based on two-digit SIC codes (31 industries).

### **Measuring Auditor Resignations**

We gathered auditor resignations for the period 2004 and 2005 from the Audit Analytics database. In order to mitigate potential confounding effects of auditor resignations for reasons other than industry specialization, we excluded resignations in which the registrant specifically identified certain issues per their disclosures. Audit Analytics tracks 21 different issues mentioned by the registrant for the auditor change in their disclosures. The issues pertain to the following areas: Internal controls, scope limitations, accounting disagreements, SEC enforcements, lack of auditor independence, and audit fees. By excluding auditor resignations due to these disclosed issues, we eliminate potential confounding effects, and thus reduce the noise on our measure of the auditor resignation and auditor specialization relation.<sup>3</sup>

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<sup>3</sup> When the 52 resignation observations in which the registrant specifically identified certain issues are included in the regression estimations, we lose some significance on the *SPEC(local)* test variable. Specifically, the Local but not National test variable in Model 3 presented in Table 4 is no longer significant, and the *SPEC(local)* variable in

## Measuring Auditor Specialization

Recent studies provide evidence that local specialization improves audit quality, more so than national specialization alone (Ferguson et al. 2003; Francis et al. 2005; Francis et al. 2006). Consistent with this research, we measure auditor specialization at both the local and national levels. We also rely upon prior research in using auditor market share as a proxy for auditor expertise (e.g., Palmrose 1986; Carcello and Nagy 2002; Balsam et al. 2003; Francis et al. 2005). We measure auditor market share as the percentage of audit fees captured within each industry, based on two-digit SIC code. At the local level, this variable is measured within the Metropolitan Statistical Areas (MSA) of the auditor's engagement office.<sup>4</sup>We arbitrarily determine an industry expert as an audit firm with a market share of 25 percent or more.<sup>5</sup>

## Control Variables

We include control variables to measure different components of litigation risk. Client financial distress has been associated with higher litigation risk and, in turn, auditor resignations (Krishnan and Krishnan 1997; Shu 2000). Consistent with prior research, we include the variables *LOSS*, *ROA*, *LEV*, *GROWTH*, and *SIZE* to measure client financial distress and the possibility of misleading financial statements in an attempt to capture the litigation risk of the company (Ettredge et al. 2006; Hertz 2006).

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model 2 is significant at the  $p < .10$  level. All the remaining test variables' significance levels are the same as reported in Table 4.

<sup>4</sup> The U.S. Census Bureau uses MSAs to provide nationally consistent definitions for collecting, tabulating, and publishing Federal statistics for a set of geographic areas. The general concept of a MSA is that of an area containing a recognized population nucleus and adjacent communities that have a high degree of integration with that nucleus (Office of Management and Budget 2000). The current listing of MSAs and components (cities and counties) may be found at [www.census.gov/population/www/estimates/metrodef](http://www.census.gov/population/www/estimates/metrodef). We obtained the location (i.e., city) of the auditor's engagement office from Audit Analytics.

<sup>5</sup> During the years of our study, there were only four large international accounting firms. Therefore, the 25 percent cutoff is comparable to the lower cutoffs used by other studies during periods when five, six or eight large international accounting firms existed. We consider alternative cutoffs for specialist determination in the additional analyses section of the paper.

The control variables *GC*, *TENSHORT*, *TENLONG*, and *BUSY* are different proxies for the possibility of audit failure, and thus measure components of litigation risk as well. Prior research provides evidence that auditor resignations are more likely for clients that received a going-concern report (Krishnan and Krishnan 1997; Ettredge et al. 2006). Krishnan and Krishnan (1997) find auditor resignation is more likely for short tenured clients. The *BUSY* variable considers the possibility that limited resources lessens audit quality (increases the possibility of audit failure) during the audit firms' busy seasons. Hertz (2006) provides evidence of a positive relation between auditor resignations and *BUSY*.

Prior research suggests that auditors resign from engagements when client risk cannot be offset by audit fees (Krishnan and Krishnan 1997; Hackenbrack and Hogan 2005; Ettredge et al. 2006). Ettredge et al. (2006) find that auditors tend to resign from companies that pay relatively low audit fees. We measure both audit fees (*AUDFEE*) and non-audit service fees (*NAS*) to control for the effect that revenue from the client may have on the auditor resignation decision. Lastly, we include industry dummy variables (*IND*) to control for any possible industry effects on the resignation decision.

Based on the prior literature, we expect positive coefficients for *GC*, *LOSS*, *LEV*, *BUSY*, and *TENSHORT*, and negative coefficients for *AUDFEE*, *NAS*, *SIZE*, *ROA*, *TENLONG* and *GROWTH*. We do not have any prediction for the *IND* variables.

## **Sample**

Our initial resignation sample included all Big 4 auditor resignations occurring in 2004 and 2005 per the Audit Analytics database. We attempt to measure the effect that industry specialization has on the auditor resignation decision, and thus we measure the specialization variables and the control variables using the data from the period immediately preceding the

resignation. This is the time period in which we assume the auditor was making the resignation decision.

Table 1 presents a description of the auditor resignation sample. From the Audit Analytics database, we obtained 479 Big 4 auditor resignations for 2004 and 2005. Audit Analytics did not have previous period audit fee data for 97 of these observations, and we were unable to obtain control variable data from Research Insight for an additional 166 observations.<sup>6</sup>We exclude 52 resignation observations because the registrant mentioned an issue for the auditor change in their disclosures. Lastly, we exclude companies that had less than two observations in their local market (36 observations) and financial institutions (31 observations).<sup>7</sup>This leaves a final sample of 97 resignation observations and 5,684 non resignation (control) observations.

[INSERT TABLE 1 ABOUT HERE]

The final local sample includes 57 different industries and 75 different cities (MSAs). The overall ten largest cities in terms of total observations per city are: New York (578), San Francisco (567), Boston (407), Los Angeles (403), Chicago (309), Houston (268), Dallas (247), Philadelphia (241), Minneapolis-St. Paul (220), and Atlanta (197). The total unique city-industry combinations for each sample year is 626 (2003) and 595 (2004). There is an average of five observations for each city-industry market.

The average audit firm local (city) industry market share is 46 percent. The distribution of local auditor specialist (at least 25 percent market share) by audit firm is as follows: PwC

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<sup>6</sup> Trusts and fund accounts make up a large percentage of this number. These trust and fund accounts are not included in Research Insight.

<sup>7</sup> Consistent with Francis et al. (2005), we exclude from the sample those city-industry combinations that have only one observation. If we exclude from the sample those city-industry combinations that have four or less observations, we lose some significance on the local specialist test variable. Specifically, the Local but not National test variable in Model 3 presented in Table 4 is no longer significant, and the *SPEC(local)* variable in Model 2 is significant at the  $p < .10$  level. All the remaining test variables' significance levels are the same as reported in Table 4.

(457), EY (484), DT (382), and KPMG (345). The average audit firm national industry market share is 27 percent. The distribution of national specialist (at least 25 percent market share) by audit firm is as follows: PwC (513), EY (428), DT (207), and KPMG (198).<sup>8</sup>

## RESULTS

Table 2 presents descriptive statistics, separately for resignation and non-resignation observations, for each of the study's independent variables. The univariate comparisons indicate that an auditor resignation is more likely from clients in a non-specialist industry, measured at the local, national, and both local and national levels. Regarding the control variables, the univariate comparisons indicate that auditors are less likely to resign from financially healthy companies as measured by the *ROA*, *LEV*, *LOSS*, *GROWTH*, *SIZE* and *GC* variables. Furthermore, the auditor is less likely to resign from clients with higher non-audit service fees (*NAS*). No significant difference exists for the remaining control variables (*TENSHORT*, *TENLONG*, *AUDFEE*, and *BUSY*).

[INSERT TABLE 2 ABOUT HERE]

The correlations among the independent variables are presented in Table 3. The correlations between industry specialist auditors (*SPEC[local]*, *SPEC[national]*, *SPEC[both]*) and *ROA*, *SIZE* and *LOSS* suggest that larger, financially healthier companies tend to have an industry specialist as an auditor. Additionally, the correlations indicate that industry specialist auditors tend to associate with companies that have higher debt ratios (*LEV*), lower audit fees (*AUDFEE*), and longer auditor tenures (*TENLONG*, *TENSHORT*).<sup>9</sup> As expected, the control

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<sup>8</sup> Each of the Big 4 firms appears to be well represented in the sample. However, to test for the possibility of firm specific effects, we estimated our regressions including audit firm control variables in the models. The results are qualitatively the same as those reported in Table 4.

<sup>9</sup> The positive correlation between *SPEC* and *LEV* may reflect the demand-side effects for an auditor industry specialist. The negative correlation between *SPEC* and *AUDFEE* suggests cost efficiencies from specialist industries are passed to the client. This is not the focus of our study and we leave the examination of these characteristics for future research.

variables that increase with company financial health (*ROA*, *GROWTH*) are negatively correlated with the control variables that increase with financial distress (*LEV*, *LOSS*, *GC*). Large companies (*SIZE*) have higher return on assets (*ROA*), higher debt to asset ratios (*LEV*), less frequency of net losses (*LOSS*), and higher growth in the past year (*GROWTH*). The *AUDFEE* positive (negative) correlations with *LEV*, *LOSS* (*ROA*, *GROWTH*) suggest that higher audit fees are associated with less financially healthy companies. The negative correlation between *AUDFEE* and *SIZE* may be due to the construct of the variables (*AUDFEE* is scaled by a measure of size). *TENLONG* is positively (negatively) correlated with *ROA* and *SIZE* (*GC* and *LOSS*) suggesting that auditors tend to have longer tenures with financially healthier companies.

[INSERT TABLE 3 ABOUT HERE]

Table 4 presents the results of the logistic regression models used to test the relation between auditor resignation and auditor industry specialization. The first and second models (Model 1 and Model 2) include the auditor industry specialist variable measured at the national level (*SPEC[national]*) and local level (*SPEC[local]*), respectively. The third model (Model 3) includes the auditor specialist variable measured when the auditor is both the local and national industry specialist (*SPEC[both]*), as well as when the auditor is either the national or local industry specialist but not both.

All three models are highly significant ( $p < 0.0001$ ) and the pseudo- $R^2$ s are 17 and 18 percent. In a further analysis to assess the fit of the models, we computed the Hosmer-Lemeshow goodness-of-fit statistic. The Hosmer-Lemeshow goodness-of-fit test puts observations into groups based on estimated probabilities and then computes a Pearson Chi-square statistic based on the observed and estimated expected frequencies in each of the groups (Hosmer and Lemeshow 2000, 148). A significant Hosmer-Lemeshow statistic suggests differences between

the observed and the expected frequencies in the groups, and thus a lack of model fit. For all three models, the Hosmer-Lemeshow statistic is not significant (highest p-value = 0.89), suggesting that the data fits the models well.

[INSERT TABLE 4 ABOUT HERE]

Consistent with our hypothesis, we find a negative relation between auditor industry specialization and auditor resignations. The auditor specialization variable is negative and significant when measured at the national level (Model 1 – *SPEC[national]*), the local level (Model 2 – *SPEC[local]*), and as both local and national levels (Model 3 – *SPEC[both]*). In addition, the coefficients of the variables in Model 3 that measure both the National but not Local and the Local but not National effects are also negative and significant. These results suggest that auditors consider industry specialization at both the local and national levels in making resignation decisions.

The control variables *LOSS*, *SIZE*, and *GC* are significant in the predicted direction for all three models. The remaining control variables are insignificant in all the models.

### **Additional Analyses**

To assess the robustness of our results, we perform two additional analyses (results not tabled). First, we consider alternative measures of industry specialization. Second, we use a matched-pairs sample to re-estimate the regressions that include a board of director composition variable.

The cutoff of 25 percent auditor market share is arbitrarily selected as the determination of industry expert. We re-estimated the regressions using two alternative parameters to measure auditor industry expertise: 20 percent of the market share, and industry leader. For the 20 percent cutoff analysis, the *SPEC(local)* (p-value = .14) in Model 2, the Local but not National (p-value

= .53) and National but not Local variables in Model 3 are not significant at any conventional level. However, *SPEC(national)* in Model 1 and the *SPEC(both)* in Model 3 remain highly significant ( $p < .01$ ). When we measure industry specialist as the industry leader, the Model 3 variable Local but not National is no longer significant. The remaining test variables of the three models remain significant in the predicted direction. In summary, the additional cutoff analyses suggest that the reported negative relation between auditor resignations and auditor specialist at both the local and national level (*SPEC[both]*) is robust. However, the local level effects alone (*SPEC[local]* and Local but not National) lessen in these additional tests.

Lee et al. (2004) find that audit committee and board of director independence are both negatively associated with the likelihood of an auditor resignation. A matched-pairs design allows us to include a board independence variable for a sample of resignations versus non-resignation companies.<sup>10</sup> All the matched-pairs have the same two-digit SIC code and are within 30 percent of total assets of each other. The matching procedure resulted in 184 (92 resignations, 92 non-resignations) observations.

In the matched-pairs analysis, we performed the logistic analysis on the differences between observations in the test sample and the control sample (Cram et al. 2006).<sup>11</sup> The *SPEC(national)* ( $p < 0.05$ ) variable in Model 1 and *SPEC(local)* ( $p < 0.10$ ) in Model 2 are negative and significant. For Model 3, the *SPEC(both)* variable ( $p < .05$ ) and the National but not Local ( $p < 0.10$ ) are negative and significant. The Local but not National variable and the board composition variable are not significant in any of the models. Both the alternative cutoffs

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<sup>10</sup> The director characteristics were hand-collected by reading proxy statements. We do not include an audit committee independence variable since the vast majority of our observations have fully independent audit committees. The earlier time frame used in the Lee et al. (2004) study found audit committees with various compositions. Consistent with Beasley (1996), we define independent directors as non-insiders and measure the variable as the percentage of non-insiders sitting on the board.

<sup>11</sup> The logistic regression assumption of independence is violated in the case of a matched-pairs design (Cram et al. 2006). We address this problem by performing a conditional logistic regression analysis using SAS's PHREG procedure.

analysis and the matched-pairs analysis suggest that the auditor resignation and *SPEC(both)* relation reported in Table 4 is robust. Furthermore, the additional analyses suggest that the local level effects alone (*SPEC[local]* and Local but not National) are not overly robust and may be dependent on the chosen model.

### **SUMMARY, IMPLICATIONS, AND LIMITATIONS**

The Big 4 firms have had significant increases in workload and litigation risk in the newly regulated public audit environment. As a result, the Big 4 firms have been reevaluating their client portfolios and resigning from audit engagements at an increasing rate. Such an environment provides a rich setting to examine the client characteristics that effect auditor resignation decisions. We examine the relation between auditor resignations and the important characteristic of auditor industry specialization, and refine the analysis to include auditor industry specialization at both the national and local levels.

We provide evidence that audit firms consider industry expertise at both the local and national level when making client portfolio decisions. The additional tests performed suggest that the local industry specialization alone is not a significant factor in the auditor resignation decision. However, the joint effect (i.e, when the auditor is both a local and national industry specialist) remains significant throughout the analyses. In summary, the findings suggest that the auditor is most reluctant to resign from clients that are in both local and national specialist industries. This indicates that audit firms value industry expertise at both the local and national levels.

Our study is subject to several limitations. First, our auditor specialization measures are noisy. We attempt to capture industry expertise at both the firm and office level. However, a more refined measure of industry expertise may be at the individual partner level. Due to data

restrictions, we are unable to proxy this effect. In addition, although it is the primary measure used in prior research, industry market share is an imperfect measure of auditor specialization. Second, we examine auditor resignations in a rather unique time period. The audit firms were overwhelmed with work and under tremendous scrutiny from regulators and investors during the time period of our study. Such an environment results in audit firms reevaluating their client portfolios and thus provides a rich setting to examine the auditor resignation/retention decision. However, if this environment is short-lived, then the contribution of our study is lessened. Lastly, although we attempt to control for other potential factors that influence the auditor resignation decision, the possibility exists that an omitted correlated variable is driving our results.

We provide evidence that auditor specialization, measured at both the local and national levels, affects the auditor resignation decision. We call on future research to further refine the supply-side auditor specialization effects. For example, future studies may identify specific local market characteristics and/or audit firm characteristics that impact the value and effectiveness of local auditor specialization. We hope that our findings, along with future research in the area, provide a better understanding of supply-side auditor industry specialization effects.

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**TABLE 1**  
**Sample Description**

Initial sample of auditor resignations <sup>a</sup>	479
Missing control variables data per Research Insight	(166)
No audit fee data per Audit Analytics	(97)
Company disclosed issue per Audit Analytics	(52)
Local market less than 2 observations	(36)
Financial institution (SIC in 6000s)	(31)
Final sample of auditor resignations	<u>97</u>

<sup>a</sup> The initial sample is Big 4 auditor resignations for 2004 and 2005 per the Audit Analytics database.

**TABLE 2**  
**Descriptive Statistics**  
**Mean (Median)**

<i>Variable<sup>a</sup></i>	<i>Predicted Relation</i>	<i>Resignations (n=97)</i>	<i>Non Resignations (n=5,684)</i>	<i>Difference (Res – Non Res)<sup>b</sup></i>
SPEC(local)	-	0.52 (1.00)	0.69 (1.00)	-0.17*** (0.00)*** <sup>c</sup>
SPEC(national)	-	0.39 (0.00)	0.56 (1.00)	-0.17*** (-1.00)***
SPEC(both)	-	0.12 (0.00)	0.29 (0.00)	-0.17*** (0.00)*** <sup>c</sup>
ROA	-	-0.40 (-0.13)	-0.05 (0.03)	-0.35*** (-0.10)***
LEV	+	0.30 (0.08)	0.25 (0.19)	0.05** (-0.11)
LOSS	+	0.67 (1.00)	0.35 (0.00)	0.32*** (1.00)***
GROWTH	-	-2.44 (0.03)	-0.03 (0.09)	-2.41*** (-0.06)***
SIZE	-	3.49 (3.66)	5.74 (5.88)	-2.25*** (-2.22)***
AUDFEE	-	0.009 (0.01)	0.003 (0.01)	0.006 (0.00)
NAS	-	0.22 (0.19)	0.28 (0.25)	-0.06*** (-0.06)*** <sup>c</sup>
GC	+	0.22 (0.00)	0.04 (0.00)	0.18*** (0.00)*** <sup>c</sup>
TENSHORT	+	0.26 (0.00)	0.33 (0.00)	-0.07 (0.00)
TENLONG	-	0.38 (0.00)	0.40 (0.00)	-0.02 (0.00)
BUSY	+	0.81 (1.00)	0.79 (1.00)	0.02 (0.00)

\*, \*\*, and \*\*\* indicate significance at  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively (based on one-tailed tests).

<sup>a</sup> Variable definitions:

- SPEC(local) = 1 if local industry audit fees received by the auditor is  $\geq 25\%$  market share, else 0.
- SPEC(national) = 1 if national industry audit fees received by the auditor is  $\geq 25\%$  market share, else 0.
- SPEC(both) = 1 if both local and national industry audit fees received by the auditor are  $\geq 25\%$  market share, else 0.
- ROA = net income before extraordinary items divided by total assets.
- LEV = ratio of debt to total assets.
- LOSS = 1 if net income is negative, else 0.
- GROWTH = percent increase in sales from prior year.
- SIZE = log of total sales.
- AUDFEE = audit service fee as a percent of total assets.
- NAS = non-audit service fees as a percent of total fees paid to the auditor.
- GC = 1 if a going concern audit report was issued, else 0.
- TENSHORT = 1 if the auditor audited the firm 3 years or less, else 0.
- TENLONG = 1 if the auditor audited the firm 9 years or more, else 0.
- BUSY = 1 if the fiscal year end is in December, January, February, or March, else 0.

<sup>b</sup> Tests for differences in the means are based on t-statistics (z-statistics) for continuous variables (proportions). Nonparametric tests for differences in location are based on the Wilcoxon rank sum test.

<sup>c</sup> The Wilcoxon rank sum test does not test whether the medians for the two groups are different. Instead, the test identifies a difference in location, specifically, whether the observations in the two groups are from populations with different medians. Thus, the test indicates a significant difference even though the medians for the two groups are the same.

**TABLE 3**  
**Correlations Among Variables<sup>a,b</sup>**

	<u>SPEC</u> <u>(national)</u>	<u>SPEC</u> <u>(both)</u>	<u>ROA</u>	<u>LEV</u>	<u>LOSS</u>	<u>GROWTH</u>	<u>SIZE</u>	<u>AUDFEE</u>	<u>NAS</u>	<u>GC</u>	<u>TEN-</u> <u>SHORT</u>	<u>TEN-</u> <u>LONG</u>	<u>BUSY</u>
SPEC(local)	.23***	.43***	.06***	.11***	-.08***	.01	.23***	-.16***	.01	-.02	-.04***	.04***	.08***
SPEC(national)		.56***	.07***	.05***	-.10***	-.03**	.15***	-.11***	.05***	-.02	-.06***	.04***	.01
SPEC(both)			.06***	.10***	-.10***	.01	.20***	-.15***	.01	-.02	-.05***	.06***	.04***
ROA				-.35***	-.82***	.25***	.32***	-.60***	.08***	-.20***	-.03*	.13***	-.06***
LEV					.01	-.19***	.12***	.33***	-.01	.05***	.05***	-.01	.08***
LOSS						-.19***	-.41***	.34***	-.10***	.19***	.02*	-.13***	.04***
GROWTH							.15***	-.05***	.02*	-.09***	.04***	-.02	.03*
SIZE								-.34***	.19***	-.11***	-.05***	.20***	.03**
AUDFEE									-.15***	.14***	.03**	-.15***	.01
NAS										-.05***	-.09***	.11***	-.15***
GC											.04***	-.06***	.01
TENSHORT												-.58***	.07***
TENLONG													-.09***

\*, \*\*, and \*\*\* indicate significance at  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively, based on two-tailed tests.

<sup>a</sup> We report Spearman-rank correlation coefficients for discrete variables (SPEC(local), SPEC(national), SPEC(both), LOSS, GC, TENSHORT, TENLONG, BUSY) and Pearson correlations otherwise.

<sup>b</sup> Variable definitions:  
See Table 2 for variable definitions.

**TABLE 4**  
**Logistic Regression Results**

$$RES = \beta_0 + \beta_1 SPEC + \beta_2 ROA + \beta_3 LEV + \beta_4 LOSS + \beta_5 GROWTH + \beta_6 SIZE + \beta_7 AUDFEE + \beta_8 NAS + \beta_9 GC + \beta_{10} TENSORT + \beta_{11} TENLONG + \beta_{12} BUSY + \beta_{13-43} IND + \varepsilon$$

<i>Variable<sup>ab</sup></i>	<i>Predicted Relation</i>	<u>Model 1</u>		<u>Model 2</u>		<u>Model 3</u>	
		<i>Estimated Coefficients</i>	<i>Wald Chi-Square</i>	<i>Estimated Coefficients</i>	<i>Wald Chi-Square</i>	<i>Estimated Coefficients</i>	<i>Wald Chi-Square</i>
Intercept	none	-2.41	11.54***	-2.34	10.72***	-2.16	9.15***
ROA	-	0.05	0.08	0.03	0.03	0.08	0.18
LEV	+	0.12	0.21	0.17	0.45	0.18	0.45
LOSS	+	0.48	3.28**	0.47	3.20**	0.47	3.12**
GROWTH	-	-0.01	0.51	-0.01	0.38	-0.01	0.59
SIZE	-	-0.32	28.97***	-0.33	28.98***	-0.32	28.75***
AUDFEE	-	-4.21	0.34	-5.90	0.75	-4.14	0.34
NAS	-	-0.78	1.50	-0.80	1.61	-0.77	1.46
GC	+	1.25	16.97***	1.22	16.39***	1.32	18.69***
TENSORT	+	-0.41	2.25	-0.38	1.97	-0.39	2.01
TENLONG	-	0.16	0.36	0.16	0.40	0.21	0.63
BUSY	+	0.28	0.94	0.27	0.92	0.28	0.98
SPEC(national)	-	-0.64	7.85***				
SPEC(local)	-			-0.47	4.70**		
SPEC(both)	-					-1.17	11.80***
<i>National but not Local</i>	-					-0.78	4.64**
<i>Local but not National</i>	-					-0.48	2.95**
Number of Observations		5,781		5,781		5,781	
Chi-Square for Model:		131.01***		129.61***		135.29***	
Pseudo R <sup>2</sup>		0.17		0.17		0.18	
Hosmer-Lemeshow (H-L) Statistic		3.68		5.11		4.10	
H-L Statistic p-value		0.89		0.75		0.85	

\*, \*\*, and \*\*\* indicate significance at  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively (based on one-tailed tests where relation is predicted).

<sup>a</sup> Variable definitions:

RES = 1 if the auditor resigned from the audit engagement in 2004 or 2005 and had no issues listed in the Form 8-k, 0 otherwise.

See Table 2 for remaining variables definitions

<sup>b</sup> Industry dummy variables have been suppressed for expositional convenience.