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National and Office-Specific Measures of Auditor Industry Expertise and Effects on Audit Quality

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ABSTRACT

Our paper examines whether audit quality is higher for industry audit specialists at the national and city-office levels using the framework developed in Ferguson et al. [2003] and Francis et al. [2005]. We find that auditors who are both national and city-specific industry specialists have clients with the lowest abnormal accruals, suggesting that joint national and city-specific industry specialists have the highest audit quality. In addition, we find some evidence that abnormal accruals of firms audited by city-industry specialists alone (without also being national specific industry specialists) are lower than those audited by nonindustry specialists. Using alternative measures of audit quality, we find that when the auditor is both a national and a city-specific industry specialist, its clients are less likely to meet or beat analysts' earnings forecasts by one penny per share and more likely to be issued a going-concern audit opinion. Together these results provide consistent evidence that audit quality is higher when the auditor is both a national and city-specific industry specialist, suggesting that auditors' national positive network synergies and the individual auditors' deep industry knowledge at the office level are jointly important factors in delivering higher audit quality.

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1. Introduction

The objective of this study is to determine if audit quality is higher for industry specialists at the firm-wide (i.e., national) and the office level (i.e., city). Prior studies report that abnormal accruals are smaller for clients of auditors that are national industry specialists (Balsam, Krishnan, and Yang [2003], Krishnan [2003]), that national industry specialists are more likely to issue a going-concern audit opinion (GCAO) (Lim and Tan [2008]), and clients audited by national industry specialists disclose information of higher quality (Dunn and Mayhew [2004]). While these studies provide robust evidence that auditors' national industry expertise is associated with better audit quality, recent studies have also documented that auditors' city-specific industry expertise plays an important role in audit pricing. In particular, Ferguson, Francis, and Stokes [2003] and Francis, Reichelt, and Wang [2005] document that joint national and city-specific industry specialists charge significantly higher fees than other auditors, ceteris paribus. We extend this line of research by examining the impact of auditors' national and city-specific industry expertise on audit quality.

The research question is important in several aspects. First, the key feature between "national" and "city" perspectives on industry expertise is the degree to which there are positive network synergies (Bental and Spiegel [1995], Katz and Shapiro [1985]). At the firm-wide (national) level, positive synergies arise when accounting firms capture industry expertise through knowledge-sharing practices, such as internal benchmarking of best practices, the use of standardized industry-tailored audit programs, and extending the "reach" of professionals from their primary local-office clientele to other clients through travel and internal consultative practices. At the office (city) level, auditor expertise is specifically tied to individual professionals who have deep personal knowledge of clients that cannot be readily captured and distributed to other offices and clients. The existing literature on audit quality and auditor industry expertise has unanimously assumed that positive synergies exist in audit firms. However, audit firms are partnerships where key audit decisions are made at local offices. Thus, the auditor's individual industry knowledge at the local level may also play an essential role in the perceived audit quality of audit firms and thus should not be ignored.

The second motivation is the possible connection between the implied audit quality from an audit fee premium, documented in Francis, Reichelt, and Wang [2005], and observable audit quality from measures such as earnings quality and propensity to issue a GCAO. Arguably, if higher audit fees lead to greater audit effort, then higher audit fees lead to higher audit quality (Simunic [1980]). However, an audit fee premium may also result from the industry audit specialist's superior reputation and greater client market share, which strengthens their bargaining power to command a fee premium for an assumed differentiated service. The audit quality of a reputed industry audit specialist is not readily discernable from that of a nonspecialist, since clients (existing or prospective) rarely have the opportunity or capacity to compare auditor quality with that of another auditor(s). Evidently, Craswell, Stokes, and Laughton [2002], using Australian data, fail to find evidence that clients paying higher fees are associated with a greater propensity to receive a going-concern opinion. To the best of our knowledge, no other published study has reported an association between an office-level audit fee premium and office-level audit quality. Therefore, it is unclear whether an audit fee premium among U.S. firms, as observed by Francis, Reichelt, and Wang [2005], leads to better audit quality.

A third motivation is that the results in Francis, Reichelt, and Wang [2005] indicate a three-level hierarchy in the pricing of audits: (1) auditors that are joint national and city-specific industry specialists have the largest fee premium; (2) auditors that are city-leaders alone, but not national leaders, have a significant but smaller fee premium; and (3) fees of auditors that are national leaders alone, but not city-specific leaders, are not significantly different from the fees of nonleaders. If their findings hold, it implies that the city-specific industry expertise dominates national industry expertise. Consequently, the results in other studies (Balsam, Krishnan, and Yang [2003], Krishnan [2003], Lim and Tan [2008]) may be solely driven by the auditor's city-specific industry expertise. Furthermore, the Francis, Reichelt, and Wang [2005] paper was based on the first disclosed audit fee data in 2000 and 2001 and thus city-specific leadership dominance over national leadership may not generalize to subsequent years. Our paper can further clarify these issues.

A fourth motivation is that our research question is relevant to policy makers who may be interested in knowing whether auditor industry specialization is a national or a local phenomenon. If it is a national phenomenon, then policy makers would be more concerned about protecting audit firms from further failures. However, if specialization is a local phenomenon, then there should be less concern because local expertise can more easily be transferred to the successor auditor.

Audit quality is defined as the market-assessed joint probability that a given auditor will both (1) discover a breach in the client's accounting system and (2) report the breach (DeAngelo [1981]). Following prior literature, audit quality is higher if clients' earnings are of a higher quality, evident from lower abnormal accruals (Balsam, Krishnan, and Yang [2003], Krishnan [2003], Lim and Tan [2008]), and lower frequency of either meeting or beating analysts' earnings forecasts by one cent per share (Lim and Tan [2008]). Both abnormal accruals and earnings benchmark tests have been used in prior research to identify firms that engage in earnings management behavior. Prior literature has also used the propensity to issue a qualified going-concern opinion as a measure of audit quality (Lim and Tan [2008]).

We find that when the auditor is both a national and a city industry specialist, clients report smaller abnormal accruals magnitude, smaller income-increasing abnormal accruals magnitude, and smaller income-decreasing abnormal accruals magnitude; are less likely to meet or beat analysts' earnings forecasts by one penny per share; and are more likely to receive a GCAO. In all tests, the results indicate that joint national and city-specific industry expertise is associated with higher audit quality. In other words, both positive synergies at the national level and individual accountants' deep industry knowledge at the office level are associated with higher earnings quality and with the auditor's greater propensity to issue a going-concern opinion. While we do find some evidence that city industry expertise alone (when not a national specialist) plays an important role in two of our measures of audit quality (meeting or beating analysts' earnings forecasts by one penny and marginal evidence pertaining to abnormal accruals), it is not consistently significant with the other measure of audit quality—propensity to issue a going-concern opinion. Although it seems that the national industry expertise alone (when not a city specialist) is not an important factor in most cases, we do find some evidence that clients audited by a national only specialist report a lower magnitude of income-decreasing abnormal accruals. All tests control for client characteristics (size, risk, etc.) and are robust to alternative measures of industry auditor expertise. Thus, we conclude from these analyses that joint national and city-specific industry expertise is associated with differential audit quality.[1]

The remainder of the paper is organized as follows. Section 2 presents the background to the study and reviews relevant prior literature. Section 3 describes the sample and industry specialist definitions. Sections 4–7 report our empirical test results: abnormal accrual tests, meeting or beating analysts' earnings forecast tests, GCAO tests, and sensitivity tests. Section 8 concludes the study.

2. *Background and Prior Studies*

2.1 INDUSTRY EXPERTISE AND AUDIT QUALITY

The notion that auditors have differential industry expertise has been around for some time (e.g., Eichenseher and Danos [1981]). Industry specialists appear to charge a higher price for audits, which in turn implies they produce higher quality audits (Craswell, Francis, and Taylor [1995], DeFond, Francis, and Wong [2000]). There is also recent evidence that audited financial statements are of higher quality when audited by industry specialists. For example, Balsam, Krishnan, and Yang [2003] and Krishnan [2003] document that abnormal accruals are smaller for companies audited by national-level industry specialists (measured in various ways), which

[1] The findings are somewhat different from the findings in Francis, Reichelt, and Wang [2005], which document a three-level hierarchy of audit pricing. More specifically, Francis, Reichelt, and Wang [2005] find that the auditor's city-specific industry expertise dominates the national level industry expertise. We find that the joint national and city-specific industry expertise is important in providing higher audit quality. We argue that the difference is possibly because the fee premium does not exactly map to better audit quality. Another possible reason is that Francis, Reichelt, and Wang [2005] only use first-time reported audit fees, namely 2000 and 2001 data, while our study uses data from 2003 to 2007.

implies that there is less managerial discretion and higher earnings quality for audit clients of national-level industry specialists.

Our analysis builds on these studies plus recent research arguing that auditor industry expertise may have both “localized” (office-specific) characteristics as well as a “national” (firm-wide) dimension. Ferguson, Francis, and Stokes [2003] and Francis, Reichelt, and Wang [2005] argue that industry expertise derives from deep client knowledge of professionals working primarily out of practice offices that are typically located near their clients. Audit reports are issued on office-specific letterhead by the lead engagement partner administering an audit, and even though other offices may participate in the audit, the lead engagement partner directs the total effort, interprets the audit evidence, and ultimately determines the appropriate audit report. The degree to which industry expertise is firm-wide versus office-specific depends on the extent to which the deep expertise of office-based professionals can be captured and distributed within the firm through knowledge sharing practices (Francis, Maydew, and Sparks [1999], Reynolds and Francis [2000]).

Recent evidence in the audit pricing literature indicates that both national-level and office-level industry expertise appear to affect the auditor’s reputation for industry expertise (Ferguson, Francis, and Stokes [2003], Francis, Reichelt, and Wang [2005]). Using Australian data, Ferguson, Francis, and Stokes [2003] document that audits are priced as if both national and office-specific market shares jointly affect the market’s perception of auditor industry expertise. They document an audit premium for auditors that are both the national industry specialist and the city-specific industry specialist in the city where the client is headquartered (and which administers the audit engagement). Francis, Reichelt, and Wang [2005] examine the U.S. audit market using the framework in Ferguson, Francis, and Stokes [2003] and also document that audit fees are highest when auditors are jointly the national industry specialist and the city-specific industry specialist. The research question investigated in this study is whether auditors who are jointly the national specialist and the city-specific specialist map to systematic differences in audit quality, given that prior research observes a fee premium for these industry specialists.[2] For the purpose of this study, we define audit quality as clients’ earnings quality and the propensity to issue a going-concern opinion.

2.2 INDUSTRY EXPERTISE AND CLIENTS’ EARNINGS QUALITY

During his term as SEC Chairman, Arthur Levitt [1998] was critical of earnings quality in the United States due to what he termed the

[2] We acknowledge that there are concurrent studies examining office size as a determinant of audit quality (Choi et al. [2007], Francis and Yu [2009]). Our paper complements these studies by examining joint national-city auditor industry expertise and audit quality. As an additional analysis, we include the office size variable, as measured by the natural logarithm of total audit fee revenues of the office, in all our models. Our inferences are not affected.

"numbers game" or aggressive earnings management behavior in order to meet quarterly earnings targets. While stopping short of declaring such behavior fraudulent, he nevertheless believes it fundamentally undermines the credibility of accounting and lowers investor confidence in the securities market. Levitt [1998] stated:

> Too many corporate managers, auditors, and analysts are participants in a game of nods and winks. In the zeal to satisfy consensus earnings estimates and project a smooth earnings path, wishful thinking may be winning the day over faithful representation. As a result, I fear that we are witnessing an erosion in the quality of earnings, and therefore, the quality of financial reporting. Managing may be giving way to manipulation; Integrity may be losing out to illusion.

The effect of earnings management on earnings quality cannot be directly observed but is instead inferred by researchers from certain statistical properties and characteristics of earnings numbers (Schipper and Vincent [2003]). We examine two widely investigated properties of earnings numbers: abnormal accruals and the likelihood of meeting or beating analysts' earnings forecasts by one penny per share. Abnormal accruals are derived from an econometric estimation of "expected accruals" and represent the degree to which accruals have been potentially managed in order to achieve strategic earnings objectives (Dechow, Sloan, and Sweeney [1995], DeFond and Jiambalvo [1994], Jones [1991], Kothari, Leone, and Wasley [2005]).

The second analysis is based on the likelihood of companies meeting or beating analysts' earnings forecasts by one penny per share. Berenson [2003] chronicles the market's increasing pressure on companies to meet earnings benchmarks such as analysts' forecasts. The failure to meet earnings forecasts by even one cent per share can result in significant stock price declines and reduced CEO compensation (Bartov, Givoly, and Hayn [2002], Matsunaga and Park [2001]). Thus there is a strong incentive to manage earnings by meeting or beating earnings targets. Degeorge, Patel, and Zeckhauser [1999] report evidence consistent with incentives to exactly meet or beat analysts' earnings forecasts by one cent per share by documenting a discontinuity around zero. Specifically, there is over-representation of firms that exactly meet or beat analysts' forecasts by one cent and under-representation of firms in the distribution just missing analysts' forecasts by one cent, which is consistent with the use of earnings management to "push" earnings upward for firms that otherwise may have fallen short of their benchmark earnings target.

Industry audit specialists reduce earnings management behavior and improve earnings quality in several ways. First, industry specialists presumably have a greater knowledge of industry accounting practices and therefore are better able to identify and reign in more aggressive practices. Second, because industry audit specialists have developed a reputation for industry expertise, they have an incentive to protect their reputation in order to earn audit fee premia for that expertise (Craswell, Francis, and Taylor [1995]).

In general, auditors protect their reputation by resisting client pressure for greater discretion and by imposing stricter standards on clients in order to minimize the risk of misleading reporting (Reynolds and Francis [2000]). Thus, if industry specialists are stricter and are better able to constrain their clients' earnings management behavior, then their clients' earnings reports should have smaller abnormal accruals relative to the clients of other auditors, and are less likely to meet or beat analysts' earnings forecasts by one cent per share, ceteris paribus.

2.3 INDUSTRY EXPERTISE AND GOING-CONCERN AUDIT OPINIONS

The notion that higher quality auditors are more likely to issue a GCAO has been well established in the literature, but whether office level industry expertise increases the likelihood of issuing a GCAO has not been clearly established. Extant literature suggests that larger auditors (Weber and Willenborg [2003]), larger audit fees (Geiger and Rama [2003]), and *national* industry expertise (Lim and Tan [2008]) are positively associated with an auditor's propensity to issue a GCAO. A limited number of studies examine the relation between the propensity to issue a modified audit opinion and the client fee influence at the *office* and national levels, by examining GCAOs in the United States (Li [2009], Reynolds and Francis [2000]) and qualified audit opinions in Australia (Craswell, Stokes, and Laughton [2002]). However, these studies do not clearly examine whether office level expertise affects the propensity to issue a going-concern opinion. Prior literature has established that joint national and office level industry audit specialists command a higher fee premium (Basioudis and Francis [2007], Ferguson, Francis, and Stokes [2003], Francis, Reichelt, and Wang [2005]), suggesting that they offer a more differentiated and higher quality audit service. If joint national and office level auditor specialists perform a higher quality audit, then arguably they are more likely to issue a GCAO.

Industry audit specialists, both national and city-level, possess a greater propensity to express a GCAO in several ways. First, industry specialists presumably have a greater knowledge of their client's industry and are better able to evaluate whether an industry specific client has substantial doubt about its ability to continue as a going-concern. Prior literature argues that auditors that specialize in particular industries build expertise in these specific areas and make greater specific investments in building up their reputation of superior quality (Carcello and Nagy [2004], Craswell, Francis, and Taylor [1995], Kwon, Lim, and Tan [2007], Lim and Tan [2008], O'Keefe, Simunic, and Stein [1994], Owhoso, Messier, and Lynch [2002], Solomon, Shields, and Whittington [1999]). For instance, higher quality auditors deploy more audit effort in a more contextual and less procedural approach by allocating more resources to planning and risk assessment (Blokdijk et al. [2006]). Consequently, they have more effective procedures to measure a client's risk of business failure and they impose stricter quality standards on their staff when performing these procedures. Secondly, industry specialists have developed a reputation for higher audit quality, so they have a greater incentive to protect their reputation against possible litigation in the event of a client's business failure. To protect themselves against client pressure to express an unqualified opinion, which would otherwise increase their risk of litigation, industry specialists will express a going-concern audit opinion based on a lower probability of client business failure than that of nonspecialists. In short, national and office level industry specialist auditors can better assess their clients' business risk and they will protect their reputation by expressing a more conservative audit opinion to minimize litigation risk. We expect that national and office level industry specialist auditors more frequently issue a going-concern audit opinion to their clients, ceteris paribus.

3. Sample and Industry Specialist Definitions

3.1 SAMPLE

We begin our sample selection process by including all nonfinancial domestic companies from Audit Analytics' 32,479 firm-year observations with valid audit fee data for the period 2003–2007.[3] We use this maximum sample to compute the auditor's market share in each industry at the national level and city level. In order to utilize variables from Compustat Annual, we deduct 7,476 observations without a matching CIK code. To ensure that city expertise is not determined by too few observations in a city-industry-fiscal year combination, we require a minimum of two observations per city-industry-year combination (Francis, Reichelt, and Wang [2005]) by deleting 3,420 observations with less than two, yielding a total sample of 21,583 firm-year observations.

From this sample, we derive three subsamples used in this study for three types of analysis: abnormal accrual analysis, meeting or beating analysts' earnings forecasts analysis, and going-concern opinion analysis. The abnormal accruals analysis subsample has 13,771 firm-year observations, after deducting missing values or those without values necessary to compute abnormal accruals (7,443), and after deducting observations with an absolute studentized residual greater than 3 (369). The meeting or beating analysts' earnings forecasts analysis subsample has 5,865 firm-year observations, after deducting observations without analysts' earnings forecasts (14,582), and without control variable values (1,136).[4] Our going-concern opinion analysis subsample has 4,969 firm-year observations, after deducting observations with missing values (6,136), those not classified as financially distressed

[3] The sample period begins in the first year of the Big 4.

[4] Analyst forecasts are obtained from the I/B/E/S unadjusted detail file to avoid the problem of lost precision in the EPS decimal places from stock splits (Payne and Thomas [2003]). To avoid using stale dated forecasts we exclude forecasts that are older than two months before the earnings release date, following Lim and Tan [2008].

TABLE 1
Sample Selection

Panel A: Sample for computing auditor expertise	
Domestic nonfinancial companies from Audit Analytics with positive audit fees, with MSA codes, and with SIC codes for the period 2003–2007 (representing 202 unique MSAs)	32,479
Number of observations used to compute auditors' national and city market share	32,479
Delete: Number of observations not in Compustat (without CIK code in Compustat)	(7,476)
Delete: City-industry-fiscal year combinations less than 2 observations	(3,420)
Number of observations for further analysis, representing audit clients from 119 MSAs	21,583
Panel B: Unsigned abnormal accruals analysis	
Number of observations from panel A	21,583
Delete: Number of observations with missing values of control variables or missing values necessary to compute abnormal accruals	(7,443)
Delete: |studentized residuals| greater than 3	(369)
Final sample in unsigned abnormal accruals analysis (106 MSAs)	13,771
Panel C: Analysis of meeting or beating analysts' earnings forecasts	
Number of observations from panel A	21,583
Delete: Number of observations without analysts' earnings forecast data	(14,582)
Delete: Number of observations with missing values of control variables	(1,136)
Delete: Number of observations with |logit deviance residuals| >3	(0)
Final sample in the analysis of meeting or beating analysts' forecasts (79 MSAs)	5,865
Panel D: Analysis of going-concern opinion	
Number of observations from panel A	21,583
Delete: Number of observations with missing values	(6,136)
Delete: Nonfinancially distressed firm-year observations	(10,472)
Delete: Number of observations with |logit deviance residuals| >3	(6)
Final sample in the analysis of going-concern opinion (93 MSAs)	4,969

firms[5] (10,472), and those with a logit absolute deviance residual[6] greater than 3 (6). Table 1 summarizes the sample selection process.

3.2 INDUSTRY SPECIALIST DEFINITIONS

Auditor industry expertise is measured at a national and a city level. National level auditor industry expertise is based on the auditor's annual market share of audit fees within a two-digit SIC category (Ferguson, Francis, and Stokes [2003], Hogan and Jeter [1999]). City level auditor industry expertise is based on the auditor's annual market share of audit fees within a two-digit SIC category for a particular city.[7] A city is defined as a

[5] We restrict our going-concern opinion analysis to financially distressed firms, following prior literature such as Lim and Tan [2008] and Reynolds and Francis [2000]. A firm is defined as a financially distressed firm if it reports negative operating cash flow (*OANCF-XIDOC*).

[6] Logit deviance residuals are computed differently from OLS studentized residuals; however, the two types of residuals are approximately equal (Menard [2002, p. 85]).

[7] National level annual industry market shares of audit fees, averaged across all unique 52 industries and the five years in the abnormal accruals subsample, are as follows: The top-ranked

Metropolitan Statistical Area (MSA), following Francis, Reichelt, and Wang [2005]. Audit Analytics identifies the geographical city (not the MSA) from the audit report of the financial statements found in the Form 10-K filing. Geographic cities are categorized by MSA from the U.S. Census Bureau's MSA cross-map.[8]

Two definitions (definitions 1 and 2) are employed to measure national and city industry expertise, which follows prior studies (e.g., Balsam, Krishnan, and Yang [2003], Dunn and Mayhew [2004], Krishnan [2003], Mayhew and Wilkins [2003]). Definition 1 measures industry expertise by auditor dominance, following Mayhew and Wilkins [2003]. Dominant auditors differentiate themselves from nonspecialists by investing in industry-specific specialization costs (e.g., training, personnel, and technology) that develop and maintain their industry expertise. They spread these costs over more clients, making it less likely for competing auditors to invest in industry expertise. In particular, definition 1 defines a national (city) industry specialist if in a particular year (and in a particular city) the auditor has the largest market share in a two-digit SIC category and if its market share is at least 10% points greater than the second largest industry leader in a national (city) audit market. A sufficiently larger market share than the second largest industry leader ensures that the industry leader is dominant. A 10% point greater market share follows Mayhew and Wilkins [2003].

Definition 2 measures industry expertise assuming that auditor expertise increases with industry market share and that a sufficiently large market share exists. Consistent with DeAngelo's [1981] argument that audit quality increases with audit firm size, definition 2 assumes that industry expertise increases with the size of the auditor's industry market share. An auditor with a sufficiently large industry market share has stronger incentives to provide higher audit quality by investing in industry-specific specialization costs. Specifically, definition 2 defines a national (city) industry specialist if in a particular year (and in a particular city) the auditor has a market share greater than 30% (50%) in a two-digit SIC category.[9]

audit firm has 42%, the second-ranked has 26%, the third-ranked has 17%, and the fourth-ranked has 10%. City level annual industry market shares of audit fees, averaged across all 52 industries, 106 unique cities and five years in the abnormal accruals subsample, are as follows: The top-ranked audit firm has 73%, and the second-ranked has 23%. These results are comparable to those of Francis, Reichelt, and Wang [2005].

[8] The U.S. Census Bureau's MSA cross-map (2003 definition) is available at the following web-site: http://www.census.gov/population/www/metroareas/metrodef.html. Not listed on the cross-map are 318 unique geographical cities that we hand-collected: 257 are geographically within a certain MSA and 61 are not within any MSA that is eventually excluded from the final sample due to data restrictions. The geographical location of these cities was found using the Google Maps website. Table 1 reports the beginning and final number of MSAs for each sample.

[9] The minimum national industry market share is 30%, following Neal and Riley [2004], who define the minimum as 1.2 times the inverse of the number of Big N auditors ($1.2 \times 1/4$). To apply Neal and Riley's formula to the city level, we use the average number of auditors per city-industry combination instead of the number of Big N auditors because there are fewer

We acknowledge that the choice of an industry expertise definition has its limitations and challenges. Industry expertise is not directly observable, so our two definitions likely include measurement noise. To ensure that measurement noise is not biasing our results, we also test the following industry specialist (national or city level) definitions: the largest annual market share and at least 5% points greater industry market share than the closest competitor; at least a 30% annual industry market share for both national and city levels; and only the largest annual industry market share (industry leaders). Our results are robust to these alternative definitions. In addition, because two of these measures are based on arbitrary industry market share cut-off values, we report that our results are robust to using a continuous variable interaction term technique (Aiken and West [1991]) that is less arbitrary (See Section 7 for further details).

3.3. DESCRIPTIVE STATISTICS OF INDUSTRY SPECIALISTS

Table 2, panel A reports the mean and standard deviation of the two industry specialist definitions, and their interaction terms. Definition 1 is more restrictive than definition 2 at the national level, evident from fewer national industry specialists (a mean of 11.6% vs. 21.4%) and fewer national specialists only (4.0% vs. 9.0%).[10] However, at the city level, the two definitions are more comparable, evident from a similar mean city industry specialist percentage (35% vs. 32.7%). At the city level, definition 2, like definition 1, does not permit multiple industry specialists due to the requirement of a minimum 50% market share.

Table 2, panels B-1 and B-2 report the number of industry specialists for definition 1, at the national and city levels, respectively. National industry specialists are distributed among an annual average of 24 industry auditors over the five-year period as follows: Deloitte Touche (DT) is in 5 industries; Ernst & Young (EY) is in 8 industries; KPMG is in 1 industry; and PricewaterhouseCoopers (PWC) is in 10 industries. Non–Big 4 auditors are not national specialists in any industry.[11] City industry specialists are distributed among an annual average of 523 city-industry auditors as follows: DT (102), EY (135), KPMG (95), PWC (121), Grant Thornton (12), BDO Seidman (9), and all other auditors (48).

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auditors in a city-industry combination and non–Big N firms can also be specialists at the city level. On average, there are 2.5 auditors per city industry market, which computes to 48% ($1.2 \times 1/2.5$), or approximately 50%.

[10] Definition 1 is more restrictive, since, in some cases, the auditor has the greatest market share but does not have more than a 10% lead over its nearest competitor, as noted by Mayhew and Wilkins [2003, p. 42].

[11] The annual number of national industry specialists and city industry specialists declines slightly from 2004 to 2006 and more dramatically in 2007. This decline is mainly explained by a combination of an annual decline in the number of firms covered by Audit Analytics and Compustat, and a decline in the Big 4 market share.

TABLE 2

Descriptive Statistics of Auditor Industry Expertise

Panel A: Definition and descriptive statistics of auditor industry specialist ($N = 13{,}771$)

Auditor Industry Specialist Definition 1: An auditor is defined as a national (city) industry specialist if it has the largest annual market share in an industry, based on the two-digit SIC category, and if its annual market share is at least 10 percentage points greater than its closest competitor in a national (city) audit market.

Auditor Industry Specialist Definition 2: An auditor is defined as a national (city) industry specialist if it has an annual market share greater than 30% (50%) in an industry, based on the two-digit SIC category in the national (city) audit market.

	Definition 1		Definition 2	
	Mean	*SD*	Mean	*SD*
National Specialist	0.116	0.320	0.214	0.410
City Specialist	0.350	0.477	0.327	0.469
Both National and City Specialist	0.076	0.265	0.124	0.330
National Specialist Only	0.040	0.195	0.090	0.287
City Specialist Only	0.274	0.446	0.203	0.402

Variable Definitions:

National Specialist = 1 if a company is audited by a national industry specialist based on one of the two above definitions, and 0 otherwise.

City Specialist = 1 if a company is audited by a city industry specialist based on one of the two above definitions, and 0 otherwise.

Both National and City Specialist = 1 if a company is audited by an auditor that is defined as both a national industry specialist and a city industry specialist (i.e., *National Specialist* = 1 and *City Specialist* = 1), and 0 otherwise.

National Specialist Only = 1 if a company is audited by an auditor that is defined as a national industry specialist but not a city industry specialist (i.e., *National Specialist* = 1 and *City Specialist* = 0), and 0 otherwise.

City Specialist Only = 1 if a company is audited by an auditor that is not defined as a national industry specialist but is defined as a city industry specialist (i.e., *National Specialist* = 0 and *City Specialist* = 1), and 0 otherwise.

(Continued)

Table 2, panels B-3 and B-4 reports the number of industry specialists for definition 2.[12] National industry specialists are distributed among an annual average of 46 industry auditors over the five-year period (table 2, panel B-3), and city industry specialists are distributed among an annual average of 500 city-industry auditors (table 2, panel B-4).[13] The distribution of national and city level industry specialists among audit firms are similar to those reported for definition 1.

[12] Definition 2 requires a minimum 30% market share for national industry specialists, allowing for multiple industry specialists. Untabulated analysis shows that, for the five year period from 2003 to 2007, on average, there are 8 industries with two national industry specialists (16%), 30 industries with one national industry specialist (64%), and 9 industries without a national industry specialist (20%).

[13] Definitions 1 and 2 are similar for the city industry specialist measure. Under definition 1, 78% (523/668, table 2B-2) of city industry combinations have a specialist, compared to 75% (500/668, table 2B-4) under definition 2. The similar but higher proportion of city specialists (relative to the portion of national specialists) is likely because both city specialist definitions only permit one specialist per city-industry combination and because there are fewer auditors per industry at the city level.

TABLE 2—*Continued*

Panel B: Industry specialists by auditor and year (based on the abnormal accruals sample)

B-1: National Industry Specialists by Auditor and Year—Definition 1

Auditors/Fiscal Years	2003	2004	2005	2006	2007	Average
PWC	13	14	9	9	7	10
EY	7	6	8	8	10	8
DT	4	6	4	4	6	5
KPMG	1	1	2	0	0	1
Total National Industry Specialists	25	27	23	21	23	24
Total Industries	48	50	48	48	44	48
Total Industry-Auditor combinations (specialists and nonspecialists)	538	628	672	697	596	626

B-2: City Industry Specialists by Auditor and Year—Definition 1

Auditors/Fiscal Years	2003	2004	2005	2006	2007	Average
PWC	143	151	121	104	88	121
EY	159	143	142	127	106	135
DT	110	104	108	100	86	102
KPMG	101	116	99	95	63	95
Grant Thornton	9	4	13	17	18	12
BDO Seidman	5	7	11	10	14	9
All other auditors (84 auditors)	35	50	57	53	45	48
Total City Industry Specialists	562	575	551	506	420	523
Total Cities	86	88	87	84	80	85
Total Industries	48	50	48	48	44	48
Total City-Industry combinations	688	720	711	660	560	668
Total City-Industry-Auditor combinations (specialists and nonspecialists)	1,709	1,790	1,788	1,691	1,419	1,679

B-3: National Industry Specialists by Auditor and Year—Definition 2

Auditors/Fiscal Years	2003	2004	2005	2006	2007	Average
PWC	18	23	17	18	12	18
EY	17	11	14	15	14	14
DT	10	10	10	11	10	10
KPMG	6	5	5	3	1	4
Total National Industry Specialists	51	49	46	47	37	46
Total Industries	48	50	48	48	44	48
Total Industry-Auditor combinations (specialists and nonspecialists)	538	628	672	697	596	626

(Continued)

4. *Abnormal Accruals Tests*

Following prior studies (e.g., Dechow, Sloan, and Sweeney [1995], DeFond and Jiambalvo [1994], Jones [1991], Kothari, Leone, and Wasley [2005]), we estimate performance-adjusted abnormal accruals based on the cross-sectional modified Jones [1991] model. Expected accruals are estimated from equations (1) and (2). Equation (1) estimates total accruals from the change in revenue, the level of property plant and equipment, and the prior year's operating performance (Kothari, Leone, and Wasley

TABLE 2—*Continued*

B-4: City Industry Specialists by Auditor and Year—Definition 2

Auditors/Fiscal Years	2003	2004	2005	2006	2007	Average
PWC	134	143	117	100	80	115
EY	150	137	136	123	97	129
DT	112	105	104	92	80	99
KPMG	91	116	100	89	59	91
Grant Thornton	8	5	14	17	17	12
BDO Seidman	7	6	11	10	15	10
All other auditors (84 auditors)	31	49	54	48	45	45
Total City Industry Specialists	533	561	536	479	393	500
Total Cities	86	88	87	84	80	85
Total Industries	48	50	48	48	44	48
Total City-Industry combinations	688	720	711	660	560	668
Total City-Industry-Auditors combinations (specialists and nonspecialists)	1,709	1,790	1,788	1,691	1,419	1,679

Total National Industry Specialists is the number of unique national industry specialist auditors, defined in panel A. *Total Industries* is the number of unique two-digit SIC categories in the sample. *Total Industry-Auditor combinations* is the number of unique industry-auditor combinations, including specialists and non-specialists. *Total City Industry Specialists* is the number of unique city industry specialist auditors, defined in panel A. *Total Cities* is the number of unique MSAs in the sample. *Total City-Industry combinations* is the number of unique city-industry combinations. *Total City-Industry-Auditor combinations* is the number of unique city-industry-auditor combinations, including specialists and nonspecialists. Panels B-1 and B-3 do not report amounts for Grant Thornton, BDO Seidman or any other non–Big 4 auditors since there are no national industry specialists among these auditors.

[2005]), by industry (two-digit SIC code) and year:[14, 15]

$$TA_{it} = \beta_0(1/A_{it-1}) + \beta_1 \Delta REV_{it} + \beta_2 PPE_{it} + \beta_3 ROA_{it-1} + e_{it} \qquad (1)$$

where:

TA_{it} = total accruals (net income from continuing operations (*IB*),[16] minus operating cash flow (*OANCF-XIDOC*))for company i for year t divided by total assets (*AT*) at the end of year $t-1$,

A_{it-1} = total assets for company i at the end of year $t-1$,

ΔREV_{it} = change in revenue (*SALE*) from prior year, company i for year t divided by total assets at the end of year $t-1$,

PPE_{it} = gross PP&E (*PPEGT*) for company i at the end of year t divided by total assets at the end of year $t-1$,

ROA_{it-1} = return on assets, measured by net income (*NI*) for company i for year $t-1$ divided by average total assets for year $t-1$, and

e_{it} = error term assumed to have normal OLS regression properties.

Equation (2) estimates expected total accruals from the coefficient estimates of equation (1) with an adjustment for the change in accounts

[14] Equation (1) is estimated from all available firm-year observations from Compustat annual for the years ending 2003 to 2007, in order to more accurately estimate expected accruals.

[15] In estimating equation (1), we truncate the top and bottom 1% of the distribution of all variables and mandate at least 20 observations in each industry and year.

[16] The Compustat variable name is in parentheses.

receivable (Dechow, Sloan, and Sweeney [1995]):

$$ETA_{it} = \hat{\beta}_0(1/A_{it-1}) + \hat{\beta}_1(\Delta REV_{it} - \Delta REC_{it}) + \hat{\beta}_2 PPE_{it} + \hat{\beta}_3 ROA_{it-1} \quad (2)$$

where:

$\hat{\beta}_0$ to $\hat{\beta}_3$ = estimated coefficients from Equation (1),

ETA_{it} = expected total accruals for company i in year t, and

ΔREC_{it} = change in accounts receivable ($RECT$) from prior year, for company i in year t.

Abnormal accruals is the difference between total accruals and expected total accruals:

$$DACC_{it} = TA_{it} - ETA_{it} \quad (3)$$

where $DACC$ represents the amount of company i's *abnormal* or unexpected accruals and is the amount of earnings that have been potentially distorted through managerial discretion (i.e., earnings management).

To determine if managerial discretion, with respect to accruals, varies with the industry expertise of a company's auditor, the absolute value of abnormal accruals is regressed on auditor industry expertise variables, plus a set of control variables based on prior studies (e.g., Ashbaugh, LaFond, and Mayhew [2003], Frankel, Johnson, and Nelson [2002], Lim and Tan [2008]); firm subscripts are omitted for brevity:[17]

$$\begin{aligned}|DACC| = {} & b_0 + b_1 SIZE + b_2\sigma(CFO) + b_3 CFO + b_4 LEV \\ & + b_5 LOSS + b_6 MB + b_7 LIT + b_8 ALTMAN + b_9 TENURE \\ & + b_{10}|ACCR\_1| + b_{11} BIG4 + b_{12} SEC\_TIER \\ & + b_{13} AUDITOR\#1 + b_{14} AUDITOR\#2 + b_{15} AUDITOR\#3 + e \end{aligned} \quad (4)$$

where

$|DACC|$ = the absolute value of abnormal accruals (from equation (3)),

$SIZE$ = the natural logarithm of market value of common equity ($CSHO * PRCL\_F$) at the end of the fiscal year,

$\sigma(CFO)$ = the standard deviation of operating cash flow (scaled by total assets at the beginning of the fiscal year) from $t-4$ to t,

CFO = operating cash flow scaled by total assets at the beginning of the fiscal year,

LEV = total long-term debt ($DLTT$) scaled by total assets,

$LOSS$ = 1 if net income < 0, and 0 otherwise,

MB = the market value of equity divided by book value of equity (total assets − total liabilities (LT)),

[17] Industry indicator variables and year indicator variables are not added to equation (4) since abnormal accruals are estimated by two-digit SIC category and by year.

LIT = 1 if the company operates in a high litigation industry (SIC codes of 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370–7370), and 0 otherwise,
ALTMAN = Altman's [1983] scores,[18]
TENURE = the natural logarithm of the number of years that the auditor has audited the firm's financial statements,
$|ACCR\_1|$ = total accruals from prior year, scaled by total assets at beginning of fiscal year,
BIG4 = 1 if audited by a Big 4 auditor, and 0 otherwise,
SEC_TIER = 1 if audited by Grant Thornton or BDO Seidman, and 0 otherwise,
AUDITOR#1 = 1 if the auditor is an industry specialist at both national and city levels, and 0 otherwise,
AUDITOR#2 = 1 if the auditor is a national industry specialist but not a city industry specialist, and 0 otherwise,
AUDITOR#3 = 1 if the auditor is a city industry specialist but not a national industry specialist, 0 otherwise, and
e = the error term, assumed to have normal OLS regression properties.

The dependent variable, $|DACC|$, is the absolute value of abnormal accruals, a measure of abnormal accruals magnitude.[19] The test variables of interest are the three auditor indicator variables. *AUDITOR#1* is coded one if the auditor is the industry specialist at both the national and city level; *AUDITOR#2* is coded one if the auditor is the national industry specialist, but not the city-specific industry specialist in the city where the auditor's office is located; and *AUDITOR#3* is coded one if the auditor is the city industry specialist in the city where the auditor's office is located, but not the national industry specialist. The default comparison is an auditor who is neither a specialist at the national nor the city level. The test variables are computed under each of the two industry specialist definitions.

Table 3, panel A provides the descriptive statistics of the control variables used in estimating equation (4). Their descriptive statistics are consistent with prior literature (e.g., Lim and Tan [2008]), except that *SIZE, CFO*, and *LOSS* are lower by including non–Big 4 firms in our sample.

Consistent with prior studies, higher abnormal accruals magnitude ($|DACC|$) is expected for firms with more growth opportunities (*MB*), higher litigation risk (*LIT*), higher bankruptcy risk (*ALTMAN*), losses (*LOSS*), higher nonaccrual earnings volatility ($\sigma(CFO)$), and higher prior year total accruals ($|ACCR\_1|$). Lower abnormal accruals magnitude is expected for firms with larger size (*SIZE*), higher operating cash flow (*CFO*), higher lever-

[18] The Altman score measures the likelihood of company survival. Lower (higher) scores measure greater (lesser) bankruptcy risk. We expect a negative association between $|DACC|$ and *ALTMAN*. Results are not affected if we use Altman's [1968] scores.

[19] To minimize the effect of outliers, all continuous variables in equations (2) through (6) are winsorized at 1% and 99%.

TABLE 3
Descriptive Statistics of Variables in Multivariate Analysis

Panel A: Abnormal accruals analysis ($N = 13{,}771$)					
Variables	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
$\|DACC\|$	0.104	0.134	0.026	0.061	0.127
DACC	0.005	0.164	−0.062	−0.006	0.059
SIZE	5.470	2.286	3.867	5.534	7.092
$\sigma(CFO)$	0.195	0.652	0.035	0.067	0.133
CFO	−0.001	0.298	−0.031	0.068	0.138
LEV	0.168	0.230	0	0.081	0.261
LOSS	0.395	0.489	0	0	1
MB	3.022	5.653	1.331	2.197	3.776
LIT	0.258	0.438	0	0	1
ALTMAN	−0.069	7.324	0.264	1.590	2.592
TENURE	1.803	0.737	1.386	2.079	2.398
ACCR_1	−0.101	0.215	−0.114	−0.057	−0.017
$\|ACCR\_1\|$	0.126	0.207	0.034	0.067	0.126
BIG4	0.694	0.461	0	1	1
SEC_TIER	0.102	0.303	0	0	0
Panel B: Analysis of meeting or beating analysts' earnings forecasts ($N = 5{,}865$)					
Variables	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
MEET	0.222	0.415	0	0	0
SIZE	7.286	1.644	6.098	7.175	8.356
$\sigma(EARN)$	0.119	0.275	0.019	0.044	0.110
LEV	0.187	0.193	0.002	0.154	0.292
LOSS	0.234	0.424	0	0	0
ROA	0.019	0.159	0.005	0.049	0.094
MB	3.481	4.391	1.739	2.624	4.115
LIT	0.288	0.453	0	0	1
ALTMAN	1.804	1.805	1.049	1.878	2.812
TENURE	1.940	0.664	1.609	2.197	2.398
ACCR	−0.066	0.092	−0.099	−0.054	−0.023
$\sigma(FOR)$	0.003	0.014	0	0	0
$LN(NUMEST)$	0.096	0.291	0	0	0
BIG4	0.911	0.285	1	1	1
SEC_TIER	0.052	0.222	0	0	0

(Continued)

age (*LEV*), longer auditor tenure (*TENURE*), and are audited by a Big 4 auditor (*BIG4*) or a Second-Tier auditor (*SEC_TIER*). Table 4 provides correlation analysis, which reports that $|DACC|$ is correlated with these variables in the predicted direction, except for *SEC_TIER*, which is positively correlated with $|DACC|$, and *LEV*, which is insignificant. As expected, $|DACC|$ is negatively correlated with the three test variables, suggesting that all three levels of auditor industry expertise (joint national-city, national-only, and city-only levels) constrain accruals-based earnings management. Because these correlations are pair-wise, the coefficient sign may differ in our multivariate analysis.

Results of estimating equation (4) are reported in table 5 for each of the two auditor industry specialist definitions. The first two columns of each

TABLE 3—*Continued*

Panel C: Analysis of going-concern opinion ($N = 4{,}969$)

Variables	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
GC	0.299	0.458	0	0	1
SIZE	3.700	1.939	2.443	3.807	5.075
$\sigma(EARN)$	3.311	18.372	0.096	0.218	0.634
LEV	0.200	0.476	0	0.009	0.195
LOSS	0.859	0.348	1	1	1
ROA	−0.384	0.395	−0.704	−0.284	−0.074
MB	3.258	16.872	0.546	1.953	4.743
LIT	0.288	0.453	0	0	1
ALTMAN	−1.524	2.956	−5.000	−1.201	0.927
TENURE	1.702	0.738	1.386	1.946	2.303
ACCR	−0.773	3.949	−0.250	−0.067	0.019
BIG4	0.449	0.497	0	0	1
SEC_TIER	0.106	0.308	0	0	0

Variable Definitions:

DACC = abnormal accruals from equation (3),
$|DACC|$ = the absolute value of abnormal accruals,
SIZE = the natural logarithm of market value of common equity at the end of the fiscal year;
$\sigma(CFO)$ = the standard deviation of operating cash flow (scaled by total assets at the beginning of the fiscal year) in the past four years ($t-4$ to $t-1$),
CFO = operating cash flow scaled by total assets at the beginning of the fiscal year,
LEV = total long-term debt scaled by total assets,
LOSS = 1 if net income < 0, and 0 otherwise,
MB = the market value of equity divided by book value of equity,
LIT = 1 if the company operates in a high litigation industry (SIC codes of 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370–7370), and 0 otherwise,
ALTMAN = Altman's [1983] scores,
TENURE = the natural logarithm of the number of years that the auditor has audited the firm's financial statements,
ACCR_1 = total accruals in year $t-1$ scaled by total assets at the end of $t-1$,
BIG4 = 1 if audited by a Big 4 auditor, and 0 otherwise,
SEC_TIER = 1 if audited by Grant Thornton or BDO Seidman, and 0 otherwise,
MEET = 1 if earnings exactly meet or beat the latest analysts' earnings forecast by one cent per share, and 0 otherwise,
$\sigma(EARN)$ = the standard deviation of income before extraordinary items (scaled by total assets at the beginning of the fiscal year) in the past four years ($t-4$ to $t-1$),
ROA = return on assets,
$\sigma(FOR)$ = the standard deviation of analysts' earnings forecasts,
$LN(NUMEST)$ = the natural logarithm of the number of analysts following the company,
ACCR = total accruals from continuing operations scaled by total assets at the beginning of the fiscal year,
GC = 1 if the auditor issues a going-concern opinion, and 0 otherwise.

auditor industry specialist definition report the coefficient estimates and *p*-values of equation (4), substituting the *National Specialist* indicator variable for the three *AUDITOR#n* variables (hereafter, model 1). *National Specialist* is equal to one if the auditor is the national industry specialist based on national clienteles, and zero otherwise. This result permits comparison to the national level measures of industry expertise in Balsam, Krishnan, and Yang [2003] and Krishnan [2003]. The second two columns report the coefficient estimates and *p*-values of equation (4) substituting the *City Specialist* indicator variable for the three *AUDITOR#n* variables (hereafter, model 2).

TABLE 4
Spearman Correlation Matrix

Panel A: Analysis of abnormal accruals ($N = 13{,}771$)

Variables	*BOTH*	*NAT_ ONLY*	*CITY_ ONLY*	*|DACC|*	*SIZE*	σ (*CFO*)	*CFO*	*LEV*	*LOSS*	*MB*	*LIT*	*ALTMAN*	*TENURE*	*|ACCR_1|*	*BIG4*
NAT_ONLY	**−0.058**														
CITY_ONLY	**−0.177**	**−0.125**													
|DACC|	**−0.075**	**−0.033**	**−0.094**												
SIZE	**0.185**	**0.045**	**0.219**	**−0.327**											
σ (*CFO*)	**−0.041**	**−0.021**	**−0.061**	**0.276**	**−0.208**										
CFO	**0.051**	**0.025**	**0.082**	**−0.541**	**0.351**	**−0.312**									
LEV	**0.024**	0.006	**0.072**	0.003	**0.078**	**−0.020**	**−0.055**								
LOSS	**−0.079**	**−0.042**	**−0.070**	**0.295**	**−0.433**	**0.195**	**−0.518**	**0.067**							
MB	0.008	0.006	−0.001	**0.027**	**0.136**	0.003	−0.011	**−0.109**	**−0.016**						
LIT	**−0.059**	−0.007	−0.008	**0.069**	−0.004	**0.025**	**−0.142**	**−0.071**	**0.145**	**0.034**					
ALTMAN	**0.056**	**0.034**	**0.078**	**−0.491**	**0.370**	**−0.287**	**0.598**	**−0.102**	**−0.378**	**0.099**	**−0.055**				
TENURE	**0.069**	**0.031**	**0.098**	**−0.066**	**0.205**	**−0.018**	**0.066**	**0.028**	**−0.115**	0.007	0.012	**0.076**			
|ACCR_1|	**−0.059**	**−0.028**	**−0.070**	**0.528**	**−0.302**	**0.267**	**−0.445**	**0.062**	**0.294**	**−0.034**	**0.034**	**−0.493**	**−0.071**		
BIG4	**0.191**	**0.135**	**0.265**	**−0.261**	**0.586**	**−0.189**	**0.240**	**0.073**	**−0.229**	**0.027**	**0.030**	**0.239**	**0.289**	**−0.222**	
SEC_TIER	**−0.097**	**−0.069**	**−0.138**	**0.018**	**−0.170**	**−0.023**	−0.005	**−0.039**	**0.054**	0.000	0.013	0.014	**−0.248**	0.010	**−0.508**

(Continued)

TABLE 4—*Continued*

Panel B: Analysis of meeting or beating analysts' earnings forecasts ($N = 5{,}865$)

Variables	*BOTH*	*NAT_ ONLY*	*CITY_ ONLY*	*SIZE*	*σ (EARN)*	*LEV*	*LOSS*	*ROA*	*MB*	*LIT*	*ALTMAN*	*TENURE*	*ACCR*	*σ (FOR)*	*LN (NUMEST)*	*BIG4*	*SEC_ TIER*
MEET	**−0.027**	0.007	**−0.034**	0.000	0.002	**−0.097**	**−0.056**	**0.054**	**0.044**	**0.051**	**0.064**	−0.005	0.008	**−0.047**	**0.070**	−0.003	**0.019**
σ (FOR)	**0.019**	**−0.022**	−0.006	**0.070**	−0.011	**0.063**	**0.027**	**−0.022**	−0.009	−0.016	**−0.035**	0.004	**−0.062**		**0.528**	**0.029**	−0.012
LN (NUMEST)	**0.016**	**−0.036**	0.002	**0.065**	−0.006	−0.011	−0.005	0.000	−0.002	**0.023**	0.004	−0.007	**−0.050**			**0.036**	−0.015

Panel C: Analysis of going-concern opinion ($N = 4{,}969$)

Variables	*BOTH*	*NAT_ ONLY*	*CITY_ ONLY*	*SIZE*	*σ (EARN)*	*LEV*	*LOSS*	*ROA*	*MB*	*LIT*	*ALTMAN*	*TENURE*	*ACCR*	*BIG4*	*SEC_ TIER*
GC	**−0.066**	**−0.057**	**−0.100**	**−0.500**	**0.175**	**0.176**	**0.157**	**−0.497**	**−0.069**	**−0.043**	**−0.481**	**0.033**	**−0.376**	**−0.361**	**−0.079**

Coefficients in **bold** are significant at 5%.

Variable definitions of auditor industry specialists:

BOTH = 1 if a company is audited by an auditor that is defined as both a national industry specialist and a city industry specialist (i.e., *National Specialist* = 1 and *City Specialist* = 1), 0 otherwise;

NAT_ONLY = 1 if a company is audited by an auditor that is defined as a national industry specialist but not a city industry specialist (i.e., *National Specialist* = 1 and *City Specialist* = 0), 0 otherwise;

CITY_ONLY = 1 if a company is audited by an auditor that is not defined as a national industry specialist but is defined as a city industry specialist (i.e., *National Specialist* = 0 and *City Specialist* = 1), 0 otherwise.

The variable names *BOTH*, *NAT_ONLY*, and *CITY_ONLY* are abbreviations of the variables names *Both National and City Specialists*, *National Specialists Only*, and *City Specialists Only*, respectively, as defined in table 2. Refer to table 3 for all other variable definitions.

TABLE 5

Multivariate Analysis of Abnormal Accruals and Auditor Industry Specialization

Dependent variable is the absolute value of abnormal accruals ($|DACC|$, $N = 13{,}771$)

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
Intercept	0.113	<0.001	0.113	<0.001	0.113	<0.001	0.113	<0.001	0.113	<0.001	0.113	<0.001
SIZE	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001
σ (*CFO*)	0.009	0.002	0.009	0.002	0.009	0.002	0.009	0.002	0.009	0.002	0.009	0.002
CFO	−0.133	<0.001	−0.133	<0.001	−0.133	<0.001	−0.133	<0.001	−0.133	<0.001	−0.133	<0.001
LEV	−0.015	0.004	−0.015	0.005	−0.015	0.005	−0.015	0.004	−0.015	0.005	−0.015	0.005
LOSS	−0.013	<0.001	−0.013	<0.001	−0.013	<0.001	−0.013	<0.001	−0.013	<0.001	−0.013	<0.001
MB	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001
LIT	0.004	0.099	0.004	0.099	0.004	0.117	0.004	0.093	0.004	0.099	0.004	0.111
ALTMAN	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001	−0.003	<0.001
TENURE	0.001	0.324	0.001	0.301	0.001	0.301	0.001	0.333	0.001	0.298	0.001	0.308
|ACCR_1|	0.193	<0.001	0.193	<0.001	0.193	<0.001	0.193	<0.001	0.193	<0.001	0.193	<0.001
BIG4	−0.021	<0.001	−0.020	<0.001	−0.020	<0.001	−0.020	<0.001	−0.020	<0.001	−0.019	<0.001
SEC_TIER	−0.013	0.002	−0.013	0.002	−0.013	0.002	−0.013	0.002	−0.013	0.002	−0.013	0.002
National Specialist	−0.006	0.012					−0.007	<0.001				
City Specialist			−0.005	0.006					−0.005	0.006		
Both National and City Specialist					**−0.009**	**0.001**					**−0.011**	**<0.001**
National Specialist Only					−0.005	0.227					−0.004	0.128
City Specialist Only					−0.004	0.027					−0.003	0.178
F-value	781.82	<0.001	782.14	<0.001	678.07	<0.001	782.55	<0.001	782.15	<0.001	725.49	<0.001
Adj. R^2	0.4243		0.4244		0.4245		0.4246		0.4244		0.4242	

Coefficient *p*-values are two-tailed and based on asymptotic *t*-statistics robust to heteroscedasticity and time-series correlation, following the methodology in Rogers [1993]. Refer to tables 2 and 3 for variable definitions.

City Specialist is equal to one if the auditor is the city-specific industry specialist based on city-specific clienteles, and zero otherwise. This estimation is included for comparison purposes. However, the primary interest is in the third two columns, which report the estimation of equation (4), including the three *AUDITOR#n* variables (hereafter, model 3).

All models in table 5 are significant ($p < 0.001$), and their adjusted R^2 are 42%. To be statistically conservative, all p-values are reported as two-tailed, unless otherwise stated. Most of the control variables are significant at $p < 0.10$ except for *TENURE*, and *LIT*. The coefficient signs are consistent with prior studies mentioned earlier, except for *LIT* and *LOSS*, which differs due to the distribution of positive and negative abnormal accruals.

Model 1 analyzes national-level industry expertise, which reports that there is a negative association between national industry expertise and the magnitude of abnormal accruals for the two industry specialist definitions. These results are roughly consistent with the national-level analysis in Balsam, Krishnan, and Yang [2003] and Krishnan [2003], who both used Jones [1991] abnormal accruals. In model 2, which analyzes city-specific expertise, there is a negative association between city-specific industry expertise and the magnitude of abnormal accruals from both definitions.

Model 3 reports the estimation of equation (4) and is the primary model of interest. Clients of auditors who are both national and city-specific industry specialists have a lower magnitude of abnormal accruals. The coefficient on *Both National and City Specialist* is negative under definition 1 (−0.009) and significant ($p = 0.001$), and negative under definition 2 (−0.011) and significant ($p < 0.001$).[20] In contrast, the coefficient on *National Specialist Only* is not significant at $p = 0.10$ under either definition. The coefficient on *City Specialists Only* is only statistically significant under definition 1 (−0.004, $p = 0.027$), but is statistically lower than that of *Both National and City Specialist* at $p < 0.10$. However, under definition 2, the coefficient on *City Specialists Only* is not significant at $p = 0.10$. These results indicate that earnings quality is the highest when the auditor is a joint national and city-specific industry specialist. In contrast, we do not find consistent evidence that national expertise alone or city expertise alone is sufficient for auditors to provide higher audit quality. In other words, these results suggest that the joint positive synergies of national industry expertise and individual auditor's office industry expertise are associated with higher audit quality.

To illustrate the economic significance of the coefficient on joint national and city industry expertise in model 3, the magnitude of the coefficient for definitions 1 (−0.009) and 2 (−0.011) is equivalent to 11.9% and 14.7% of pretax income, respectively, based on the mean pre-tax income in the

[20] The higher p-value for definition 1 may be the result of definition 1 being more restrictive than definition 2.

sample.[21] Indeed, the dollar impact of smaller abnormal accruals has a material effect on earnings using the five-per-cent rule of thumb, and perhaps an even greater effect given that even one cent of earnings per share can have a significant effect on stock prices. We conclude that the impact of joint national and city-level auditor industry expertise on abnormal accruals is both statistically and economically significant.

For robustness purposes, we separate abnormal accruals into income-increasing ($DACC \geq 0$) and income-decreasing ($DACC < 0$). Table 6, panel A reports the estimation of equation (4), where the dependent variable is income-increasing abnormal accruals, and panel B reports the estimation of equation (4), where the dependent variable is the absolute value of income-decreasing abnormal accruals.

Examining table 6, panel A, all models are significant ($p < 0.001$), and the adjusted R^2 are 49%. Models 1 and 2 results are consistent with those reported in table 5. Results from model 3, the primary model of interest, indicate that clients of auditors who are both national and city-specific industry specialists have lower income-increasing abnormal accruals. The coefficient on *Both National and City Specialist* is negative under definition 1 (-0.011) and significant ($p = 0.004$), and negative under definition 2 (-0.010) and significant ($p = 0.003$). However, the coefficients on *National Specialist Only* and *City Specialist Only* are not significant at $p = 0.10$. These results are consistent with those reported in table 5, where the dependent variable is the absolute value of abnormal accruals.

Examining table 6, panel B, all models are significant ($p < 0.001$) and the adjusted R^2 are 39%. Models 1 and 2 results are consistent with those reported in table 5. Results from model 3, the primary model of interest, indicate that clients of auditors who are both national and city-specific industry specialists have lower income-decreasing abnormal accrual magnitude under definition 2. The coefficient on *Both National and City Specialist* is negative under definition 1 (-0.006) and significant at $p = 0.059$ (one-tailed), and the coefficient on *City Specialist Only* is -0.004 and significant at $p = 0.051$ (one-tailed), indicating city industry expertise plays an important role in lowering income-decreasing abnormal accruals. Under definition 2, the coefficient on *Both National and City Specialist* is -0.009 and significant ($p = 0.002$), and the coefficient on *National Specialist Only* is -0.007 with a p-value of 0.041.[22] Taken together, we find similar evidence that auditors with both national-level expertise and city-level expertise have clients with lower

[21] The magnitude is computed by dividing the coefficient on *Both National and City Specialist* by the sample mean pre-tax earnings (scaled by lagged assets).

[22] Joint national and city level industry expertise is economically significant (>5% pretax income). The coefficient on *Both National and City Specialist*, for definitions 1 and 2, is equivalent to 8.0% and 11.9% of pretax income, respectively. However, a Chi-square test indicates that these coefficients are not statistically different from the coefficient on *National Specialist Only*, indicating that national industry expertise dominates city industry expertise under definition 2.

TABLE 6

Multivariate Analysis of Income-Increasing versus Income-Decreasing Abnormal Accruals and Auditor Industry Specialization

Panel A: Dependent variable is the absolute value of income-increasing abnormal accruals (*DACC* $>=0$, $N=6{,}459$)

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
Intercept	0.147	<0.001	0.147	<0.001	0.147	<0.001	0.147	<0.001	0.147	<0.001	0.146	<0.001
SIZE	−0.008	<0.001	−0.008	<0.001	−0.008	<0.001	−0.008	<0.001	−0.008	<0.001	−0.008	<0.001
σ (*CFO*)	0.006	0.079	0.006	0.079	0.006	0.079	0.006	0.078	0.006	0.079	0.006	0.079
CFO	−0.215	<0.001	−0.215	<0.001	−0.215	<0.001	−0.215	<0.001	−0.215	<0.001	−0.215	<0.001
LEV	−0.001	0.855	−0.001	0.880	−0.001	0.879	−0.001	0.873	−0.001	0.899	−0.001	0.898
LOSS	−0.052	<0.001	−0.052	<0.001	−0.052	<0.001	−0.052	<0.001	−0.052	<0.001	−0.052	<0.001
MB	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
LIT	−0.001	0.718	−0.001	0.738	−0.001	0.667	−0.001	0.759	−0.001	0.745	−0.001	0.717
ALTMAN	−0.001	0.008	−0.001	0.008	−0.001	0.008	−0.001	0.008	−0.001	0.009	−0.001	0.008
TENURE	0.001	0.723	0.001	0.735	0.001	0.715	0.001	0.742	0.001	0.728	0.001	0.727
|*ACCR_1*|	0.185	<0.001	0.186	<0.001	0.185	<0.001	0.186	<0.001	0.186	<0.001	0.186	<0.001
BIG4	−0.022	<0.001	−0.022	<0.001	−0.021	<0.001	−0.022	<0.001	−0.022	<0.001	−0.022	<0.001
SEC_TIER	−0.018	0.001	−0.018	0.001	−0.018	0.001	−0.018	0.001	−0.018	0.001	−0.018	0.001
National Specialist	−0.008	0.008					−0.005	0.065				
City Specialist			−0.005	0.084					−0.005	0.087		
Both National and City Specialist					**−0.011**	**0.004**					**−0.010**	**0.003**
National Specialist Only					−0.007	0.189					0.000	0.981
City Specialist Only					−0.004	0.218					−0.002	0.592
F-value	483.97	<0.001	483.76	<0.001	419.52	<0.001	483.72	<0.001	483.77	<0.001	419.51	<0.001
Adj. R^2	0.4930		0.4929		0.4929		0.4928		0.4929		0.4929	

(Continued)

TABLE 6—*Continued*

Panel B: Dependent variable is the absolute value of income-decreasing abnormal accruals ($|DACC < 0|$, $N = 7{,}312$)

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
Intercept	0.069	<0.001	0.069	<0.001	0.069	<0.001	0.069	<0.001	0.069	<0.001	0.069	<0.001
SIZE	0.000	0.593	0.001	0.477	0.001	0.478	0.000	0.547	0.001	0.485	0.001	0.467
σ (*CFO*)	0.011	0.022	0.011	0.022	0.011	0.022	0.011	0.022	0.011	0.022	0.011	0.022
CFO	−0.038	0.031	−0.038	0.030	−0.038	0.030	−0.038	0.030	−0.038	0.030	−0.038	0.029
LEV	−0.030	<0.001	−0.029	<0.001	−0.029	<0.001	−0.030	<0.001	−0.029	<0.001	−0.029	<0.001
LOSS	0.026	<0.001	0.026	<0.001	0.026	<0.001	0.025	<0.001	0.026	<0.001	0.026	<0.001
MB	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
LIT	0.008	0.008	0.008	0.008	0.008	0.009	0.008	0.007	0.008	0.008	0.008	0.008
ALTMAN	−0.005	<0.001	−0.005	<0.001	−0.005	<0.001	−0.005	<0.001	−0.005	<0.001	−0.005	<0.001
TENURE	0.002	0.343	0.002	0.314	0.002	0.319	0.002	0.354	0.002	0.316	0.002	0.337
$|ACCR\_1|$	0.222	<0.001	0.221	<0.001	0.221	<0.001	0.221	<0.001	0.221	<0.001	0.221	<0.001
BIG4	−0.014	0.003	−0.014	0.005	−0.013	0.006	−0.013	0.008	−0.014	0.004	−0.012	0.012
SEC_TIER	−0.006	0.316	−0.006	0.308	−0.006	0.307	−0.006	0.306	−0.006	0.309	−0.006	0.301
National Specialist	−0.003	0.263					−0.007	0.003				
City Specialist			−0.004	0.075					−0.004	0.071		
Both National and City Specialist					**−0.006**	**0.118**					**−0.009**	**0.002**
National Specialist Only					−0.004	0.425					−0.007	0.041
City Specialist Only					−0.004	0.102					−0.004	0.209
F-value	363.51	<0.001	363.75	<0.001	315.22	<0.001	364.14	<0.001	363.75	<0.001	315.67	<0.001
Adj. R^2	0.3919		0.3921		0.3922		0.3924		0.3921		0.3923	

Coefficient *p*-values are two-tailed and based on asymptotic *t*-statistics robust to heteroscedasticity and time-series correlation following the methodology in Rogers [1993]. Refer to tables 2 and 3 for variable definitions.

income-decreasing abnormal accruals.[23] Overall, these results corroborate our findings with those of abnormal accrual magnitude reported in table 5; namely, joint national and city-specific industry expertise matters by constraining client accruals-based earnings management.

5. *Tests of Meeting or Beating Analysts' Earnings Forecasts*

If industry audit specialists are less tolerant of aggressive earnings management, then we should expect that their clients are less likely to meet or beat analysts' earnings forecasts within one penny of earnings per share. To test this hypothesis, we estimate the following logit model to examine the relation between auditor expertise and the propensity for meeting or beating analysts' earnings forecasts by one penny per share; firm subscripts are omitted for brevity:

$$\begin{aligned} MEET = {} & b_0 + b_1 SIZE + b_2 \sigma(EARN) + b_3 LEV + b_4 LOSS + b_5 MB \\ & + b_6 LIT + b_7 ALTMAN + b_8 TENURE + b_9 ROA + b_{10} ACCR \\ & + b_{11} BIG4 + b_{12} SEC\_TIER + b_{13} \sigma(FOR) + b_{14} LN(NUMEST) \\ & + b_{15} AUDITOR\#1 + b_{16} AUDITOR\#2 + b_{17} AUDITOR\#3 \\ & + \text{Industry and Year fixed effects}^{24} + e \end{aligned} \tag{5}$$

where:

$MEET$ = 1 if earnings exactly meet or beat the latest analysts' earnings forecast by one cent per share, and 0 otherwise,[25]

$\sigma(EARN)$ = the standard deviation of income before extraordinary items (scaled by total assets at the beginning of the fiscal year) in the past four years ($t-4$ to $t-1$),

ROA = return on assets,

$\sigma(FOR)$ = the standard deviation of analysts' earnings forecasts,

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[23] Although we find consistent results for income-decreasing abnormal accruals, we admit that the evidence from these tests, that joint national and city level industry expertise constrains abnormal accruals, is weaker than those of income-increasing accruals. We argue that auditors with expertise are more concerned about income-increasing earnings management than income-decreasing earnings management.

[24] Industry fixed effects are controlled by using dummy variables based on the two-digit SIC category. Year fixed effects are controlled by using dummy variables based on fiscal years.

[25] The latest analysts' forecast is the most recent EPS forecast prior to the date of the earnings announcement, following Brown and Caylor [2005, p. 427] and Lim and Tan [2008]. EPS forecasts are obtained from the I/B/E/S unadjusted detail file. Where there is more than one analyst forecast on the same last day, we use the median forecast. To avoid the problem of lost precision of EPS decimal places from stock splits, the unadjusted detail file is used (Payne and Thomas [2003]). To ensure that forecasts are not stale dated, they must be no older than two months before the earnings announcement date (Lim and Tan [2008]). The same maximum two month period is used to compute the standard deviation of analysts' forecasts ($\sigma(FOR)$) and the natural logarithm of the number of analysts ($LN(NUMEST)$) from the most current forecast of each analyst. For consistency, actual earnings are from I/B/E/S.

$LN(NUMEST)$ = the natural logarithm of the number of analysts following the company, and

$ACCR$ = total accruals from continuing operations scaled by total assets at the beginning of the fiscal year.

All other variables are as defined in equation (4). The dependent variable is *MEET*, equal to one if actual earnings meet or beat the latest analysts' forecasted earnings by one cent per share, and equal to zero otherwise. As shown in panel B of table 3, about 22% of firms exactly meet or beat the latest analysts' earnings forecasts by one penny per share. Our control variables are similar to those in equation (4), controlling for client risk characteristics with the addition of earnings volatility, profitability, total accruals, and analyst characteristics. We control for earnings volatility ($\sigma(EARN)$) since firms with higher earnings volatility are more difficult to forecast (a mean of 0.119). We add profitability (*ROA*) (Lim and Tan [2008]) to control for performance and total level of accruals (*ACCR*) to control for accrual attributes; the means are 0.019 and −0.066, respectively. Finally, we control for analyst characteristics: forecast dispersion ($\sigma(FOR)$) (mean of 0.003) and the natural logarithm of the number of analysts following the company ($LN(NUMEST)$) (mean of 0.096). The descriptive statistics of other variables are similar to those reported in panel A of table 3, except that these firms are larger, more profitable, and more likely to be audited by the Big 4, consistent with prior studies (e.g., Ashbaugh, LaFond, and Mayhew [2003], Lim and Tan [2008]).

We expect that firms are more likely to meet or beat analysts' earnings forecasts within one cent per share when they are larger (*SIZE*), more profitable (*ROA*), have more growth opportunities (*MB*), higher litigation risk (*LIT*), higher accruals (*ACCR*), are followed by more analysts ($LN(NUMEST)$), and are audited by a Second-Tier auditor (*SECTIER*).[26] We expect that firms are less likely to meet or beat within one cent per share when they have more volatile earnings ($\sigma(EARN)$), more leverage (*LEV*), a loss (*LOSS*), greater bankruptcy risk (*ALTMAN*), greater analyst forecast dispersion ($\sigma(FOR)$), and are audited by a Big 4 (*BIG4*). Table 4, panel B reports the correlation analysis. *MEET* is correlated with these variables in the predicted direction, except for *SIZE*, *ACCR*, ($\sigma(EARN)$), and *BIG4*, which are not significant at a 5% level. In addition, *MEET* is negatively correlated with *AUDITOR#1* (*BOTH*) and *AUDITOR#3* (*CITY_ONLY*), suggesting that auditor industry expertise at the joint national and city-specific level and at the city alone level (not national level) provides higher audit quality.[27]

[26] Compared to Big N auditors, Second-Tier auditors are an inferior substitute for constraining earnings management (Francis, Maydew, and Sparks [1999]).

[27] Intuitively, we expect that firms reporting higher abnormal accruals are more likely to meet or beat analysts' earnings forecasts by one cent per share ($MEET = 1$). We examine this conjecture and report these findings. First, we find that firms with higher abnormal accruals (per share) report higher earnings per share in excess of analysts' earnings forecasts, suggesting

The estimation of the logit regression–based equation (5) is presented in table 7. All models are significant at $p < .001$, and pseudo-R^2 are around 6%. The control variables *LN* (*NUMEST*), *LEV*, σ (*FOR*), and *LOSS* have the predicted coefficient sign; all other control variables are not significant at $p =$ 0.10 except for *ACCR* and *ALTMAN*, which are in the opposite direction.[28]

Model 1 results report that clients audited by national industry specialists are less likely to exactly meet or beat analysts' earnings forecasts by one cent per share, under definition 1, significant at $p = 0.10$. Model 2 results report that clients audited by city-specific industry specialists are less likely to exactly meet or beat analysts' forecasts by one cent per share, significant under both definitions.

Model 3 reports the estimation of equation (5). Clients of auditors that are both national and city-specific industry specialists are less likely to meet or beat analysts' earnings forecasts by one cent per share. The coefficient on *Both National and City Specialist* is negative (−0.382) and significant ($p =$ 0.003) under definition 1, and negative (−0.297) and significant ($p =$ 0.007) under definition 2. Clients of auditors that are city-only industry specialists (not national industry specialists) are less likely to meet or beat analysts' forecasts by one cent. The coefficient on *City Specialist Only* is negative (−0.264) and significant ($p = 0.001$) under definition 1, and negative (−0.195) and significant ($p = 0.034$) under definition 2. The coefficient on *National Specialist Only* is not significant under either definition. Together these results indicate that joint national and city-specific industry expertise plays an important role for auditors to provide higher audit quality by constraining earnings management. In fact, it seems that city industry expertise is more important than national industry expertise, in order for auditors to deliver higher audit quality, since the coefficient on *City Specialist Only* is significant under both definitions, while it is not significant on *National Specialist Only*.[29]

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that abnormal accruals are used to *beat* analysts' earnings forecasts. Second, however, we find that the variable *MEET* is not significantly associated with abnormal accruals, consistent with Lim and Tan [2008, table 6, panel B]. The insignificant correlation is because extremely high abnormal accruals are associated with *beating* analysts' earnings forecasts by more than one cent per share (*MEET* = 0). Excluding the top 10% of abnormal accruals per share, we find that abnormal accruals are positively correlated with the variable *MEET* (Pearson correlation coefficient = 0.06 ($p < 0.001$)). The evidence that a higher percentile of abnormal accruals per share is positively associated with the probability of *beating* analysts' forecasts by more than one cent per share suggests that higher abnormal accruals are likely used to meet other benchmarks (e.g., executive compensation). Taken together, we find evidence that firms meeting or beating analysts' earnings forecasts by one cent per share (*MEET* = 1) report moderately (not extremely) higher abnormal accruals.

[28] Analysts following (*NUMEST*) and forecast dispersion (σ (*FOR*)) are two strong variables in the model. To ensure that our results are not driven by either single or multiple analyst followings, we partition the sample and find our results are robust.

[29] A Chi-square test indicates that the coefficient on *Both National and City Specialist* is not significantly different from that of *City Specialist Only*. This implies that city level expertise dominates national expertise.

TABLE 7

Logit Regressions of Meeting or Beating Analysts' Earnings Forecasts and Auditor Industry Specialization

Dependent variable is the probability of meeting or beating analysts' earnings forecasts [*MEET*, $N = 5{,}865$]

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
Intercept	−2.679	0.002	−2.762	0.001	−2.755	0.001	−2.699	0.002	−2.737	0.001	−2.738	0.001
SIZE	0.028	0.295	0.043	0.108	0.045	0.097	0.027	0.316	0.039	0.149	0.041	0.130
σ (*EARN*)	−0.163	0.223	−0.156	0.250	−0.155	0.254	−0.166	0.217	−0.157	0.246	−0.159	0.243
LEV	−0.741	0.002	−0.717	0.003	−0.719	0.003	−0.736	0.002	−0.720	0.003	−0.719	0.003
LOSS	−0.239	0.051	−0.233	0.058	−0.234	0.057	−0.238	0.053	−0.236	0.056	−0.236	0.056
ROA	0.764	0.079	0.790	0.071	0.779	0.075	0.771	0.076	0.770	0.079	0.765	0.080
MB	0.023	0.009	0.022	0.010	0.023	0.010	0.023	0.009	0.023	0.010	0.023	0.010
LIT	0.179	0.180	0.191	0.148	0.190	0.152	0.179	0.179	0.184	0.164	0.184	0.164
ALTMAN	−0.052	0.117	−0.058	0.084	−0.058	0.085	−0.052	0.120	−0.056	0.092	−0.056	0.092
TENURE	0.008	0.890	0.006	0.908	0.007	0.902	0.008	0.889	0.007	0.902	0.007	0.896
ACCR	−0.669	0.084	−0.673	0.082	−0.669	0.084	−0.676	0.081	−0.660	0.089	−0.657	0.090
σ (*FOR*)	−30.795	< 0.001	−30.631	< 0.001	−30.633	< 0.001	−30.705	< 0.001	−30.649	< 0.001	−30.626	< 0.001
LN (*NUMEST*)	0.998	< 0.001	0.999	< 0.001	0.997	< 0.001	0.997	< 0.001	0.999	< 0.001	0.997	< 0.001
BIG4	0.021	0.912	0.088	0.651	0.094	0.632	0.026	0.893	0.072	0.712	0.068	0.729
SEC_TIER	0.266	0.256	0.271	0.249	0.269	0.253	0.266	0.257	0.272	0.246	0.269	0.253
National Specialist	−0.170	0.103					−0.094	0.261				
City Specialist			−0.278	0.001					−0.235	0.002		
Both National and City Specialist					**−0.382**	**0.003**					**−0.297**	**0.007**
National Specialist Only					−0.110	0.505					−0.003	0.981
City Specialist Only					−0.264	0.001					−0.195	0.034
Likelihood ratio	365.18	< 0.001	377.41	< 0.001	378.76	< 0.001	363.65	< 0.001	372.86	< 0.001	373.75	< 0.001
Pseudo-R^2	0.0589		0.0608		0.0610		0.0586		0.0601		0.0602	

Coefficient *p*-values are two-tailed and based on Wald Chi-squares robust to heteroscedasticity and time-series correlation following the methodology in Rogers [1993]. Estimates on fiscal year dummies and industry dummies are not reported for brevity. Refer to tables 2 and 3 for variable definitions.

In order to gauge the economic magnitude of the results in table 7, we estimate the mean probability of meeting or beating analysts' earnings forecasts within one cent per share (*MEET*) when companies are audited by industry specialists, and when the control variables are set to their mean values. Under definition 1 (definition 2), the mean probability of *MEET*, when the auditor is a nonindustry specialist, is 22.2% (21.6%), which drops to 18.0% (18.5%) when the auditor is a city industry specialist alone, a reduction of 4.2% (3.1%), and which drops even further to 16.3% (17.0%) when the auditor is a joint national and city-specific industry specialist, a reduction of 5.9% (4.6%). The relative reduction in *MEET* associated with a joint national and city-specific industry specialist is 26.6% (5.9/22.2) under definition 1, and with a city industry specialist alone is 18.9% (4.2/22.2). Thus joint national and city-specific industry expertise, and to a lesser extent city expertise alone, are not only statistically significant they are also economically significant, contributing to higher audit quality.

6. *Going Concern Opinion Tests*

If industry audit specialists are stricter with their clients, then we expect that they are more likely to issue a going-concern audit opinion. To test this hypothesis, we estimate the following logistic model in equation (6); firm subscripts are removed for brevity:

$$\begin{aligned} GC = {} & b_0 + b_1 SIZE + b_2 \sigma(EARN) + b_3 LEV \\ & + b_4 LOSS + b_5 MB + b_6 LIT + b_7 ALTMAN \\ & + b_8 TENURE + b_9 ROA + b_{10} ACCR \\ & + b_{11} BIG4 + b_{12} SEC\_TIER + b_{13} AUDITOR\#1 \\ & + b_{14} AUDITOR\#2 + b_{15} AUDITOR\#3 \\ & + \text{Industry and Year fixed effects} + e \end{aligned} \tag{6}$$

where:

$GC = 1$ if the auditor issues a going-concern opinion, and 0 otherwise.

All other variables are as previously defined. The dependent variable *GC* is obtained from Audit Analytics. If the auditor qualifies his opinion with a going-concern assumption, then *GC* is equal to one, and zero otherwise. The other variables in the model are the same as those in equation (4), controlling for client risk. Descriptive statistics for variables included in equation (4) are reported in table 3, panel C. Under one third (29.9%) of the sample receives a going-concern opinion. Not surprisingly, these firms are much smaller in size (a mean of 3.7), more likely to report a loss (85.9%), and are unprofitable (the mean ROA is –0.384), suggesting they are more likely to be financially distressed.

We expect that auditors are more likely to issue a going-concern opinion to clients who have more volatile earnings ($\sigma(EARN)$), are financially distressed (*ALTMAN*), incur a loss (*LOSS*), are more leveraged (*LEV*), and have higher litigation risk (*LIT*). We expect auditors are less likely to issue a going-concern opinion if the client is larger in size (*SIZE*), more profitable (*ROA*), has higher growth opportunities (*MB*) or higher accruals (*ACCR*), or is Big 4 audited (*BIG4*) or Second-Tier audited (*SEC_TIER*). The correlation analysis, reported in table 4, panel C, shows that all control variables are correlated with *GC* in the predicted direction, except *LIT*, which is in the opposite direction. However, *AUDITOR#1* (*BOTH*), *AUDITOR#2* (*NAT_ONLY*), and *AUDITOR#3* (*CITY_ONLY*) are *less* likely to issue a going-concern opinion.

The results of estimating equation (6) are reported in table 8. All models are significant at $p < 0.001$, and pseudo-R^2 are around 43%. All control variables are significant at $p < 0.10$ except *MB*, *LIT*, and *TENURE*. The control variables *SIZE, ROA, ACCR*, *BIG4*, *SEC_TIER*, σ(*EARN*), *LEV*, and *ALTMAN* have the predicted coefficient sign.[30]

Model 1 results report that clients of auditors that are national industry specialists are more likely to be issued a going-concern audit opinion, but the coefficient on *National Specialist* is not significant under either definition 1 (0.372, $p = 0.133$,) or 2 (0.299, $p = 0.143$). Model 2 results report that clients of auditors that are city industry specialists are more likely to be issued a going-concern audit opinion since the coefficient on *City Specialist* is positive and significant ($p < 0.10$).

Model 3 reports the estimation of equation (6). Clients of auditors who are both national and city-specific specialists are more likely to receive a going-concern audit opinion. The coefficient on *Both National and City Specialist* is positive under definition 1 (0.590) and significant ($p = 0.050$), and positive (0.483) and significant ($p = 0.044$) under definition 2. The coefficients on *National Specialist Only* and *City Specialist Only* are not significant under either definition at the conventional level ($p < 0.10$). Together these results indicate that joint national and city specific industry specialists are more likely to issue a going-concern opinion, consistent with providing higher audit quality.

Consistent with the previous analyses, the economic magnitude of auditor industry expertise is calculated when the control variables are at their mean values. Under definition 1 (definition 2) of auditor industry expertise, the mean likelihood of receiving a going-concern audit opinion is 18.0% (18.1%) when the auditor is a nonspecialist, but increases to 28.4% (26.3%) when the auditor is a joint national and city-specific industry specialist, an increase of 10.4% (8.2%), more than one and a half times the probability of issuing a going-concern opinion by a nonspecialist. Indeed, the probability of issuing a going-concern opinion is greater for a joint national and city-specific industry specialist than for a nonspecialist, and the marginal probability is economically significant.

[30] The sign of the *LOSS* coefficient is negative due to correlation with the *ROA* variable, which if excluded results in a positive *LOSS* coefficient sign. Table 4, panel C reports that the *LOSS* variable is positively correlated with the going-concern variable (*GC*).

TABLE 8

Logit Regressions of Going-Concern Opinion and Auditor Industry Specialization

Dependent variable is the probability of issuing a going-concern opinion [*GC*, *N* = 4,969]

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
Intercept	0.224	0.461	0.220	0.468	0.218	0.474	0.224	0.460	0.222	0.465	0.218	0.473
SIZE	−0.543	<0.001	−0.549	<0.001	−0.547	<0.001	−0.544	<0.001	−0.548	<0.001	−0.547	<0.001
σ (*EARN*)	0.008	0.004	0.008	0.004	0.008	0.004	0.008	0.004	0.008	0.004	0.008	0.004
LEV	0.477	0.001	0.480	0.001	0.482	0.001	0.476	0.001	0.480	0.001	0.482	0.001
LOSS	−0.649	0.001	−0.659	0.001	−0.658	0.001	−0.649	0.001	−0.655	0.001	−0.655	0.001
ROA	−2.074	<0.001	−2.088	<0.001	−2.089	<0.001	−2.081	<0.001	−2.083	<0.001	−2.090	<0.001
MB	0.000	0.946	0.000	0.989	0.000	0.994	0.000	0.950	0.000	0.995	0.000	0.993
LIT	0.081	0.758	0.096	0.717	0.095	0.720	0.079	0.764	0.089	0.735	0.087	0.741
ALTMAN	−0.199	<0.001	−0.199	<0.001	−0.199	<0.001	−0.199	<0.001	−0.199	<0.001	−0.199	<0.001
TENURE	0.126	0.096	0.119	0.118	0.123	0.107	0.127	0.095	0.119	0.116	0.123	0.104
ACCR	−0.070	0.005	−0.069	0.006	−0.069	0.006	−0.070	0.005	−0.070	0.005	−0.069	0.006
BIG4	−0.825	<0.001	−0.844	<0.001	−0.888	<0.001	−0.843	<0.001	−0.831	<0.001	−0.893	<0.001
SEC_TIER	−0.617	0.002	−0.619	0.003	−0.617	0.003	−0.617	0.002	−0.619	0.002	−0.617	0.003
National Specialist	0.372	0.133					0.299	0.143				
City Specialist			0.267	0.071					0.245	0.098		
Both National and City Specialist					**0.590**	**0.050**					**0.483**	**0.044**
National Specialist Only					0.286	0.456					0.258	0.398
City Specialist Only					0.240	0.126					0.223	0.175
Likelihood ratio	2,594.78	<0.001	2,596.64	<0.001	2,598.93	<0.001	2,594.51	<0.001	2,595.71	<0.001	2,597.78	<0.001
Pseudo-R^2	0.4279		0.4282		0.4286		0.4278		0.4280		0.4284	

Coefficient *p*-values are two-tailed and based on Wald Chi-squares robust to heteroscedasticity and time-series correlation following the methodology in Rogers [1993]. Estimates on fiscal year dummies and industry dummies are not reported for brevity. Refer to tables 2 and 3 for variable definitions.

7. *Sensitivity Analysis*

7.1 ANNUAL REGRESSION ANALYSIS

Our main regression analysis, reported in tables 4 to 8, is based on cross-sectional pooled regression models. To control for potential cross-sectional correlation of residuals, we conduct the Fama and MacBeth [1973] style regression test by computing the mean coefficients and *p*-values from five annual regressions.

Table 9, panels A to C report the mean test variable coefficients and one-tailed *p*-values of model 3, where the dependent variable is $|DACC|$, *MEET*, and *GC*, respectively. The coefficient on *Both National and City Specialist* has the expected sign (negative in panels A and B, and positive in panel C) and is significant at the conventional level. We conclude that our results are robust to controlling for cross-sectional correlation, based on the Fama-MacBeth style regression test.

7.2 CONTINUOUS MARKET SHARE MEASURE

To ensure that our results are not driven by arbitrary cut-off values of industry market share that distinguish specialists from nonspecialists, we use a continuous industry market share variable interaction term in the following model (*represents a standardized variable (Hayes [2005])).

$$\begin{aligned}\text{Dependent variable } (y) &= \text{intercept} + \text{control}\\ &\quad + \beta_1(\textit{national market share}^*) \times (\textit{city market share}^*)\\ &\quad + \beta_2(\textit{national market share}^*) + \beta_3(\textit{city market share}^*)\\ &\quad + \text{error} \end{aligned} \tag{7}$$

where

Dependent variable (y) = audit quality($|DACC|$, *MEET*, or *GC*),
national market share = the auditor's industry market share at the national level,
city market share = the auditor's industry market share at the city level.[31]

We follow Aiken and West's [1991, p. 40] technique for analyzing continuous variable interaction terms. First, we explore the association between city market share and audit quality when national market share is set at three levels: *high* (*national market share** = 1, one standard deviation above the mean national market share), *medium* (0, at the mean), and *low* (−1, one standard deviation below the mean). Next, we also explore the association

[31] Based on equation (7), the association between national market share and y is measured by $[\beta_1(\textit{city market share}^*) + \beta_2]$ and between city market share and y is measured by $[\beta_1(\textit{national market share}^*) + \beta_3]$. Note that one type of market share must be held constant to test the other.

TABLE 9

Fama-MacBeth Regressions

Panel A: Analysis of abnormal accruals ($N = 5$), dependent variable is $|DACC|$

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Mean Estimate	p-value	Mean Estimate	p-value	Mean Estimate	p-value	Mean Estimate	p-value	Mean Estimate	p-value	Mean Estimate	p-value
Controls			Included						Included			
National Specialist	−0.006	0.098					−0.006	0.010				
City Specialist			−0.005	0.028					−0.004	0.060		
Both National and City Specialist					**−0.010**	**0.019**					**−0.010**	**0.002**
National Specialist Only					−0.006	0.228					−0.002	0.330
City Specialist Only					−0.004	0.071					−0.003	0.224

Panel B: Analysis of meeting or beating analysts' earnings forecasts ($N = 5$), dependent variable is *MEET*

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Controls			Included						Included			
National Specialist	−0.089	0.266					−0.034	0.355				
City Specialist			−0.282	0.018					−0.234	0.031		
Both National and City Specialist					**−0.314**	**0.077**					**−0.240**	**0.077**
National Specialist Only					−0.033	0.409					0.068	0.242
City Specialist Only					−0.274	0.017					−0.202	0.031

(Continued)

TABLE 9—*Continued*

Panel C: Analysis of going-concern opinion ($N = 5$), dependent variable is *GC*

	Auditor Industry Specialist Definition 1						Auditor Industry Specialist Definition 2					
	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value	Estimate	*p*-value
Controls			Included						Included			
National Specialist	0.735	0.017					0.415	0.059				
City Specialist			0.297	0.003					0.304	0.045		
Both National and City Specialist					**1.063**	**0.033**					**0.707**	**0.023**
National Specialist Only					−1.837	0.255					0.297	0.021
City Specialist Only					0.281	0.018					0.268	0.054

Mean estimate is the average of the coefficients of the five annual regressions. *P*-values are one tailed and computed following Fama and MacBeth [1973]. Refer to tables 2 and 3 for variable definitions.

between national market share and audit quality when city market share is set at three levels of city market share. We find that, in most cases, the predicted associations hold for the *high* level; that is when national (city) market share is at a higher level, city (national) market share is associated with audit quality.[32] We conclude that our inferences are robust to using a continuous market share measure.

7.3 OTHER TESTS

Several other sensitivity tests are performed, to which our results hold. First, regression models (4), (5), and (6) are estimated separately, at above and below the mean client size, in order to control for any potential size effect that may arise from correlation of client size and the three auditor specialist variables.[33] Second, two-digit SIC industry categories (52 unique categories) are replaced with Fama and French [1997] industry categories (44). Third, non–Big 4 client observations are dropped to control for the low proportion of Big 4 clients in the going-concern subsample (45%) versus the abnormal accruals analysis subsample (69%), and versus the analysts' forecasts subsample (91%). Fourth, a minimum of four (instead of two) observations are required for each city-industry-fiscal year combination to ensure that our results are not influenced by city industry specialists with only two or three clients.

8. *Summary and Conclusion*

Our tests indicate that audit quality is systematically associated with joint national and city-specific auditor industry expertise. We find that clients of auditors that are both national and city-specific industry specialists have a consistently smaller magnitude of abnormal accruals, as well as a smaller magnitude of income-increasing and income-decreasing abnormal accruals.

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[32] When *national market share** is *high*, in all three analyses, the estimate of $[\beta_1(\textit{national market share}^*) + \beta_3]$ is in the predicted direction and significant at $p < 0.10$, comparable to results with the indicator variable *Both National and City Specialist*. When national market share is *medium*, the same is found for meeting or beating analysts' forecasts analysis and going-concern analyses, but the abnormal accruals analysis association is insignificant at the conventional level. However, when *national market share** is *low*, the association in all three analyses is insignificant, comparable to an insignificant coefficient on the indicator *City Specialist Only*.

Exploring the association between national market share and audit quality when holding *city market share** at high ($\textit{city market share}^* = 1$), medium ($= 0$) and low ($= -1$) yields similar results, except that in the meeting or beating analysts' earnings forecast analysis the association is not statistically significant at any of the three levels of city market share. These weaker results suggest that city leadership is a stronger measure than national leadership.

[33] Specifically, we estimate separate models for the abnormal accrual analysis: large clients (above the mean client size, $n = 7{,}040$) and small clients (below the mean client size, $n = 6{,}731$). We find that the coefficient on *Both National and City Specialist* for both models is similar to our main results reported in table 5. Additionally applying the same test to the meeting or beating analysts' earnings forecasts and going-concern analyses indicates that they too are not sensitive to client size.

The dollar magnitude of these abnormal accruals is material, averaging between 8.0 and 14.7% of pre-tax earnings. In other earnings management tests, we find that clients of auditors that are both national and city-specific industry specialists are less likely to meet or beat analysts' earnings forecasts by one penny per share. Our results from going-concern audit opinion tests are consistent with those of the earnings management tests. Auditors who are joint national and city-specific industry specialists are more likely to issue a going-concern audit opinion.

Overall, these tests provide compelling evidence that differential auditor industry expertise is primarily the result of joint national and city-specific industry expertise based on joint office-level clienteles and national clienteles of Big 4 accounting firms. In other words, the evidence is that differential Big 4 industry expertise is primarily the joint result of the expertise of national and office-based professionals, captured and distributed more broadly throughout the firm and within their offices.

This study is important in advancing our understanding of the role that auditing plays in the production of credible accounting reports, whether audits by industry specialists improve the quality of corporate earnings, whether industry specialists are more conservative in their audit opinions, and whether auditor industry expertise is best understood as a firm-wide or office-specific phenomenon. The evidence is that industry specialists do improve earnings quality and are more conservative in their audit opinions, and that differential industry expertise among Big 4 auditors is better understood as a joint national and office-specific phenomenon. If the auditor's industry expertise does improve the quality of earnings, then accounting firms have economic incentives to develop and market their industry expertise at the national and city-specific office levels. In addition, investors may have incentives to invest in such companies because their earnings and their auditor's reports may be more credible. Industry auditor specialists have incentives to protect their reputation against potentially harmful litigation by expressing more conservative audit opinions. They do so by stricter tolerance of their client's accruals management, and by issuing more going-concern opinions.

As a final note, we have two caveats. First, we note that the results of the study are not intended to be pejorative with respect to auditors who are not industry specialists. All audits are assumed to meet minimum legal and professional standards of quality. However, the evidence does indicate that within the dominant group of auditors there is differential audit quality based on joint national and city-specific industry expertise. A second caveat is that our measure of national and city-specific auditor industry expertise is subject to measurement error, since actual industry expertise is not directly observable from archival data. Consequently, our joint national and city-specific measure of auditor industry expertise could possibly be a more precise measure of auditor expertise than either national or city-specific expertise alone. We leave this question of efficacy for future research.

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[Correction added after online publication December 16, 2009: On the first page, "E.J. Orso College of Business" was misspelled and should have read "E.J. Ourso College of Business".]