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Non-audit Service Fees and Audit Quality: The Impact of Auditor Specialization

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ABSTRACT

We posit that the effect of non-audit fees on audit quality is conditional on auditor industry specialization. Industry specialist auditors are more likely than nonspecialists to be concerned about reputation losses and litigation exposure, and to benefit from knowledge spillovers from the provision of non-audit services. We find evidence that audit quality measured by increased propensity to issue going-concern opinion, increased propensity to miss analysts' forecasts, as well as higher earnings-response coefficients increases with the level of non-audit services acquired from industry specialist auditors compared to nonspecialist auditors.

1. *Introduction*

In this study, we investigate whether the relation between the provision of non-audit services and the impairment of auditor quality is conditional on auditor specialization. We posit and provide evidence that impairment of audit quality is contingent on auditor specialization—audit quality is less likely to be impaired with the provision of non-audit services in the case of specialists compared to nonspecialists. In doing so, we add to prior research that documents mixed findings on the relation between non-audit service provision and audit quality (e.g., Defond, Raghunandan, and Subramanyam [2002], Frankel, Johnson, and Nelson [2002], Ashbaugh,

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Lafond, and Mayhew [2003], Krishnan, Sami, and Zhang [2005], Francis and Ke [2006]) by showing that the effects of non-audit services on audit quality are not readily apparent without also jointly accounting for the effects of auditor specialization.

Regulators' concerns that the provision of non-audit services impairs auditor independence (Levitt [1998], SEC [2000]) gave rise to several studies that examine whether the provision of non-audit services impairs audit quality. These studies report seemingly conflicting results depending on the proxy of audit quality used. For example, notwithstanding earlier evidence by Frankel, Johnson, and Nelson [2002], recent evidence indicates that provision of non-audit services is not associated with the incidence of higher discretionary accruals and the propensity to meet earnings benchmarks (Ashbaugh, Lafond, and Mayhew [2003], Chung and Kallapur [2003]). Similarly, there is no evidence of an association between the provision of non-audit services and a reduced proclivity to issue going-concern opinions for financially distressed firms (Defond, Raghunandan, and Subramanyam [2002]). Kinney, Palmrose, and Scholz [2004] examine restatements of previously issued financial statements and find either no or negative association between restatements and major classes of non-audit services, and a positive association only for a small class of unspecified non-audit services (comprising 4.6% of total fees in their sample). In contrast, Francis and Ke [2006] document that market response to quarterly earnings surprises is significantly lower for firms with higher (vs. lower) non-audit fees. Krishnan, Sami, and Zhang [2005] also find a negative association between non-audit fees and earnings response coefficients in each of the three quarters following the proxy statement public disclosure of fee information.

We view higher discretionary accruals, greater (lower) propensity to meet (miss) earnings benchmarks, lower propensity to issue going-concern opinions, and higher incidence of restatements to be proxies for impairment of auditor independence in fact. Discretionary accruals are subject to more measurement error than the other measures (Dechow, Sloan, and Sweeney [1995], Defond, Raghunandan, and Subramanyam [2002], Kinney and Libby [2002]). The strength of stock market responses to earnings surprises due to non-audit fees proxies for the market's perceptions of auditor independence in appearance. Given this assessment, one interpretation of cumulative research to-date is that there is some evidence that provision of non-audit services impairs independence in appearance, but has either a weak or no effect on independence in fact.[1]

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[1] One possible interpretation is that the market has been systematically wrong in its responses (in terms of earnings response coefficients) in that it may have overreacted in its responses to the possibility of impairment of audit (and financial reporting) quality when in actual fact, this is either not the case or is restricted to a small subset of firms/non-audit fee classes. Yet another interpretation of prior studies that find no statistical association between non-audit fees and various proxies for audit quality (going-concern opinions and discretionary accruals) is that these proxies lack power (e.g., see Defond, Raghunandan, and Subramanyam [2002, p. 1250]).

Prior research indicates that the provision of non-audit services creates economic bonds that weaken an auditor's independence, and therefore, audit quality (DeAngelo [1981], Simunic [1984], Beck, Frecka, and Solomon [1988]). However, research also indicates that reputation concerns (Benston [1975], Watts and Zimmerman [1983]), litigation exposure (Palmrose [1988], Shu [2000]), and knowledge spillovers (Simunic [1984]) serve to counter incentives for auditors to lose independence and compromise audit quality. If auditors are to maintain independence and preserve audit quality even when they provide non-audit services, concerns about reputation losses, litigation exposure, and knowledge spillover benefits must be sufficient to overwhelm incentives arising from provision of non-audit services. Prior studies (e.g., Defond, Raghunandan, and Subramanyam [2002]) use this argument to interpret the absence of an association between non-audit service provision fees and audit quality. However, disentanglement of the effects of non-audit service provision and other mitigating factors (reputation concerns, litigation exposure, and knowledge spillover) requires separate measurement or proxies for these mitigating factors.

We follow prior literature that argues auditors/audit firms that specialize in particular industries build expertise in these specific areas and make greater specific investments in building up a reputation of good quality. We posit that concerns about reputation and litigation exposure, as well as benefits from knowledge spillover, are heightened with auditor industry specialization (O'Keefe, Kin, and Gaver [1994], Craswell, Francis, and Taylor [1995], Solomon, Shields, and Whittington [1999], Owhoso, Messier, and Lynch [2002], Carcello and Nagy [2004]). More specifically, we posit that the association between provision of non-audit services and impairment of auditor quality is moderated by auditor industry specialization, and that failure to account for this moderating role of auditor industry specialization can mask the relation between the provision of non-audit services and auditor quality.

Empirical measures for our theoretical constructs—audit quality, non-audit fees, and auditor specialization—can be noisy, and there is little consensus on the most appropriate proxy. Hence, we conduct our empirical tests using multiple proxies of audit quality that are used by prior studies. We infer improved audit quality from: (1) a higher propensity for auditors to issue a going-concern opinion to financially distressed firms, (2) a lower level of discretionary current accruals associated with the firm, (3) a reduced (heightened) propensity for firms to just meet (miss) analyst forecasts, and (d) a stronger market response to quarterly earnings surprises (i.e., earnings-returns coefficients [ERCs]). The first three measures proxy for actual (as apposed to perceived) audit quality, while the last measure proxies for investors' perception of audit quality.

We proxy auditor industry specialization based on the market share of the Big 5 auditors, and test the sensitivity of our results using other operationalizations of market share. We proxy the economic bond with the client created through the provision of non-audit services both by the magnitude of the non-audit fee and by client importance, measured in terms

of non-audit fees provided to the client relative to the firm's other clients. To provide a more complete coverage of the total economic bonding between auditor and client, we also include total fees that include both audit and non-audit fees.[2]

Our results provide some evidence that audit quality is higher when clients purchase more non-audit services from industry specialists. For our first proxy of audit quality, going-concern opinions, we use a sample of 1,692 financially distressed firm-year observations for the period 2000–2001. We find that, consistent with Defond, Raghunandan, and Subramanyam [2002], the provision of non-audit services (measured using the natural log of non-audit fees and percentile rank of a client's non-audit fees) is not associated with a reduced propensity to issue going-concern opinions. However, we find a positive association between the issuance of going-concern opinions and the natural log of total fees. More importantly, all three fee measures interact significantly with audit specialization in explaining auditors' propensity to issue going-concern opinions. Specifically, we find that an increased level of non-audit services is positively and significantly associated (not associated) with the incidence of going-concern opinions issued for clients audited by specialists (nonspecialists), suggesting that audit specialists are more likely than nonspecialists to issue going-concern opinions to financially distressed firms when they provide non-audit services.

For our second proxy of audit quality relating to discretionary current accruals, we detect weak or no association between provision of non-audit services and the absolute level of discretionary current accruals for our sample of 4,943 firm-year observations for the 2000–2001 period, consistent with findings by Frankel, Johnson, and Nelson [2002], Ashbaugh, Lafond, and Mayhew [2003], and Chung and Kallapur [2003]. Unlike the going-concern analysis, we find that auditor specialization does not moderate the relation between provision of non-audit services and (signed and unsigned) discretionary current accruals.

Our third proxy of audit quality relates to firms' propensity to meet or avoid missing analysts' forecasts. We analyze a sample of 3,498 firm-year observations from 2000 to 2001, and find that non-audit fees are not associated with firms' propensity to just meet analysts' forecasts (coded as the tendency for actual earnings minus analysts' forecasts to be within zero to positive one cent). By comparison, prior research either finds no such association (Ashbaugh, Lafond, and Mayhew [2002]) or finds a positive association (Frankel, Johnson, and Nelson [2002]). We find no interaction between the provision of non-audit services and industry specialization for firms' propensity to just meet analysts' forecasts. In contrast, we find that firms' propensity to avoid missing analysts' forecasts (coded as the tendency for actual earnings minus analysts' forecasts to be within negative two cents)

[2] For brevity, we refer to all three measures as proxies for non-audit fees, although total fees (which include non-audit fees) are more related to total economic bonding.

is negatively associated with the provision of non-audit services as proxied by percentile rank of a client's non-audit fees (but not with the other two fee measures). For all three fee measures, we find that compared to specialist auditors, clients audited by nonspecialists are less likely to just miss analysts' forecasts when the public accounting firms provide non-audit services. Finally, in terms of the market's reaction to earnings surprises, we find that ERCs for a set of 2,935 firm-year observations during the period 2000–2001 are significantly lower for firms that purchase non-audit services (using all three fee measures) from non-audit specialists relative to firms that do so from audit specialists.

Our paper contributes to the literature on the effect of non-audit service provision on audit quality by providing the first empirical evidence that this effect is conditional on auditor specialization. Prior research presents seemingly conflicting results on the effects of non-audit service provision on actual audit quality (e.g., no effects on going-concern opinions, negative effects on propensity to avoid missing analysts' forecasts) and perceived audit quality (effects on ERCs). We provide triangulation with prior research findings by examining multiple proxies of audit quality in the same study. Across a variety of audit quality proxies, we generally obtain consistent evidence that specialists provide higher audit quality as non-audit services increase while nonspecialist auditors provide lower audit quality as non-audit fees increase. Our results suggest the important role of auditor specialization in addressing the regulatory and academic communities' concerns about the appropriateness of accounting firms providing non-audit services.

Our study also contributes to the literature on auditor industry specialization. Prior studies (e.g., Krishnan [2003], Balsam, Krishnan, and Yang [2003]) generally show that audit quality, as measured by ERCs and discretionary accruals, is higher for firms audited by specialists. There have not been any studies that examine the association between audit specialization and audit quality proxied by going-concern opinions and the propensity to meet or miss analysts' forecasts, nor the interaction between industry specialization and the provision of non-audit services in determining audit quality. Our results show that industry specialization interacts with the provision of non-audit services in influencing audit quality in terms of going-concern opinions, the propensity to avoid missing analysts' forecasts, and ERCs.

The remainder of this paper is organized as follows. We discuss prior literature and develop our hypotheses in section 2. We present our research design, including the sample characteristics, in section 3, and report empirical results in section 4. We offer some concluding remarks in section 5.

2. *Background and Hypothesis Development*

Following regulators' concern about the lack of auditor independence through the provision of non-audit services (e.g., Levitt [1998]), the Securities and Exchange Commission (SEC) revised auditors' independence rules in 2000, narrowing the scope of non-audit services and requiring disclosure

of both audit fees and fees derived from different components of non-audit services (SEC [2000]). The Sarbanes Oxley Act passed in 2002 went a step further, and effectively banned auditors from performing certain types of non-audit services. The assumption made by regulators is that the provision of non-audit services impairs auditor independence both in fact and in appearance.

Research indicates that auditors' provision of non-audit services creates economic bonds on the auditor and may potentially cause the auditor to be financially reliant on the client (DeAngelo [1981], Simunic [1984], Beck, Frecka, and Solomon [1988]) and lose objectivity. In addition, auditors may be less objective when they audit operations or transactions that they (or members of the certified public accounting firm) had previously provided advice on (Plumlee [1985]). However, prior research also indicates that several factors counter these incentives that dilute auditors' objectivity—reputation concerns (Benston [1975], Watts and Zimmerman [1983]), litigation exposure (Palmrose [1988], Shu [2000]), and knowledge spillovers (Simunic [1984], Beck, Frecka, and Solomon. [1988]). Whether auditors' independence and audit quality are impaired when they provide non-audit services is a function of the net balance of the economic dependency arising from non-audit service provision, and the mitigating factors that promote auditor independence. However, without a proxy for these mitigating factors, it is difficult to disentangle their effects.

In this study, we attempt to measure and disentangle some of these factors that have been discussed in the literature on non-audit services and auditor independence. We posit that the effects of these mitigating factors are magnified with auditor specialization. Auditors with industry specializations who make investments in developing a reputation for performing audits in particular industries are particularly concerned about preserving their reputational capital, and avoiding reputation damage through litigation exposure. Similarly, at the firm level, audit firms that make strategic choices and invest organizational resources in developing intellectual capital in particular industries likely have greater concerns about reputation preservation, and are less likely to cave in to client pressures and lose objectivity. Consistent with this argument, prior research shows that industry-specialist auditors are more likely to comply with auditing standards (O'Keefe, Kin, and Gaver [1994]), and have clients that are less likely to be associated with SEC enforcement actions (Carcello and Nagy [2004]), lower discretionary accruals, and higher ERCs (Balsam, Krishnan, and Yang [2003], Krishnan [2003]).

In addition, knowledge spillover, the incremental knowledge generated from providing non-audit services (Simunic [1984], Beck, Frecka, and Solomon [1988]), is also likely associated with auditor specialization.[3] In

[3] Simunic [1984] and Beck, Frecka, and Solomon [1988] argue that knowledge that auditors acquire while performing non-audit services can transfer to the performance of an audit and

recent years, audit firms have moved to a business-risk audit methodology (Bell, Peecher, and Solomon [2005]) centered on understanding of the client's risk and operations. Knowledge spillover from provision of non-audit services can enhance the auditor's understanding of the client and its risks. Prior research shows that auditors with industry specialization have superior knowledge and performance relative to nonspecialists (e.g., Solomon, Shields, and Whittington [1999], Owhoso, Messier, and Lynch [2002]). This suggests that industry-specialist auditors (vs. non–industry specialist auditors) have the background knowledge both to more effectively perform the non-audit services of a client from a specialized industry and to acquire and leverage on the knowledge spillover from performing non-audit services to perform a more effective and efficient audit.[4] Finally, auditor expertise arising from industry specialization can improve audit quality, in and of itself. Ceteris paribus, two auditors may have similar incentives to meet clients' preferences, but the overall quality of the auditor with greater industry specialization will still be higher than the one without.

In summary, our discussion above suggests that the provision of non-audit services is less likely to impair audit quality of industry specialists than non–industry specialists. We test the following hypothesis (stated in alternative form):

H1: The association between the level of non-audit services and audit quality is conditional on whether or not the audit firm is an industry specialist.

This hypothesis is tested using four proxies for audit quality: going-concern opinions, discretionary current accruals, the propensity to meet (avoid missing) analysts' forecasts, and the ERC.

3. Data and Research Design

3.1 SAMPLE

Our initial sample consists of 9,501 firm-years with fee data available from the Compustat database for fiscal years 2000–2001. We do not include year 2002 because that year is associated both with the demise of Arthur Andersen and the effective banning of auditors from performing various kinds of non-audit services by the Sarbanes-Oxley Act. These two events may have undue

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thus generate production efficiencies. A caveat to this knowledge spillover effect is that tests of this effect yield mixed results (see discussion by Solomon [1990]). In fact, using internal billing data from a public accounting firm, Davis, Ricchiute, and Trompeter [1993] provide evidence that questions the knowledge spillover argument. However, consistent with our arguments in this paper, it is possible that knowledge spillover effects are more apparent for specialist auditors because these specialist auditors can better leverage on their expertise (Solomon, Shields, and Whittington [1999]) to generate these production efficiencies.

[4] Note that, unlike the reputation preservation factor, the knowledge-spillover and expertise effects are more directly related to enhancement of audit quality, and less with the motivation to withstand client pressure.

influences on the firms, and the audit and stock market during that year.[5] We restrict our study to clients of Big 5 auditors to control for brand name (Craswell, Francis, and Taylor [1995], Chung and Kallapur [2003]). Accordingly, we remove 1,269 observations that are not audited by Big 5 auditors.[6] We further remove 1,852 financial firms (Standard Industrial Classification [SIC] codes 6000–6999), leaving a remaining sample of 6,380 firm-year observations. We winsorize each of the continuous control variables used in the regression at the top and bottom 1% to remove extreme values. For our first proxy of audit quality, going-concern opinions, we select those firms that are subject to financial difficulties. Following prior studies (e.g., Reynolds and Francis [2000], Defond, Raghunandan, and Subramanyam [2002]), we define financially distressed firms to be firms that report either negative earnings or operating cash flows during the current fiscal year. There are a total of 1,692 firm-years that meet these criteria and have all available financial information for the control variables used in the going-concern opinion study. Of these firm-year observations, a total of 120 firms receive going-concern opinions for the first time during 2000–2001.[7]

For the discretionary accruals test, a total of 4,943 firm-years are available with all necessary financial information in Compustat. For the analysts' forecasts benchmark test, we obtain analyst data from I/B/E/S detailed files, of which a total of 3,498 firm-years with complete information are available. Finally, for the earnings-returns regression test, we have 2,935 firm-year observations with complete information from Compustat, I/B/E/S detailed files, and the Center for Research in Security Prices (CRSP) databases. Table 1, panels A and B report the distribution of sample firms by year and industry, respectively, for the four sets of data used for the going-concern opinion, discretionary current accruals, analysts' forecasts benchmark, and earnings-returns regression tests.

3.2 NON-AUDIT FEES

Following prior studies (e.g., Defond, Raghunandan, and Subramanyam [2002], Chung and Kallapur [2003]), we use the following three measures to capture the economic bonding between the clients and auditor through the provision of non-audit services: (1) the natural log of non-audit fees (*LNAU*), which captures the level of economic bonding resulting from the

[5] For instance, clients may deliberately reduce the purchase of non-audit services simply to avoid attracting public and regulatory attention. In addition, we find a big decrease in fee ratio in 2002: the mean (median) fee ratio is 0.52 (0.54) for the year 2000, 0.45 (0.45) for the year 2001, and 0.28 (0.26) for the year 2002.

[6] The Big 5 public accounting firms command a premium in audit fees compared to the other smaller firms. Of the 1,269 firms not audited by Big 5 auditors, only 650 firms have their auditors' names identified in Compustat, of which two-thirds are audited by BDO Seidman and Grant Thornton. We re-run our analyses with these firms, and our results remain unchanged.

[7] Compustat does not provide the nature of the modified opinion. Hence, we hand collect the going-concern opinions from firms' annual reports stored in the SEC Edgar database.

TABLE 1

Sample Size and Industry Description

Panel A: Distribution of sample firms by year

	Opinion Model		Accruals Model		Analysts' Forecast Model		ERC Model	
YEAR	*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent
2000	649	38.36	2,027	41.00	1,535	43.88	1,219	41.53
2001	1,043	61.64	2,916	59.00	1,963	56.12	1,716	58.47
Total	1,692	100.00	4,943	100.00	3,498	100.00	2,935	100.00

Panel B: Distribution of sample firms by industry

		Opinion Model		Accruals Model		Analysts' Forecast Model		ERC Model	
SIC		*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent
73	Business services, including software	474	28.01	979	19.81	602	17.21	369	12.57
28	Chemical and allied products	262	15.48	581	11.75	366	10.46	291	9.91
36	Electronic/other electric equipment	224	13.24	512	10.36	337	9.63	296	10.09
35	Industrial machinery/equipment	125	7.39	386	7.81	250	7.15	210	7.16
38	Instruments and related products	159	9.40	336	6.80	275	7.86	230	7.84
48	Communications	86	5.08	212	4.29	113	3.23	89	3.03
13	Oil and gas extraction	20	1.18	180	3.64	107	3.06	103	3.51
87	Engineering, accounting, research, management, and related services	59	3.49	150	3.03	93	2.66	74	2.52
49	Electric/gas/sanitary services	9	0.53	147	2.97	84	2.40	157	5.35
20	Food and kindred products	12	0.71	128	2.59	66	1.89	64	2.18
50	Durable goods—wholesale	38	2.25	125	2.53	61	1.74	56	1.91
37	Transportation equipment	23	1.36	124	2.51	88	2.52	85	2.90
59	Miscellaneous retail	28	1.65	121	2.45	80	2.29	58	1.98
	Others (45 industries)	173	10.22	962	19.46	976	27.90	853	29.05
Total		1,692	100.00	4,943	100.00	3,498	100.00	2,935	100.00

The sample period is fiscal years 2000–2001, and consists of nonfinancial firms audited by Big 5 public accounting firms. For the going-concern opinion study, the sample consists of 1,692 financially distressed firms that report either negative earnings or operating cash flows during the current fiscal year over the period 2000–2001. Of these firm-year observations, a total of 120 firms receive going-concern opinion for the first time during the sample period. For the accruals model, the sample consists of 4,943 firm-year observations for the period 2000–2001 that have complete financial information in the Compustat database. A total of 3,498 firm-year observations is available for the analysts' forecast model for the period 2000–2001. Analyst forecast data are from the detailed I/B/E/S file. The sample for the earnings-returns regression model is 2,935 firm-year observations, with all information available from Compustat, I/B/E/S detailed files, and CRSP.

purchase of non-audit services; (2) the percentile rank of a particular client's non-audit fees given all total fees received by the audit firm (*PRNAU*), which captures the relative significance of client non-audit fees to the total fees revenue received by the auditor;[8] and (3) the natural log of total fees (*LTOT*), which captures the total economic bonding of the client to the auditor created by the provision of both non-audit and audit services.[9]

3.3 AUDITOR INDUSTRY SPECIALIZATION

We use client sales to estimate industry market share of the Big 5 auditors (Krishnan [2003], Balsam, Krishnan, and Yang [2003], Dunn and Mayhew [2004]), defined as follows:[10]

$$ADTR\_MS_{ik} = \frac{\sum_{j=1}^{J_{ik}} SALES_{ijk}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_{ik}} SALES_{ijk}} \tag{1}$$

For brevity, we do not denote the subscript denoting a specific year. The variable *SALES* denotes the client's sales revenue. The numerator is the sum of the sales of all J_{ik} clients (reported in Compustat) of Big 5 audit firm i in industry k. The denominator in equation (1) is the sales of all J_{ik} clients in industry k reported in Compustat, summed over all I_k audit firms (including both Big 5 firms and other audit firms auditing in the industry). To estimate industry market share for the Big 5 auditors in a given industry for a particular year, we require a minimum of 20 clients in the industry (using the two-digit SIC classification).

Consistent with prior literature (Lys and Watts [1994], Chung and Kallapur [2003]), we define the auditor with the largest industry market share (*SPEC*) as the specialist.[11] As a robustness check, we also use another

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[8] Chung and Kallapur [2003] use client importance measured by non-audit fees relative to total revenue received by the auditor. However, the measure for client importance is highly skewed and non-normal (skewness = 55.89; kurtosis = 3338) for the overall sample. Hence, we transform it using ranks, such that firms are assigned a rank of 1 (100) for those in the lowest (highest) percentile (skewness = −0.06, kurtosis = −1.16).

[9] Prior research indicates that audit and non-audit fee are jointly determined (Whisenant, Sankaraguruswamy, and Raghunandan [2003]). To assess whether audit fees affect the association between non-audit fees and audit quality, we reanalyze our results by including audit fees as an additional control variable (along with *LNAU* and *PRNAU*, but not *LTOT*). We obtain similar results with our main analyses for all tests with the exception that for the ERC test, the fee by specialization interaction is no longer significant when fee is measured by *LNAU* (p = 0.16). This nonresult is likely driven by the significant positive correlation between audit and non-audit fees (correlation coefficient = 0.75).

[10] We do not use the actual audit fees to compute market share of each auditor because the Compustat database provides audit fees details for only 50% of all the listed firms.

[11] We also measure *SPEC* using the number of clients as the base. Using number of clients as the base avoids the bias toward larger clients that is implied by using sales as the base. Our results are similar with this alternative measure.

three alternative measures of audit specialization: (1) we measure industry specialization using a continuous measure of market share, (2) we define an auditor to be a specialist when it has the largest market share and its market share is at least 10% higher than the second largest auditor (e.g., Mayhew and Wilkins [2003]), and (3) we designate any auditor with a market share of 24% or more as a specialist (e.g., Neal and Riley [2004]).[12] We obtain similar results as our main analyses using the first two alternative measures of specialization. For the last measure (market share cutoff of 24%), we obtain similar results as our main analyses for the various measures of audit quality with the following exceptions: for the going-concern measure, significant effects are obtained only when fees are measured using *LNAU*, and for the propensity to avoid missing test, significant effects are obtained only when fees are measured using *PRNAU*.[13] In the interest of parsimony, we only report results based on *SPEC*.

4. *Research Design and Empirical Results*

4.1 GOING-CONCERN OPINIONS

4.1.1. Empirical Model. To test the association between non-audit fees and going-concern opinion, we estimate the following logistic regression model:

$$\begin{aligned} OPIN = {} & \beta_o + \beta_1 FEE + \beta_2 ZSCORE + \beta_3 BETA + \beta_4 RETURN + \beta_5 VOL \\ & + \beta_6 LEV + \beta_7 CLEV + \beta_8 LLOSS + \beta_9 OCF + \beta_{10} REPLAG \\ & + \beta_{11} ASSET + \beta_{12} INVM + \beta_{13} AGE + \beta_{14} FFIN + \beta_{15} SPEC \\ & + \beta_{16} Y00 + \beta_{17} FEE * SPEC + e \end{aligned} \tag{2}$$

where

OPIN = 1 if the firm receives a going-concern opinion, and 0 otherwise;
FEE = fee metrics, *LNAU*, *PRNAU*, and *LTOT*, as defined earlier;
ZSCORE = Altman's [1968] *Z*-score reported by Compustat; it is coded 2 if the score is less than 1.81, 1 if the score is between 1.81 and 3, and 0 if the score is more than 3;[14]
BETA = systematic risk over the fiscal year;

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[12] Following Neal and Riley [2004], the appropriate cutoff for the market share is given by $(1/N)*1.2$. Hence, when $N = 5$, an auditor holding more than 24% market share is considered as a specialist.

[13] In particular, the consistency of our results using *SPEC* and the continuous measure provides assurance that our results are not driven by some arbitrary cutoff point in identifying specialists versus nonspecialists.

[14] We do not use the bankruptcy score based on Zmijewski [1984] because the distribution of that variable is not normal (skewness = −7.43, kurtosis = 141.63). Instead, we use the Altman [1968] *Z*-score provided by Compustat, which has a normal distribution (skewness = −0.16, kurtosis = −1.98).

RETURN = the firm's stock return over the fiscal year;
VOL = the variance of the residual from the market model over the fiscal year;
LEV = debt-to-capital ratio;
CLEV = change in *LEV* during the year;
LLOSS = 1 if the firm reports a loss for the previous year, and 0 otherwise;
OCF = operating cash flows divided by total assets at fiscal year-end;
REPLAG = number of days between the fiscal year-end and earnings announcement date;
ASSET = natural log of total assets at fiscal year-end;
INVM = cash, cash equivalents, and short- and long-term investment securities deflated by total assets at fiscal year-end;
AGE = natural log of the number of years since the company was listed on a stock exchange;
FFIN = an indicator variable, equals 1 when the firm issues equity or debt in the following year;
SPEC = 1 if the auditor has the largest market share in the industry, and 0 otherwise;
*Y*00 = year dummy.

To enable comparability with Defond, Raghunandan, and Subramanyam [2002], we use a set of control variables (listed above) that is similar to those used in their study.

4.1.2. Empirical Results. Table 2 presents the descriptive statistics for the going-concern opinion results. Twenty-six percent of the financially distressed firms are audited by specialist auditors. Additionally, about 7% of these financially distressed firms receive a going-concern opinion from the auditors**,** which is comparable with that reported in prior studies (Defond, Raghunandan, and Subramanyam [2002] and Reynolds and Francis [2000] report values of 9% and 8%, respectively). We also compare the fees between firms audited by specialists and nonspecialists. *LNAU* and *LTOT* (but not *PRNAU*) are significantly greater for firms audited by specialists than those audited by nonspecialists. This finding is consistent with specialist auditors being able to provide higher-quality non-audit (and audit) services because of their superior expertise, and clients' preference for specialist auditors to perform non-audit services. The descriptive statistics for other control variables and the correlation coefficients are reported in panels A and B of table 2, respectively.

We report the results of the logistic regression in table 3. For each independent variable, we report the regression coefficient, followed by the Wald statistic in parentheses, and the marginal effect (in percent) in the square brackets. The marginal effect indicates the change in the probability of a firm receiving a going-concern opinion per standard deviation change in each respective independent variable (holding other independent variables

TABLE 2

Descriptive Statistics and Correlation between Variables Used in the Going-Concern Opinion Model

Panel A: Descriptive statistics

	Mean	Median	1st Quartile	3rd Quartile	Std. Dev.
Fee metrics					
Total audit fees	317	174	105	315	542
Total non-audit fees	578	153	53	455	2, 131
Total fees	805	360	185	782	2, 493
Fee ratio	0.46	0.47	0.28	0.65	0.24
Auditor specialization					
SPEC	0.26	0.00	0.00	1.00	0.44
Control variables used in opinion model					
OPIN	0.07	0.00	0.00	0.00	0.26
ZSCORE	1.08	2.00	0.00	2.00	1.00
BETA	2.22	1.99	0.95	3.22	1.87
RETURN	−0.16	−0.36	−0.66	0.06	0.93
VOL	0.08	0.05	0.03	0.09	0.10
LEV	0.25	0.06	0.00	0.39	1.04
CLEV	−0.05	0.00	−0.02	0.06	1.85
LLOSS	0.70	1.00	0.00	1.00	0.46
OCF	−0.16	−0.06	−0.22	0.03	0.34
REPLAG	57	48	32	82	37
ASSET	4.85	4.70	3.80	5.82	1.60
INVM	0.51	0.38	0.10	0.82	0.46
AGE	1.45	1.58	0.56	2.28	1.18
FFIN	0.63	1.00	0.00	1.00	0.48

	Specialists ($N = 447$)		Nonspecialists ($N = 1,245$)		Difference	
	Mean	Median	Mean	Median	*t*-statistic	*z*-statistic
LNAU	5.15	5.22	4.91	4.96	2.32*	2.87**
PRNAU	44	42	43	42	0.77	0.61
LTOT	6.17	5.99	5.93	5.84	3.77**	3.18**

(*Continued*)

TABLE 2 — *Continued*

Panel B: Pearson correlation matrix

	OPIN	*LNAU*	*PRNAU*	*LTOT*	*ZSCORE*	*BETA*	*RETURN*	*VOL*	*LEV*	*CLEV*	*LLOSS*	*OCF*	*REPLAG*	*ASSET*	*INVM*	*AGE*	*FFIN*	*SPEC*
OPIN	1.00																	
LNAU	−0.05	1.00																
PRNAU	−0.04	0.93**	1.00															
LTOT	−0.02	0.87**	0.88**	1.00														
ZSCORE	0.21**	0.03	0.07**	0.14**	1.00													
BETA	−0.02	0.05*	0.06*	0.05*	−0.08**	1.00												
RETURN	−0.06*	−0.11**	−0.09**	−0.10**	−0.11**	0.04	1.00											
VOL	0.10**	−0.10**	−0.10**	−0.10**	0.03	0.41**	0.13**	1.00										
LEV	0.07**	0.02	0.03	0.06*	0.16**	−0.05	0.01	−0.03	1.00									
CLEV	−0.06*	0.00	0.00	0.01	0.01	0.01	−0.01	−0.03	0.65**	1.00								
LLOSS	0.12**	−0.17**	−0.19**	−0.23**	0.05*	0.16**	0.01	0.25**	−0.03	−0.03	1.00							
OCF	−0.28**	0.20**	0.23**	0.27**	−0.08**	−0.11**	0.08**	−0.17**	0.03	0.02	−0.31**	1.00						
REPLAG	−0.04	0.01	0.00	0.00	−0.02	0.02	0.02	0.02	0.00	0.02	0.00	0.00	1.00					
ASSET	−0.15**	0.65**	0.66**	0.79**	0.07**	−0.03	−0.04	−0.20**	0.09**	0.04	−0.27**	0.45**	0.03	1.00				
INVM	−0.16**	−0.13**	−0.18**	−0.27**	−0.35**	0.18**	−0.04	0.10**	−0.13**	0.01	0.33**	−0.25**	−0.02	−0.22**	1.00			
AGE	0.05	−0.09**	−0.06*	0.00	0.18**	−0.21**	0.14**	−0.14**	0.10**	0.02	−0.33**	0.17**	−0.02	0.09**	−0.35**	1.00		
FFIN	−0.03	0.10**	0.07**	0.06*	−0.09**	0.09**	0.10**	0.03	−0.05	−0.02	0.08**	−0.04	−0.03	0.04	0.02	0.00	1.00	
SPEC	0.03	0.06*	0.02	0.10**	0.09**	0.00	0.02	0.01	0.04	0.02	−0.01	0.04	0.02	0.08**	−0.06**	0.01	0.02	1.00

The table reports the descriptive statistics for the fee metrics and the correlation between variables used in the going-concern opinion model. All the fees are expressed in thousands of dollars. Total audit fees is the sum of audit fees and audit-related fees. Total non-audit fees is the sum of IS fees, tax fees, and other fees. Total fees is the sum of total audit fees and total non-audit fees. Fee ratio is the proportion of total non-audit fees relative to total fees. *SPEC* is coded 1 if the auditor has the largest industry market share. *OPIN* equals 1 if the firm receives a going-concern opinion, and 0 otherwise. *LNAU* is the natural log of non-audit fees. *PRNAU* is the percentile rank of a particular client's non-audit fees given all non-audit fees received by the audit firm. *LTOT* is the natural log of total fees. *ZSCORE* is Altman's [1968] *Z* score reported by Compustat. It is coded 2 if the score is less than 1.81; 1 if the score is between 1.81 and 3; and 0 if the score is more than 3. *BETA* is systematic risk over the fiscal year. *RETURN* is the firm's stock return over the fiscal year. *VOL* is the variance of the residual from the market model over the fiscal year. *LEV* is debt-to-capital ratio. *CLEV* is the change in *LEV* during the year. *LLOSS* equals 1 if the firm reports a loss for the previous year, and 0 otherwise. *OCF* is operating cash flows divided by total assets at fiscal year-end. *REPLAG* is the number of days between the fiscal year-end and earnings announcement date. *ASSET* is the natural log of total assets at fiscal year-end. *INVM* is cash, cash equivalents, and short- and long-term investment securities deflated by total assets at fiscal year-end. *AGE* is the natural log of the number of years since the company was listed on a stock exchange. *FFIN* is an indicator variable that equals 1 when the firm issues equity or debt in the following year. Mean (median) differences in fees between specialists and nonspecialists are based on *t*-tests (Mann-Whitney tests). * and ** denote significance at the 5% and 1% levels (two-tailed), respectively.

constant), given a base-rate probability of 7% of receiving a going-concern opinion.[15]

In a model with *SPEC* alone (without fee measures), the coefficient estimate for *SPEC* is positive but insignificant. In a model with fee measures alone (without *SPEC*), consistent with Defond, Raghunandan, and Subramanyam's [2002] finding of no association between the provision of non-audit services and going-concern opinion, we find that *LNAU* and *PRNAU* are not associated with *OPIN*. However, in contrast to Defond, Raghunandan, and Subramanyam [2002], we find that *LTOT* is positively and significantly associated with *OPIN*. For the set of control variables, our results indicate that firms with higher bankruptcy risk, leverage, stock return volatility, poor stock market performance, losses in prior years, and smaller assets, as well as poor operating cash flow and liquidity, are more likely to receive going-concern opinions.

We next examine the interaction effect between the fee metrics and auditor specialization on *OPIN*. The coefficient for $FEE * SPEC$ (β_{17}) shows the incremental effect of *FEE* on *OPIN* when a firm is audited by a specialist rather than a nonspecialist auditor. We expect this coefficient to be positive based on our hypothesis. Consistent with our prediction, the coefficient estimate for $FEE * SPEC$ is positive and statistically significant for all the three fee variables, which suggests that firms audited by audit specialists are more likely to receive going-concern opinions when non-audit services increase. The impact of considering this interaction is nontrivial. The marginal effect associated with this interaction effect (see table 3) indicates that, depending on the fee proxy, every standard deviation change in $FEE * SPEC$ increases a firm's likelihood of receiving a going-concern opinion by 2.97% to 17.41% (i.e., the likelihood increases from 7% to a range of 10% to 24% depending on the fee metric used).

To assess the nature of the interaction, we further analyze the coefficient of *FEE* ($\beta 1$), which represents the effect of non-audit fees on the issuance of going-concern opinions when firms are audited by nonspecialists (i.e., when *SPEC* is coded zero). To the extent that non-audit services provided by nonspecialists impair auditor independence, we expect these auditors to be less likely to issue going-concern reports for the financially distressed firms, implying a negative β_1. The coefficient estimate for *FEE* is not statistically significant across all three measures of fees. The sum of the coefficients of $FEE + FEE * SPEC$ ($\beta_1 + \beta_{17}$) represents the effect of *FEE* on *OPIN* when firms are audited by specialists. If specialist auditors provide high-quality audits, we expect the sum of the coefficients of ($\beta_1 + \beta_{17}$) to be non-negative (in contrast to a negative association in the case of nonspecialists). We use chi-square statistics to test whether the sum of the two regression coefficients

[15] The marginal effect per standard deviation (SD) change for a variable is computed as $p \times (1 - p) \times \beta \times \text{SD}$, where p is the base rate (0.07) and β is the estimated coefficient from the logistic regression (Liao [1994]).

differs from zero. The results in table 3 indicate that the sum of these coefficients is positive and statistically significant at either 1% or 5% for all our three fee variables.

As a robustness check, we use an alternative definition for financially distressed firms. Following previous studies (McKeown, Mutchler, and Hopwood [1991], Geiger and Rama [2003]), we classify a company as being in financial stress if at least one of the following financial stress signals is met: negative working capital at the end of the fiscal year, negative retained earnings at the end of the fiscal year, or loss for the fiscal year. There are 2,071 firms that meet the criteria. The unreported results using this alternative definition do not vary with those reported in table 3.

Overall, there is evidence that specialist auditors, but not nonspecialists, are more likely to issue qualified going-concern opinions when they receive higher non-audit fees from clients. To the extent that a greater propensity to issue qualified going-concern opinions to financially distressed firms is associated with higher audit quality, this result implies that specialists are more likely than nonspecialists to provide higher quality audits with increased provision of non-audit services to clients.

4.2 DISCRETIONARY CURRENT ACCRUALS

4.2.1. Empirical Model. Following Ashbaugh, Lafond, and Mayhew [2003], we compute performance-adjusted discretionary current accruals based on the cross-sectional modified Jones [1991] model for all firms recorded in Compustat. We define current accruals (CA) as income before extraordinary items plus depreciation and amortization minus operating cash flows. To obtain the discretionary current accruals (DCA) in a given year, we regress the following:

$$\frac{CA_{i,t}}{TA_{i,t-1}} = \lambda_1 \left(\frac{1}{TA_{i,t-1}}\right) + \lambda_2 \left(\frac{\Delta REV_{i,t}}{TA_{i,t-1}}\right) + \lambda_3 \left(\frac{IB_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (3)$$

where $CA_{i,t}$ is the current accruals for firm i in fiscal year t, $TA_{i,t-1}$ is the total assets for firm i in fiscal year $t-1$, $\Delta REV_{i,t}$ measures the change in revenues for firm i in year t less revenues in $t-1$, IB_{t-1} is the income before extraordinary items in year $t-1$, and $\varepsilon_{i,t}$ is the random residual term. Similar to previous studies, we estimate equation (3) cross-sectionally on all firms recorded in Compustat with the same two-digit SIC industry code. DCA are then estimated as:

$$DCA_{i,t} = \left(\frac{CA_{i,t}}{TA_{i,t-1}}\right) - \hat{\lambda}_1 \left(\frac{1}{TA_{i,t-1}}\right) - \hat{\lambda}_2 \left(\frac{(\Delta REV - \Delta TR)_{i,t}}{TA_{i,t-1}}\right) - \hat{\lambda}_3 \left(\frac{IB_{t-1}}{TA_{t-1}}\right) \quad (4)$$

where $\hat{\lambda}_i$ is the estimated parameters from equation (3) and $\Delta TR_{i,t}$ is the change in trade receivables for firm i in year t less the trade receivables in the previous year.

TABLE 3

Going Concern Opinion Model: Fee Metrics and Auditer Specialization

			LNAU		*PRNAU*		*LTOT*	
Intercept	β_0	−3.386	−3.591	−3.141	−3.373	−3.159	−5.112	−4.041
		(20.95)***	(22.68)***	(15.79)***	(20.63)***	(17.34)***	(28.69)***	(13.84)***
FEE	β_1		0.131	0.036	0.007	0.003	0.503	0.313
			(2.33)	(0.13)	(1.61)	(0.23)	(8.31)***	(2.52)
			[1.46%]	[0.40%]	[1.25%]	[0.55%]	[3.60%]	[2.24%]
ZSCORE	β_2	0.812	0.824	0.816	0.827	0.821	0.813	0.812
		(16.89)***	(13.37)***	(16.79)***	(17.48)***	(16.94)***	(16.75)***	(16.31)***
		[5.27%]	[5.35%]	[5.30%]	[5.37%]	[5.33%]	[5.28%]	[5.27%]
BETA	β_3	−0.090	−0.097	−0.109	−0.096	−0.107	−0.111	−0.120
		(1.66)	(1.95)	(2.43)	(1.90)	(2.32)	(2.48)	(2.85)*
		[−1.10%]	[−1.18%]	[−1.33%]	[−1.16%]	[−1.30%]	[−1.34%]	[−1.45%]
RETURN	β_4	−0.439	−0.441	−0.473	−0.433	−0.462	−0.384	−0.422
		(5.13)**	(5.09)**	(5.67)**	(4.93)**	(5.44)**	(3.89)**	(4.52)**
		[−2.67%]	[−2.68%]	[−2.87%]	[−2.63%]	[−2.81%]	[−2.33%]	[−2.56%]
VOL	β_5	1.861	1.892	2.012	1.866	1.98	1.656	1.818
		(3.40)*	(3.58)*	(3.99)**	(3.47)*	(3.88)**	(2.66)*	(3.20)*
		[1.22%]	[1.24%]	[1.32%]	[1.22%]	[1.30%]	[1.09%]	[1.19%]
LEV	β_6	0.145	0.159	0.162	0.156	0.158	0.162	0.164
		(2.74)*	(3.26)*	(3.31)*	(3.15)*	(3.19)*	(3.28)*	(3.30)*
		[0.97%]	[1.07%]	[1.09%]	[1.05%]	[1.07%]	[1.09%]	[1.10%]
CLEV	β_7	−0.075	−0.079	−0.081	−0.077	−0.079	−0.079	−0.079
		(2.37)	(2.54)	(2.68)	(2.44)	(2.59)	(2.56)	(2.63)
		[−0.90%]	[−0.95%]	[−0.98%]	[−0.93%]	[−0.95%]	[−0.95%]	[−0.95%]
LLOSS	β_8	1.342	1.362	1.411	1.355	1.390	1.354	1.393
		(15.19)***	(15.55)***	(16.27)***	(15.40)***	(15.87)***	(15.31)***	(15.62)***
		[4.01%]	[4.06%]	[4.21%]	[4.04%]	[4.15%]	[4.04%]	[4.16%]
OCF	β_9	−2.144	−2.020	−2.021	−2.051	−2.045	−1.936	−1.916
		(42.61)***	(37.13)***	(36.87)***	(38.69)***	(38.19)***	(34.37)***	(33.39)***
		[−4.74%]	[−4.46%]	[−4.47%]	[−4.53%]	[−4.53%]	[−4.28%]	[−4.23%]

(*Continued*)

TABLE 3 — *Continued*

			LNAU		*PRNAU*		*LTOT*	
REPLAG	β_{10}	−0.008 (3.97)** [−1.80%]	−0.008 (3.61)* [−1.72%]	−0.008 (3.91)** (−1.81%)	−0.007 (3.65)* [−1.73%]	−0.008 (3.89)** [−1.80%]	−0.007 (3.69)** [−1.76%]	−0.007 (3.59)* [−1.75%]
ASSET	β_{11}	−0.194 (5.82)*** [−2.03%]	−0.281 (7.73)*** [−2.93%]	−0.299 (8.55)*** [−3.12%]	−0.269 (6.79)*** [−2.81%]	−0.297 (7.88)*** [−3.11%]	−0.458 (13.46)*** [−4.78%]	−0.466 (13.44)*** [−4.86%]
INVM	β_{12}	−3.277 (40.85)*** [−9.92%]	−3.223 (39.24)*** [−9.76%]	−3.280 (39.86)*** [−9.93%]	−3.212 (38.98)*** [−9.72%]	−3.245 (39.17)*** [−9.82%]	−3.128 (35.95)*** [−9.47%]	−3.159 (36.23)*** [−9.56%]
AGE	β_{13}	0.143 (1.42) [1.10%]	0.174 (2.05) [1.33%]	0.171 (1.95) [1.31%]	0.174 (2.03) [1.33%]	0.171 (1.94) [1.31%]	0.181 (2.26) [1.39%]	0.167 (1.88) [1.28%]
FFIN	β_{14}	−0.115 (0.25) [−0.36%]	−0.127 (0.30) [−0.40%]	−0.155 (0.45) [−0.49%]	−0.117 (0.26) [−0.37%]	−0.141 (0.37) [−0.44%]	−0.139 (0.36) [−0.44%]	−0.174 (0.56) [−0.55%]
SPEC	β_{15}	0.350 (2.15) [1.00%]		−0.884 (1.67) [−2.54%]		−0.222 (0.24) [−0.64%]		−2.391 (3.40)* [−6.87%]
Y00	β_{16}	−0.169 (0.44)	−0.176 (0.48)	−0.245 (0.90)	−0.079 (0.09)	−0.133 (0.26)	−0.132 (0.27)	−0.181 (0.49)
FEE∗*SPEC*	β_{17}			0.261 (4.04)** [6.34%]		0.015 (2.70)* [2.97%]		0.449 (4.70)** [17.41%]
χ^2 test: *FEE* + *FEE*∗*SPEC*	$\beta_1 + \beta_{17}$			0.225 [6.36]***		0.018 [4.83]**		0.762 [13.29]***
N		1,692	1,692	1,692	1,692	1,692	1,692	1,692
Pseudo R^2		37.0%	37.0%	38.0%	36.9%	37.7%	37.8%	38.7%
χ^2 statistic		143.43***	144.44***	144.28***	143.93***	143.62***	147.01***	147.15***

The going concern opinion logistic model is:

$$OPIN = \beta_o + \beta_1 FEE + \beta_2 ZSCORE + \beta_3 BETA + \beta_4 RETURN + \beta_5 VOL + \beta_6 LEV + \beta_7 CLEV + \beta_8 LLOSS + \beta_9 OCF + \beta_{10} REPLAG + \beta_{11} ASSET + \beta_{12} INVM + \beta_{13} AGE + \beta_{14} FFIN + \beta_{15} SPEC + \beta_{16} Y00 + \beta_{17} FEE * SPEC + \varepsilon$$

The sample includes a set of financially distressed firms. We define financially distressed firms as firms that report either negative earnings or operating cash flows during the current fiscal year. The variables used in the logistic regression model are as defined in the footnotes of table 2. *Y00* is year dummy. For each variable, we report the regression coefficient, followed by the Wald statistic in parentheses, and the marginal effect (in percent) in the square brackets. The marginal effect indicates the change in the probability of a firm receiving a going-concern opinion per standard deviation change in each respective independent variable (holding other independent variables constant), given the base-rate probability of the going concern opinion (7%). We use χ^2 statistics to test whether the sum of the coefficients ($\beta_1 + \beta_{17}$) differs from zero and report the χ^2 statistic in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Consistent with Frankel, Johnson, and Nelson [2002] and Ashbaugh, Lafond, and Mayhew [2003], we run the following model to test the association between non-audit fees and discretionary current accruals:

$$\begin{aligned} ADCA = {} & \omega_0 + \omega_1 FEE + \omega_2 TENU + \omega_3 CFO + \varphi_4 LEV + \omega_5 LITIG + \omega_6 MB \\ & + \omega_7 MV + \omega_8 LOSS + \omega_9 FIN + \omega_{10} LCA + \omega_{11} SPEC + \omega_{12} Y00 \\ & + \omega_{13} FEE * SPEC + \varepsilon \end{aligned} \tag{5}$$

where

$ADCA$ = absolute value of discretionary current accruals estimated with lagged return on assets (ROA) in the cross-sectional Jones [1991] model;
FEE = fee metrics, *LNAU*, *PRNAU*, and *LTOT*, as defined earlier;
$TENU$ = number of years that the auditor has audited the firm's financial statements;
CFO = cash flow from operations scaled by total assets at the beginning of the fiscal year;
LEV = debt-to-capital ratio;
$LITIG$ = 1 if the firm operates in a high-litigation industry, and 0 otherwise; high-litigation industries are industries with SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370–7374;
MB = market-to-book ratio;
MV = natural log of market value;
$LOSS$ = 1 if a firm reports a loss, and 0 otherwise;
FIN = 1 if the firm issued securities or acquired another company, and 0 otherwise;
LCA = lag of absolute current accruals in the previous year;
$SPEC$ = 1 if the auditor has the largest market share in the industry, and 0 otherwise;
$Y00$ = year dummy.

4.2.2. Empirical Results. We report the descriptive statistics and the correlation coefficients for the fee metrics and variables used in the discretionary current accruals model in table 4. The mean (median) absolute value for discretionary current accruals (*ADCA*) is 0.13 (0.08). On average, 27% of the firms are audited by industry specialists. All the three fee variables are significantly higher for firms audited by specialists than nonspecialists.

We report the regression results for the absolute discretionary current accruals in table 5, panel A. The adjusted R^2 is around 16%, compared to the adjusted R^2 of 18% to 21% reported in Ashbaugh, Lafond, and Mayhew [2003]. In a model with *SPEC* alone (without fee measures), we find no significant association between *ADCA* and *SPEC*. In contrast, Krishnan [2003] and Balsam, Krishnan, and Yang [2003] document a negative relation between auditor industry specialization and absolute discretionary

TABLE 4

Descriptive Statistics and Correlation between Variables Used in the Discretionary Current Accrual Model

Panel A: Descriptive statistics

	Mean	Median	1st Quartile	3rd Quartile	Std. Dev.
Fee metrics					
Total audit fees	628	223	125	500	1,682
Total non-audit fees	1,359	241	74	747	4,938
Total fees	1,987	498	225	1,257	6,191
Fee ratio	0.48	0.50	0.31	0.67	0.23
Auditor specialization					
SPEC	0.27	0.00	0.00	1.00	0.44
Control variables used in discretionary current accruals model					
ADCA	0.13	0.08	0.03	0.22	0.52
TENU	8.88	6.00	4.00	12.00	7.50
CFO	0.00	0.06	−0.05	0.13	0.26
LEV	0.34	0.22	0.01	0.51	0.77
LITIG	0.42	0.00	0.00	1.00	0.49
MB	3.07	2.00	1.06	3.70	8.12
MV	5.66	5.61	4.24	6.95	2.08
LOSS	0.46	0.00	0.00	1.00	0.50
FIN	0.23	0.00	0.00	0.00	0.42
LCA	0.33	0.02	0.00	0.09	3.64

	Specialists ($N = 1{,}337$)		Nonspecialists ($N = 3{,}606$)		Difference	
	Mean	Median	Mean	Median	*t*-statistic	*z*-statistic
LNAU	5.71	5.73	5.35	5.39	5.63**	5.98**
PRNAU	52	53	50	50	2.49*	2.53*
LTOT	6.62	6.41	6.31	6.14	7.01**	6.33**

(*Continued*)

TABLE 4 — *Continued*

Panel B: Pearson correlation matrix

	ADCA	*LNAU*	*PRNAU*	*LTOT*	*TENU*	*LEV*	*LITIG*	*MB*	*MV*	*LOSS*	*FIN*	*LCA*	*SPEC*
ADCA	1.00												
LNAU	−0.08**	1.00**											
PRNAU	−0.08**	0.93**	1.00										
LTOT	−0.10**	0.90**	0.89**	1.00									
TENU	−0.07**	0.22**	0.23**	0.26**	1.00								
LEV	−0.05**	0.08**	0.09**	0.12**	0.06**	1.00							
LITIG	−0.08**	−0.09**	−0.10**	−0.14**	−0.18**	−0.16**	1.00						
MB	0.04*	0.01	0.00	0.00	0.01	−0.04**	0.07**	1.00					
MV	−0.14**	0.66**	0.63**	0.72**	0.23**	−0.03*	−0.05**	0.13**	1.00				
LOSS	0.10**	−0.18**	−0.17**	−0.21**	−0.25**	−0.01	0.27**	0.01	−0.33**	1.00			
FIN	0.03*	−0.03	−0.05**	−0.06**	−0.10**	0.00	0.06**	0.08**	−0.01	0.13**	1.00		
LCA	0.12**	−0.07**	−0.07**	−0.08**	−0.05**	−0.02	0.03*	0.04**	−0.10**	0.07**	0.06**	1.00	
SPEC	−0.01	0.08**	0.04*	0.10**	−0.04**	0.01	−0.06**	−0.03*	0.07**	−0.04**	0.01	0.00	1.00

The table reports the descriptive statistics for the fee metrics and the correlation between variables used in the discretionary current accruals model. See table 2 for the definitions of fee metrics and auditor specialization. Definitions of other variables are as follows: *ADCA* is the absolute value of discretionary current accruals estimated with lagged ROA in the cross-sectional Jones [1991] model. *LNAU* is the natural log of non-audit fees. *PRNAU* is the percentile rank of a particular client's non-audit fees given all non-audit fees received by the audit firm. *LTOT* is the natural log of total fees. *TENU* is the number of years that the auditor has audited the firm's financial statements. *CFO* is cash flow from operations scaled by total assets at the beginning of the fiscal year. *LEV* is debt-to-capital ratio. *LITIG* equals 1 if the firm operates in a high-litigation industry, and 0 otherwise. High-litigation industries are industries with SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370–7374. *MB* is market-to-book ratio. *MV* is the natural log of market value. *LOSS* equals 1 if a firm reports a loss, and 0 otherwise. *FIN* equals 1 if the firm issued securities or acquired another company, and 0 otherwise. *LCA* is the absolute value of current accruals in the prior year. *SPEC* equals 1 if the auditor has the largest market share in the industry, and 0 otherwise. Mean (median) differences in fees between specialists and nonspecialists are based on *t*-tests (Mann-Whitney tests). * and ** denote significance at the 5% and 1% levels (two-tailed), respectively.

accruals. In a model with fee measures alone (without *SPEC*), we find that *ADCA* is positively and significantly associated with *LNAU*, but not with *PRNAU* and *LTOT*. Prior studies document either a positive or no association between *ADCA* and non-audit fees, depending on the measure of non-audit fees used (Frankel, Johnson, and Nelson [2002], Ashbaugh, Lafond, and Mayhew [2003], Chung and Kallapur [2003]). Contrary to our prediction in H1, the coefficient estimate for the interaction term ($FEE * SPEC$) is not statistically significant for all three measures of fee variables. We do observe that when fees are proxied by *LNAU*, the sum of the coefficients $FEE + FEE * SPEC$ ($\omega_1 + \omega_{13}$) is positive and significant at the 5% level, suggesting that firms audited by specialists are associated with higher absolute levels of discretionary current accruals as non-audit fees increase. As shown below, this association is primarily driven by negative discretionary accruals.

We next partition the sample based on the sign of discretionary accruals and report the results for positive and negative discretionary accruals in table 5, panels B and C, respectively. We find no association between *SPEC* and signed discretionary accrual measures in models that contain *SPEC* but without the fee measures. In a model with fee alone (without *SPEC*), only *LTOT* (but not *LNAU* and *PRNAU*) is negatively and significantly associated with positive (or income increasing) discretionary current accruals. In contrast, all three fee variables are negatively and significantly associated with negative (or income decreasing) discretionary current accruals; that is, firms report more income-decreasing accruals as fees increase. For both signed discretionary accrual measures, estimates for the interaction term ($FEE * SPEC$) are not statistically significant across all three measures of fee variables.[16] Further analysis of the model with the interaction term (table 5, panel C) reveals that the coefficients of *FEE* (ω_1) and the summation $FEE + FEE * SPEC$ ($\omega_1 + \omega_{13}$) are both negative and statistically significant for all fee measures, suggesting that firms audited by *both* nonspecialists and specialists report more income-decreasing accruals as fees increase.[17] This finding is consistent with both nonspecialist and specialist auditors being either more conservative or more tolerant of income-decreasing earnings management as fees increase.

We also compute an alternative measure for discretionary current accruals based on a portfolio approach, as in Ashbaugh, Lafond, and Mayhew [2003]. We partition firms within each two-digit SIC code into deciles based on their prior year's ROA. Performance-adjusted discretionary current accruals are

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[16] Chung and Kallapur [2003] also examine the interaction between audit specialization and fees on discretionary accruals. They also report insignificant results for the interaction term.

[17] In comparison, Ashbaugh, Lafond, and Mayhew [2003] find no association between non-audit services provision and positive discretionary current accruals, and some evidence of a negative association for negative discretionary accruals. Frankel, Johnson, and Nelson [2002] report a significant positive (negative) association between non-audit fees and positive (negative) discretionary accruals.

TABLE 5

Discretionary Current Accruals Model: Fee Metrics and Auditor Specialization

Panel A: Absolute discretionary current accruals

			LNAU		*PRNAU*		*LTOT*	
Intercept	ω_0	0.495	0.478	0.497	0.494	0.499	0.475	0.496
		(17.82)***	(16.67)***	(15.44)***	(17.99)***	(16.98)***	(11.98)***	(10.74)***
FEE	ω_1		0.010	0.007	0.048	0.043	0.005	0.002
			(1.96)**	(1.27)	(1.40)	(1.15)	(0.65)	(0.27)
TENU	ω_2	−0.002	−0.003	−0.003	−0.003	−0.003	−0.002	−0.003
		(−2.37)***	(−2.53)***	(−2.55)***	(−2.48)**	(−2.49)**	(−2.42)**	(−2.44)**
CFO	ω_3	−0.181	−0.181	−0.180	−0.182	−0.181	−0.182	−0.181
		(−5.09)***	(−5.09)***	(−5.06)***	(−5.10)***	(−5.10)***	(−5.10)***	(−5.08)***
LEV	ω_4	−0.048	−0.051	−0.051	−0.050	−0.050	−0.049	−0.049
		(−5.05)***	(−5.26)***	(−5.28)***	(−5.20)***	(−5.20)***	(−5.09)***	(−5.10)***
LITIG	ω_5	−0.151	−0.149	−0.150	−0.150	−0.150	−0.150	−0.150
		(−9.70)***	(−9.60)***	(−9.60)***	(−9.60)***	(−9.60)***	(−9.57)***	(−9.57)***
MB	ω_6	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		(3.61)***	(3.80)***	(3.78)***	(3.74)***	(3.73)***	(3.68)***	(3.66)***
MV	ω_7	−0.025	−0.031	−0.032	−0.029	−0.029	−0.028	−0.028
		(−6.51)***	(−6.31)***	(−6.36)***	(−5.99)***	(−5.97)***	(−5.10)***	(−5.12)***
LOSS	ω_8	0.035	0.032	0.032	0.033	0.033	0.034	0.033
		(1.92)*	(1.76)*	(1.73)*	(1.80)*	(1.79)*	(1.84)*	(1.81)*
FIN	ω_9	0.006	0.007	0.007	0.007	0.007	0.007	0.007
		(0.36)	(0.41)	(0.41)	(0.41)	(0.41)	(0.40)	(0.40)
LCA	ω_{10}	1.279	1.279	1.277	1.279	1.278	1.278	1.278
		(6.33)***	(6.34)***	(6.33)***	(6.33)***	(6.33)***	(6.33)***	(6.33)***
SPEC	ω_{11}	−0.005		−0.064		−0.014		−0.072
		(−0.28)		(−1.31)		(−0.43)		(−0.93)
Y00	ω_{12}	−0.050	−0.052	−0.052	−0.047	−0.047	−0.050	−0.050
		(−3.29)***	(−3.45)***	(−3.45)***	(−3.08)***	(−3.08)***	(−3.30)***	(−3.30)***
FEE ∗ *SPEC*	ω_{13}			0.010		0.020		0.010
				(1.26)		(0.34)		(0.88)
FEE + *FEE* ∗ *SPEC*	$\omega_1 + \omega_{13}$			0.017		0.063		0.012
				[5.04]**		[1.32]		[1.21]
N		4,943	4,943	4,943	4,943	4,943	4,943	4,943
F-statistic		29.63***	29.99***	25.51***	29.81***	25.23***	29.66***	25.16***
Adj. R^2		15.99%	16.06%	16.06%	16.03%	15.99%	16.00%	15.98%

(*Continued*)

TABLE 5 — *Continued*

Panel B: Positive discretionary current accruals

		LNAU			*PRNAU*		*LTOT*	
Intercept	ω_0	0.588	0.590	0.616	0.590	0.596	0.712	0.754
		(12.26)***	(11.91)***	(11.22)***	(12.46)***	(11.87)***	(9.93)***	(9.29)***
FEE	ω_1		0.001	−0.004	−0.049	−0.064	−0.034	−0.041
			(0.07)	(−0.43)	(−0.82)	(−0.97)	(−2.24)**	(−2.54)***
TENU	ω_2	−0.003	−0.003	−0.003	−0.003	−0.003	−0.002	−0.002
		(−1.44)	(−1.49)	(−1.40)	(−1.43)	(−1.38)	(−1.26)	(−1.17)
CFO	ω_3	−0.151	−0.151	−0.148	−0.147	−0.147	−0.140	−0.137
		(−2.37)**	(−2.37)**	(−2.33)**	(−2.32)**	(−2.30)**	(−2.20)**	(−2.15)**
LEV	ω_4	−0.088	−0.088	−0.088	−0.086	−0.086	−0.080	−0.080
		(−5.05)***	(−5.00)***	(−5.00)***	(−4.86)***	(−4.87)***	(−4.49)***	(−4.49)***
LITIG	ω_5	−0.300	−0.301	−0.300	−0.302	−0.301	−0.308	−0.308
		(−10.99)***	(−11.03)***	(−10.97)***	(−11.06)***	(−11.01)***	(−11.24)***	(−11.19)***
MB	ω_6	0.006	0.006	0.006	0.006	0.006	0.005	0.005
		(3.43)***	(3.40)***	(3.40)***	(3.32)***	(3.33)***	(3.06)***	(3.07)***
MV	ω_7	−0.027	−0.027	−0.028	−0.022	−0.023	−0.011	−0.011
		(−3.89)***	(−3.01)***	(−3.11)***	(−2.46)**	(−2.52)**	(−1.07)	(−1.14)
LOSS	ω_8	0.004	0.003	0.003	0.004	0.004	0.005	0.005
		(0.11)	(0.10)	(0.10)	(0.10)	(0.12)	(0.14)	(0.15)
FIN	ω_9	0.049	0.049	0.050	0.048	0.049	0.047	0.047
		(1.58)	(1.58)	(1.61)	(1.58)	(1.59)	(1.52)	(1.55)
LCA	ω_{10}	1.155	1.157	1.156	1.160	1.156	1.168	1.170
		(4.38)***	(4.39)***	(4.38)***	(4.40)***	(4.38)***	(4.44)***	(4.44)***
SPEC	ω_{11}	0.012		−0.093		−0.019		−0.147
		(0.42)		(−1.07)		(0.33)		(−1.05)
Y00	ω_{12}	−0.032	−0.032	−0.031	−0.035	−0.034	−0.030	−0.029
		(−1.20)	(−1.21)	(−1.16)	(−1.32)	(−1.27)	(−1.14)	(−1.08)
FEE∗*SPEC*	ω_{13}			0.019		0.063		0.025
				(1.36)		(0.61)		(1.19)
FEE +	$\omega_1 +$			0.015		−0.001		−0.016
FEE∗*SPEC*	ω_{13}			[1.07]		[0.00]		[0.53]
N		2,196	2,196	2,196	2,196	2,196	2,196	2,196
F-statistic		19.17***	19.16***	16.35***	19.22***	16.30***	19.66***	16.76***
Adj. R^2		18.35%	18.34%	18.33%	18.37%	18.31%	18.55%	18.54%

(*Continued*)

TABLE 5 — *Continued*

Panel C: Negative discretionary current accruals

		LNAU			*PRNAU*		*LTOT*	
Intercept	ω_0	−0.393	−0.361	−0.371	−0.391	−0.393	−0.285	−0.284
		($V12.70$)***	(−11.31)***	(−10.26)***	(−12.79)***	(−11.92)***	(−6.64)***	(−5.58)***
FEE	ω_1		−0.018	−0.017	−0.127	−0.129	−0.030	−0.031
			(−3.26)***	(−2.77)***	(−3.47)***	(−3.20)***	(−3.51)***	(−3.28)***
TENU	ω_2	0.002	0.003	0.003	0.003	0.003	0.003	0.003
		(2.03)**	(2.39)**	(2.46)**	(2.41)**	(2.43)**	(2.53)***	(2.60)***
CFO	ω_3	0.163	0.153	0.153	0.154	0.155	0.155	0.155
		(4.09)***	(3.85)***	(3.85)***	(3.88)***	(3.89)***	(3.90)***	(3.91)***
LEV	ω_4	0.015	0.019	0.019	0.019	0.019	0.021	0.021
		(1.49)	(1.84)*	(1.85)*	(1.86)*	(1.86)*	(2.04)**	(2.06)**
LITIG	ω_5	0.033	0.028	0.029	0.027	0.028	0.025	0.026
		(1.95)**	(1.65)*	(1.69)*	(1.58)	(1.61)	(1.47)	(1.51)
MB	ω_6	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002
		(−1.73)*	(−2.04)**	(−2.02)**	(−2.05)**	(−2.02)**	(−2.14)**	(−2.12)**
MV	ω_7	0.022	0.033	0.033	0.034	0.033	0.037	0.037
		(5.29)***	(6.23)***	(6.22)***	(6.37)***	(6.29)***	(6.30)***	(6.30)***
LOSS	ω_8	−0.062	−0.054	−0.054	−0.053	−0.053	−0.051	−0.050
		(−3.11)***	(−2.72)***	(−2.69)***	(−2.66)***	(−2.65)***	(−2.54)***	(−2.50)***
FIN	ω_9	0.020	0.018	0.017	0.016	0.016	0.015	0.014
		(1.02)	(0.90)	(0.88)	(0.83)	(0.80)	(0.75)	(0.71)
LCA	ω_{10}	−1.848	−1.848	−1.835	−1.851	−1.847	−1.849	−1.842
		(−4.69)***	(−4.70)***	(−4.66)***	(−4.70)***	(−4.69)***	(−4.70)***	(−4.68)***
SPEC	ω_{11}	0.012		0.037		0.008		0.012
		(0.69)		(0.71)		(0.21)		(0.15)
Y00	ω_{12}	0.068	0.073	0.074	0.062	0.062	0.069	0.069
		(4.11)***	(4.40)***	(4.42)***	(3.69)***	(3.69)***	(4.17)***	(4.18)***
FEE ∗ *SPEC*	ω_{13}			−0.004		0.007		0.001
				(−0.44)		(0.12)		(0.88)
FEE + *FEE* ∗ *SPEC*	$\omega_1 + \omega_{13}$			−0.021		−0.122		−0.030
				[6.54]***		[4.51]**		[6.52]***
N		2,747	2,747	2,747	2,747	2,747	2,747	2,747
F-statistic		18.88***	19.88***	16.89***	20.02***	16.96***	20.04***	17.03***
Adj. R^2		16.69%	17.03%	17.00%	17.08%	17.03%	17.09%	17.06%

The sample for the accruals test consists of 4,943 firm-year observations for the period 2000–2001 that have complete financial information in Compustat. The regression model is:

$$ADCA = \omega_0 + \omega_1 FEE + \omega_2 TENU + \omega_3 CFO + \varphi_4 LEV + \omega_5 LITIG + \omega_6 MB + \omega_7 MV + \omega_8 LOSS + \omega_9 FIN + \omega_{10} LCA + \omega_{11} SPEC + \omega_{12} Y00 + \omega_{13} FEE * SPEC + \varepsilon$$

See table 4 for the definitions of the variables used in the regression. Note that the dependent variables in panels B and C are signed while panel A is the absolute value of discretionary accruals. *Y00* is year dummy. We use *F*-statistics to test whether the sum of the coefficients ($\omega_1 + \omega_{13}$) differs from zero and report the *F*-statistic in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

calculated as the difference between a sample firm's discretionary current accruals and the median discretionary current accruals for each ROA decile excluding the sample firm. We repeat the analyses and the untabulated results are similar to those reported in table 5.

Overall, our results document no moderating effect of auditor specialization on the association between the various fee measures and discretionary accruals.

4.3 BENCHMARK TESTS

4.3.1. Meeting or Missing Analysts' Forecasts. We also use firms' propensity to meet or avoid missing analysts' forecasts to infer audit quality. Prior research suggests that the market appears to reward firms that meet analysts' forecasts and punish those that miss analysts' forecasts (Bartov, Givoly, and Hayn [2002], Kasznik and McNichols [2002], Lopez and Rees [2002]). Following prior studies (e.g., Frankel, Johnson, and Nelson [2002], Ashbaugh, Lafond, and Mayhew [2003]), we compute actual earnings per share (EPS) minus the last available median consensus analysts' forecasts prior to the announcement of annual earnings, with *MEET* equal to one for firms reporting an earnings surprise of zero to positive one cent, and zero otherwise.[18] Consistent with Frankel, Johnson, and Nelson [2002], we compute *MISS* for firms that just fall short of meeting analysts' consensus forecasts, with *MISS* equal to one for firms that miss the forecasts by two cents, and zero otherwise.

We run the following logistic regression model:

$$\begin{aligned} MEET \text{ or } MISS = {} & \varphi_0 + \varphi_1 FEE + \varphi_2 TENU + \varphi_3 LITIG + \varphi_4 MB + \varphi_5 MV \\ & + \varphi_6 LOSS + \varphi_7 CFO + \varphi_8 FIN + \varphi_9 ROA + \varphi_{10} DCA \\ & + \varphi_{11} SPEC + \varphi_{12} Y00 + \varphi_{13} FEE{*}SPEC + \varepsilon \end{aligned} \tag{6}$$

where

MEET = 1 when a firm's actual EPS minus the consensus analysts' forecast is within zero to one cent (both inclusive), and zero otherwise;
MISS = 1 when a firm's actual EPS minus the consensus analysts' forecast falls between 0 cents (exclusive) and −2 cents (inclusive), and zero otherwise;
ROA = returns on assets;
DCA = discretionary current accruals estimated with lagged ROA in the cross-sectional Jones [1991] model;

All other variables are as previously defined.

[18] We define the consensus analyst forecast as the median EPS forecast computed over the set of the analysts providing forecasts for the firm. We use the most recent forecasts that are no earlier than two months before the earnings release date. This procedure avoids the problem of stale analyst forecasts. We use the unadjusted I/B/E/S forecasts so that we do not have the problem of losing precision in the decimal places of the forecasts because of I/B/E/S adjustments of prior forecasts for subsequent stock splits (Payne and Thomas [2003]). To be consistent, we measure the actual earnings using I/B/E/S as well.

4.3.2. Empirical Results. Table 6 reports the descriptive statistics and correlation matrix for the fees and variables used in the analysts' forecast model. On average, 17% of the firms just meet analysts' forecasts by one cent, and 7% of firms just miss analysts' forecasts by two cents. The fee variables measured by *LNAU* and *LTOT* (but not *PRNAU*) are significantly greater for audit specialists than non-audit specialists.

We report the results for the logistic regression for meeting and missing the analysts' forecasts in panels A and B of table 7. For each independent variable, we report the regression coefficient, followed by the Wald statistic in parentheses, and the marginal effect (in percent) in the square brackets.

We find no association between *SPEC* and either *MEET* or *MISS* in models that only include *SPEC* but not the fee measures. In a model with fee measures alone (without *SPEC*), we find that *MEET* is not significantly associated with all three fee variables and *MISS* is negatively associated with *PRNAU* (but not *LNAU* and *LTOT*). In comparison, Frankel, Johnson, and Nelson [2002] find that non-audit fees have a positive association with *MEET* and a negative association with *MISS*, while Ashbaugh, Lafond, and Mayhew [2003] do not test *MISS* and find no such association with *MEET*.

When we include the interaction term (*FEE* $*$ *SPEC*) in the *MEET* model, the coefficient for the interaction term (ϕ_{13}) for all three fee variables is not statistically significant, inconsistent with the prediction in H1. However, for the *MISS* model, the coefficient ϕ_{13} for the interaction term (*FEE* $*$ *SPEC*) is positive and statistically significant for all the three fee variables. The significant positive interaction term (*FEE* $*$ *SPEC*) suggests that firms audited by audit specialists rather than nonspecialists are more likely to miss analysts' forecasts when non-audit services increase. Analysis of the marginal effects associated with this interaction term (reported in table 7, panel B) shows that, depending on the fee proxy, every standard deviation change in *FEE* $*$ *SPEC* increases the firm's likelihood of missing the earnings benchmark by 1.94% to 5.06% (i.e., the likelihood increases to about 9% to 12%, starting from a base rate of 7%). For *MISS*, the coefficient estimate for *FEE* (ϕ_1) is significantly negative, suggesting that firms audited by nonspecialists are less likely to miss analysts' forecasts as non-audit services increase. The sum of the coefficient estimates ($\phi_1 + \phi_{13}$) for all three fee variables does not vary significantly from zero, indicating a lack of evidence that firms audited by specialists are likely to avoid missing analysts' forecasts.[19]

Overall, the results indicate that firms that purchase more non-audit services from nonspecialists are less likely to miss analysts' forecasts, relative to those that purchase more non-audit services from specialists. To the extent that a firm's enhanced ability to avoid missing analysts' forecasts is achieved

[19] As additional analyses, we also code the dependent variable *MEET_MISS* to be one if a firm's actual EPS minus the consensus analysts' forecast is within zero to one cent, and 0 if a firm's actual EPS minus the consensus analysts' forecast is within negative two cents (see footnote 13 of Frankel, Johnson, and Nelson [2002]). We fail to find a significant fee by specialization interaction for this measure.

TABLE 6

Descriptive Statistics and Correlation between Variables Used in the Analysts' Forecast Model

Panel A: Descriptive statistics

	Mean	Median	1st Quartile	3rd Quartile	Std. Dev.
Fee metrics					
Total audit fees	591	259	145	555	1,369
Total non-audit fees	1,195	304	104	869	3,876
Total fees	1,786	604	288	1,427	4,903
Fee ratio	0.51	0.53	0.34	0.69	0.23
Auditor specialization					
SPEC	0.24	0.00	0.00	1.00	0.43
Control variables used in analysts' forecast model					
MEET	0.17	0.00	0.00	0.00	0.38
MISS	0.07	0.00	0.00	0.00	0.26
TENU	9.14	6.00	4.00	12.00	7.62
LITIG	0.41	0.00	0.00	1.00	0.49
MB	3.00	2.15	1.26	3.79	2.92
MV	6.15	6.04	4.93	7.19	1.65
LOSS	0.40	0.00	0.00	1.00	0.49
CFO	0.03	0.07	−0.02	0.13	0.17
FIN	0.22	0.00	0.00	0.00	0.42
ROA	−0.08	0.02	−0.09	0.07	0.39
DCA	0.03	−0.01	−0.09	0.05	1.00

	Specialists ($N = 827$)		Nonspecialists ($N = 2,671$)		Difference	
	Mean	Median	Mean	Median	*t*-statistic	*z*-statistic
LNAU	5.84	5.83	5.63	5.68	3.09**	3.10**
PRNAU	54	56	54	57	0.13	0.09
LTOT	6.65	6.45	6.51	6.38	2.95**	2.46*

(*Continued*)

TABLE 6 — *Continued*

Panel B: Pearson correlation matrix

	MEET	*MISS*	*LNAU*	*PRNAU*	*LTOT*	*TENU*	*LITIG*	*MB*	*MV*	*LOSS*	*CFO*	*FIN*	*ROA*	*DCA*	*SPEC*
MEET	1.00														
MISS	−0.13**	1.00													
LNAU	0.09**	0.06**	1.00												
PRNAU	0.11**	0.05**	0.93**	1.00											
LTOT	0.10**	0.08**	0.89**	0.88**	1.00										
TENU	0.07**	0.07**	0.24**	0.25**	0.31**	1.00									
LITIG	−0.05**	−0.02	−0.07**	−0.08**	−0.14**	−0.19**	1.00								
MB	0.08**	0.02	0.01	−0.01	−0.04*	−0.04**	0.16**	1.00							
MV	0.18**	0.12**	0.58**	0.57**	0.66**	0.30**	−0.04*	0.34**	1.00						
LOSS	−0.16**	−0.08**	−0.14**	−0.13**	−0.17**	−0.25**	0.27**	0.01	−0.31**	1.00					
CFO	0.11**	0.01	0.18**	0.20**	0.23**	0.23**	−0.24**	−0.07**	0.35**	−0.58**	1.00				
FIN	−0.04**	−0.02	−0.03	−0.05**	−0.08**	−0.10**	0.05**	0.13**	−0.03	0.15**	−0.20**	1.00			
ROA	0.09**	0.03	0.08**	0.06**	0.10**	0.18**	−0.21**	−0.01	0.23**	−0.47**	0.60**	−0.07**	1.00		
DCA	0.00	−0.02	−0.01	−0.03*	−0.03*	0.00	−0.09**	0.04*	0.01	−0.08**	−0.01	0.03*	0.25**	1.00	0.01
SPEC	−0.01	−0.01	0.05**	0.00	0.05**	−0.06**	−0.03	0.01	0.04*	0.01	0.01	0.01	0.02	0.01	1.00

The table reports descriptive statistics for the fee metrics and the correlation between variables used in the analysts' forecast model. See table 2 for the definitions of fee metrics and auditor specialization. Definitions of other variables are as follows: *MEET* equals 1 when a firm's actual EPS minus consensus analysts' forecast is within zero to one cent, and 0 otherwise. *MISS* equals 1 when a firm's actual EPS minus consensus analysts' forecast is within negative two cents, and 0 otherwise. *TENU* is the number of years that the auditor has audited the firm's financial statements. *LITIG* equals 1 if the firm operates in a high-litigation industry, and 0 otherwise. High-litigation industries are industries with SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370–7374. *MB* is market-to-book ratio. *MV* is the natural log of market value. *LOSS* equals 1 if a firm reports a loss, and 0 otherwise. *CFO* is cash flow from operations scaled by total assets at the beginning of the fiscal year. *FIN* equals 1 if the firm issued securities or acquired another company, and 0 otherwise. *ROA* is the returns on assets. *DCA* is the discretionary current accruals estimated with lagged ROA in the cross-sectional Jones [1991] model. *SPEC* equals 1 if the auditor has the largest market share in the industry, and 0 otherwise. Mean (median) differences in fees between specialist and nonspecialists are based on *t*-tests (Mann-Whitney tests). * and ** denote significance at the 5% and 1% levels (two-tailed), respectively.

TABLE 7

Fee Metrics, Auditor Specialization, and Analysts' Forecast

Panel A: Meeting analysts' forecasts

		LNAU			*PRNAU*		*LTOT*	
Intercept	φ_0	−2.425	−2.456	−2.390	−2.423	−2.338	−2.351	−2.164
		(129.77)***	(129.17)***	(101.92)***	(129.81)***	(109.00)***	(76.77)***	(50.06)***
FEE	φ_1		0.013	0.008	0.003	0.002	−0.030	−0.051
			(0.14)	(0.05)	(1.26)	(0.47)	(0.30)	(0.78)
			[0.31%]	[0.19%]	[0.95%]	[0.62%]	[−0.52%]	[−0.52%]
TENU	φ_2	−0.002	−0.002	−0.002	−0.002	−0.002	−0.001	−0.001
		(0.09)	(0.06)	(0.11)	(0.09)	(0.14)	(0.03)	(0.06)
		[−0.20%]	[−0.17%]	[−0.22%]	[−0.20%]	[−0.25%]	[−0.11%]	[−0.16%]
LITIG	φ_3	−0.098	−0.093	−0.095	−0.090	−0.092	−0.102	−0.104
		(0.94)	(0.84)	(0.88)	(0.79)	(0.82)	(1.00)	(1.03)
		[−0.68%]	[−0.65%]	[−0.66%]	[−0.62%]	[−0.64%]	[−0.71%]	[−0.72%]
MB	φ_4	0.038	0.039	0.039	0.042	0.042	0.035	0.034
		(5.08)**	(5.27)**	(5.27)**	(6.11)**	(6.07)***	(3.75)**	(3.70)**
		[1.55%]	[1.62%]	[1.62%]	[1.75%]	[1.74%]	[1.42%]	[1.41%]
MV	φ_5	0.211	0.199	0.199	0.182	0.181	0.227	0.225
		(40.62)***	(23.22)***	(22.88)***	(19.74)***	(19.42)***	(23.50)***	(23.02)***
		[4.93%]	[4.65%]	[4.64%]	[4.24%]	[4.23%]	[5.30%]	[5.25%]
LOSS	φ_6	−0.850	−0.854	−0.854	−0.856	−0.857	−0.848	−0.851
		(38.19)***	(38.53)***	(38.53)***	(38.89)***	(38.98)***	(37.95)***	(38.20)***
		[−5.87%]	[−5.90%]	[−5.90%]	[−5.91%]	[−5.92%]	[−5.86%]	[−5.88%]
CFO	φ_7	−0.599	−0.588	−0.585	−0.588	−0.580	−0.608	−0.590
		(1.76)	(1.69)	(1.67)	(1.68)	(1.63)	(1.81)	(1.69)
		[−1.43%]	[−1.41%]	[−1.40%]	[−1.41%]	[−1.39%]	[−1.46%]	[−1.41%]

(*Continued*)

TABLE 7 — *Continued*

Panel A: Meeting analysts' forecasts

		LNAU			*PRNAU*		*LTOT*	
FIN	φ_8	−0.158	−0.160	−0.157	−0.159	−0.157	−0.162	−0.158
		(1.75)	(1.78)	(1.72)	(1.77)	(1.72)	(1.83)	(1.73)
		[−0.93%]	[−0.94%]	[−0.93%]	[−0.94%]	[−0.92%]	[−0.95%]	[−0.93%]
ROA	φ_9	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		(0.86)	(0.85)	(0.87)	(0.93)	(0.92)	(0.78)	(0.76)
		[1.12%]	[1.12%]	[1.13%]	[1.18%]	[1.17%]	[1.07%]	[1.06%]
DCA	φ_{10}	−0.047	−0.047	−0.047	−0.047	−0.047	−0.048	−0.048
		(0.77)	(0.78)	(0.77)	(0.79)	(0.76)	(0.81)	(0.79)
		[−0.67%]	[−0.67%]	[−0.67%]	[−0.67%]	[−0.66%]	[−0.68%]	[−0.68%]
SPEC	φ_{11}	−0.109		−0.314		−0.351		−0.791
		(0.98)		(0.66)		(1.65)		(1.86)
		[−0.65%]		[−1.88%]		[−2.11%]		[−4.74%]
Y00	φ_{12}	−0.426	−0.428	−0.432	−0.413	−0.415	−0.421	−0.424
		(19.86)***	(19.81)***	(20.08)***	(18.44)***	(18.61)***	(19.34)***	(19.57)***
FEE ∗ *SPEC*	φ_{13}			0.033		0.004		0.100
				(0.29)		(0.98)		(1.45)
				[1.23%]		[1.53%]		[4.07%]
FEE + *FEE* ∗ *SPEC*	$\varphi_1 + \varphi_{13}$			0.041		0.006		0.049
				[0.46]		[2.03]		[0.34]
N		3,498	3,498	3,498	3,498	3,498	3,498	3,498
χ^2 statistic		175.01***	174.60***	175.55***	175.69***	176.87***	174.19***	176.00***
Pseudo R^2		9.0%	8.9%	9.0%	9.0%	9.1%	9.0%	9.1%

(*Continued*)

TABLE 7 — *Continued*

Panel B: Missing analysts' forecast

			LNAU		*PRNAU*		*LTOT*	
Intercept	φ_0	−3.990	−3.935	−3.650	−4.059	−3.852	−3.767	−3.281
		(167.00)***	(159.25)***	(117.64)***	(171.72)***	(142.12)***	(98.10)***	(58.09)***
FEE	φ_1		−0.071	−0.100	−0.005	−0.007	−0.083	−0.141
			(2.30)	(4.19)**	(2.84)*	(5.04)**	(1.20)	(3.06)*
			[−0.80%]	[−1.13%]	[−0.93%]	[−1.29%]	[−0.66%]	[−1.12%]
TENU	φ_2	0.009	0.011	0.010	0.011	0.010	0.011	0.010
		(1.11)	(1.56)	(1.38)	(1.59)	(1.39)	(1.56)	(1.32)
		[0.44%]	[0.53%]	[0.50%]	[0.53%]	[0.50%]	[0.53%]	[0.49%]
LITIG	φ_3	−0.062	−0.066	−0.066	−0.064	−0.068	−0.074	−0.080
		(0.18)	(0.21)	(0.21)	(0.20)	(0.22)	(0.26)	(0.30)
		[−0.20%]	[−0.21%]	[−0.21%]	[−0.21%]	[−0.22%]	[−0.24%]	[−0.26%]
MB	φ_4	−0.035	−0.044	−0.044	−0.045	−0.045	−0.045	−0.047
		(2.01)	(2.94)*	(2.98)*	(3.08)*	(3.17)*	(2.86)*	(3.05)*
		[−0.66%]	[−0.83%]	[−0.84%]	[−0.85%]	[−0.86%]	[−0.85%]	[−0.88%]
MV	φ_5	0.290	0.339	0.328	0.344	0.338	0.337	0.331
		(38.65)***	(33.57)***	(31.21)***	(35.18)***	(33.65)***	(25.90)***	(24.85)***
		[3.12%]	[3.65%]	[3.53%]	[3.70%]	[3.64%]	[3.63%]	[3.56%]
LOSS	φ_6	−0.666	−0.658	−0.667	−0.662	−0.669	−0.662	−0.674
		(11.96)***	(11.59)***	(11.90)***	(11.72)***	(11.96)***	(11.75)***	(12.13)***
		[−2.12%]	[−2.10%]	[−2.12%]	[−2.11%]	[−2.13%]	[−2.11%]	[−2.15%]
CFO	φ_7	−2.458	−2.485	−2.468	−2.457	−2.449	−2.486	−2.442
		(17.25)***	(17.65)***	(17.27)***	(17.35)***	(17.13)***	(17.69)***	(16.90)***
		[−2.71%]	[−2.74%]	[−2.73%]	[−2.71%]	[−2.71%]	[−2.75%]	[−2.70%]
FIN	φ_8	−0.157	−0.161	−0.153	−0.163	−0.159	−0.167	−0.158
		(0.87)	(0.91)	(0.82)	(0.93)	(0.88)	(0.97)	(0.88)
		[−0.43%]	[−0.44%]	[−0.42%]	[−0.44%]	[−0.43%]	[−0.45%]	[−0.43%]

(*Continued*)

TABLE 7 — *Continued*

Panel B: Missing analysts' forecast

		LNAU			*PRNAU*		*LTOT*	
ROA	φ_9	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		(1.23)	(1.07)	(1.05)	(0.98)	(0.95)	(1.07)	(0.99)
		[0.74%]	[0.69%]	[0.69%]	[0.66%]	[0.65%]	[0.69%]	[0.66%]
DCA	φ_{10}	−0.155	−0.157	−0.156	−0.157	−0.155	−0.157	−0.156
		(4.62)**	(4.72)**	(4.54)**	(4.71)**	(4.48)**	(4.77)**	(4.60)**
		[−1.01%]	[−1.03%]	[−1.02%]	[−1.02%]	[−1.01%]	[−1.02%]	[−1.02%]
SPEC	φ_{11}	−0.157		−1.264		−0.851		−2.051
		(0.98)		(4.53)**		(4.35)**		(6.02)***
		[−0.43%]		[−3.50%]		[−2.35%]		[−5.67%]
Y00	φ_{12}	0.981	0.110	0.104	0.064	0.060	0.094	0.091
		(0.38)	(0.67)	(0.60)	(0.23)	(0.20)	(0.50)	(0.46)
FEE ∗ *SPEC*	φ_{13}			0.177		0.011		0.269
				(4.00)**		(3.61)*		(5.54)**
				[3.02%]		[1.94%]		[5.06%]
FEE + *FEE* ∗ *SPEC*	$\varphi_1 + \varphi_{13}$			0.077		0.004		0.128
				[0.77]		[0.44]		[1.22]
N		3,498	3,498	3,498	3,498	3,498	3,498	3,498
χ^2 statistic		78.92***	79.47***	83.70***	80.25***	83.95***	78.54***	84.00***
Pseudo R^2		5.6%	5.7%	6.0%	5.7%	6.0%	5.6%	6.0%

A total of 3,498 firm-year observations is available for the analysts' forecast model for the period 2000–2001. Analyst forecast data are from the detailed I/B/E/S file. The logistic regression is as follows:

$$MEET \text{ or } MISS = \varphi_0 + \varphi_1 FEE + \varphi_2 TENU + \varphi_3 LITIG + \varphi_4 MB + \varphi_5 MV + \varphi_6 LOSS + \varphi_7 CFO + \varphi_8 FIN + \varphi_9 ROA + \varphi_{10} DCA + \varphi_{11} SPEC + \varphi_{12} Y00 + \varphi_{13} FEE * SPEC + \varepsilon$$

Other variables are as defined in the footnotes of table 6. *Y*00 is year dummy. For each variable, we report the regression coefficient, followed by the Wald statistic in parentheses, and the marginal effect (in percent) in square brackets. The marginal effect indicates the change in the probability of a firm meeting (missing) an earnings benchmark per standard deviation change in each respective independent variable (holding other independent variables constant), given the base-rate probability of meeting (missing) the earnings benchmark of 17% (7%). We use χ^2 statistics to test whether the sum of the coefficients ($\varphi_1 + \varphi_{13}$) differs from zero and report the χ^2 statistic in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

through lower audit and financial reporting quality, these results suggest that when an auditor's provision of non-audit services to a firm increases, audit quality is more likely to be impaired for nonspecialist auditors than specialist auditors.

4.4 EARNINGS-RETURNS RELATION

4.4.1. Empirical Model. We use the ERC from earnings-returns regressions as a proxy for investor perceptions of earnings quality. Following prior studies (e.g., Krishnan, Sami, and Zhang [2005], Francis and Ke [2006]), we measure three-day cumulative abnormal returns for days −1, 0, and 1, where day 0 is the day of the first quarterly earnings announcement after fee disclosure in the proxy statements, where abnormal returns is defined as the difference between a firm's returns and CRSP value-weighted market returns.[20]

To ensure comparability with prior studies, we use a set of control variables similar to those used in Francis and Ke [2006]. Specifically, we run the following regression:

$$\begin{aligned} CAR = {} & \alpha_0 + \alpha_1(UE) + \alpha_2(FEE) + \alpha_3(UE{*}FEE) + \alpha_4(GRW) + \alpha_5(UE{*}GRW) \\ & + \alpha_6(VOL) + \alpha_7(UE{*}VOL) + \alpha_8(LEV) + \alpha_9(UE{*}LEV) + \alpha_{10}(MV) \\ & + \alpha_{11}(UE{*}MV) + \alpha_{12}(LOSS) + \alpha_{13}(UE{*}LOSS) + \alpha_{14}(RESTR) \\ & + \alpha_{15}(UE{*}RESTR) + \alpha_{16}SPEC + \alpha_{17}(UE{*}SPEC) + \alpha_{18}Y00 \\ & + \alpha_{19}(UE{*}Y00) + \alpha_{20}(FEE{*}SPEC) + \alpha_{21}(UE{*}FEE{*}SPEC) + \varepsilon \end{aligned} \tag{7}$$

where

CAR = three-day cumulative abnormal returns around the first quarterly earnings announcement after the fee discourse in the proxy statements;
UE = earnings surprise, measured by the difference between actual EPS and the most recent median earnings forecast for the quarter immediately after the disclosure of fee information in the proxy statement, scaled by stock price at the beginning of the quarter; both actual and forecasted EPS are from I/B/E/S detailed files;
FEE = fee metrics, $LNAU$, $PRNAU$, and $LTOT$, as defined earlier;
GRW = sum of the market value of equity and book value of debt scaled by book value of assets at the end of the quarter;
VOL = standard deviation of daily stock returns over a 90-day window ending seven days prior to the earnings announcement date;
LEV = debt-to-capital ratio at the end of the quarter;
MV = natural log of market capitalization at the end of the quarter;

[20] Firms must file proxy statements with fee information to the SEC, which is typically three to four months after the fiscal year-end. We track the date of these proxy statements indicated in the Audit Analytics database to ensure that the fee information is available to investors when firms make the first quarterly earnings announcements after the fiscal year-end.

$LOSS =$ 1 if the current quarter's earnings is negative, and 0 otherwise;
$RESTR =$ 1 if the special item as a percentage of total assets in the quarter is less than or equal to -5%, and 0 otherwise;
$SPEC =$ 1 if the auditor has the largest market share in the industry, and 0 otherwise;
$Y00 =$ year dummy.

4.4.2. Empirical Results. Descriptive statistics for the fee data and variables used in the earnings-returns regression model are reported in table 8. The mean (median) *CAR* is 1% (0.5%). The mean (median) earnings surprise is 0.2% (0.1%) of the stock price at the beginning of the quarter. All three fee variables are significantly higher for the audit specialists than the non-audit specialists.

Table 9, panel A reports the results of the impact of non-audit fees and auditor specialization on the earnings-returns relation. Consistent with Balsam, Krishnan, and Yang [2003], we find that auditor specialization (in the model with *SPEC* but without *FEE*) is associated with a higher ERC. When we assess the effects of fees (without *SPEC*), consistent with prior studies (Krishnan, Sami, and Zhang [2005], Francis and Ke [2006]), we find that non-audit service fees are associated with a lower ERC, indicating that investors perceive earnings quality to be lower with high non-audit fees.[21]

We next include the interaction term $UE * FEE * SPEC$ (α_{21}) in the model. Consistent with our prediction in H1, the coefficient estimate for $UE * FEE * SPEC$ is positive and statistically significant for all three fee measures, suggesting that when auditors provide non-audit services to clients, earnings quality, and presumably audit quality, is perceived to be higher for specialist auditors than for nonspecialist auditors. To investigate the nature of this three-way interaction, we split the sample into two groups, firms audited by specialist and nonspecialist auditors, and assess whether the $UE * FEE$ interaction varies by auditor specialization. Results are shown in table 9, panel B. The $UE * FEE$ interaction tests whether the earnings-returns relation varies at different levels of fees. For firms audited by specialists, the coefficient estimate for $UE * FEE$ (α_3) is positive and significant at the 1% level, which is consistent with the notion that investors perceive earnings quality and presumably audit quality to be higher as specialists provide more non-audit services to their clients. In contrast, for firms audited by nonspecialists, the coefficient estimate for $UE * FEE$ (α_3) is negative and significant at the 1% level. This suggests that investors perceive earnings quality to be eroded when non-audit specialists provide more non-audit services.

[21] Krishnan, Sami, and Zhang [2005] find that total fees are associated with lower ERC only in the first quarter (but not the second and third quarters) following the release of fee information in the proxy statements. However, they find that unexpected total fees are associated with lower ERC in the second and third quarters following the proxy releases. In conclusion, they interpret their results as consistent with the notion of investors perceiving the provision of non-audit services as impairing auditor independence.

TABLE 8

Descriptive Statistics and Correlation between Variables Used in the Earnings-Returns Regression

Panel A: Descriptive statistics

	Mean	Median	1st Quartile	3rd Quartile	Std. Dev.
Fee metrics					
Total audit fees	857	332	164	758	2,053
Total Non-audit fees	1,943	420	139	1,300	5,814
Total fees	2,800	813	351	2,104	7,362
Fee ratio	0.53	0.56	0.38	0.70	0.22
Auditor specialization					
SPEC	0.25	0.00	0.00	0.00	0.43
Variables used in earnings-returns regression model					
CAR	0.010	0.005	−0.034	0.050	0.096
UE	0.002	0.001	0.000	0.002	0.021
GRW	1.975	1.399	0.934	2.328	1.824
VOL	0.039	0.033	0.023	0.049	0.022
LEV	0.598	0.369	0.017	0.986	4.865
MV	6.686	6.568	5.468	7.718	1.706
LOSS	0.280	0.000	0.000	1.000	0.449
RESTR	0.020	0.000	0.000	0.000	0.138

	Specialists ($N = 733$)		Nonspecialists ($N = 2{,}202$)		Difference	
	Mean	Median	Mean	Median	*t*-statistic	*z*-statistic
LNAU	6.36	6.27	5.95	5.95	5.10**	5.10**
PRNAU	60	64	58	60	2.37*	2.69**
LTOT	7.10	6.89	6.75	6.63	5.54**	4.75**

(*Continued*)

TABLE 8 — *Continued*

Panel B: Pearson correlation matrix

	CAR	*UE*	*LNAU*	*PRNAU*	*LTOT*	*GRW*	*VOL*	*LEV*	*MV*	*LOSS*	*RESTR*	*SPEC*
CAR	1.00											
UE	0.08*	1.00										
LNAU	0.00	−0.01	1.00									
PRNAU	−0.02	0.00	0.94**	1.00								
LTOT	−0.01	0.00	0.92**	0.88**	1.00							
GRW	−0.02	−0.03	−0.13**	−0.14**	−0.17**	1.00						
VOL	0.08**	0.07**	−0.20**	−0.26**	−0.28**	0.10**	1.00					
LEV	0.00	−0.03	0.05**	0.05*	0.06**	−0.06**	−0.06**	1.00				
MV	−0.01	−0.08**	0.64**	0.61**	0.72**	0.17**	−0.41**	0.04*	1.00			
LOSS	−0.10**	−0.02	−0.18**	−0.18**	−0.22**	0.03	0.42**	−0.01	−0.33**	1.00		
RESTR	−0.02	0.03	0.06**	0.05**	0.05**	−0.04	0.15**	0.02	−0.02	0.09**	1.00	
SPEC	−0.03	−0.03	0.10**	0.04*	0.11**	−0.02	0.00	−0.02	0.07**	0.01	0.04*	1.00

The sample for the earnings-returns regression model is 2,935 firm-year observations, with all information available from Compustat, I/B/E/S detailed files, and CRSP. See table 2 for definitions of fee metrics and auditor specialization. Definitions of other variables are as follows: *CAR* is three-day cumulative abnormal returns around the first quarterly earnings announcement after the fee discourse in the proxy statements. *UE* is earnings surprise, measured by the difference between actual EPS and most recent median earnings forecast for the quarter immediately after the disclosure of fee information in the proxy statement, scaled by stock price at the beginning of the quarter. Both actual and forecasted EPS are from I/B/E/S detailed files. *LNAU* is the natural log of non-audit fees. *PRNAU* is the percentile rank of a particular client's non-audit fees given all non-audit fees received by the audit firm. *LTOT* is the natural log of total fees. *GRW* is the sum of the market value of equity and book value of debt scaled by book value of assets at end of quarter. *VOL* is the standard deviation of daily stock returns over a 90-day window ending seven days prior to the earnings announcement date. *LEV* is the debt-to-capital ratio at the end of the quarter. *MV* is the natural log of market capitalization at the end of the quarter. *LOSS* equals 1 if the current quarter's earnings is negative, and 0 otherwise. *RESTR* equals 1 if the special item as a percentage of total assets in the quarter is less than or equal to −5%, and 0 otherwise. *SPEC* equals 1 if the auditor has the largest market share in the industry, and 0 otherwise. Mean (median) differences in fees between specialists and nonspecialists are based on *t*-tests (Mann-Whitney tests). * and ** denote significance at the 5%, and 1% levels (two-tailed), respectively.

TABLE 9

Fee Metrics, Auditor Specialization, and Earnings-Returns Relation

Panel A: Interaction effect between fee metrics and auditor specialization on earnings-returns relation

			LNAU		*PRNAU*		*LTOT*	
Intercept	α_0	−0.007	−0.009	−0.004	−0.010	−0.007	−0.005	0.004
		(0.76)	(−0.91)	(−0.42)	(−1.05)	(−0.67)	(−0.40)	(0.35)
UE	α_1	−2.960	−0.815	−0.093	−1.411	−0.730	0.565	1.244
		(−4.86)***	(−0.82)	(−0.09)	(−1.67)*	(−0.85)	(0.43)	(0.93)
FEE	α_2		−0.001	−0.002	−0.006	−0.011	−0.002	−0.003
			(−0.73)	(−1.05)	(−0.64)	(−1.12)	(−0.97)	(−1.42)
UE∗FEE	α_3		−0.323	−0.362	−0.018	−0.020	−0.450	−0.477
			(−2.95)***	(−3.26)***	(−2.92)***	(−3.22)***	(−3.16)***	(−3.33)***
GRW	α_4	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002	−0.002
		(−1.59)	(−1.69)*	(−1.73)*	(−1.64)*	(−1.74)*	(−1.78)*	(−1.85)*
UE∗GRW	α_5	0.408	0.292	0.319	0.266	0.321	0.242	0.278
		(1.70)	(1.19)	(1.29)	(1.07)	(1.28)	(0.97)	(1.11)
VOL	α_6	0.568	0.587	0.580	0.586	0.583	0.586	0.583
		(5.51)***	(5.68)***	(5.61)***	(5.67)***	(5.65)***	(5.68)***	(5.66)***
UE∗VOL	α_7	−7.375	−19.674	−21.129	−21.646	−23.283	−21.793	−22.759
		(−1.41)	(−3.03)***	(−3.21)***	(−3.13)***	(−3.33)***	(−3.24)***	(−3.34)***
LEV	α_8	−0.060	−0.047	−0.044	−0.047	−0.042	−0.044	−0.042
		(−1.49)	(−1.17)	(−1.08)	(−1.16)	(−1.04)	(−1.10)	(−1.04)
UE∗LEV	α_9	0.084	0.066	0.058	0.066	0.057	0.063	0.056
		(3.90)***	(2.94)***	(2.53)**	(2.90)***	(2.48)**	(2.78)***	(2.44)**
MV	α_{10}	0.008	0.084	0.091	0.067	0.083	0.142	0.153
		(0.07)	(0.54)	(0.58)	(0.44)	(0.55)	(0.80)	(0.86)

(*Continued*)

TABLE 9 — *Continued*

Panel A: Interaction effect between fee metrics and auditor specialization on earnings-returns relation

		LNAU			*PRNAU*		*LTOT*	
UE ∗ *MV*	α_{11}	1.003	1.178	1.046	1.144	0.987	1.176	1.035
		(7.20)***	(8.26)***	(7.09)***	(8.17)***	(6.78)***	(8.30)***	(7.00)***
LOSS	α_{12}	−0.027	−0.026	−0.026	−0.026	−0.026	−0.026	−0.026
		(−6.02)***	(−5.93)***	(−5.84)***	(−5.97)***	(−5.88)***	(−5.88)***	(−5.82)***
UE ∗ *LOSS*	α_{13}	−0.892	−1.090	−1.097	−0.963	−0.963	−1.144	−1.133
		(−2.82)***	(−3.30)***	(−3.28)***	(−3.01)***	(−2.98)***	(−3.44)***	(−3.36)***
RESTR	α_{14}	−0.020	−0.020	−0.020	−0.020	−0.019	−0.020	−0.019
		(−1.53)	(−1.59)	(−1.55)	(−1.58)	(−1.52)	(−1.55)	(−1.50)
UE ∗ *RESTR*	α_{15}	−0.548	−0.002	0.108	−0.024	0.039	−0.099	−0.032
		(−1.17)	(−0.00)	(0.21)	(−0.05)	(0.08)	(−0.20)	(−0.07)
SPEC	α_{16}	−0.006		−0.018		−0.015		−0.031
		(−1.51)		(−1.30)		(−1.61)		(−1.59)
UE ∗ *SPEC*	α_{17}	1.387		−3.878		−2.382		−7.015
		(2.45)**		(−1.77)*		(−1.84)*		(−2.01)**
Y00	α_{18}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		(3.09)***	(3.22)***	(3.29)***	(3.04)***	(3.10)***	(3.21)***	(3.24)***
UE ∗ *Y00*	α_{19}	0.287	0.350	0.388	0.233	0.346	0.376	0.417
		(0.72)	(0.87)	(0.97)	(0.58)	(0.86)	(0.94)	(1.04)
FEE ∗ *SPEC*	α_{20}			0.002		0.015		0.004
				(0.89)		(1.03)		(1.31)
UE ∗ *FEE* ∗ *SPEC*	α_{21}			0.901		0.069		1.253
				(2.47)**		(3.18)***		(2.42)**
N		2,935	2,935	2,935	2,935	2,935	2,935	2,935
F-statistic		14.30***	14.41***	12.40***	14.39***	12.62***	14.52***	12.52***
Adj. R^2		7.15%	7.21%	7.55%	7.20%	7.68%	7.27%	7.62%

(*Continued*)

TABLE 9 — *Continued*

Panel B: Effect of fee metrics on earnings-returns relation based on audit specialization

		Specialists			Nonspecialists		
		LNAU	*PRNAU*	*LTOT*	*LNAU*	*PRNAU*	*LTOT*
Intercept	α_0	−0.037	−0.039	−0.036	−0.003	−0.005	0.007
		(−1.86)*	(−1.94)*	(−1.61)	(−0.24)	(−0.45)	(0.49)
UE	α_1	3.803	6.494	−3.113	−0.250	−0.861	1.087
		(1.05)	(1.91)*	(−0.67)	(−0.24)	(−0.99)	(0.79)
FEE	α_2	−0.002	−0.005	−0.070	−0.134	−0.011	−0.369
		(−0.77)	(−0.27)	(−0.16)	(−0.88)	(−1.08)	(−1.54)
UE ∗ *FEE*	α_3	1.667	0.115	2.678	−0.381	−0.022	−0.496
		(3.19)***	(3.82)***	(3.39)***	(−3.37)***	(−3.49)***	(−3.36)***
GRW	α_4	−0.001	0.001	0.001	−0.002	−0.002	−0.003
		(−0.08)	(0.05)	(0.14)	(−2.10)**	(−2.12)**	(−2.35)**
UE ∗ *GRW*	α_5	0.470	0.617	0.522	0.411	0.363	0.360
		(0.84)	(1.10)	(0.93)	(1.48)	(1.29)	(1.27)
VOL	α_6	0.627	0.623	0.643	0.553	0.557	0.556
		(3.08)***	(3.06)***	(3.15)***	(4.63)***	(4.67)***	(4.68)***
UE ∗ *VOL*	α_7	−6.990	2.348	−9.790	−24.141	−27.251	−25.649
		(−0.26)	(0.09)	(−0.36)	(−3.59)***	(−3.79)***	(−3.68)***
LEV	α_8	0.091	0.092	0.085	−0.109	−0.107	−0.105
		(1.30)	(1.33)	(1.22)	(−2.15)**	(−2.11)**	(−2.07)**
UE ∗ *LEV*	α_9	−0.113	−0.081	−0.081	0.075	0.073	0.073
		(−0.81)	(−0.59)	(−0.58)	(3.15)***	(3.07)***	(3.05)***
MV	α_{10}	0.422	0.288	0.260	0.076	0.088	0.205
		(1.23)	(0.89)	(0.66)	(0.44)	(0.52)	(1.03)

(*Continued*)

TABLE 9 — *Continued*

Panel B: Effect of fee metrics on earnings-returns relation based on audit specialization

		Specialists			Nonspecialists		
		LNAU	*PRNAU*	*LTOT*	*LNAU*	*PRNAU*	*LTOT*
$UE * MV$	α_{11}	−1.104	−1.140	−1.377	1.158	1.127	1.153
		(−1.83)*	(−2.00)**	(−2.14)**	(7.56)***	(7.47)***	(7.54)***
LOSS	α_{12}	−0.025	−0.025	−0.026	−0.023	−0.023	−0.023
		(−2.67)***	(−2.72)***	(−2.74)***	(−4.62)***	(−4.64)***	(−4.58)***
$UE * LOSS$	α_{13}	−5.608	−5.663	−5.244	−1.046	−0.904	−1.088
		(−4.09)***	(−4.21)***	(−3.77)***	(−3.00)***	(−2.67)***	(−3.09)***
RESTR	α_{14}	0.008	0.008	0.009	−0.036	−0.035	−0.035
		(0.37)	(0.35)	(0.39)	(−2.28)**	(−2.24)**	(−2.20)**
$UE * RESTR$	α_{15}	−2.497	−3.155	−2.605	0.317	0.311	0.149
		(−1.06)	(−1.33)	(−1.11)	(0.61)	(0.60)	(0.30)
*Y*00	α_{18}	0.016	0.015	0.014	0.012	0.011	0.012
		(1.93)*	(1.83)*	(1.78)*	(2.87)***	(2.61)***	(2.84)***
$UE * Y00$	α_{19}	−1.307	−1.306	−1.188	0.318	0.182	0.352
		(−0.95)	(−0.22)	(−0.87)	(0.76)	(0.44)	(0.84)
N		733	733	733	2,202	2,202	2,202
F-statistic		6.23***	6.51***	6.31***	11.94***	12.03***	12.05***
Adj. R^2		10.82%	11.35%	10.97%	7.79%	7.85%	7.86%

The earnings- returns regression model is:

$$CAR = \alpha_0 + \alpha_1(UE) + \alpha_2(FEE) + \alpha_3(UE * FEE) + \alpha_4(GRW) + \alpha_5(UE * GRW) + \alpha_6(VOL) + \alpha_7(UE * VOL) + \alpha_8(LEV)$$
$$+ \alpha_9(UE * LEV) + \alpha_{10}(MV) + \alpha_{11}(UE * MV) + \alpha_{12}(LOSS) + \alpha_{13}(UE * LOSS) + \alpha_{14}(RESTR) + \alpha_{15}(UE * RESTR) + \alpha_{16}SPEC$$
$$+ \alpha_{17}(UE * SPEC) + \alpha_{18}Y00 + \alpha_{19}(UE * Y00) + \alpha_{20}(FEE * SPEC) + \alpha_{21}(UE * FEE * SPEC) + \varepsilon$$

The variables are as defined in the footnotes of table 8. *Y*00 is a year dummy. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

As a robustness check, we include industry dummies that interact with earnings surprises in the ERC model to assess whether our results are driven by industry effects (Balsam, Krishnan, and Yang [2003]). Our results remain robust even after the inclusion of industry dummies. We also measure returns over [−1,0] or [−1,1] around the quarterly announcement date, with or without adjusting for market returns, and obtain similar results.

Overall, the evidence indicates that when auditors provide non-audit services to clients, earnings quality, and therefore audit quality, is perceived to be higher for specialist auditors than for nonspecialist auditors.

4.5 YEAR-BY-YEAR ANALYSES

In additional analyses, we analyze the models for each year separately. For the going-concern opinion model, the coefficient estimate for the interaction term (*FEE* ∗ *SPEC*) is positive and significant at the 10% level for each year only for *LTOT*, but, inconsistent with our main findings, is not significant in either year for *LNAU* and *PRNAU*. One possible reason is that the power of the test is reduced when we split the sample by year. There are 649 firms in 2000, with only 33 firms receiving going-concern opinions, and 1,043 firms in 2001, with 87 firms with going-concern opinions.

For the discretionary accruals test, similar to those reported in table 5, we do not find any statistically significant *FEE* ∗ *SPEC* interaction. For the *MEET* test, the interaction term is not statistically significant for all three fee variables, similar to our main analyses. For the *MISS* test, the interaction term (*FEE* ∗ *SPEC*) is positive and statistically significant only for the year 2001, but not 2000, for all three fee measures (whereas interaction terms for all three fee proxies are statistically significant when pooled, as reported in the main analyses). Finally, for the ERC test, we find that firms audited by specialists are associated (not associated) with a higher ERC in year 2000 (2001). In comparison, firms audited by nonspecialists are associated with a lower ERC only in the year 2001, but not in the year 2000. In the pooled analyses, we find that firms audited by specialists (nonspecialists) are associated with a higher (lower) ERC.

Overall, our results are generally weaker using year-by-year data than those found in the main analyses using pooled data, likely due to the lower power associated with smaller sample sizes.

4.6 SIZE EFFECT

It is possible that our measures of auditor specialization and fees are proxying for some size effect—that is, larger firms likely have more complex operations and attract larger litigation risks, and are therefore more likely to employ specialized auditors for their expertise and pay higher fees. In all our analyses, we control for firm size, which somewhat alleviates this concern. We further explore this issue here. We find that *SPEC* has low correlations with firm size (between 0.04 and 0.08) and the various fee measures (between 0.00 and 0.11); see panel B of various tables. Thus, *SPEC*

has good discriminant validity from other constructs such as firm size and fees.

On the other hand, the correlation between size and fee measures is high (between 0.57 and 0.79), which raises the possibility that fees and firm size are substitutes and not distinct constructs. If this is the case, it implies that our findings of a two-way interaction between *SPEC* and *FEE* should replicate when we replace our fee measures with firm size. On the other hand, if they are distinct constructs, these results may not replicate. In untabulated results, for models that exclude the fee measures but include *SPEC*, firm size (using total assets as a proxy for size), and their interaction, we fail to find significant interactions between *SPEC* and firm size for any of the audit quality measures. In contrast, we find a *SPEC* by *FEE* interaction for the going-concern, *MISS*, and ERC measures. These findings suggest that fees and firm size are different constructs.

5. Conclusion

Recent studies on whether the provision of non-audit services impairs auditor independence and audit quality have found mixed results, depending on the proxy for audit quality used. We posit and provide some evidence that the effect of non-audit fees on audit quality is conditional on auditor industry specialization. Table 10 summarizes our primary results, and key differences between findings in our study and those of prior studies. We find that audit quality as measured by the increased propensity to issue going-concern opinions, reduced propensity to avoid missing analysts' forecasts, and higher ERCs, is generally enhanced for firms that acquire non-audit services from specialist auditors compared to those that acquire non-audit services from nonspecialist auditors. We fail to detect a non-audit fee by auditor specialization interaction for both the propensities to record higher discretionary current accruals and to just meet analysts' forecasts. Taken together, our results provide some evidence, using going-concern opinions, propensity to avoid missing analysts' forecasts, and ERCs, that industry-specialized auditors are more likely than nonspecialists to provide higher audit quality when they provide non-audit services to clients. This higher audit quality associated with industry specialists (relative to nonspecialists) when they provide non-audit services can be attributed to their greater independence both in fact and in appearance, and/or their greater ability to benefit from knowledge spillovers.

Our failure to detect an interaction between non-audit service provision and auditor specialization for discretionary accruals and the propensity to just meet analysts' forecasts raises questions on the measurement error associated with some of these measures (e.g., see Kinney and Libby's [2002] comment on the reliability of discretionary accruals) and on the sensitivity of benchmark tests to how they are operationalized (e.g., in terms of avoiding missing or just meeting analysts' forecasts). It is also possible that the provision of non-audit fees has no association with some proxies of audit

TABLE 10

Summary of Results

Going-concern opinions test

	Defond, Raghunandan, and Subramanyam [2002]		Our Study			
	Non-audit Fees	Total Fees	Non-Audit Fees	Client Importance	Total Fees	Moderating Role of Auditor Specialization
GC opinions	No association	No association	No association	No association	Positive association	Yes

Discretionary accruals test

	Frankel, Johnson, and Nelson [2002]		Ashbaugh, Lafond, and Mayhew [2003]		Chung and Kallapur [2003]	Our Study			
	Non-Audit Fees	Total Fees	Non-Audit Fees	Total Fees	Client Importance	Non-Audit Fees	Client Importance	Total Fees	Moderating Role of Auditor Specialization
Absolute accruals	Positive association	No association	Positive/no association*	No association	No association	Positive association	No association	No association	No
Positive accruals	Positive association	Positive association	No association	No association	Not tested	No association	No association	Negative association	No
Negative accruals	Negative association	No association	Negative/no association*	No association	Not tested	Negative association	Negative association	Negative association	No

(*Continued*)

TABLE 10 — *Continued*

Propensity to meet analysts' forecasts	Frankel, Johnson, and Nelson [2002]		Ashbaugh, Lafond, and Mayhew [2003]		Our Study			
	Non-Audit Fees	Total Fees	Non-Audit Fees	Total Fees	Non-Audit Fees	Client Importance	Total Fees	Moderating Role of Audit Specialization
MEET	Positive association	No association	No association	No association	No association	No association	No association	No
MISS	Negative association	Not reported	Not tested	Not tested	No association	Negative association	No association	Yes

ERC test	Francis and Ke [2006]	Krishnan, Sami, and Zhang [2005]		Our Study			
	Non-Audit Fees	Non-Audit Fees	Total Fees	Non-Audit Fees	Client Importance	Total Fees	Moderating Role of Audit Specialization
ERC	Negative association	Negative association	Negative association	Negative association	Negative association	Negative association	Yes

The table summarizes and compares our primary results and those of prior studies. Stated associations are statistically significant at the 10% level.
*Depending on the proxies of accruals used.

quality to begin with, that there are limits to the extent auditor specialization moderates the influence of non-audit services, and/or that the relation between auditor specialization and provision of non-audit fees is more complex and involves other moderators not investigated in this study. Future research can explore these possibilities.

In conclusion, concerns about the impairment of auditors' independence through the provision of non-audit services to their audit clients have led to a series of recent actions by regulators, beginning with the requirement for SEC registrants to disclose audit fees in their proxy statements, followed by restrictions of certain categories of non-audit services that auditors can provide. These measures apply to all public accounting firms and their listed clients. Our findings suggest that not all public accounting firms are necessarily tainted by the provision of non-audit services. Our results suggest that there is some evidence consistent with industry specialist auditors retaining their independence both in fact and appearance even when they provide non-audit services to their audit clients. In addition, our findings indicate that auditor industry specialization, or more broadly speaking, auditor expertise, can play an important role in mitigating the regulatory and academic communities' concerns about the appropriateness of accounting firms providing non-audit services.

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