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Relation between Audit Effort and Financial Report Misstatements: Evidence from Quarterly and Annual Restatements

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ABSTRACT: We identify two research design issues that explain the inconsistency between the theoretically predicted negative relation between audit effort and misstatements (measured using restatements) and empirical findings. First, auditor risk adjustment behavior induces an upward bias in the association between audit effort and restatements. Second, the theoretical prediction applies only to audited financial reports (i.e., annual reports) and not to unaudited reports (i.e., interim quarterly reports). Comingling restatements of audited with unaudited reports introduces an additional upward bias in the association between audit effort and restatements. After correcting for these two sources of bias, we find a robust negative association between audit effort and annual report restatements.

Keywords: *audit effort*; *audit fees*; *financial report misstatements*.

JEL Classification: *M49.*

Data Availability: *Data used in this study are available from public sources.*

I. INTRODUCTION

This study examines whether the likelihood of misstatements in financial reports decreases as audit effort increases. Theory predicts that higher audit effort increases the likelihood of detected errors and reduces the likelihood of undetected errors (Shibano 1990; Matsumura and Tucker 1992; Dye 1993; Hillegeist 1999), implying a negative relation between current-year audit effort and subsequent restatement of current-year financial reports. Despite its importance for audit research, few empirical studies have explicitly tested this theoretical prediction. The most

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relevant among those studies is Hribar et al. (2010), but they find a positive association between current-year audit effort, measured by audit fees, and the probability of restatements. We posit that two reasons for this inconsistency between the theoretical prediction and empirical findings are (1) the empirical tests' failure to control for auditor risk adjustment, and (2) the empirical tests' failure to separate restatements of audited financial reports from restatements of unaudited reports, both of which positively bias the estimated relation between audit effort and subsequent restatements. We provide empirical evidence consistent with these explanations.

The role of the audit in reducing misstatements is not only fundamental to audit research, but also has profound practical implications. The Securities and Exchange Commission (SEC) regards restatements as "the most visible indicator of improper accounting" (Schroeder 2001). When the public was outraged by the accounting scandals in the late 1990s and early 2000s, regulators questioned audit quality. This concern is reflected in the statement by John D. Dingell, the ranking Democrat on the House Energy and Commerce Committee, that "[h]ow to make accountants do their job will be one of our big interests" (Byrnes el al. 2002). A similar concern is expressed by former SEC chief accountant Lynn E. Turner, who states, "Given the billions of dollars that the public lost in the savings and loan crisis of the 80s, one must ask if these costs don't justify more effective audits today—before it becomes hundreds of billions of dollars" (Turner 1999). Despite its important policy implications, there is a surprising paucity of empirical evidence on whether higher audit effort reduces misstatements.

We posit that two research design issues, which positively bias the estimated relation between audit effort and subsequent restatements, hinder researchers' ability in this regard. The first source of bias arises because audit effort is endogenous (Johnstone and Bedard 2001, 2003). The external auditor responds to increases in misstatement risk by increasing audit effort (hereafter, auditor risk adjustment). To the extent that misstatement risk increases both the audit effort and the likelihood of eventual restatements, failure to control for misstatement risk leads to an upward bias in the estimated relation between audit effort and the likelihood of restatements (hereafter, endogeneity bias), reflecting a serious correlated omitted variable problem (Wooldridge 2009, 89–94). The second source of bias arises because prior research fails to separate restatements of audited reports from restatements of unaudited reports when estimating the relation between audit effort and restatements. An implicit assumption in prior theoretical work is that financial reports are issued, not before, but after the audit is completed (Shibano 1990; Matsumura and Tucker 1992; Dye 1993; Hillegeist 1999). This assumption implies that the predicted negative relation between audit effort and subsequent restatements is applicable only to audited financial reports (i.e., annual reports), but not to unaudited financial reports (i.e., quarterly reports).[1] As a result, the negative relation between audit effort and restatements will be weaker (less negative) if quarterly report restatements are comingled with annual report restatements. In sum, the failure to correct for the upward bias caused by auditor risk adjustment, together with the failure to separate restatements of audited reports from restatements of unaudited reports, potentially result in an estimated positive association between audit effort and restatements.

This study attempts to correct for these two sources of bias and thereby reconcile the difference between theory and empirical evidence. To control for the upward bias caused by quarterly restatements, we simply separate restatements of quarterly-only reports from restatements of annual reports. We employ two approaches to control for the upward bias due to auditor risk adjustment. First, we correct for the endogeneity bias by including estimates of misstatement risk in modeling the probability of restatements. A variation of this procedure is to purge the effects of common

[1] Although the auditor conducts a review of quarterly reports primarily through inquiries of clients' employees and analytical procedures, no substantive testing is performed. Given that the auditor does not conduct an audit on quarterly reports, the auditor is less likely to detect a misstatement in quarterly reports.

determinants, including misstatement risk, on audit effort, and focus on the association between abnormal audit effort and restatements. Consistent with prior research (Gul 2006; Srinidhi and Gul 2007), we use total and abnormal audit fees as our proxies for audit effort. Second, we identify a subsample with *actual* pre-audit misstatement risk approximately equal to 1 (hereafter, the conditional sample), and use this conditional sample to examine the association between audit effort and annual restatements. To the extent that the observations in this conditional sample have approximately the same actual pre-audit misstatement risk, we implicitly control for auditor risk adjustment and thereby reduce the upward bias in the estimated relation between audit effort and restatements.

Using U.S. firm data from 2000 to 2009, we report the following key results. First, before correcting for the two sources of upward bias, we find either a positive association or no association between audit fees and the likelihood of future restatements, consistent with prior findings (Kinney et al. 2004; Hribar et al. 2010). However, after simultaneously correcting for the two sources of upward bias, we find a negative relation between audit fees and subsequent annual report restatements, consistent with the theoretical prediction. Based on the average marginal effect for the full sample, our results imply that as total audit fees (abnormal audit fees) increase from the 25th percentile to the 75th percentile, the unconditional probability of a future annual report restatement decreases by 2.17 percent (1.15 percent), a significant reduction in relation to the 7.67 percent base rate of annual report restatements for the full sample.

We believe that ours is the first study to document a robust negative association between audit fees and annual report restatements. This result is important to both audit research and audit practice. DeAngelo (1981) defines audit quality as the joint probability that the auditor detects an existing problem (auditor competence) and reports the detected problem (auditor independence). Holding audit effort constant, a more competent and more independent auditor is more likely to identify and correct a misstatement, thus reducing subsequent restatements. We propose an operational definition of audit quality that is consistent with DeAngelo (1981), with a stronger negative association between audit fees and restatements reflecting higher audit quality. With regard to audit practice, our results underscore the value of the audit to investors. Prior research documents significant loss of investor wealth when restatements are announced (Palmrose et al. 2004; GAO 2006; Hennes et al. 2008). We provide empirical evidence that higher audit effort can effectively reduce the likelihood of such costly restatements.

Section II reviews the prior literature, and Section III develops the hypotheses. Section IV describes the research design, Section V discusses the results of the main and additional analyses, and Section VI concludes the study.

II. PRIOR RELATED LITERATURE

Shibano (1990) develops a model that relates audit quality to the likelihood of misstatements. His model demonstrates that the auditor can decrease the probability of undetected misstatements through higher audit effort. The models in Dye (1993) and Hillegeist (1999) predict that hard-working auditors are more likely to detect earnings management. Using a two-stage game theoretic framework, Matsumura and Tucker (1992) analyze the relation between various dimensions of audit and fraud risk and conduct an experiment to test the predictions from their model. Their experiment finds that audit fees are negatively related to undetected fraud.[2]

[2] The expectation that higher audit effort reduces the probability of undetected misstatements is not only grounded in theory, but is also intuitive and implicitly assumed by auditing standards. For example, AS No. 13, *The Auditor's Responses to the Risks of Material Misstatement* requires the auditor to "obtain more persuasive audit evidence the higher the auditor's assessment of risk" (PCAOB 2010b, para. 9).

Few prior empirical studies explicitly investigate the relation between audit fees and the frequency of misstatements. An exception is Hribar et al. (2010), who document that abnormal audit fees are positively associated with subsequent restatements. They attribute the positive association to the auditor's private information about the client's misstatement risk, consistent with the auditor risk adjustment explanation. Other studies investigate restatements in a variety of other settings where audit fees are a control variable (Kinney et al. 2004; Stanley and DeZoort 2007; Cao et al. 2012; Newton et al. 2012). These studies report either a positive association or no association between audit fees and subsequent restatements.[3] In this study, we propose viable explanations and conduct tests to reconcile empirical evidence with theory.

III. HYPOTHESES

Audit risk is the risk that "the auditor expresses an inappropriate audit opinion when the financial statements are materially misstated" (AS No. 8, PCAOB 2010a). The purpose of the audit is to reduce audit risk to a level acceptable under auditing standards. We denote audit risk as the post-audit misstatement risk (MR_{post}) and express it as the product of pre-audit misstatement risk (MR_{pre}) and detection risk (DR):[4]

$$MR_{post} = MR_{pre} * DR. \tag{1}$$

Holding MR_{pre} constant, higher audit effort leads to lower DR and lower MR_{post}. We use Figure 1 to illustrate the relationship described in (1).[5]

Line MR_{accept} in Figure 1 denotes the acceptable level of MR_{post} based on auditing standards, regardless of MR_{pre}. Lines E_0 through E_3 represent four increasing levels of audit effort ($E_0 < E_1 < E_2 < E_3$). At E_0 (the 45 degree line), audit effort equals 0 (i.e., $DR = 1$), and $MR_{pre} = MR_{post}$. Consider two firms with differential levels of pre-audit misstatement risk. Firm 1 has low pre-audit misstatement risk, MR_{pre1}, and firm 2 has high pre-audit misstatement risk, MR_{pre2} (i.e., $MR_{pre1} < MR_{pre2}$). To meet auditing standards, the auditor must exert at least effort E_1 (E_3) for the low- (high-) risk firm. If the auditor exerts effort level E_2 for the high-risk firm, then MP_{post3} is above MR_{accept} and audit quality falls below the standard.

The value of the audit stems from the reduction in MR_{post}. For example, as audit effort increases from E_0 to E_1 for the low-risk firm, MR_{post} decreases from its current level, MR_{post1}, to the acceptable level, MR_{accept}. Similarly, as audit effort increases from E_0 to E_3 for the high-risk firm, MR_{post} decreases from MR_{post2} to MR_{accept}. Such a negative association between audit effort and MR_{post} is consistent with theoretical predictions. However, if we do not hold MR_{pre} constant, then we would observe either no association or a positive association between audit effort and MR_{post} when comparing points D to B and D to E, respectively. Econometrically, failure to control for MR_{pre} will upwardly bias the association between audit effort and MR_{post}, due to the correlated omitted variable problem (Wooldridge 2009, 89–94). We posit that this upward bias is one reason why prior empirical research fails to find the theoretically predicted negative association between audit effort and misstatements.

Second, we note that an important but implicit assumption in prior analytical work is that the audit is conducted before financial reports are issued. Since quarterly reports are issued before the annual audit, the theoretical prediction should therefore be applicable only to annual reports and not

[3] An exception is Stanley and DeZoort (2007), who find a negative relation between audit fees and GAAP violations for engagements with short auditor tenure (equal to or less than three years), but a positive relation for engagements with long tenure (greater than three years).

[4] Pre-audit misstatement risk is the risk that the financial report contains a material misstatement before the audit. Detection risk is the risk that the auditor fails to detect an existing material misstatement.

[5] We thank Bin Srinidhi for suggesting the use of this graph.

FIGURE 1
Relation between Pre-Audit Misstatement Risk, Audit Effort, and Post-Audit Misstatement Risk

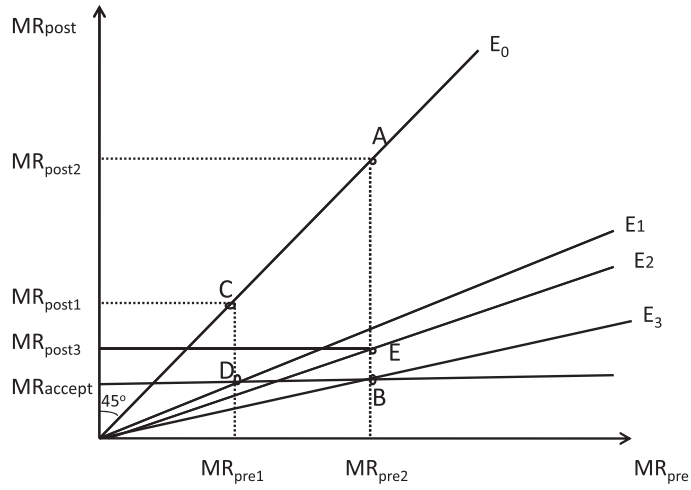

Figure 1 describes the relation between pre-audit misstatement risk (MR_{pre}), audit effort (E), and post-audit misstatement risk (MR_{post}). E_0 through E_3 represent four increasing levels of audit effort ($E_0 < E_1 < E_2 < E_3$). MR_{accept} denotes the acceptable level of post-audit misstatement risk under the auditing standards.

to quarterly reports. Stated differently, higher audit effort at the end of the year is unlikely to improve the quality of quarterly reports issued before the year-end. To the extent that higher audit effort detects more misstatements in quarterly reports or that the auditor increases audit effort in response to quarterly report restatements announced before year-end, we may even expect a positive association between year-end audit effort and quarterly restatements. Such a positive association between audit effort and quarterly restatements induces a second upward bias in the association between audit effort and restatements if researchers comingle annual restatements with quarterly-only restatements.

In this study, we attempt to correct for these two biases. To eliminate the upward bias induced by the positive association between quarterly restatements and audit effort, we separate quarterly-only restatements from annual restatements. We next explain the two methods that we use to correct for the upward bias caused by omission of pre-audit misstatement risk.

First, we follow the textbook solution for correlated omitted variables (Wooldridge 2009, 89–94) by including estimates of pre-audit misstatement risk in modeling the likelihood of restatements. A variation of this approach is to purge the effects of common determinants, including pre-audit misstatement risk, on audit effort and focus on abnormal audit effort. To the extent that the estimate of pre-audit misstatement risk appropriately captures the actual misstatement risk assessed by the auditor, we expect to observe the predicted negative association between total and abnormal audit effort and the probability of annual restatements (Shibano 1990; Dye 1993; Hillegeist 1999). Accordingly, we test the following hypothesis:

H1: After controlling for pre-audit misstatement risk, the likelihood of annual report restatement is negatively related to total and abnormal audit effort.

Since pre-audit misstatement risk is unobservable, any estimate potentially contains measurement error, which likely compromises the power of the test. To address this concern, our second approach identifies a unique subsample of firms whose pre-audit misstatement risk is approximately 1 ($MR_{pre} \approx 1$). We rely on the nature of the annual reporting process to identify this subsample, which we refer to as the conditional sample.

The annual report accumulates the information in quarterly reports. This cumulative nature of the annual report implies that any uncorrected errors in quarterly reports will likely be carried forward to the annual report. Stated differently, given that quarterly reports are misstated, the pre-audit misstatement risk (MR_{pre}) for the annual report approximates 1. Whether the annual report is also restated reveals whether errors affecting quarterly reports are corrected during the annual audit.[6] Based on this reasoning, we restrict our conditional sample to firms with at least one quarterly restatement that is not detected before the year-end. We then examine the conditional association between audit effort and annual restatements, and test the following hypothesis:

H2: Conditional on quarterly reports being restated, the likelihood of annual report restatement is negatively related to total and abnormal audit effort.

IV. RESEARCH DESIGN

Measuring Pre-Audit Misstatement Risk

Auditors assess current-year financial reporting misstatement risk based on both current-year financial information and the firm's prior record of reporting quality. To estimate misstatement risk based on current-year financial information, we rely on the misstatement detection model of Dechow et al. (2011) and use the predicted probability of misstatement (*P_SCORE*) from that model as our first proxy for pre-audit misstatement risk.[7] Specifically, we model restatements using the following logistic specification (firm and year subscripts omitted):

$$REST = \alpha_0 + \alpha_1 TOTAL\_ACCRUAL + \alpha_2 \Delta REC + \alpha_3 \Delta INV + \alpha_4 SOFT\_ASSETS + \alpha_5 \Delta CSALE + \alpha_6 \Delta ROA + \alpha_7 ISSUANCE + \alpha_8 \Delta EMP + \alpha_9 LEASE + \alpha_{10} ABRET + \alpha_{11} LAGABRET + \varepsilon. \quad (2)$$

The dependent variable *REST* equals 1 if either the annual report or the quarterly report for the current year is subsequently restated, and 0 otherwise. Table 1 presents definitions of the independent variables.

To measure the firm's prior record of reporting quality, we use *LAGREST*, which equals 1 if the prior-year annual or quarterly report is restated, and 0 otherwise, as our second proxy for pre-audit misstatement risk. Given that each incidence of accounting impropriety typically affects multiple

[6] Quarterly misstatements may be corrected before the annual audit, such that the auditor is already aware of the error before starting the audit. This possibility increases the likelihood that the auditor charges higher fees and reduces the likelihood that the annual report is restated, thus biasing toward finding a negative association between audit fees and annual restatements. To control for this effect, in constructing the conditional sample we exclude observations with quarterly restatements announced before the year-end. Nonetheless, we acknowledge that quarterly restatements can be announced after the fiscal year-end but before the start of the audit. Therefore, we recommend caution in interpreting our results.

[7] Dechow et al.'s (2011) prediction model is developed for detecting misstatements subject to SEC Accounting and Auditing Enforcement Releases, not for the whole population of misstatements. However, the fact that financial reports contain material misstatements indicates that misstatement firms share many common characteristics.

TABLE 1

Variable Definitions

		Description (Compustat mnemonic in brackets)
Audit-Related Variables		
AUDFEE	=	natural log of total audit fees;
ABFEE	=	abnormal audit fees = the difference between the actual and the fitted values of audit fees estimated based on Model (3);
BIG	=	1 if the client is audited by one of the Big 5 (4) accounting firms, 0 otherwise;
SPECIALIST	=	1 if in a particular year the accounting firm has the largest market share of audit fee revenue in the client's industry (by two-digit SIC code) and its market share is at least 10 percentage points greater than the second industry leader in the market, 0 otherwise;
DEC	=	1 if the client has a December year-end, 0 otherwise;
DELAY	=	natural log of the number of days between fiscal year-end and the signature date of audit opinion;
GC	=	1 if the client receives a going concern audit opinion for the current year, 0 otherwise;
SHORT_TENURE	=	1 if the current auditor has engaged with the client for no more than three years, 0 otherwise; and
TENURE	=	natural log of the number of years that the company is audited by the same audit firm (on Compustat).
Client Financial Characteristics		
LEV	=	total long-term debt divided by total assets: $(DLTT_t + DLC_t)/AT_t$;
INV_INT_COV	=	inverse interest expense coverage = interest expense divided by operating income before depreciation: $XINT_t/OIBDP_t$. The ratio is capped at 2 and assigned a value of 2 if $OIBDP < 0$;
ROA	=	return on lagged total assets: IB_t/AT_{t-1};
ΔROA	=	change in *ROA* from year $t-1$ to t;
LOSS	=	1 if net income is negative ($NI_t < 0$), 0 otherwise;
NEG_EQUITY	=	1 if total liabilities are greater than total assets ($LT_t > AT_t$), 0 otherwise;
TA	=	natural log of total assets: $\ln(AT_t)$;
BM	=	book-to-market ratio at the end of the fiscal year: $(CEQ_t)/(PRCC\_F_t * CSHO_t)$;
INV	=	inventory scaled by total assets: $INVT_t/AT_t$;
ΔINV	=	change in inventory, $INV_t - INV_{t-1}$;
REC	=	accounts receivable scaled by total assets: $RECT_t/AT_t$;
ΔREC	=	change in accounts receivable, $REC_t - REC_{t-1}$;
$\Delta CSALE$	=	percentage change in cash sales: $(CSALE_t - CSALE_{t-1})/CSALE_{t-1}$. Cash sales $(CSALE) = SALE_t - \Delta REC_t$;
SALEGR	=	percentage change in sales from the prior year to the current year, $(SALE_t - SALE_{t-1})/SALE_{t-1}$;
TOTAL_ACCRUAL	=	total accruals = change in noncash assets (noncash total assets minus total liabilities and preferred stocks) from year $t-1$ to year t scaled by average total assets: $\{[(AT_t - CHE_t) - (LT_t + PSTK_t)] - [(AT_{t-1} - CHE_{t-1}) - (LT_{t-1} + PSTK_{t-1})]\}/[(AT_t + AT_{t-1})/2]$;
CURRENT_ACCRUAL	=	current accruals = change in noncash current assets from year $t-1$ to t scaled by average total assets. [(ΔCurrent assets − ΔCash and short-term investments) − (ΔCurrent liabilities − ΔDebt in current liabilities − ΔTaxes payable)]/Average total assets. $[(\Delta ACT_t - \Delta CHE_t) - (\Delta LCT_t - \Delta DLC_t - \Delta TXP_t)]/[(AT_t + AT_{t-1})/2]$; and

(continued on next page)

TABLE 1 (continued)

		Description (Compustat mnemonic in brackets)
SOFT_ASSETS	=	soft assets as a percentage of total assets. $(AT_t - PPENT_t - CHE_t)/AT_t$.
Client Misstatement Risk Variable		
P_SCORE	=	predicted probability of misstatements based on the misstatement detection model of Dechow et al. (2011); and
LAGREST	=	1 if the annual report or a quarterly report of the prior year is restated, 0 otherwise.
Client Non-Financial Characteristics		
SQSEG	=	square root of the total number of segments;
PENSION	=	1 if the client has pension or retirement expense ($XPR_t > 0$), 0 otherwise;
LIT	=	1 if the client is in a litigious industry (SIC codes between 2833–2836, 3570–3577, 3600–3674, 5200–5961, 7370–7374), 0 otherwise;
AGE	=	natural log of the number of years the company is listed on Compustat;
ΔEMP	=	abnormal change in employees, defined as the percentage change in the number of employees minus the percentage change in total assets: $[(EMP_t - EMP_{t-1})/EMP_{t-1}] - [(AT_t - AT_{t-1})/AT_{t-1}]$; and
LEASE	=	1 if future operating lease obligations are greater than 0 ($MRCT > 0$), 0 otherwise.
Market-Related Incentive Variables		
FIN	=	1 if the sum of new long-term debt plus new equity exceeds 2 percent of lagged total assets $[((DLTIS_t + SSTK_t)/(AT_{t-1})) > 2\%]$, 0 otherwise;
ISSUANCE	=	1 if the firm issued debt or equity securities during year t ($DLTIS_t > 0$ or $SSTK_t > 0$), 0 otherwise;
MERGER	=	1 if the company had an acquisition that contributed to sales ($AQS_t > 0$), 0 otherwise;
ABRET	=	annual buy-and-hold stock return minus annual buy-and-hold value weighted NYSE-AMEX-NASD index return;
LAGABRET	=	*ABRET* lagged by 1 year; and
EXT_FIN_DEMAND	=	1 if $FREECASH < -0.5$, 0 otherwise. *FREECASH* is cash flows from operations minus average capital expenditure scaled by lagged current assets, $(OANCF_t - average\ CAPX_t)/ACT_{t-1}$. Capital expenditures are averaged over the preceding three years ($t-3$ to $t-1$) if data *CAPX* are available in each year. Capital expenditures are averaged over the preceding two years ($t-2$ to $t-1$) if data *CAPX* are unavailable in year $t-3$. Capital expenditures are lagged by one year ($t-1$) if data *CAPX* are unavailable in year $t-2$.
Corporate Governance Variables		
BOARD_SIZE	=	number of directors on the board;
BOARD_INDEP	=	percentage of board members who are outside rather than executive directors;
CEO_CHAIR	=	1 if the company's CEO is also chairman of the board, 0 otherwise;
AUDIT_INDEP	=	percentage of audit committee members who are outside rather than executive directors; and
AUDIT_EXPERT	=	percentage of audit committee members who have financial expertise.
SOX-Related Variables		
SOX	=	1 if the fiscal year is during 2003–2009, 0 if fiscal year is during 2000–2001; and
WEAK302	=	1 for the firm year disclosing material weaknesses in internal controls under Section 302 of SOX, 0 otherwise.

(continued on next page)

TABLE 1 (continued)

		Description (Compustat mnemonic in brackets)
Restatement Variables		
RESTK	=	1 if the annual financial report included in Form 10-K is restated, 0 otherwise;
REST	=	1 if either the annual or a quarterly financial report is restated, 0 otherwise;
REST_INTERIM	=	1 if any interim quarterly financial report is restated, 0 otherwise;
REST_Q1	=	1 if the first-quarter financial report is restated, 0 otherwise;
REST_Q2	=	1 if the second-quarter financial report is restated, 0 otherwise;
REST_Q3	=	1 if the third-quarter financial report is restated, 0 otherwise; and
REST_Q4	=	1 if the fourth-quarter financial report included in Form 10-K is restated, 0 otherwise.

years (Dechow et al. 2011), whether the prior-year's financial reports are subsequently restated is likely to be associated with whether current-year financial reports will also be restated.[8]

Measuring Audit Effort and Abnormal Audit Effort

We use audit fees to proxy for audit effort (Gul 2006; Srinidhi and Gul 2007; Rice and Weber 2012). Prior research indicates that in addition to audit labor quantity and quality, audit fees also contain risk premiums (Pratt and Stice 1994; Houston et al. 1999; Johnstone and Bedard 2001). If higher audit fees reflect primarily audit risk premium rather than audit effort, then it will bias against finding a negative association between the likelihood of annual restatements and audit fees, because only higher audit effort can reduce misstatements, whereas a greater risk premium cannot.

We measure abnormal audit effort using abnormal audit fees. Abnormal audit fees reflect charges for incremental audit labor above and beyond the expected level under normal circumstances. We model total audit fees as a function of misstatement risk (*P_SCORE* and *LAGREST*) and other control variables, and estimate abnormal audit fees as residuals from the following model, where firm and year subscripts are omitted:

$$\begin{aligned} AUDFEE = {} & \beta_0 + \beta_1 P\_SCORE + \beta_2 LAGREST + \beta_3 TA + \beta_4 SQSEG + \beta_5 PENSION + \beta_6 FIN \\ & + \beta_7 MERGER + \beta_8 INV + \beta_9 REC + \beta_{10} ROA + \beta_{11} LOSS + \beta_{12} GC + \beta_{13} BM \\ & + \beta_{14} LEV + \beta_{15} ABRET + \beta_{16} DEC + \beta_{17} BIG + \beta_{18} SPECIALIST \\ & + \beta_{19} SHORT\_TENURE + \beta_{20} DELAY + YEAR + INDUSTRY + \varepsilon. \end{aligned} \tag{3}$$

The dependent variable (*AUDFEE*) is the natural logarithm of total audit fees. Table 1 presents definitions of the independent variables.

By including *LAGREST* in Model (3), we assume that the auditor knows whether the prior-year financial report is subsequently restated and adjusts the level of audit effort for the current-year accordingly. However, it is possible that the misstatement of the prior-year financial report is discovered after completion of the current-year audit. We investigate this possibility by

[8] Based on our full sample, the Pearson correlation between *REST* and *LAGREST* is 0.68 ($p < 0.001$).

decomposing *LAGREST* into two indicator variables, *BEFORE* and *AFTER*. *BEFORE* (*AFTER*) equals 1 if the restatement of the prior-year report is announced before (after) the current fiscal year-end, and 0 otherwise. If the auditor believes that the prior-year reporting quality of the "*AFTER*" group is as good as that of clients without a prior-year restatement, then we should observe the coefficient of *AFTER* to be 0 in Model (3). Untabulated results indicate that the coefficient of *AFTER* is 0.07 (p-value = 0.003), suggesting that the auditor has private information about prior-year reporting quality of the "*AFTER*" group, even before the prior-year misstatement is publicly announced.[9]

Modeling the Relation between Audit Effort and Restatements

We follow recent research on accounting misstatements (Burns and Kedia 2006; Erickson et al. 2006; Efendi el al. 2007; Lennox and Pittman 2010) in specifying our model relating the probability of restatement to audit effort:

$$\begin{aligned} REST(RESTK) = {} & \gamma_0 + \gamma_1 FEE + \theta_1 P\_SCORE + \theta_2 LAGREST + \theta_3 BIG + \theta_4 SPECIALIST \\ & + \theta_5 SIZE + \theta_6 AGE + \theta_7 TENURE + \theta_8 NEG\_EQUITY + \theta_9 MERGER \\ & + \theta_{10} FIN + \theta_{11} LOSS + \theta_{12} CURRENT\_ACCRUAL + \theta_{13} LEV \\ & + \theta_{14} INV\_INT\_COV + \theta_{15} SALEGR + \theta_{16} BM + \theta_{17} EXT\_FIN\_DEMAND \\ & + YEAR + \varepsilon. \end{aligned} \tag{4}$$

The dependent variable, *REST* (*RESTK*), is a binary variable that equals 1 if a current-year annual *or* quarterly report (current-year annual report) is subsequently restated, and 0 otherwise. *FEE* represents either total audit fees (*AUDFEE*) or abnormal audit fees (*ABFEE*). *P_SCORE* is the fitted value from Model (2). *P_SCORE* and *LAGREST* control for the pre-audit misstatement risk. Table 1 presents definitions of the control variables.

We expect a positive coefficient for *P_SCORE*, *LAGREST*, *TA*, *FIN*, and *LOSS*, and a negative coefficient for *BIG* and *SPECIALIST*. Due to the conflicting findings of prior research (Burns and Kedia 2006; Erickson et al. 2006; Efendi et al. 2007), we do not predict the signs of the other control variables.

To facilitate comparison with prior research, we first estimate Model (4) with *REST* as the dependent variable. Next, to test H1 (H2), which focuses on the relation between annual restatements and audit fees using the full (conditional) sample, we set the dependent variable in Model (4) to *RESTK*. Evidence that $\gamma_1 < 0$ supports the theoretical prediction that higher audit effort reduces the likelihood of misstatements. We estimate Model (4) using logistic regression with robust standard errors clustered by firms.

V. SAMPLE SELECTION AND RESULTS

Sample Selection

We select all observations with requisite audit fee data, financial data, and stock return data from Audit Analytics, Compustat, and CRSP, respectively. Our sample period begins in 2000 because audit fee data are available starting from 2000. It ends in 2009 because our search for restatement announcements ends in 2011 and prior research indicates an average lag of two years

[9] This result is consistent with Hogan and Wilkins (2008), who find that auditors charge higher fees for clients with material weakness in internal controls even before the first year that Section 302 internal control reports were filed.

between the end of the misstatement period and the restatement announcement (Cheffers et al. 2010). After deleting observations with missing values, we have 25,408 (16,238) firm-year observations for 4,639 (3,671) firms as our samples for testing the association between annual restatements and total audit fees (abnormal audit fees), hypothesized in H1 based on the full sample.

To investigate the conditional association between annual restatements and audit fees (H2), we focus on observations with at least one quarterly misstatement undetected before the current year-end. To construct this subsample, we rely on a recent SEC rule on reportable events to minimize the likelihood that the auditor is aware of the quarterly misstatement before the audit. This rule, which became effective on August 23, 2004, requires that whenever a registrant concludes that a previously issued financial statement can no longer be relied upon due to error, the registrant must file Form 8-K disclosing the details of the error in Item 4.02 (Non-Reliance of Previously Issued Financial Statements) within four business days of the conclusion. It formalizes restatement disclosure and greatly facilitates identification of the timing of the disclosure.[10]

Specifically, we identify firm-year observations with at least one quarterly restatement disclosed in Form 8-K filed after both the misstatement fiscal year-end *and* the effective date of the SEC rule. These two restrictions reduce the probability that quarterly misstatements are revealed before the year-end.[11,12] This procedure yields 950 firm-year observations, of which 617 also have annual report restatements, indicating an overall detection rate of 35 percent ([950 − 617]/950) for the conditional sample.[13]

We use the Audit Analytics Advanced Non-Reliance Restatement database, which indicates the specific fiscal quarters and fiscal years affected by each restatement event, to identify restated quarterly and annual reports. Extant research relies on several other sources to identify restatements, including AAERs issued by the SEC (Dechow et al. 2011; Lennox and Pittman 2010; Erickson et al. 2006; Carcello and Nagy 2004), the GAO database (Burns and Kedia 2006; Efendi et al. 2007), and web-based keyword search (Hennes et al. 2008; Kinney et al. 2004). We use the Audit Analytics database for the following two reasons. First, the Audit Analytics database covers a more complete population of restatements, rather than only restatements subject to SEC enforcements. Second, it excludes technical restatements that do not imply a misstatement in the original filing and restatements of earnings releases. The auditor is typically not held responsible for such technical restatements (e.g., restatements for mergers, discontinued operations, changes in accounting principle).[14]

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[10] For more details, see SEC Release No. 33-8400 and the speech by Louise M. Dorsey, associate chief accountant of the SEC (Dorsey 2006).

[11] Despite the restrictions imposed on the conditional sample, it is still possible that the auditor is aware of the quarterly misstatement prior to the audit. This could occur if the audit starts several weeks after the year-end.

[12] Myers et al. (2011) note that materiality of misstatements likely influences a firm's decision to disclose through Form 8-K. Restricting the conditional sample to restatements disclosed through 8-Ks potentially biases toward more material misstatements. However, in analysis using the full sample, we find that the association between audit fees and restatements does not vary with the magnitude of the misstatements, indicating that this bias is unlikely to affect our main inferences on the relation between audit fees and restatements.

[13] We recognize that auditors often undertake tests throughout the fiscal year, especially tests of internal controls and individual transactions. The conditional sample excludes cases in which audit procedures conducted during the fiscal year prevent any misstatement of the interim accounts. We also acknowledge the possibility that the conditional sample excludes interim misstatements that are never discovered. We do not anticipate that either type of exclusion will systematically bias the association between audit fees and annual report restatements for the conditional sample.

[14] Srinivasan (2005) reports that around 19 percent of restatements in the GAO database relate to technical restatements, and Burks (2011) reports that around 12 percent of restatements in the GAO database relate to technical restatements or restatements of earnings releases rather than of prior Form 10-Qs or 10-Ks (Burks 2011, 516).

We use all firm-year observations without subsequent restatements as our control sample. We winsorize each continuous variable at its first and ninety-ninth percentiles to control for the potential effect of extreme values and report two-tailed significance levels unless indicated otherwise.

Estimation Results for Pre-Audit Misstatement Risk and Abnormal Audit Fee Models

Table 2, Panel A presents estimation results for the misstatement detection Model (2). We estimate this model using 51,507 firm-year observations with requisite data. For benchmarking purposes, we also include the results reported by Dechow et al. (2011, Table 7, Model 3) in Table 2. Because our study concerns quarterly and annual restatements, the dependent variable (*REST*) equals 1 if any current-year quarterly or annual report is subsequently restated, and 0 otherwise. In contrast, Dechow et al. (2011) investigate only annual restatements subject to SEC enforcement actions. The results in Table 2, Panel A indicate that the coefficients on *TOTAL_ACCRUAL*, ΔREC, *SOFT_ASSETS*, $\Delta CSALE$, and ΔROA have the same signs as Dechow et al. (2011), but have lower significance.[15] Panel B of Table 2 presents results for the audit fee regression in Model (3). We estimate this model using all 32,915 firm-year observations with requisite data during 2000–2009. Total audit fees are positively related to *P_SCORE* and *LAGREST* ($p < 0.01$ for both), consistent with the auditor exerting higher effort in response to higher misstatement risk. The results for the other independent variables are generally consistent with the findings of prior audit research. Specifically, the results show that audit fees increase in client size (*TA*), complexity (*SQSEG*, *PENSION*, *MERGER*), and risk (*INV*, *REC*, *LOSS*, *GC*, *LEV*), and decrease in client performance (*ROA*, *ABRET*). In addition, audit fees increase for December year-end clients (*DEC*), Big N auditor (*BIG*), specialist auditor (*SPECIALIST*), and audit delay (*DELAY*), and are lower for new clients (*SHORT_TENURE*).

Association between Annual Report Misstatements and Audit Fees: Tests of H1 and H2

Table 3 tabulates the restatement distribution based on whether annual reports are restated. Of the 2,821 total firm-year observations with quarterly or annual restatements, 871 firm-year observations have only quarterly restatements (Group 1) and 1,950 firm-year observations have annual restatements (Group 2).

Table 4, Panels A and B present Pearson correlations for the restatement variables and control variables used in the main regression. Total audit fees (*AUDFEE*) are positively related to *REST* ($\rho = 0.089$, $p < 0.01$), *RESTK* ($\rho = 0.039$, $p < 0.01$), *P_SCORE* ($\rho = 0.132$, $p < 0.01$), and *LAGREST* ($\rho = 0.136$, $p < 0.01$), consistent with the auditor charging higher fees for clients with higher *ex post* and higher *ex ante* misstatement risk. *ABFEE* is not reliably related to *REST* ($\rho = 0.007$, $p = 0.36$), but is negatively related to *RESTK* ($\rho = -0.042$, $p < 0.01$).

Table 4, Panel C reports univariate comparisons between the annual-restatement ($RESTK = 1$) and no-annual-restatement ($RESTK = 0$) samples. Again, consistent with the auditor risk adjustment explanation, *AUDFEE* is significantly higher for the annual-restatement sample ($AUDFEE = 13.066$) than for the no-annual-restatement sample ($AUDFEE = 12.871$). By contrast, *ABFEE* is lower for the annual-restatement sample ($ABFEE = -0.058$) than the no-annual-restatement sample ($ABFEE = 0.040$), consistent with abnormal audit effort decreasing annual misstatements. In sum,

[15] We recognize that the Dechow et al. (2011) model has relatively low explanatory power for restatements (Pseudo $R^2 = 0.0049$). This low explanatory power potentially compromises the validity of *P_SCORE* as a proxy for the auditor's *ex ante* assessment of misstatement risk. Nonetheless, *P_SCORE* loads significantly in the audit fee regression (Table 2, Panel B), suggesting that *P_SCORE* at least partially captures the auditor's *ex ante* assessment of misstatement risk. Doogar et al. (2010) also use the fitted value from the Dechow et al. (2011) model to estimate the auditor's fraud risk assessment.

TABLE 2

Models for Estimating Restatement Risk and Abnormal Audit Fees

Panel A: Estimating the Probability of Restatements

		Our Estimates			Dechow et al. (2011) Estimates		
Variable	**Pred. Sign**	**Coeff. Est.**	**Wald Chi-square**	**p-value**	**Coeff. Est.**	**Wald Chi-square**	**p-value**
Intercept	−	−2.897	1448.54	0.000***	−7.966	708.5	0.001***
TOTAL_ACCRUAL	+	0.098	1.40	0.118	0.909	11.1	0.001***
ΔREC	+	0.206	0.76	0.192	1.731	7.4	0.003***
ΔINV	+	1.578	20.94	0.000***	1.447	4.0	0.023**
SOFT_ASSETS	+	0.008	0.02	0.441	2.265	68.4	0.001***
ΔCSALE	+	0.010	0.46	0.248	0.160	5.9	0.008***
ΔROA	−	−0.055	0.50	0.240	−1.455	20.1	0.001***
ISSUANCE	+	0.500	62.60	0.000***	0.651	8.2	0.002***
ΔEMP	−	−0.046	1.48	0.112	−0.121	1.5	0.113
LEASE	+	0.347	77.17	0.000***	0.345	4.4	0.019**
ABRET	+	0.026	2.12	0.073*	0.082	8.4	0.002***
LAGABRET	+	0.077	16.23	0.000***	0.098	8.9	0.001***
n			51,507			88,032	
RESTK = 1			NA			354	
REST = 1			5,573			NA	
Sample period			1999–2009			1979–2002	
Pseudo R^2			0.0049			Not Reported	
Model likelihood ratio Chi-square			250.9			Not Reported	
Model p-value			< 0.0001			Not Reported	

(continued on next page)

TABLE 2 (continued)

Panel B: Estimating Abnormal Audit Fees

Variable	Pred. Sign	Coeff. Est.	t-stat	p-value
Intercept	+	8.863	101.33	0.000***
P_SCORE	+	1.163	8.45	0.000***
LAGREST	+	0.122	6.97	0.000***
TA	+	0.472	91.04	0.000***
SQSEG	+	0.207	13.78	0.000***
PENSION	+	0.121	7.91	0.000***
FIN	−	−0.024	−2.29	0.011**
MERGER	+	0.160	8.50	0.000***
INV	+	0.106	1.62	0.053*
REC	+	0.665	9.40	0.000***
ROA	−	−0.178	−8.01	0.000***
LOSS	+	0.147	10.92	0.000***
GC	+	0.163	7.05	0.000***
BM	−	−0.090	−11.08	0.000***
LEV	+	0.175	6.59	0.000***
ABRET	−	−0.042	−8.61	0.000***
DEC	+	0.094	5.39	0.000***
BIG	+	0.336	17.65	0.000***
SPECIALIST	+	0.039	2.16	0.015**
SHORT_TENURE	−	−0.036	−2.89	0.002***
DELAY	+	0.159	9.16	0.000***
n		32,915		
Year indicator		Yes		
Industry indicator		Yes		
Sample period		2000–2009		
R^2		0.783		

*, **, *** Denote one-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.
We use one-tailed tests because all of the coefficients have predicted signs. See Table 1 for definitions of the variables. Panel A presents the estimation results for pre-audit misstatement risk based on Model (2). Panel B presents the estimation results for abnormal audit fees based on Model (3).

TABLE 3

Distribution of Quarterly and Annual Restatements
Distribution of Restatements by Whether the Annual Report Is Restated

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	Number of Firm-Years	*REST_Q1* = 1	*REST_Q2* = 1	*REST_Q3* = 1	*REST_Q4* = 1	*RESTK* = 1
Annual reports not restated (Group 1)	871	708	615	471	7	0
Annual reports restated (Group 2)	1,950	639	665	685	632	1,950
Grand Total	2,821	1,347	1,280	1,156	639	1,950

See Table 1 for definitions of the variables. The sample period is 2000–2009. Table 3 presents the distribution of restatements based on whether the annual report is restated.

the results in Table 4 provide preliminary evidence on the importance of separating quarterly-only restatements from annual restatements and controlling for the effects of auditor risk adjustment on audit fees in estimating the association between audit effort and misstatements.

Table 5, Panel A presents multivariate test results of Model (4) relating annual restatements and audit fees (H1). For comparison with prior research, we first estimate the relation between audit fees and *REST*, which equals 1 if the annual *or* a quarterly report for the current year is restated, and 0 otherwise. When *P_SCORE* and *LAGREST* are excluded from (included in) the model as shown in Column 1 (Column 2), total audit fees (*AUDFEE*) are positively associated (not associated) with the likelihood of subsequent restatements with significance levels of $p < 0.001$ ($p = 0.338$). These results are consistent with prior research findings of positive or no association between audit fees and subsequent restatements (Kinney et al. 2004; Stanley and DeZoort 2007; Cao et al. 2012; Hribar et al. 2010; Newton et al. 2012).

The results in Column 3 are markedly different when *RESTK*, which equals 1 if the annual report is restated and 0 otherwise, is the dependent variable. Column 3 shows that *AUDFEE* is not significantly related to *RESTK* ($z = -1.08$, $p = 0.282$), although the estimated coefficient is negative ($\gamma_1 = -0.060$). In Column 4, the negative relation becomes much stronger and statistically significant ($\gamma_1 = -0.255$, $z = -5.89$, $p < 0.001$) when *P_SCORE* and *LAGREST* are included in the model. The changes in the coefficient of *AUDFEE* from 0.182 in Column 1 to −0.060 in Column 3, and from 0.036 in Column 2 to −0.255 in Column 4, are indicative of the magnitude of the upward bias in the coefficient of *AUDFEE* when annual restatements are comingled with quarterly-only restatements. Similarly, the change in the coefficient of *AUDFEE* from 0.182 in Column 1 to 0.036 in Column 2, and from −0.060 in Column 3 to −0.255 in Column 4, are indicative of the magnitude of the upward bias in the coefficient of *AUDFEE* when pre-audit misstatement risk is not included

TABLE 4

Pearson Correlations and Descriptive Statistics

Panel A: Pearson Correlation Matrix—Part I

		1	2	3	4	5	6	7	8	9	10
1	*REST*	1									
2	*RESTK*	0.820***	1								
3	*AUDFEE*	0.089***	0.039***	1							
4	*ABFEE*	0.007	−0.042***	0.463***	1						
5	*P_SCORE*	0.081***	0.082***	0.132***	−0.039***	1					
6	*LAGREST*	0.677***	0.551***	0.136***	0.009	0.067***	1				
7	*BIG*	0.046***	0.060***	0.441***	−0.052***	0.176***	0.044***	1			
8	*SPECIALIST*	0.006	0.006	0.090***	−0.002	0.040***	0.004	0.189***	1		
9	*TA*	0.100***	0.092***	0.809***	−0.039***	0.199***	0.114***	0.540***	0.123***	1	
10	*AGE*	0.011*	−0.004	0.077***	−0.059***	0.098***	0.036***	−0.133***	−0.018***	0.030***	1
11	*TENURE*	0.010	0.019***	0.217***	0.035***	0.061***	0.016**	0.217***	0.048***	0.190***	0.278***
12	*NEG_EQUITY*	−0.044***	−0.039***	−0.176***	−0.009	−0.181***	−0.041***	−0.221***	−0.047***	−0.316***	0.059***
13	*MERGER*	0.009	0.005	0.137***	−0.024***	0.030***	0.013**	0.047***	0.000	0.120***	0.022***
14	*FIN*	0.044***	0.040***	0.058***	−0.005	0.143***	0.021***	0.031***	0.015**	0.075***	−0.101***
15	*LOSS*	−0.037***	−0.045***	−0.290***	−0.001	−0.187***	−0.040***	−0.174***	−0.039***	−0.405***	−0.081***
16	*CURRENT_ACCRUAL*	0.020***	0.022***	0.082***	−0.026***	0.107***	0.022***	0.073***	0.015**	0.133***	−0.026***
17	*LEV*	−0.033***	−0.027***	−0.101***	−0.070***	−0.156***	−0.033***	−0.171***	−0.026***	−0.178***	0.055***
18	*INV_INT_COV*	−0.063***	−0.065***	−0.397***	−0.002	−0.216***	−0.072***	−0.235***	−0.051***	−0.521***	−0.095***
19	*SALEGR*	0.002	0.002	−0.081***	−0.040***	0.006	−0.011*	−0.027***	−0.017***	−0.045***	−0.175***
20	*BM*	0.015**	0.010*	0.037***	0.025***	0.064***	0.012*	0.092***	0.033***	0.136***	−0.032***
21	*EXT_FIN_DEMAND*	−0.060***	−0.053***	−0.286***	0.013*	−0.136***	−0.067***	−0.195***	−0.043***	−0.407***	−0.081***

Panel B: Pearson Correlation Matrix—Part II

		11	12	13	14	15	16	17	18	19	20	21
11	*TENURE*	1										
12	*NEG_EQUITY*	−0.04***	1									
13	*MERGER*	0.05***	−0.03***	1								
14	*FIN*	0.00	0.03***	0.02***	1							
15	*LOSS*	−0.12***	0.22***	−0.03***	−0.01	1						

(continued on next page)

TABLE 4 (continued)

		11	12	13	14	15	16	17	18	19	20	21
16	*CURRENT_ACCRUAL*	0.00	−0.21***	0.02**	0.04***	−0.18***	1					
17	*LEV*	0.00	0.61***	−0.01	0.11***	0.13***	−0.21***	1				
18	*INV_INT_COV*	−0.14***	0.26***	−0.07***	0.00	0.75***	−0.18***	0.15***	1			
19	*SALEGR*	−0.05***	0.00	0.00	0.13***	0.05***	0.05***	−0.02***	0.08***	1		
20	*BM*	0.00	−0.53***	0.02**	−0.05***	−0.08***	0.13***	−0.40***	−0.12***	0.00	1	
21	*EXT_FIN_DEMAND*	−0.06***	0.28***	−0.05***	0.16***	0.28***	−0.08***	0.25***	0.38***	0.19***	−0.13***	1

Panel C: Descriptive Statistics for Sample with and without Annual Report Restatements

	Column (1) *RESTK* = 0		Column (2) *RESTK* = 1		(2) − (1)		
Variable	**n**	**Mean**	**n**	**Mean**	**Diff. in Means**	**t-stat**	**p-value**
AUDFEE	23,458	12.871	1,950	13.066	0.195	7.00	0.000***
ABFEE	15,020	0.040	1,218	−0.058	−0.098	−4.89	0.000***
P_SCORE	23,458	0.087	1,950	0.100	0.013	12.38	0.000***
LAGREST	23,458	0.066	1,950	0.733	0.667	65.72	0.000***
BIG	23,458	0.736	1,950	0.835	0.099	11.16	0.000***
SPECIALIST	23,458	0.094	1,950	0.101	0.007	1.00	0.316
TA	23,458	5.055	1,950	5.840	0.785	18.62	0.000***
AGE	23,458	1.908	1,950	1.894	−0.015	−0.69	0.487
LOGTENURE	23,458	1.585	1,950	1.643	0.058	3.21	0.001***
NEG_EQUITY	23,458	0.098	1,950	0.055	−0.043	−7.87	0.000***
MERGER	23,458	0.049	1,950	0.053	0.004	0.78	0.436
FIN	23,458	0.608	1,950	0.680	0.072	6.56	0.000***
LOSS	23,458	0.502	1,950	0.418	−0.084	−7.22	0.000***
CURRENT_ACCRUAL	23,458	−0.008	1,950	0.004	0.012	4.97	0.000***
LEV	23,458	0.282	1,950	0.235	−0.047	−6.66	0.000***
INV_INT_COV	23,458	0.873	1,950	0.653	−0.220	−11.38	0.000***
SALEGR	23,458	0.271	1,950	0.278	0.007	0.36	0.720
BM	23,458	0.380	1,950	0.447	0.067	2.20	0.028**
EXT_FIN_DEMAND	23,458	0.090	1,950	0.034	−0.056	−12.26	0.000***

*, **, *** Denote two-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.
RESTK = 1 if the annual financial report is restated, 0 otherwise. See Table 1 for definitions of the other variables. The sample period is 2000–2009. Panels A and B present the Pearson correlation matrix for all variables used in the main regression. Panel C presents descriptive statistics for variables partitioned by whether the annual report is restated.

TABLE 5

Association between Restatements and Total and Abnormal Audit Fees

Panel A: Association between Quarterly *or* Annual Restatements (*REST*)/Annual Restatements (*RESTK*) and Total Audit Fees

		REST				*RESTK*			
		Column 1		Column 2		Column 3		Column 4	
Dependent Variable	Pred. Sign	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Est.	z-stat
Intercept	−	−6.221	−10.67***	−5.649	−12.25***	−5.098	−7.74***	−3.965	−7.25***
AUDFEE	−	0.182	3.58***	0.036	0.96	−0.060	−1.08	−0.255	−5.89***
P_SCORE	+			2.232	3.82***			2.188	3.14***
LAGREST	+			4.273	64.62***			3.975	51.95***
BIG	−	−0.247	−2.48***	−0.298	−3.62***	−0.148	−1.22	−0.148	−1.43
SPECIALIST	−	−0.066	−0.63	−0.065	−0.69	−0.142	−1.20	−0.138	−1.28
TA	+	0.079	2.53***	0.084	3.51***	0.203	6.00***	0.220	8.13***
AGE	?	0.034	0.88	−0.068	−1.93**	−0.009	−0.20	−0.128	−3.12***
TENURE	?	0.020	0.44	0.072	1.95**	0.114	2.35**	0.197	4.58***
NEG_EQUITY	?	−0.090	−0.59	−0.162	−1.10	0.005	0.03	−0.071	−0.39
MERGER	?	0.050	0.46	0.054	0.44	0.100	0.77	0.061	0.43
FIN	+	0.271	4.79***	0.302	4.94***	0.285	4.35***	0.230	3.39***
LOSS	+	0.223	2.96***	0.091	1.08	0.140	1.66*	0.014	0.16
CURRENT_ACCRUAL	?	0.149	0.84	−0.016	−0.06	0.362	1.63*	0.309	1.01
LEV	?	−0.249	−2.09**	−0.118	−1.26	−0.317	−2.14**	−0.155	−1.30
INV_INT_COV	?	−0.096	−1.82*	−0.021	−0.40	−0.130	−2.20**	−0.073	−1.31
SALEGR	?	0.047	2.27**	0.057	2.18**	0.029	1.12	0.031	1.01
BM	?	0.012	0.61	0.008	0.35	−0.016	−0.71	−0.031	−1.23
EXT_FIN_DEMAND	?	−0.525	−3.44***	−0.307	−2.16**	−0.471	−2.62**	−0.215	−1.25
Year indicator			Yes		Yes		Yes		Yes
REST = 1			2,821		2,821				
REST = 0			22,587		22,587				
RESTK = 1							1,950		1,950

(continued on next page)

TABLE 5 (continued)

		REST				*RESTK*			
		Column 1		Column 2		Column 3		Column 4	
Dependent Variable	**Pred. Sign**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**
RESTK = 0							23,458		23,458
Pseudo R^2			0.052		0.449		0.073		0.408
Likelihood ratio χ^2			517.18		5158.97		463.09		3401.16
Model p-value			< 0.001***		< 0.001***		< 0.001***		< 0.001***

Panel B: Association between Quarterly *or* Annual Restatements (*REST*)/Annual Restatements (*RESTK*) and Abnormal Audit Fees

		REST				*RESTK*			
		Column 1		Column 2		Column 3		Column 4	
Dependent Variable	**Pred. Sign**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**
Intercept	−	−3.726	−15.65***	−4.723	−19.07***	−5.357	−15.46***	−6.474	−17.67***
ABFEE	−	0.045	0.73	0.041	0.85	−0.252	−3.70***	−0.316	−5.73***
P_SCORE	+			0.795	1.01			1.708	1.88*
LAGREST	+			4.023	50.67***			3.676	39.54***
BIG	−	−0.357	−3.31***	−0.293	−3.10***	−0.347	−2.61***	−0.230	−1.86*
SPECIALIST	−	0.032	0.25	−0.030	−0.27	−0.070	−0.49	−0.145	−1.11
TA	+	0.074	3.17***	0.026	1.30	0.101	3.82***	0.058	2.35**
AGE	?	0.059	1.32	−0.033	−0.81	−0.027	−0.53	−0.151	−3.13***
TENURE	?	0.007	0.14	0.066	1.49	0.158	2.75***	0.260	5.00***
NEG_EQUITY	?	0.129	0.68	−0.125	−0.67	0.093	0.39	−0.159	−0.66
MERGER	?	0.174	1.32	0.163	1.16	0.153	0.94	0.037	0.22
FIN	+	0.217	3.30***	0.305	4.23***	0.210	2.71***	0.201	2.48***
LOSS	+	0.234	2.58***	0.076	0.73	0.145	1.35	0.006	0.05
CURRENT_ACCRUAL	?	−0.284	−1.06	−0.276	−0.72	0.030	0.09	0.159	0.38
LEV	?	0.139	0.87	0.184	1.38	0.030	0.16	0.045	0.27
INV_INT_COV	?	−0.042	−0.68	0.017	0.27	−0.075	−1.03	−0.047	−0.67

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TABLE 5 (continued)

Dependent Variable	Pred. Sign	*REST* Column 1 Coeff. Est.	*REST* Column 1 z-stat	*REST* Column 2 Coeff. Est.	*REST* Column 2 z-stat	*RESTK* Column 3 Coeff. Est.	*RESTK* Column 3 z-stat	*RESTK* Column 4 Coeff. Est.	*RESTK* Column 4 z-stat
SALEGR	?	0.059	2.07**	0.082	2.45***	0.023	0.63	0.039	0.94
BM	?	0.021	0.80	0.037	1.22	−0.008	−0.26	−0.008	−0.23
EXT_FIN_DEMAND	?	−0.391	−2.30**	−0.236	−1.36	−0.389	−1.77*	−0.204	−0.88
Year indicator			Yes		Yes		Yes		Yes
REST = 1			1,875		1,875				
REST = 0			14,363		14,363				
RESTK = 1							1,218		1,218
RESTK = 0							15,020		15,020
Pseudo R^2			0.048		0.422		0.068		0.375
Likelihood ratio χ^2			322.58		3234.57		333.72		2065.59
Model p-value			< 0.001***		< 0.001***		< 0.001***		< 0.001***

Panel C: Association between Interim- and Fourth-Quarter Restatements and Audit Fees

Dependent Variable	Pred. Sign	*REST_INTERIM* Column 1 Coeff. Est.	*REST_INTERIM* Column 1 z-stat	*REST_INTERIM* Column 2 Coeff. Est.	*REST_INTERIM* Column 2 z-stat	*REST_Q4* Column 3 Coeff. Est.	*REST_Q4* Column 3 z-stat	*REST_Q4* Column 4 Coeff. Est.	*REST_Q4* Column 4 z-stat
Intercept	−	−6.32	−11.44***	−4.39	−16.03***	−5.53	−7.31***	−6.86	−13.78***
AUDFEE	?	0.15	3.20***			−0.12	−2.07**		
ABFEE	?			0.18	3.02***			−0.14	−1.90*
P_SCORE	+	1.33	1.63*	0.47	0.47	0.46	0.41	0.32	0.23
LAGREST	+	3.53	46.71***	3.41	38.20***	3.66	32.39***	3.46	25.67***
BIG	−	−0.19	−1.96**	−0.10	−0.94	0.19	1.28	0.21	1.18
SPECIALIST	−	−0.02	−0.15	0.02	0.13	−0.11	−0.71	0.00	0.01
TA	+	−0.04	−1.41	−0.03	−1.09	0.07	1.64*	−0.03	−0.80
AGE	?	−0.07	−1.66*	−0.02	−0.45	−0.13	−2.41**	−0.14	−2.25**

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TABLE 5 (continued)

		REST_INTERIM				*REST_Q4*			
		Column 1		Column 2		Column 3		Column 4	
Dependent Variable	**Pred. Sign**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**
TENURE	?	0.02	0.48	−0.01	−0.18	0.19	3.15***	0.26	3.56***
NEG_EQUITY	?	0.00	0.00	0.08	0.39	0.33	1.37	0.38	1.27
MERGER	?	−0.15	−0.94	−0.08	−0.46	−0.02	−0.08	−0.15	−0.57
FIN	+	0.22	3.14***	0.26	3.06***	0.03	0.32	0.07	0.61
LOSS	+	0.23	2.21**	0.09	0.78	0.14	1.12	−0.02	−0.14
CURRENT_ACCRUAL	?	−0.77	−2.88***	−1.19	−2.88***	−0.30	−0.73	−0.61	−1.12
LEV	?	−0.18	−1.69*	0.04	0.23	−0.32	−1.80*	−0.15	−0.64
INV_INT_COV	?	−0.07	−1.12	−0.01	−0.12	−0.16	−1.98**	−0.09	−0.89
SALEGR	?	0.10	3.25***	0.13	3.12***	0.12	2.53**	0.13	2.47**
BM	?	0.00	0.03	−0.02	−0.45	−0.04	−1.09	−0.05	−1.09
EXT_FIN_DEMAND	?	−0.28	−1.71*	−0.02	−0.10	−0.07	−0.29	0.05	0.17
Year indicator			Yes		Yes		Yes		Yes
REST_INTERIM = 1			1,403		993				
REST_INTERIM = 0			24,005		15,245				
REST_Q4 = 1							635		431
REST_Q4 = 0							24,773		15,807
Pseudo R^2			0.349		0.332		0.323		0.301
Likelihood ratio χ^2			2,820.91		1,850.69		1,386.87		878.76
Model p-value			< 0.001***		< 0.001***		< 0.001***		< 0.001***

Panel D: Association between Annual Restatements (*RESTK*) and Audit Fees Conditional on Quarterly Restatements

		RESTK			
		Column 1		Column 2	
Dependent Variable	**Pred. Sign**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**
Intercept	–	3.438	2.75***	−1.670	−2.67***
AUDFEE	–	−0.429	−3.89***		

(continued on next page)

TABLE 5 (continued)

		RESTK			
		Column 1		**Column 2**	
Dependent Variable	**Pred. Sign**	**Coeff. Est.**	**z-stat**	**Coeff. Est.**	**z-stat**
ABFEE	−			−0.527	−3.76***
BIG	−	0.297	1.32	0.174	0.68
SPECIALIST	−	−0.192	−0.66	−0.110	−0.32
TA	+	0.154	1.91*	0.021	0.29
AGE	?	−0.181	−1.98**	−0.320	−2.83***
TENURE	?	0.499	4.67***	0.670	5.10***
NEG_EQUITY	?	−0.408	−1.00	−0.519	−1.13
MERGER	?	0.117	0.36	0.267	0.65
FIN	+	−0.135	−0.74	−0.113	−0.53
LOSS	+	−0.147	−0.64	−0.242	−0.90
CURRENT_ACCRUAL	?	−1.364	−1.77*	−0.977	−1.12
LEV	?	0.704	2.02**	0.641	1.49
INV_INT_COV	?	−0.183	−1.36	−0.187	−1.15
SALEGR	?	−0.004	−0.05	−0.017	−0.18
BM	?	−0.125	−0.87	−0.247	−1.45
EXT_FIN_DEMAND	?	0.458	1.22	0.493	1.13
Year indicator			Yes		Yes
RESTK = 1			617		454
RESTK = 0			333		243
Pseudo R^2			0.174		0.197
Likelihood ratio χ^2			130.13		124.44
Model p-value			< 0.001***		< 0.001***

*, **, *** Denote two-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

The z-statistics are calculated based on robust standard errors clustered by firm. The sample period is 2000–2009. The logistic regression is based on Model (4). Panel A presents the logistic regression results for the association between restatements and total audit fees. Panel B presents the logistic regression results for the association between restatements and abnormal audit fees. Panel C presents the logistic regression results for the association between interim- and fourth-quarter restatements and audit fees. Panel D presents the logistic regression results for the association between annual report restatement and total audit fees (Column 1) and abnormal audit fees (Column 2) conditional on quarterly reports being misstated. All observations used in Panel D have at least one quarterly misstatement announced after the fiscal year-end.

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TABLE 5 (continued)

Variable Definitions:
REST = 1 if either the annual or a quarterly financial report is restated, 0 otherwise;
RESTK = 1 if the annual financial report is restated, 0 otherwise;
REST_INTERIM = 1 if an interim-quarter financial report is restated, 0 otherwise;
REST_Q4 = 1 if the fourth-quarter financial report is restated, 0 otherwise;
AUDFEE = natural logarithm of total audit fees; and
ABFEE = abnormal audit fees.
See Table 1 for definitions of the other variables.

in the model. The change in the coefficient of *AUDFEE* from 0.182 in Column 1 to −0.255 in Column 4 reflects the sum of these two biases.

Table 5, Panel B is similar to Panel A, except that it focuses on the association between abnormal audit fees (*ABFEE*) and restatements. In Table 5, Panel B, *ABFEE* is negatively associated with *RESTK* regardless of whether *P_SCORE* and *LAGREST* are excluded from ($\gamma_1 = -0.252$, $z = -3.70$, $p < 0.001$ in Column 3) or included in the model ($\gamma_1 = -0.316$, $z = -5.73$ $p < 0.001$ in Column 4). This is expected given that *ABFEE* is already purged of the effect of misstatement risk on audit fees; therefore, the omission of *P_SCORE* and *LAGREST* does not significantly alter the coefficient of *ABFEE*.

To use firm-year observations without any restatements as the reference group, we repeat the main analysis after excluding observations with quarterly-only misstatements (Group 1 in Table 3) from our sample and obtain (untabulated) results similar to those reported in Column 4 of Panel A and Panel B. The coefficient of *AUDFEE* is −0.14 ($z = -2.99$, $p = 0.003$) and the coefficient of *ABFEE* is −0.20 ($z = -3.26$, $p = 0.001$). Overall, the results in both Panel A and Panel B support the negative association between audit effort and annual restatements predicted by H1 when appropriate controls for pre-audit misstatement risk are included.

The negative relation between total (abnormal) audit fees and annual restatements is also economically significant. Based on the results in Column 4 of Panel A (Panel B), the average marginal effect of *AUDFEE* (*ABFEE*) is −0.0112 (−0.0145), implying that as total audit fees (abnormal audit fees) increase from the 25th percentile to the 75th percentile of the full sample, the likelihood of annual restatement decreases by 2.17 percent (1.15 percent), a significant reduction in relation to the 7.67 percent annual report restatement rate for the full sample. Among the control variables, *TA* and *FIN* are positively associated with restatements across all specifications. Auditor tenure (*TENURE*) has a strong positive association with annual restatements, suggesting that longer auditor tenure is associated with lower audit quality.

To pinpoint the source of the upward bias in the audit fee coefficient when comingling quarterly-only with annual restatements, we re-estimate the restatement regression with the dependent variable defined as *REST_INTERIM* (*REST_Q4*), where *REST_INTERIM* (*REST_Q4*) equals 1 if an interim- (a fourth-) quarter financial report is subsequently restated, and 0 otherwise. The results reported in Table 5, Panel C show that *AUDFEE* is positively associated with *REST_INTERIM* ($\gamma_1 = 0.15$, $z = 3.20$, $p = 0.001$) and negatively associated with *REST_Q4* ($\gamma_1 = -0.12$, $z = -2.07$, $p = 0.038$). The results for *ABFEE* are similar. These results indicate that interim-quarter restatements are the main source of the upward bias in the audit fee coefficient when restatements of annual reports and restatements of quarterly reports are comingled. The positive association between audit fees and interim quarterly report restatements is consistent with both of the following explanations: (1) before the audit starts, the auditor knows interim quarterly reports are misstated and increases year-end audit effort accordingly; and (2) heightened audit effort during the year-end audit identifies more errors in interim quarterly reports, leading to a higher likelihood of interim report restatements.

Table 5, Panel D reports the regression results for the conditional sample. Since all observations in this sample have approximately the same pre-audit misstatement risk, the coefficient for *AUDFEE* is negative ($\gamma_1 = -0.429$) and significant ($z = -3.89$, $p < 0.001$) even without controlling for *P_SCORE* and *LAGREST*. The coefficient for *ABFEE* is similar ($\gamma_1 = -0.527$, $z = -3.76$, $p < 0.001$). The results in Panel D support H2 in that, conditional on quarterly reports being restated, higher audit effort reduces the likelihood that quarterly misstatements are carried into annual reports. The (untabulated) results are similar when we include *P_SCORE* and *LAGREST* in the model.

In summary, the analysis in this section highlights two important research design issues in assessing the effect of the audit in preventing misstatements. First, since quarterly-only restatements do not amount to audit failures, it is crucial to exclude them from the restatement sample when

using restatements to proxy for audit quality. Second, it is critical to control for the effect of auditor risk adjustment on audit fees.

Sensitivity Tests of Auditors' Ability to Detect Misstatements

To assess the sensitivity of the negative association between audit fees and annual report misstatements, we re-estimate Model (4) using various partitions. For brevity, we only report the results for *AUDFEE* and *ABFEE* in Table 6. We partition the full sample based on (1) whether the client size is above or below the median value (Panel A), (2) whether the client reports or does not

TABLE 6

Association between Annual Report Misstatements and Audit Fees Sensitivity Analysis

Panel A: Partition by Client Size

	TA > Median		*TA* ≤ Median		Difference	
	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Difference	Wald Chi-square
AUDFEE	−0.248	−4.50***	−0.195	−2.71***	−0.054	0.35
ABFEE	−0.324	−4.47***	−0.279	−2.95***	−0.045	0.14

Panel B: Partition by Internal Control Weakness

	WEAK302 = 1		*WEAK302* = 0		Difference	
	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Difference	Wald Chi-square
AUDFEE	−0.295	−2.19**	−0.207	−3.74***	−0.088	0.36
ABFEE	−0.311	−1.91*	−0.255	−3.99***	−0.055	0.10

Panel C: Partition by Big N versus Non-Big N Auditor

	BIG = 1		*BIG* = 0		Difference	
	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Difference	Wald Chi-square
AUDFEE	−0.262	−5.29***	−0.186	−1.90*	−0.076	0.47
ABFEE	−0.326	−5.09***	−0.365	−2.91***	0.038	0.07

Panel D: Partition by Industry Specialist versus Non-Industry Specialist Auditor

	SPECIALIST = 1		*SPECIALIST* = 0		Difference	
	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Difference	Wald Chi-square
AUDFEE	−0.509	−3.35***	−0.226	−5.04***	−0.283	3.20*
ABFEE	−0.636	−3.67***	−0.271	−4.77***	−0.365	4.12**

(continued on next page)

TABLE 6 (continued)

Panel E: Partition by Pre-SOX versus Post-SOX

	SOX = 1		*SOX* = 0		Difference	
	Coeff. Est.	z-stat	Coeff. Est.	z-stat	Coeff. Difference	Wald Chi-square
AUDFEE	−0.222	−4.57***	−0.150	−0.87	−0.071	0.16
ABFEE	−0.291	−4.88***	−0.652	−2.07**	0.361	1.26

*, **, *** Denote two-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.
The z-statistics are calculated based on robust standard errors clustered by firm. See Table 1 for definitions of the variables. The sample period is 2000–2009 unless otherwise noted. The logistic regression model is based on Model (4). The dependent variable is annual report restatement (*RESTK*). For brevity, we only report the results for *AUDFEE* and *ABFEE*. In Panel A, we partition the full sample by whether the client's total assets are above or below the sample median. In Panel B, we partition the full sample by whether the client reports material weakness in internal controls under Section 302 of the Sarbanes-Oxley Act of 2002. In Panel C, we partition the full sample by whether the auditor is a Big N or a non-Big N auditor. In Panel D, we partition the full sample by whether the auditor is a specialist or a non-specialist auditor. In Panel E, we partition the full sample by whether the observation is from the pre-SOX (2000–2001) or the post-SOX (2003–2009) period.

report material weakness in internal controls (Panel B),[16] (3) whether the auditor is a Big N or a non-Big N auditor (Panel C), (4) whether the auditor is a specialist or a non-specialist auditor (Panel D), and (5) whether the observation is from the pre-SOX period or the post-SOX period (Panel E). The coefficients of both *AUDFEE* and *ABFEE* are negative and significant at 10 percent or better in all the partitions, except the coefficient of *AUDFEE* in the pre-SOX period. Tests of coefficient restrictions fail to reject coefficient equality between subsamples in each partition with one exception: we find that compared to non-specialist auditors, specialist auditors are more than twice (−0.509/−0.226 = 2.252, −0.636/−0.271 = 2.347) as likely to detect misstatements, and the difference is significant at 10 percent or better.

Prior research suggests that a firm's internal control and corporate governance functions affect the likelihood of subsequent restatements (Farber 2005; Doyle et al. 2007). In an additional sensitivity analysis (results untabulated), we re-estimate Model (4) after supplementing it with a proxy for internal control weakness (*WEAK302*) and five corporate governance variables (*BOARD_SIZE*, *BOARD_INDEP*, *CEO_CHAIR*, *AUDIT_INDEP*, *AUDIT_EXPERT*). The coefficient for *AUDFEE* (*ABFEE*) is −0.28 (−0.45) with p = 0.064 (p = 0.023), consistent with our main findings.[17]

VI. SUMMARY AND CONCLUSIONS

In this study, we reconcile the discrepancy between the theoretical prediction and empirical evidence on the association between audit effort and subsequent restatements. We document that auditor risk adjustment and the positive relation between audit effort and quarterly restatements induce two upward biases that obscure the predicted negative association between audit effort and annual restatements. We show that after appropriately controlling for these two biases, audit effort has a robust negative association with annual restatements.

[16] We use material weakness disclosures under Section 302 of SOX to conduct this test. The results are qualitatively similar if we use material weakness disclosures under either Section 302 or Section 404 of SOX.

[17] We obtain corporate governance variables from Risk Metrics, which covers only large companies. As a result, the sample size drops to 2,722 (2,399) when using *AUDFEE* (*ABFEE*).

Restatement is arguably one of the most objective indicators of audit quality. However, due to the two sources of bias discussed in this paper, prior research has not been successful at documenting the value of the audit in preventing restatements. We propose ways to overcome this hurdle. Future studies could explore other factors affecting the magnitude of the negative association between audit effort and restatements. We believe research in this direction will further our understanding of audit quality and provide valuable information to investors, auditors, and regulators.

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