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Fee pressure and audit quality ☆

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A B S T R A C T

This study investigates the association of audit fee pressure with an inverse measure of audit quality, misstatements in audited data, during the recent recession. Fee pressure in a year is measured as the difference between benchmark "normal" audit fees and actual audit fees. We find fee pressure is positively and significantly associated with accounting misstatements in 2008, the center of the recession. Our results suggest that auditors made fee concessions to some clients in 2008, and that fee pressure was associated with reduced audit quality in that year.

Introduction

We investigate the existence of downward audit fee pressure, and the consequences of that fee pressure on audit quality, during the economic downturn that is often referred to as the "Great Recession". The Recession began in the U.S. in December of 2007 and officially ended in June of 2009 (NBER, 2010). It was longer than any other since World War II, and had more severe negative effects on gross domestic product, private sector jobs, and retail sales than preceding recessions. With regard to auditors, the severity of the Recession likely increased misstatement risk due to reduced client profitability and potential asset impairments. During and after the Recession, regulators repeatedly expressed concerns that audit fee pressure from clients could reduce audit effort and thus affect audit quality.[1] For example, Daniel Goelzer, acting chairman of the Public Company Accounting Oversight Board (PCAOB), warned audit firms that although clients expect auditors to share the economic pain by agreeing to fee reductions, the PCAOB would be closely watching to see whether the fee pressure tempted audit firms to ease up on the rigor of audits (Goelzer, 2010). SEC chief accountant James Kroeker emphasized auditors shouldn't even consider curtailing necessary audit work as a way to cope with falling revenue (Kroeker, 2010).

Despite the stated concerns of regulators, it is not clear that auditors would respond to fee pressure by reducing audit quality given the litigious climate in which they operate. Although client managers might have demanded reduced fees during the Recession, auditors arguably have incentives to maintain or increase audit effort when faced with increased engagement risk (Beck & Mauldin, 2013). One conceivable outcome is that auditors maintained audit effort and quality during the Recession despite granting fee concessions. Due to the conflicting incentives of managers vs. auditors, large sample empirical evidence about whether auditors experienced fee pressure and decreased audit quality in the face of increased misstatement risks is an important topic to consider.

Although regulators and practitioners claim that auditors experienced significant pressure to restrain or reduce audit fees during the Recession (Cheffers & Whalen,

☆ *Data Availability*: All data used in this study are publicly available from the sources identified in the text.

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[1] There is some prior evidence that auditor decisions are affected by broad economic conditions. Leone, Rice, Weber, and Willenborg (2013) find that auditors exhibited a reduced propensity to give going concern modified opinions to financially stressed internet IPO companies during the period of the "dot com bubble."

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2010; PCAOB, 2010, 4), the concept of fee pressure to which these claims refer is undeveloped. Given the lack of an accepted proxy for fee pressure, we devise our own. We compare each client's actual audit fee in the test year (2008) with a benchmark audit fee for that year. We use 2007 as the pre-recession year to calculate our benchmark audit fees.[2] The benchmark audit fees are intended to represent normal levels of audit effort by controlling for changes in audit fees that correspond with changes in fee cost drivers. Specifically, we regress log of audit fees in 2007 on various fee cost drivers to obtain the estimated parameter for each client's individual cost driver.[3] We then multiply the vector of 2007 estimated model parameters by the vector of that client's 2008 model variable values to obtain the 2008 benchmark audit fee for each client. Because a new shock to fee pressure is reflected in current year actual audit fees, but not in the benchmark fees, a comparison of each client's 2008 benchmark fee with its 2008 actual fee determines whether the client has successfully exerted fee pressure. We find approximately 47 percent of clients experienced fee pressure during 2008. The median fee pressure experienced by firms is $163,000, which represents 29 percent of median audit fees of clients that successfully exerted fee pressure.

We also validate our fee pressure metric by comparing the extent of fee pressure in 2008, the center of the Recession, with fee pressure in both 2006 and 2007, the more normal, pre-recession years. We find significantly greater median fee pressure in 2008 than in both 2006 and 2007 and significantly greater mean fee pressure in 2008 than in 2006. These differences suggest that our fee pressure metric is valid. Our hypothesis is that client-specific fee pressure in 2008 is positively associated with client misstatements in that year. If clients successfully exerted downward pressure on audit fees, audit firms might have responded in ways that reduced audit quality. Previous research suggests that misstatements of audited data reflect lower enforcement of the correct application of GAAP by the auditor. A high-quality audit should, *ceteris paribus*, be more likely to detect material misstatements at a higher rate than would a lower quality audit (Francis, Michas, & Yu, 2013; Palmrose & Scholz, 2004). Therefore, the existence of a client misstatement provides more compelling evidence of low-quality audits than do earnings quality metrics such as discretionary accruals. In addition, both theoretical and empirical studies show that misstatements are negatively associated with audit effort, which is a direct measure of audit quality (Lobo & Zhao, 2013; Shibano, 1990). If auditors decrease audit quality for clients that exert fee pressure, there should be an increase in the incidence of misstatements for those clients. Thus, we investigate whether fee pressure in 2008 is positively associated with misstatements of 2008 financial statements.[4]

Based on a sample of 3039 firms, we find a significant, positive association between the fee pressure metric and financial misstatements in 2008. This suggests that clients successfully exerting fee pressure in 2008 had lower audit quality, as measured by misstatements. Economically, a one standard deviation increase in our *Fee Pressure* metric is associated with a 1.1 percent increase in the likelihood of misstatements. This impact is large given that the mean misstatements rate in our sample is 5.8 percent for 2008.

We conduct additional analyses to investigate the effects of fee pressure in pre-recession years 2006–2007 and in the year that the recession eased and ended, 2009. Conceptually audit fee pressure could harm audit quality in any year, although we expect the impact of fee pressure on audit quality is the strongest in the Recession year of 2008. Studying those years also offers an additional benefit. Client firms that exert fee pressure could have certain characteristics that are associated with misstatements but are not controlled in our model explaining misstatements (i.e. the model is characterized by omitted variables). If our fee pressure measure proxies for stable, omitted client characteristics rather than for fee pressure, it should be positively and significantly associated with misstatements in years 2006, 2007 and 2009 as well as in 2008. The results show that such is not the case. Specifically, the association between the fee pressure measure and misstatements does not differ from zero in both 2007 and 2009, is only marginally significant in 2006, but is strongly significant in 2008. These results therefore suggest that omitted variable problems are unlikely to be the main driver of our results for 2008, and that the decrease in audit quality in that Recession year is related to fee pressure.

Finally we investigate whether differences in audit suppliers, audit clients, and misstatement characteristics affect our results. First, we examine whether the effects of fee pressure on audit quality in 2008 differ for large vs. small auditors, with size measured by Big 4 vs. non-Big 4 auditor type and by auditor office size. The results suggest that the impact of fee pressure does not differ for larger vs. smaller audit firms or audit offices. Second, we find no difference in the association between fee pressure and misstatements for larger vs. smaller clients. Third, we find that fee pressure in 2008 is positively associated with occurrence of severe misstatements, but not with less severe misstatements. This result indicates that fee pressure during the Recession was associated with serious decreases in audit quality, not just with small errors in the financial statements.

Our study makes several contributions. Although the business press reported that global and U.S. accounting firms initiated several rounds of layoffs and experienced slower receivables collections throughout the Recession (Wall Street Journal (WSJ), 2008, Accounting Today., 2009), large sample studies documenting whether clients successfully exerted fee pressure on auditors during the Recession are lacking. We develop a metric to represent

[2] Treating 2007 as a pre-recession year is consistent with a concurrent fee pressure study by Beck and Mauldin (2013). Given that fee negotiations occur in the first quarter of the fiscal year, 2008 should be the first recession year in which managers had time to press for fee concessions. Our results remain qualitatively the same if we use 2006 as the pre-recession year to calculate our benchmark audit fees.

[3] We employ a standard log–log form audit fee model and refer to our fee pressure metric as the *Fee Pressure* metric. We modify our estimation method to incorporate the recommendations of Picconi and Reynolds (2012).

[4] A client misstatement in a sample year is identified by a subsequent restatement specifying that the audited financial statements were misstated in that year.

fee pressure. We provide archival evidence that a large proportion (47 percent) of engagements during the Recession year of 2008 were characterized by positive fee pressure, and we demonstrate that fee pressure was associated with lower audit quality during the Recession. We are not aware of any published paper that comprehensively examines a major economic shock to audit fee pressure and the associated consequences for audit quality. This study provides such evidence.

The PCAOB has been closely monitoring whether audit quality has been compromised due to reduced revenues in auditing firms (PCAOB, 2010, 25), so our findings should be informative to regulators. Specifically, we document that fee pressure was pervasive during the Recession year of 2008 and median fee pressure equaled 29 percent of fees for those clients that successfully exerted fee pressure. More importantly, such pressure is associated with evidence of reduced audit quality on an important dimension, financial reporting misstatements. Our results suggest that auditors who experienced fee pressure from clients during the Recession were not able to maintain or increase audit effort in line with client risks due to pressure on audit fees.

The remainder of the paper is organized as follows. In Section 'Background and hypothesis' we provide background on concerns about the effects of the Recession on audit fees, and the resulting threat to audit quality, measured by misstatements. We also state our hypothesis. Section 'Sample selection and methodology' discusses the sample, variables, and models. Section 'Empirical results' provides major results. Section 'Additional analyses' includes additional analyses, and Section 'Conclusion' concludes.

Background and hypothesis

In this section we discuss the effects of the Recession on the audit market and possible implications for audit quality. We also state our hypothesis.

Downward pressure on audit fees in the recession

As discussed above, the Recession was longer and more severe than any other since World War II. It imposed significant financial pressures on many companies. For instance, the number of U.S. commercial bankruptcies for the first eleven months of 2008 was 35 percent greater than the number filed in the entire year of 2007 (Pugh, 2008). Companies expected auditors to share the economic pain by agreeing to fee reductions (Goelzer et al., 2010). If fee reductions occurred, such decreases would be in sharp contrast to the fee increases in the years following the passage of the Sarbanes Oxley Act of 2002 (Cheffers & Whalen, 2010; Ettredge, Li, & Scholz, 2007). In addition, Global and U.S. accounting firms had several rounds of layoffs throughout the recession (Accounting Today, 2009; WSJ, 2008). Accounting firms also experienced slower receivables collections (Accounting Today, 2009), potentially leading to cash flow problems. Thus, accounting firms as well as their clients appear to have experienced financial challenges during the Recession. Regulators have stated concerns that increased fee pressure might have threatened audit quality.

Hypothesis: downward fee pressure and reduced audit quality

The PCAOB issued Staff Audit Practice Alert (SAPA) No. 3, *Audit Considerations in the Current Economic Environment*, to remind auditors that increased misstatement risks arising from the Recession likely required modifications to audit procedures: "Higher risk may cause the auditor to expand the extent of procedures applied, apply procedures closer to or as of yearend . . . or modify the nature of procedures to obtain more persuasive evidence" (PCAOB, 2008, 3). In essence, higher risk requires greater auditor effort, which normally results in higher audit fees. However, as noted above, auditors arguably experienced fee pressure from clients and faced financial challenges during the Recession. These circumstances suggest that audit firms might not have increased their audit effort in the Recession to the extent needed to ensure satisfactorily low audit risk. Auditors likely find it difficult to fit additional procedures into engagement budgets when budgets are impacted by fee pressure. If clients are successful in obtaining fee concessions, it is less likely that their auditors will have the resources required to increase audit effort, thus audit quality is compromised.[5]

In its *Report on Observations of PCAOB Inspectors Related to Audit Risk Areas Affected by the Economic Crisis* (PCAOB, 2010, 2) the PCAOB stated: "PCAOB inspectors identified instances where auditors sometimes failed to comply with PCAOB auditing standards in connection with audit areas that were significantly affected by the economic crisis." The PCAOB attributed these failures, at least in part, to fee pressure arising from the Recession:

> "The Board's inspection staff is aware that as a result of the economic crisis and other factors, auditors might be pressured to significantly reduce their audit fees. Confronted with reduced revenues, some auditors might make inappropriate reductions in the extent of audit procedures in order to achieve cost savings. The Board's inspection staff continues to monitor whether audit quality and the [audit] firms' quality control systems have been compromised due to reduced revenues." (PCAOB, 2010, 25–26).

Some prior research supports the PCAOB's concern that fee pressure can lead to reduced audit quality.[6] On the other hand, auditors currently may hesitate to reduce audit quality in response to fee pressure because of reputation concerns and fear of litigation in the post-SOX regulatory climate. This could lead to auditors exerting the necessary

[5] An audit firm could subsidize unprofitable engagements using fees from profitable engagements. We doubt this often occurs because audit firms treat individual engagements as profit centers. Engagement teams are under substantial pressure to complete engagements on or under budget to ensure profitability on each job (Ettredge, Bedard, & Johnstone, 2008a; Ettredge, Bedard, & Johnstone, 2008b).

[6] Such studies typically employ behavioral experiments or small samples provided by a single audit firm (e.g. Coram et al., 2004, Ettredge et al. 2008b). Our study adds to this literature by investigating this phenomenon on a larger scale using archival methodology. This research compliments studies in other methodologies which often have contextually rich, but necessarily smaller samples. Consistent results across studies provides theoretical and methodological triangulation in the auditing literature.

effort and simply "eating hours" to hide engagement unprofitability, although the findings noted in the PCAOB inspection cycles (PCAOB, 2010, 25–26) suggest this may not have been the case for some engagements.[7] The above discussions lead to our hypothesis, stated in alternate form:

H1. Downward pressure on audit fees is positively associated with decreased audit quality in 2008.

We use financial reporting misstatements as an inverse proxy for audit quality. Higher quality audits should detect more errors and result in fewer misstatements (Kinney, Palmrose, & Scholz, 2004; Lobo & Zhao, 2013; Romanus, Maher, & Fleming, 2008; Stanley & DeZoort, 2007). In the challenging economic environment of the Recession, auditors may not have been able to fully respond to increased client risks by increasing audit procedures.[8] Thus, client managers that successfully exerted fee pressure may have had more ability to willingly or unintentionally misstate results while their auditors may have been less likely to detect the existence of such accounting errors.[9] We test H1 by regressing a dependent variable representing existence or non-existence of misstatements against variables often used to explain these occurrences, plus our proxy for fee pressure, which we will explain in detail in the next section. H1 is supported if the coefficient on the fee pressure metric is positive and significant.

Sample selection and methodology

Sample

We obtain a sample of all public companies that are covered by both Audit Analytics and Compustat in 2008. The initial sample is 7539 firms. Consistent with prior literature, we exclude all financial services firms due to their unique operating and regulatory nature. We then exclude 503 firms without the necessary audit fee data in 2008 as well as the necessary lagged audit fee data in 2007. We exclude an additional 1,461 firms missing the necessary financial and audit data in 2008 as well as the lagged data in 2007 necessary to calculate the audit fee and fee pressure model variables. Finally, we exclude 474 firms missing the necessary data for the misstatement model variables. This results in a final sample of 3039 firms in 2008, which is used to estimate the fee models needed to calculate expected audit fees in 2008 and the model used to test our H1. Table 1 summarizes the sample attrition process.

Table 1
Sample selection.

	2008
Companies covered by Audit Analytics and Compustat	7539
Less: financial services (SIC 6000–6999)	2062
without current year audit fee data	228
without lagged audit fee data	275
without current year financial and audit data to estimate audit fee pressure models	1273
without lagged financial and audit data to estimate audit fee pressure models	188
without necessary additional financial data to estimate the misstatement model	474
Companies with all necessary data to investigate H1	3039

Models and variables

Investigating the existence and effects of fee pressure requires a fee pressure proxy. A company might obtain a fee reduction because it experiences a decrease in size, risk, or complexity. Such a decrease could occur, for example, if a client spins off a piece of its business.[10] A good proxy for fee pressure should control for changes in audit fees that correspond with changes in fee cost drivers. Auditors normally respond to increases in client size, complexity, and financial reporting risk by expending greater audit effort and charging higher audit fees (Raghunandan & Rama, 2006; Simunic, 1980). However, the economic hardship accompanying the Recession suggests auditors likely had difficulty increasing their fees commensurate with increases in client size, complexity, and financial reporting risk in 2008.

Fig. 1 presents a graphic example of the possible effects of client changes on audit fees during the Recession. In 2007 the level of audit cost driver X is "2007 X". The cost driver maps into that year's actual fee "2007 Actual" via the "2007 Audit Fee Line," which has intercept "α" and slope "β". In Recession year 2008, the client's cost driver has increased to level "2008 X". Based on normal (pre-Recession) fee pricing, that should map into the "2008 Benchmark Fee":

$$2008\ \text{Benchmark Fee} = \alpha + \beta(2008\ X). \quad (1)$$

[7] Alternatively, auditors could have increased amounts of audit effort during the Recession, but not to the extent necessary to mitigate the increased risk. We are unable to investigate this possibility due to lack of data on auditor effort.

[8] The challenging economic environment during the Recession likely increased intentional and unintentional misstatement risk. For example, reduced client profitability could increase potential asset impairments and also pressure management to inflate earnings. This may have increased the risk that client prepared financial statements were misstated prior to audits. However, if auditors fully respond to this increased misstatement risk, the rate of misstatements in audited financial statements should not increase.

[9] An alternative perspective is offered by recent studies that suggest that abnormally high audit fees threaten auditor independence (Choi, Kim, & Zang, 2010; Kanagaretnam, Krishnan, & Lobo, 2010). If so, it is possible that increases in fees, unaccompanied by commensurate increases in cost drivers, cause auditors to be lax in averting client misstatements and restraining client accruals. This situation would bias against our finding support for H1. However, in the context of the Recession we do not expect audit fees generally increased relative to the costs of performing audits. Furthermore Francis (2011, 138) is skeptical that fee model residuals capture auditor independence.

[10] Our concept allows for the fact that some fee reductions arise for reasons that do not threaten audit quality. This was acknowledged by the chief auditor of the PCAOB, who told a conference of the AICPA that he hoped auditors were not cutting the number of hours they spend on audits "unless they are doing so because of an identifiable decrease in audit risk or other commensurate changes in circumstances" (Whitehouse, 2010).

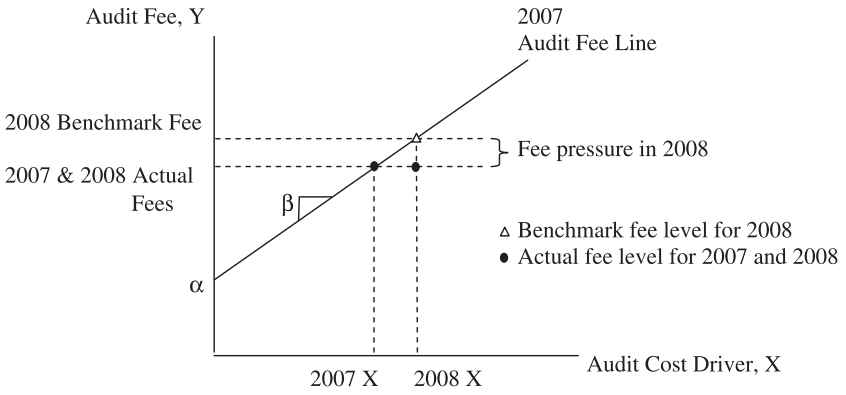


Fig. 1. A Graphic Example of Fee Pressure. This graph represents a simplified example of the effects of client change on audit fee during the Recession. In 2007, the level of audit cost driver X is "2007 X". The cost driver maps into that year's Actual Fee "2007 Actual Fee" via the "2007 Audit Fee Line". In Recession year 2008, the client's cost driver has increased to level "2008 X". Based on pre-Recession fee pricing, that should map into the "2008 Benchmark Fee". If the 2008 actual fee equals or exceeds the "2008 Benchmark Fee", it indicates that there is no fee pressure. Suppose instead that the client successfully resists a fee increase so that the actual fee for 2008 is the "2008 Actual Fee" in the diagram. Since the 2008 Actual Fee is less than the 2008 Benchmark Fee in that case, fee pressure occurs. Although the example shows no change from 2007 to 2008 in actual fee level, fee pressure also would exist in the case of a fee cut (i.e. a 2008 actual fee less than the 2007 actual fee) if there was no corresponding decrease in cost driver X.

If the 2008 actual fee equals or exceeds the "2008 Benchmark Fee", there is no fee pressure. Suppose instead that the client successfully resists a fee increase so that the 2008 actual fee is less than the 2008 benchmark fee. In that case, fee pressure occurs. Although the example shows no change from 2007 to 2008 in the actual fee level, fee pressure still exists because of the increase in the audit cost driver. Fee pressure also would exist in the case of a fee reduction (i.e. a 2008 actual fee less than the 2007 actual fee) if there was no corresponding decrease in cost driver X.

In the simple model of Fig. 1, audit fees have only one cost driver. In reality, there are multiple cost drivers. For a given client some cost drivers could increase and others might decrease from 2007 to 2008. A multivariate model based on 2007 estimated parameters can map the various cost driver levels for 2008 into a single benchmark audit fee for each client in 2008. A comparison of each client's 2008 benchmark fee with its 2008 actual fee determines whether we define the client as having successfully exerted fee pressure. Therefore, we employ a multivariate model, discussed below, to derive benchmark fees that control for the changes in client and engagement characteristics. Appendix A provides a detailed discussion of the audit fee setting process and how it links to the multivariate fee model.

Our primary fee pressure proxy, the *Fee Pressure* metric, is derived from the log–log audit fee model. The model is:

$$\begin{aligned} LnAUDITFEE = {} & b_0 + b_1 LnAT + b_2 LOSS + b_3 CRATIO \\ & + b_4 ZSCORE + b_5 CFO + b_6 ARIN \\ & + b_7 SEG + b_8 FOREIGN + b_9 SQEMPLOY \\ & + b_{10} RLAG + b_{11} GC + b_{12} ACCELERATE \\ & + b_{13} ICMW + b_{14} RESTATE + b_{15} BHRET \\ & + b_{16} IOS + b_{17} BIG4 + b_{18} AUDCHG \\ & + b_{19} POWER + b_{20} ACOMP \\ & + industry\ dummies. \end{aligned} \quad (2)$$

Firm and year subscripts are suppressed for simplicity. To obtain a benchmark audit fee for 2008, we estimate the log–log model by asset quintiles using 2007 data.[11] For each client, we then multiply the vector of 2007 estimated model parameters by the vector of that client's 2008 model variable values and sum to obtain the 2008 benchmark logged fee. We subtract the 2008 actual fee from the pre-logged (exponential) 2008 benchmark fee, and scale the difference by total assets, to get our audit *Fee Pressure* measure. Fee pressure exists if the *Fee Pressure* metric is positive. The larger the difference is, the greater the fee pressure.

Model (2) includes determinants of audit fees identified in the prior literature (e.g. Cahan, Godfrey, Hamilton, & Jeter, 2008; Castrella, Francis, Lewis, & Walker, 2004; Francis & Simon, 1987; Hogan & Wilkins, 2008; Newton, Wang, & Wilkins, 2013; Raghunandan & Rama, 2006; Simunic, 1980; Whisenant, Sankaraguruswamy, & Raghunandan, 2003). First, we include variables that relate to the company under audit. We include a proxy for size (*LnAT*) because larger companies require more audit effort and total assets is the most significant predictor of audit fees (Picconi & M., 2012). We include several proxies for financial conditions (*LOSS*, *CRATIO*, *ZSCORE*, *CFO*). Companies that have poor financial conditions have greater risk of bankruptcy and greater impairment risk requiring more audit effort. We also include proxies for complexity (*ARIN*, *SEG*, *FOREIGN, SQEMPLOY*). Companies that are more complicated require auditors to increase resources to audit all material or risky components of the business. We also include a variable for stock returns (*BHRET*) because companies with positive stock returns are associated with lower audit fees (Whisenant et al. 2003).

[11] Picconi and M. (2012) criticize the log–log model's functional form and show that it provides biased estimates of actual audit fees. We apply their suggested remedy by estimating the log–log model separately for each size quintile and also include industry dummies.

We also include several variables related to the audit. We include multiple proxies for audit risk factors (*RLAG*, *GC*, *ACCELERATE* , *ICMW, RESTATE*). Clients with a longer reporting lag (*RLAG*) may signal that the company is more difficult to audit. Accelerated filers (*ACCELERATE*) are larger with shorter reporting deadlines and may be under greater scrutiny from regulators. In addition, clients with prior issuance of a going concern opinion (*GC*), an internal control material weakness (*ICMW*), or a prior restatement (*RESTATE*) likely will require greater auditor effort in these areas. Next, we include auditor type (*BIG4*) because Big 4 auditors are associated with a fee premium (Whisenant et al. 2003). Finally, we include other audit market factors (*IOS*, *AUDCHG*, *POWER*, *ACOMP*). Clients with a more homogenous industry opportunity set (*IOS*) may enable auditors to specialize within an industry. This specialization may allow auditors to differentiate their services and charge a premium (Cahan et al. 2008). A change in auditor from prior year (*AUDCHG*) will result in a new fee negotiation and may result in fee changes. Clients with greater bargaining power (*POWER*) may be able to pressure their auditors to reduce audit fees (Castrella et al., 2004). Finally, audits in areas with greater auditor competition (*ACOMP*) are associated with lower audit fees (Newton et al., 2013).

We also include industry dummies following the Picconi and M. (2012) method. Industry dummies are based on the updated Fama–French 12 industries (Fama & French, 2011). Variable definitions are provided in Table 2. See Appendix B for model estimation results.[12]

Hypothesis test

In order to test our hypothesis, we investigate whether an inverse measure of audit quality is positively associated with *Fee Pressure* in 2008. Our inverse proxy for audit quality used to investigate H1 is the occurrence of a financial reporting misstatement in 2008. We identify misstatements using the restatement announcements from 2008 to 2012 in Audit Analytics. We argue that misstatements that involve violations of GAAP in audited financial statements are a good proxy for low audit quality because the auditor's duty is to determine whether financial reports are materially presented in accordance with GAAP.

We analyze the determinants of misstatements using the logistic regression model below:

$$\begin{aligned} MISSTATE = {} & b_0 + b_1 FeePressure + b_2 LnAT \\ & + b_3 GROWTH + b_4 ARIN + b_5 ACCRUAL \\ & + b_6 LEV + b_7 EXANTE + b_8 LOSS + b_9 GC \\ & + b_{10} MA + b_{11} VOLATILE + b_{12} SPECIAL \\ & + b_{13} NEWDEBT + b_{14} ICMW + b_{15} AGE \\ & + b_{16} ACOMP + b_{17} NAFEERATIO \\ & + b_{18} INDSPECIAL + industry\ dummies \end{aligned} \quad (3)$$

MISSTATE equals one if the firm has a financial reporting misstatement for year 2008 and zero otherwise. The coefficient of interest is that of the explanatory test variable *Fee Pressure*. If fee pressure is associated with decreased audit quality, hence increased incidence of misstatements, we expect the coefficient on the *Fee Pressure* variable to be positive and significant.

In model (3) we employ control variables based on prior literature (e.g. Kinney et al., 2004; Newton et al., 2013; Romanus et al., 2008; Stanley & DeZoort, 2007). See Table 2 for variable definitions. We control for firm size (*LnAT*) because larger clients may have more developed control systems and more resources to devote to financial reporting. Thus they might be less likely to misstate financial statements (Newton et al., 2013). We include sales growth (*GROWTH*) because prior research suggests that growth is associated with misstatements (Newton et al., 2013). Accruals (*ACCRUAL*) are included because they can be used to manage results and have been associated with misstatements (Richardson, Tuna, & Wu, 2002). We include several proxies for financial condition (*LEV*, *EXANTE*, *LOSS*) because companies that are in financially distressed or highly leveraged may face pressure to misstate financial statements.

Next, we include several controls for additional risk factors. Companies that have received a going concern opinion (*GC*) may be under pressure to manipulate results. We include a dichotomous variable capturing mergers and acquisitions (*MA*) because they are one of the most common causes of non-core account restatements (Palmrose & Scholz, 2004). Companies with volatile earnings (*VOLATILE*) can be more unpredictable and difficult to audit which increases misstatement risk. We also include two measures of complexity (*ARIN*, *SPECIAL*) because more complex companies may be more difficult to audit and have greater misstatement risk. We include financing activity (*NEWDEBT*) because firms that obtain external financing may have greater incentives to manage earnings and are associated with misstatements (Richardson et al., 2002). We include a variable for internal control material weaknesses (*ICMW*) because clients with weak controls may be less likely to prevent or detect a misstatement. We also include firm age (*AGE*) because older firms may have more established internal controls and be less likely to restate.

Finally, we include several controls related to the audit. We include auditor competition (*ACOMP*) because metro areas with higher auditor competition have been shown to have higher incidents of misstatements (Newton et al., 2013). The non-audit fee ratio (*NAFEERATIO*) is included because of concerns about the impact of non-audit fees on auditor independence and audit quality (Stanley & DeZoort, 2007). We include a measure of industry specialist auditors (*INDSPECIAL*) because these auditors may have more industry specific knowledge and be better able to detect misstatements (Stanley & DeZoort, 2007). We also include industry dummies based on the Fama–French 12 industries (Fama & French, 2011).

[12] The adjusted *R*-squares of the log–log model by quintiles for 2008 are lower than the usual *R*-squares obtained when using the traditional log–log model. This is likely due to the significantly reduced sample size and variable variance in each of five separate audit fee regressions. When we use the traditional procedure of pooling data across all quintiles, the log–log model's adjusted R^2 is 0.85. Our results remain qualitatively the same if we use the traditional log–log model with pooled data.

Table 2
Variable definitions.

Variable	Definition
Log–log model (2)	
LN_AUDITFEE	Equals the logarithm of total audit fees in year *t*
LnAT	Equals the logarithm of total assets in year *t*
LOSS	Equals 1 if the company reported a loss in year *t*, zero otherwise
CRATIO	Equals the current ratio calculated as current assets divided by current liabilities in year *t*
ZSCORE	Equals the probability of bankruptcy score (Zmijewski, 1984) measured at the end of the year *t*. The bankruptcy score is calculated as −4.3 − 4.5 ∗ (net income/total assets) + 5.7 ∗ (total debt/total assets) − 0.004 ∗ (current assets/current liabilities)
CFO	Equals operating cash flow divided by total assets in year *t*
ARIN	Equals accounts receivable plus inventories, divided by total assets in year *t*
SEG	Equals natural log of the number of operating and geographic segments in year *t*
FOREIGN	Equals 1 if the company has foreign transactions in year *t*, zero otherwise
SQEMPLOY	Equals the square root of the number of employees reported by the company in year *t*
RLAG	Equals the natural log of the number of days between the company's fiscal year end and the auditor's signing date in year *t*
GC	Equals 1 if the company received a going concern modified opinion in year *t*, zero otherwise
ACCELERATE	Equals 1 if the company is an accelerated filer in year *t*, zero otherwise
ICMW	Equals 1 if the company discloses an internal control material weakness in year *t*, zero otherwise[a]
RESTATE	Equals 1 if the company announces a restatement in year *t*, zero otherwise
BHRET	Equals the firm's buy and hold stock return for year *t*
IOS	Equals the industry investment opportunity set (IOS) as per Cahan et al. (2008). The IOS factor is calculated for each firm in the sample. The industry investment opportunity set equals the standard deviation of the IOS factors for each industry
BIG4	Equals 1 if the signing auditor is a member of the Big 4, zero otherwise
AUDCHG	Equals 1 if the company changes auditors in year *t*, zero otherwise
POWER	Equals client bargaining power in year *t*. It is calculated by taking the log of sales divided by the sum of industry sales following Castrella et al. (2004)
ACOMP	Equals the auditor competition a given metropolitan statistical area in year *t*. It is calculated by ranking the Herfindahl index into quintiles following Newton et al. (2013)
Misstatement model (3): new variables not defined above	
MISSTATE	Equals 1 if the firm misstated the year *t* financial statements, zero otherwise
GROWTH	Equals the percentage increase in revenues from year *t* − 1 to year *t*
ACCRUAL	The change in noncash working capital plus the change in noncurrent operating assets plus the change in net financial assets following Richardson et al. (2002)
LEV	Equals total liabilities divided by total assets in year *t*
EXANTE	Measures the need for future external financing. Equals 1 if the firm's free cash flow in year *t* is less than 0.1, zero otherwise. Free cash flow is calculated as net income less accruals (defined above) divided by average of the last three years of capital expenditures following Romanus et al. (2008)
MA	Equals 1 if the firm had a merger or acquisition in year *t*, zero otherwise
VOLATILE	The standard deviation of earnings in the prior seven years
SPECIAL	Special items divided by total assets.
NEWDEBT	Equals 1 if the firm issued long term debt during year *t*, zero otherwise
AGE	The natural log of the number of years the firm is in CRSP
NAFEERATIO	Equals non-audit fees divided by total fees in year *t*
INDSPECIAL	Equals 1 if the auditor is a city level industry expert, zero otherwise. Industry expertise is measured using the portfolio measure at the auditor and city level following Neal and Riley (2004). Industry portfolio share is calculated as the audit fees for each two digit SIC code divided by the auditor's total audit fees in each MSA. Each auditor is defined as an industry expert for the industry in which they have largest portfolio share
Misstatement model (3): sensitivity analysis variables	
ASIZE	Equals 1 if the auditor office revenues are more than the median of total office revenues in the sample, zero otherwise. The median total office revenue in our sample is $13,415,750
IRREGULARITY	Equals 1 if Audit Analytics codes the misstatement as a fraud or as having an SEC investigation, zero otherwise
CAR	Equals the cumulative abnormal return for the five day window (−2, 2) surrounding the restatement announcement
MAGNITUDE	The magnitude of the misstatement equals the cumulative impact of the restatement on net income scaled by total assets
REV_RELATE	Equals one if the misstatement is coded as revenue related in Audit Analytics, zero otherwise
LENGTH	Equals the natural log of the misstatement length in years

[a] The internal control material weakness is obtained from the auditor's Section 404 internal control report. 72% of our sample has Section 404 reports. For firms that do not have auditors' internal control reports, ICMW is set to be zero. In additional analyses, we examine only those firms without auditor Section 404 reports and our results remain similar.

Empirical results

Descriptive statistics for fee pressure

The untabulated results suggest that the *Fee Pressure* measure is positive for 47% of clients in 2008. Thus, almost half of clients successfully exerted fee pressure in that year. The median of the *Fee Pressure* measure for clients with positive fee pressure is 0.0006, which is about $163,000 (not tabulated).[13] Because the median 2008 audit fee for clients with positive *Fee Pressure* values in our sample

[13] The fee pressure measure is scaled by total assets. Median assets for clients with positive *Log–Log* are $291,067,500.

Table 3
Descriptive statistics for fee pressure metric.

	2008 $N = 3039$			2006 $N = 3539$			Differences in means		Differences in medians	
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	*t*-Stat	*p*-Value	*z*-Score	*p*-Value
Panel A: Comparison of fee pressure metric for 2008 vs. 2006										
Fee pressure	−0.00077	−0.00003	0.0046	−0.00148	−0.00016	0.0061	−5.29	0.001	−4.87	0.001
	2008 $N = 3039$			2007 $N = 3349$			Differences in means		Differences in medians	
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	*t*-Stat	*p*-Value	*z*-Score	*p*-Value
Panel B: Comparison of fee pressure metric for 2008 vs. 2007										
Fee pressure	−0.00077	−0.00003	0.0046	−0.00091	−0.00008	0.0049	−1.25	0.21	−1.68	0.09

is $564,090, the ratio of the dollar value of fee pressure to audit fees is approximately 29% for clients with positive fee pressure.

To validate our *Fee Pressure* measure, we compare the mean and median of *Fee Pressure* in 2008 with those in both 2006 and 2007. Because 2008 is the center year of the Recession, the fee pressure should be greater in that year compared to the other years. Thus, if the *Fee Pressure* variable proxies for fee pressure, we expect to find greater means and medians of *Fee Pressure* in 2008 than in both 2006 and 2007. Table 3 reports the results. More positive (less negative) values correspond to greater fee pressure. The results indicate that the median of *Fee Pressure* is significantly less negative in 2008 than in 2006 and 2007, indicating increased fee pressure in 2008. In addition, the mean of *Fee Pressure* is significantly less negative in 2008 than in 2006. Thus, Table 3 provides support that our *Fee Pressure* metric is valid.[14]

Descriptive statistics for model variables testing H1

Table 4 reports the descriptive statistics for the model (3) variables impacting misstatements. Both mean and median *Fee Pressure* are significantly greater for misstatement firms than for non-misstatement firms, which provides univariate support to H1. Misstatement firms have higher occurrence of internal control material weaknesses and are younger than non-misstatement firms. Incidence of receiving a going concern opinion is also lower for misstatement firms than non-misstatement firms, before controlling for other firm characteristics.

Regression results for H1

Table 5 reports the logistic regression results for Model (3), the impact of fee pressure in 2008 on financial misstatements. The area under the ROC curve is above 0.70 and the Hosmer and Lemeshow goodness of fit test is not significant, suggesting reasonable model fit. Importantly, the coefficient on *Fee Pressure* is positive and significant, suggesting that clients that successfully exert fee pressure on their auditors are more likely to have misstatements.[15] This result is consistent with our univariate analysis and supports H1. The effect is economically meaningful as well as statistically significant. Specifically, a one standard deviation increase in *Fee Pressure* is associated with a 1.1 percent increase in the likelihood of misstatements.[16] This impact is economically large given that misstatements occur in our sample at a rate of 5.8 percent for 2008. This suggests that audit quality, on this dimension, suffered due to fee pressure during the Recession.

Results for control variables show that firms with larger accruals, more special items, and firms with internal control weaknesses are more likely to misstate. On the other hand, older firms, firms with higher accounts receivable and inventory ratios, and firms with going concern opinions are less likely to have misstatements.

Fee pressure and audit quality in years surrounding the recession

Regulators have expressed concerns that increased fee pressure might have threatened audit quality during the Recession because the Recession imposed significant financial pressures on many companies and accounting firms. Conceptually, however, audit fee pressure could harm audit quality in any year, although we expect the impact of fee pressure on audit quality is the strongest in the Recession year.

To provide evidence on this, we investigate the effects of fee pressure in several years surrounding the peak recession year of 2008. The first such year is 2006. The Recession

[14] A comparison of the 2006 mean and median with those for 2007 suggest a tendency for fee pressure to increase as the recession approached. The increases in both the mean and median are significant at the 0.01 level.

[15] In untabulated results, we calculate the *Fee Pressure* metric without scaling by total assets. Our results remain qualitatively the same as those presented (positive coefficient with p-value = 0.017). In addition, we calculate fee pressure using total fees, instead of audit fees. Results remain similar to, but slightly weaker than, those presented (positive coefficient with p-value = 0.080).

[16] The economic magnitude for the impact of *Fee Pressure* on misstatements in 2008 equals the coefficient $\times\ p \times (1 - p) \times$ one standard deviation of *Fee Pressure*.

Table 4
Misstatement model (3) descriptive statistics.

	Misstate = 1 N = 177			Misstate = 0 N = 2862			Difference in means	Difference in medians
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	t Stat	z-Score
Fee pressure	−0.00017	0.00011	0.0040	−0.00080	−0.00004	0.0046	1.79*	−1.94*
LnAT	5.615	5.685	1.9499	5.629	5.687	2.3894	−0.08	0.07
GROWTH	0.209	0.081	0.6098	0.168	0.073	0.5469	0.96	−0.39
ARIN	0.229	0.195	0.1844	0.253	0.219	0.1906	−1.61	1.16
ACCRUAL	−0.041	0.011	0.3932	−0.095	−0.016	0.4377	1.60	−1.79*
LEV	0.614	0.568	0.4488	0.682	0.525	0.9046	−1.00	−1.32
EXANTE	0.480	0	0.5010	0.432	0	0.4954	1.27	−1.27
LOSS	0.497	0	0.5014	0.448	0	0.4974	1.27	−1.27
GC	0.056	0	0.2315	0.102	0	0.3023	−1.95*	1.95*
MA	0.186	0	0.3906	0.157	0	0.3641	1.03	−1.03
VOLATILE	0.211	0.078	0.4796	0.209	0.061	0.5159	0.06	−1.63
SPECIAL	0.064	0.009	0.1215	0.053	0.005	0.1125	1.29	−1.32
NEWDEBT	0.181	0	0.3859	0.192	0	0.3938	−0.36	0.36
ICMW	0.198	0	0.3994	0.022	0	0.1456	13.30***	−12.93***
AGE	2.616	2.565	0.6292	2.800	2.708	0.6686	−3.56***	2.29**
ACOMP	1.424	1	0.8958	1.512	1	0.9402	−1.21	1.67
NAFEERATIO	0.138	0.1024	0.1412	0.1303	0.0954	0.1262	0.82	−0.08
INDSPECIAL	0.209	0	0.4078	0.226	0	0.4181	−0.52	0.52

The following indicate significant differences (two-tailed).
See Table 2 for variable definitions.
*** ⩽0.01 level.
** ⩽0.05 level.
* ⩽0.10 level.

Table 5
Model (3) logistic regression results for effects of fee pressure on misstatements, 2008.

	+/−	Coeff	Chi-sqr.	p-Value
Dependent variable = MISSTATE				
Intercept		−0.95	3.21	0.073
Fee Pressure	+	42.38	3.11	0.039
LnAT	−	−0.06	1.78	0.091
GROWTH	+	0.00	0.00	0.984
ARIN	+	−1.09	4.45	0.035
ACCRUAL	+	0.48	3.32	0.034
LEV	+	0.02	0.02	0.439
EXANTE	+	−0.11	0.04	0.847
LOSS	+	0.19	0.10	0.375
GC	+	−1.03	6.29	0.012
MA	+	0.10	0.23	0.317
VOLATILE	+	0.07	0.15	0.351
SPECIAL	+	1.27	2.98	0.042
NEWDEBT	+	0.16	0.52	0.235
ICMW	+	2.42	98.19	0.001
AGE	−	−0.36	7.24	0.004
ACOMP	+	−0.12	1.56	0.212
NAFEERATIO	+	0.30	0.23	0.315
INDSPECIAL	−	−0.14	0.42	0.258
Industry dummies		Yes		
N		3039		
Misstate *N*		177		
Likelihood ratio		139.01***		
Goodness-of-fit		1.44		
ROC		0.72		
Pseudo *R*-sqr.		0.12		

See Table 2 for variable definitions. p-values are one-tailed for signed expectations, except where estimated coefficient has a sign opposite to expectation. All other p-values are two tailed.
*** Significance at the 0.01 level.

began late in 2007 so 2006 is the last year that clearly is prior to the Recession. It is also several years after the initial implementation of SOX Section 404 requirements for accelerated filers, which comprise 72% of our sample in 2008.[17] We derive the 2006 sample employing the same procedures used to obtain the 2008 sample, which results in a sample of 3,539 firms for 2006. We follow the same procedures described above for 2008 to calculate *Fee Pressure* for 2006, using 2005 as the benchmark fee year.[18]

The second pre-recession year studied is 2007. As economic conditions deteriorated in late 2007, auditors likely faced some increase in client risks and encountered fee pressure. The third additional year studied is 2009. The Recession officially ended in June of 2009, so the economy

[17] We discuss the potential impact of reduced audit fees for accelerated filers, arising from Auditing Standard No. 5 in 2007, on our results in the additional analyses.

[18] It is possible that there is a SOX 404 learning curve effect for auditors from 2005 to 2006, which may affect the audit fee changes. In untabulated tests, we control for such effect by utilizing two proxies for SOX 404 learning curve. First, we calculate the total number of internal control audit reports for each audit office from the first year of internal control audits to year t-1 (*SUM_SOXAUDITS*). Second, we calculate the ratio of internal control weaknesses to number of internal control audits from the first year of SOX to year t-1 for each audit office (*PERCENT_ICMW*). These variables proxy for both the auditors' and clients' SOX experience prior to the commencement of the current year audit. We add these variables to the audit fee model and recalculate *Fee Pressure* for both 2006 and 2008. The results of the misstatement logistic regression are generally consistent with the results reported in Tables 5 and 6: The coefficient on *Fee Pressure* is positive and significantly related to misstatements in 2008 (one-tailed p-value = 0.028), but not in 2006 (one-tailed p-value 0.429).

was gradually recovering in that year. We employ the same procedures described above to obtain a sample of 3349 (2992) firms in 2007 (2009). Likewise we follow the same procedures as previously to calculate *Fee Pressure* using 2006 (2008) as the benchmark fee year for 2007 (2009). We identify financial misstatements in those three years from subsequent restatement announcements disclosed from 2006 to 2012. If audit firms did not reduce audit quality in response to audit fee pressure in these surrounding years, the coefficient on the *Fee Pressure* variable will not be significant. If it is significant, we expect the coefficient to be positive.

Table 6 reports results for model (3) estimated with the 2006, 2007 and 2009 samples. Column (1) shows the coefficient on *Fee Pressure* is positive and marginally significant in 2006 (one-tailed $p = 0.090$), indicating a modest association between fee pressure and misstatements in 2006. Columns (2) and (3) show the coefficients on *Fee Pressure* do not differ significantly from zero at the conventional level in both 2007 and 2009 (one-tailed $p = 0.102$ and 0.385, respectively).[19,20]

Studying the associations between audit fee pressure and misstatements in those years surrounding the Recession offers an additional benefit. Client firms that exert fee pressure could have certain characteristics that are associated with misstatements but are not controlled in our model explaining misstatements (i.e. the model is characterized by omitted variables). If our fee pressure measure proxies for stable, omitted client characteristics rather than for fee pressure, it should be positively and significantly associated with misstatements in each of year 2006, 2007 and 2009 as well as in 2008. The above results show that such is not the case.[21] Therefore omitted variable problems are unlikely to be the main driver of our results for 2008, and the results are consistent with the argument that the decrease in audit quality in that Recession year is most likely due to fee pressure.[22]

Additional analyses

In the following additional analyses, we conduct various cross-sectional tests to examine whether the impact of fee pressure on audit quality differs based on auditor size, on client size, or differs with the severity of misstatements.

Large auditors vs. small auditors

The Recession might have affected auditors differently based on size. Larger auditors likely have more incentives to maintain audit quality and to preserve their reputations. They probably also are under more scrutiny from the PCAOB and have greater risk from large class action lawsuits. Finally, their "deep pockets" may enable them to absorb temporary losses due to maintaining audit effort while granting concessions to clients exerting fee pressure. In this analysis, we examine the impact of fee pressure on large vs. small auditors. We classify auditors as large or small in two ways: (1) whether they are Big 4 or non-Big 4, and (2) the auditor office size based on local office revenue, because recent research finds that large auditor offices have better audit quality (Francis et al., 2013).

Big 4 vs. non-Big 4 auditors

Panel A of Table 7 shows the logistic regression results for 2008 explaining misstatements for Big 4 vs. non-Big 4 auditors. Our misstatement sample has 1,937 clients that have Big 4 auditors and 1,102 firms that have non-Big 4 auditors. We add an interaction term, *Big4* * *Fee Pressure*, to determine if Big 4 auditors were impacted significantly differently by fee pressure compared to non-Big 4 auditors. The results show that the interaction term between *Big4* and *Fee Pressure* is not significant, suggesting that the effect of fee pressure on audit quality does not differ between Big 4 and non-Big 4 auditors. The *Fee Pressure* variable continues to be positively associated with misstatement.

[19] We note that the coefficient on *Fee Pressure* is negative (although not significant) in 2009. It is possible that by 2009 auditors had yielded to all the fee pressure they could afford to accommodate. It also is possible that auditors had found ways to become even more efficient in the face of continuing fee pressure. Given fees likely "bottomed out" in 2008, there would be little fee pressure in 2009 as measured using a 2008 benchmark. As an alternative we use 2007 as the benchmark year (rather than 2008) when obtaining *Fee Pressure* for 2009. As a second alternative we employ the abnormal fee for 2009 (i.e. the 2009 fee model residual) as proxy for fee pressure in that year. In both cases the coefficients for fee pressure in 2009 do not differ significantly from zero and our conclusion remains unchanged.

[20] Although H1 hypothesizes that the coefficient on *Fee Pressure* is significantly greater than zero in 2008, we also compare that coefficient to the coefficients on *Fee Pressure* in 2006, 2007, and 2009. The 2008 coefficient is more positive than in the other years, but the difference is not significant (one-tailed p-value = 0.133). This likely is due to a weak tendency for fee pressure to be positively associated with misstatements in two of the other years studied.

[21] In untabulated results, we employ a two year lag (vs. a one year lag) when computing the benchmark audit fees. The results are qualitatively similar to those presented in the paper. Specifically, the *Fee Pressure* variable coefficient is positive but not significant in 2006 (one tailed p-value = 0.135), is positive and marginally significant in 2007 (one tailed p-value = 0.093), is positive and marginally significant in 2008 (one tailed p-value = 0.093), and is negative and not significant in 2009 (p-value = 0.647).

[22] It is possible that some omitted variable is uniquely associated with both fee pressure and misstatements in 2008. One method to address this concern is to perform a propensity score matching of firms that successfully exerted fee pressure to those that did not. To do that, we dichotomize *Fee Pressure* at a cut-point of zero and code firms with positive (negative) fee pressure as Fee Pressure = 1 (=0) respectively. We predict fee pressure using one year changes in the audit fee model variables from model (2) (i.e. from 2007 to 2008). We also include a one-year-lagged Fee Pressure variable since previously exerting fee pressure may be indicative of the ability to exert fee pressure in future years. We match high (=1) and low (=0) fee pressure observations using a narrow difference in the probability of fee pressure of 0.001. The resulting one-to-many matched sample contains 991 high fee pressure firms and 4281 low fee pressure observations. We then estimate the misstatement logistic regression using the matched sample and cluster by firm CIK code. The results are consistent with our main analysis; we continue to find the dichotomous Fee Pressure measure is positive and marginally significant (p-value 0.078).

Table 6
Model (3) logistic regression results for effects of fee pressure on misstatements, additional years.

	+/−	(1) 2006 (pre-Recession)			(2) 2007 (entering Recession)			(3) 2009 (Recession easing)		
		Coeff	Chi-sqr.	*p*-Value	Coeff	Chi-sqr.	*p*-Value	Coeff	Chi-sqr.	*p*-Value
Dependent variable = MISSTATE										
Intercept		−2.54	37.00	0.001	−2.58	27.59	0.001	−2.26	13.04	0.001
Fee Pressure	+	15.42	1.80	0.090	20.58	1.62	0.102	−5.93	0.09	0.385
LnAT	−	−0.04	1.04	0.154	−0.02	0.13	0.358	0.00	0.00	0.485
GROWTH	+	0.18	4.49	0.017	−0.02	0.05	0.822	−0.13	0.92	0.337
ARIN	+	0.14	0.15	0.350	0.21	0.23	0.315	−0.06	0.01	0.922
ACCRUAL	+	−0.55	8.19	0.004	−0.33	2.50	0.114	−0.19	0.64	0.424
LEV	+	0.11	1.25	0.132	−0.14	1.82	0.177	0.02	0.07	0.393
EXANTE	+	0.34	0.68	0.206	0.44	0.80	0.185	−0.02	0.00	0.967
LOSS	+	−0.31	0.54	0.464	−0.46	0.84	0.360	0.15	0.09	0.384
GC	+	−0.62	3.71	0.054	0.07	0.05	0.409	−0.46	1.18	0.278
MA	+	−0.22	1.60	0.206	0.18	0.92	0.169	0.16	0.34	0.279
VOLATILE	+	−0.01	0.01	0.934	0.17	1.42	0.117	0.00	0.13	0.715
SPECIAL	+	−0.80	1.26	0.262	0.59	0.73	0.196	0.85	0.83	0.182
NEWDEBT	+	−0.02	0.02	0.894	−0.01	0.00	0.976	0.05	0.04	0.416
ICMW	+	1.68	100.83	0.001	1.50	49.03	0.001	2.27	54.28	0.001
AGE	−	−0.02	0.06	0.407	−0.15	1.53	0.108	−0.18	1.49	0.111
ACOMP	+	0.11	1.94	0.082	0.16	4.45	0.017	−0.12	1.17	0.280
NAFEERATIO	+	0.99	4.61	0.016	−0.16	0.08	0.777	−1.44	3.34	0.068
INDSPECIAL	−	0.30	3.78	0.052	0.01	0.00	0.973	−0.17	0.47	0.248
Industry dummies		Yes			Yes			Yes		
N		3539			3349			2992		
Misstate *N*		296			208			127		
Likelihood Ratio		133.44***			63.40***			62.83***		
Goodness-of-Fit		3.38			10.31			15.60		
ROC		0.66			0.63			0.67		
Pseudo *R*-sqr.		0.08			0.05			0.07		

See Table 2 for variable definitions. *p*-values are one-tailed for the *Fee Pressure* metric.
*** Significance at the 0.01 level.

Large office size auditors vs. small office size auditors

We also measure auditor size by the size of the local office. We define large office auditors as those local offices with more than the median of total office revenue in our sample (*ASIZE* = 1) and small office auditors as those with less than the median of total office revenue (*ASIZE* = 0).[23] We then interact *ASIZE* with *Fee Pressure*. The results for the logistic regression explaining misstatements for large and small auditor office size are shown in Panel B of Table 7. The results are qualitatively consistent with the Big 4 results discussed above. Overall, the above two analyses suggest that the impact of fee pressure does not affect larger and smaller auditors differently.

Large vs. small clients

Clients could have different impacts on their auditors based on client size. Larger clients are likely to be more complex than smaller clients. Auditors might have more difficulty maintaining audit quality when large clients successfully exert fee pressure than when small clients do so. On the other hand, large clients have higher litigation risk, thus auditors are likely to be more cautious. In this sensitivity test, we divide the sample into larger and smaller clients based on median client firm assets. Firms with greater than median assets are classified as larger clients and firms with less than median assets are classified as smaller clients.[24] We then interact a client size dummy with the fee pressure variables and include the interactions in Model (3). In un-tabulated results, the coefficient on the interaction of the client size dummy with *Fee Pressure* is not significant, indicating there is no difference in the association between fee pressure and misstatements for larger vs. smaller clients.

Misstatement severity

Misstatements vary widely in severity and can be due to inadvertent errors or to more serious irregularities resulting from misapplication of GAAP or fraud. Prior studies provide multiple measures that indicate misstatement severity. Following Hennes and Leone A. J. Miller (2013), we use a composite measure of misstatement severity that includes five severity components (*IRREGULARITY*, *CAR*, *MAGNITUDE*, *REV_RELATE*, *LENGTH*).[25] These measures capture related, but not identical, aspects of misstatement severity. We use principle components analysis to create a single misstatement severity factor.[26] We then split the sample based upon the median severity factor value. Mis-

[23] The median total office revenue in our sample is $13,415,750.

[24] Median client assets in our sample are $294,845,000.

[25] Please see Table 2 for the variable definitions.

[26] The signs of the factor loadings are consistent with the results of Hennes et al. (2013). As an added sensitivity test, we repeat the analysis using the Hennes et al. (2013) factor loadings. Our results are qualitatively the same as those presented here.

Table 7
Model (3) logistic regression results for 2008 by auditor and audit office size.

	+/−	Coeff	Chi-sqr.	*p*-Value
Panel A: Big4 vs. non Big4 Auditors				
Dependent variable = *MISSTATE*				
Intercept		−0.97	3.33	0.068
Fee Pressure	+	38.43	2.07	0.075
LnAT	−	−0.03	0.35	0.278
GROWTH	+	−0.02	0.01	0.914
ARIN	+	−1.10	4.56	0.033
ACCRUAL	+	0.47	3.24	0.036
LEV	+	0.03	0.04	0.419
EXANTE	+	−0.12	0.04	0.834
LOSS	+	0.20	0.12	0.367
GC	+	−1.04	6.37	0.012
MA	+	0.10	0.20	0.328
VOLATILE	+	0.07	0.13	0.360
SPECIAL	+	1.29	3.06	0.040
NEWDEBT	+	0.16	0.52	0.235
ICMW	+	2.42	97.77	0.001
AGE	−	−0.37	7.61	0.003
ACOMP	+	−0.11	1.47	0.226
NAFEERATIO	+	0.29	0.21	0.323
INDSPECIAL	−	−0.17	0.61	0.218
BIG4	−	−0.18	0.64	0.211
BIG4 ∗ Fee Pressure	?	18.32	0.10	0.757
Industry dummies		Yes		
Fee Pressure + BIG4 ∗ Fee Pressure	?	56.75	1.13	0.287
N		3039		
Misstate *N*		177		
Likelihood ratio		139.78***		
Goodness-of-fit		3.52		
ROC		0.72		
Pseudo *R*-sqr.		0.13		
Panel B: Large vs. small audit offices				
Dependent variable = *MISSTATE*				
Intercept		−0.92	3.03	0.082
Fee Pressure	+	37.89	2.10	0.074
LnAT	−	−0.02	0.21	0.324
GROWTH	+	−0.02	0.02	0.889
ARIN	+	−1.11	4.61	0.032
ACCRUAL	+	0.47	3.23	0.036
LEV	+	0.03	0.05	0.415
EXANTE	+	−0.12	0.04	0.838
LOSS	+	0.21	0.12	0.364
GC	+	−1.03	6.36	0.012
MA	+	0.09	0.16	0.347
VOLATILE	+	0.07	0.13	0.358
SPECIAL	+	1.31	3.14	0.038
NEWDEBT	+	0.15	0.47	0.246
ICMW	+	2.41	97.06	0.001
AGE	−	−0.37	7.58	0.003
ACOMP	+	−0.17	2.82	0.093
NAFEERATIO	+	0.30	0.23	0.314
INDSPECIAL	−	−0.18	0.70	0.202
ASIZE	−	−0.31	2.40	0.061
ASIZE ∗ Fee Pressure	?	19.26	0.09	0.766
Industry dummies		Yes		
Fee Pressure + ASIZE ∗ Fee Pressure	?	57.15	0.92	0.337
N		3039		
Misstate *N*		177		
Likelihood ratio		141.59***		
Goodness-of-fit		9.08		
ROC		0.72		
Pseudo *R*-sqr.		0.13		

See Table 2 for variable definitions. *p*-values are one-tailed for signed expectations, except where estimated coefficient has a sign opposite to expectation. All other *p*-values are two tailed.
*** Significance at the 0.01 level.

Table 8
Model (3) logistic regression results for effects of fee pressure on severe and less severe misstatements.

	(1) Severe misstatements				(2) Less severe misstatements			
	+/−	Coeff	Chi-sqr.	*p*-Value	+/−	Coeff	Chi-sqr.	*p*-Value
Dependent variable = MISSTATE								
Intercept		−2.03	5.58	0.018		−1.96	5.27	0.022
Fee Pressure	+	120.40	3.98	0.023	?	22.72	0.19	0.661
LnAT	−	0.04	0.23	0.634	−	0.08	0.85	0.358
GROWTH	+	0.32	2.53	0.056	+	−0.07	0.06	0.801
ARIN	+	−0.09	0.01	0.920	+	−1.70	3.60	0.058
ACCRUAL	+	0.65	1.39	0.119	+	0.71	1.50	0.110
LEV	+	−0.28	0.34	0.562	+	−0.44	0.76	0.382
EXANTE	+	−0.08	0.00	0.945	+	−1.33	3.82	0.051
LOSS	+	0.15	0.02	0.444	+	1.61	5.75	0.008
GC	+	−2.12	3.90	0.048	+	−2.04	3.69	0.055
MA	+	0.09	0.07	0.394	+	−0.14	0.14	0.707
VOLATILE	+	−0.39	0.60	0.439	+	−0.20	0.14	0.707
SPECIAL	+	1.74	2.08	0.075	+	1.46	1.29	0.128
NEWDEBT	+	−0.10	0.07	0.794	+	−0.04	0.01	0.904
ICMW	+	2.70	61.97	0.001	+	2.58	54.09	0.001
AGE	−	−0.49	5.19	0.011	−	−0.56	6.53	0.005
ACOMP	+	−0.12	0.58	0.448	+	0.03	0.06	0.403
NAFEERATIO	+	−0.01	0.00	0.995	+	−0.07	0.00	0.948
INDSPECIAL	−	−0.09	0.07	0.394	−	−0.25	0.55	0.230
Industry dummies		Yes				Yes		
N		2929				2929		
Misstate *N*		67				67		
Likelihood Ratio		97.81***				88.31***		
Goodness-of-fit		4.04				3.28		
ROC		0.76				0.79		
Pseudo *R*-sqr.		0.17				0.15		

See Table 2 for variable definitions. *p*-values are one-tailed for signed expectations, except where estimated coefficient has a sign opposite to expectation. All other *p*-values are two tailed.
*** Significance at the 0.01 level.

statements with a severity factor greater than the median are classified as more severe, and misstatements with a severity factor less than the median are classified as less severe. The data necessary for the severity analysis is missing for 43 clients, reducing the misstatement sample for this sensitivity test to 134 (67 misstatements classified as severe and 67 classified as less severe).

Table 8 shows the results of the misstatement severity analysis. The coefficient on *Fee Pressure* (p-value = 0.023) is positively associated with more severe misstatements in Column (1). However, *Fee Pressure* is not associated with less severe misstatements in Column (2). These results suggest that fee pressure experienced during the Recession was associated with important decreases in financial reporting (and auditing) quality, not merely with smaller errors in the financial statements.[27]

Alternative audit fee pressure measure

Our primary audit fee pressure measure, *Fee Pressure*, controls for the changes in audit fees that correspond with changes in fee cost drivers. In some cases it seems likely that a reduced audit fee compared to the prior year would make it more difficult for an audit team to meet an engagement budget without cutting corners. In this additional analysis, we employ an alternative metric, the *Fee Decrease* metric, to address this aspect of audit fee pressure. We use 2007 audit fees scaled by total assets as benchmark for scaled audit fees in 2008.[28] We scale by assets since assets explain the largest part of the variance in audit fees (Picconi & M., 2012). *Fee Decrease* equals the scaled actual fee for 2007, minus the scaled actual fee for 2008. The *Fee Decrease* metric has the advantage of simplicity. Absent slack in engagement budgets, fee reductions are likely to place audit teams under stress. This metric captures such stress without the need for a fee benchmark derived from an econometric estimate. A disadvantage is that the metric does not control for contemporaneous changes in client and engagement characteristics.[29] Similar to the results we observe when using *Fee Pressure,* the coefficient on *Fee Decrease* (not tabulated) is positive and marginally significant in 2008 (*p*-value = 0.072), suggesting that during the Recession, a reduced audit fee, compared to the prior year, also impaired audit quality.[30]

[27] A possible explanation for this result is that more severe errors are more difficult for auditors to detect.

[28] Our *Fee Decrease* results remain qualitatively the same if we use 2006 as the benchmark year.

[29] For instance, a fee reduction may not impose pressure on the auditor if accompanied by a substantial reduction in the size and complexity of a client's operations. A fee increase may impose resource pressure on the auditor if accompanied by even greater increases in client financial difficulties and financial reporting risk.

[30] In further analysis, we also create two dummy variables equal to 'one' when both *Fee Pressure* and *Fee Decrease* measures are positive (zero otherwise), and add them to obtain a composite fee pressure score for each engagement. Our results are qualitatively similar when using this measure of fee pressure.

Change from AS2 to AS5

Auditing Standard No. 5 (AS5) *An Audit of Internal Control Over Financial Reporting That is Integrated with an Audit of Financial Statements* came into effect in 2007 (PCAOB, 2007) and is intended to enable auditors to use a more risk based approach when testing controls over financial reporting as required by Sarbanes Oxley Section 404. AS5 potentially requires less auditor effort and is thus less costly than the predecessor standard in place in 2006, Auditing Standard No. 2 (AS2). Kanagaretnam et al. (2010) find that promulgation of AS5 was accompanied by a general decrease in audit fees paid by clients that are accelerated filers. In addition, Krishnan, Krishnan, and Song (2011) find a 4.11 percent decrease in audit fees from 2006 to 2007–2008 accompanying implementation of AS5. Thus, AS5 could have allowed auditors to maintain assurance levels while still resulting in audit fee reductions or at least no fee increases for audit clients. In this scenario, apparent fee pressure results from auditors' cost savings passed along to clients rather than from clients' demands for restrained or reduced fees. However, if this is the case, we should not observe that the fee pressure is associated with reduced audit quality. In addition, AS5 only affects audits requiring SOX 404(b) reports, i.e. audits of clients that are accelerated filers.

In a sensitivity test, we recalculate fee pressure using only non-accelerated firms in 2008, which results in a sample of 857 firms with 42 misstatements. In un-tabulated results, we find that our results for H1 remain generally consistent with our main analyses. The coefficient of *Fee Pressure* is positive and marginally significant (p-value = 0.068). Overall this result suggests our findings are unlikely to be mainly driven by the change from AS2 to AS5.

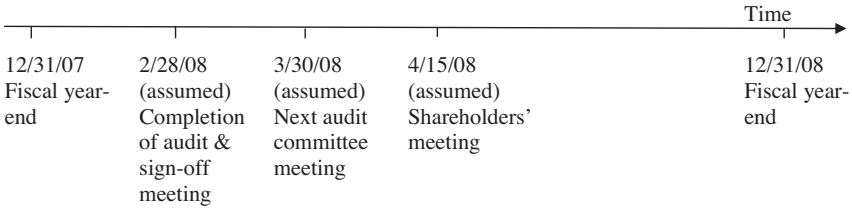
Conclusion

The economic downturn in the period from December of 2007 to June of 2009 is often referred to as the "Great Recession". The Recession imposed significant financial pressure on many companies. Regulators expressed concerns that audit fee pressure from clients might have had negative effects on audit quality during the Recession (PCAOB, 2010, 25–26). In this paper, we examine whether audit fee pressure during the Recession plays a role in misstatements of accounting information in 2008. This analysis provides evidence whether fee pressure affected audit quality in the stringent economic context of the Recession.

Our results suggest that regulators' concerns are warranted because clients that exerted fee pressure in 2008 are more likely to have accounting misstatements in 2008. The association between fee pressure and reduced audit quality appears to be restricted to the Recession because *Fee Pressure* is only marginally associated with misstatements in 2006, and the association is not significant in both 2007 and 2009. In additional analyses, we find no evidence suggesting that the impact of fee pressure differs for larger auditors and audit offices, or for larger clients. Moreover, our results seem to be driven by more severe misstatements (i.e. generating larger misstatement severity factor scores).

Our study provides initial evidence on the impact of a major economic recession on audit fees, and how the audit fee pressure affected audit quality, proxied by client misstatements. The implications from our study should be useful to regulators, especially the PCAOB, as they try to determine the factors impacting audit quality in the Recession. One limitation of our study is that we study only the most recent, and severe, recession. Another is that our sample excludes financial institutions, which played an important role in the recession. Future research could investigate additional time periods and industries. Finally, our results could reflect problems inherent in most empirical studies: the true functional form of economic relationships usually is unknown, econometric models cannot be specified without omitting some relevant explanatory variables, and data on economic variables contain measurement errors.[31]

Figure 2



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[31] Although we do not believe these problems are more severe in our case than for other empirical studies of audit fees and misstatements, future studies could use more refined methodologies, such as coefficient drivers (Swamy, Tavlas, Hall, & Hondroyiannis, 2010) to mitigate problems of model misspecification.

B. Log–log audit fee model (Model 2)

Variables	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile5	
	Coeff	*t*-Stat	Coeff	*t*-Stat	Coeff	*t*-Stat	Coeff	*t*-Stat	Coeff	*t*-Stat
Dependent variable = LN_AUDITFEE										
Intercept	9.47549	19.38***	8.98788	13.93***	9.76432	12.91***	7.93555	10.89***	9.97682	12.96***
LnAT	0.44906	17.15***	0.49677	9.69***	0.42388	7.55***	0.4586	8.2***	0.43977	10.85***
LOSS	0.14427	2.85***	0.08379	1.53	0.12659	2.24**	−0.01272	−0.2	0.05508	0.78
CRATIO	−0.04847	−6.97***	−0.04144	−5.18***	−0.03801	−3.76***	−0.03658	−2.81***	−0.03192	−1.37
ZSCORE	0.00388	0.98	−0.02009	−1.44	0.00338	0.25	0.01593	1.26	0.0184	0.84
CFO	−0.16989	−2.9***	−0.17333	−1.19	−0.30836	−1.39	−0.74543	−2.35**	−1.3004	−3.3***
ARIN	0.11259	1.16	0.14689	1.05	0.46323	3.15***	0.70518	4.25***	0.78423	3.69***
SEG	0.13913	3.65***	0.15935	4.53***	0.12795	3.84***	0.17804	5.54***	0.22038	7.5***
FOREIGN	0.03268	0.47	0.08477	1.48	0.20835	3.85***	0.10812	2.03**	0.19798	4.03***
SQEMPLOY	0.33856	2.74***	0.04651	0.79	0.0777	2.43**	0.04083	2.32**	0.04148	3.6***
RLAG	0.13823	1.27	0.20582	1.56	0.16135	1.17	0.50523	4.02***	0.02638	0.18
GC	0.04674	0.81	0.32532	2.39**	−0.17391	−0.72	−0.05759	−0.19	0.10014	0.29
ACCELERATE	0.23825	3.87***	0.29391	4.48***	0.23312	1.81*	0.67508	6.49***	0.46257	5.39***
ICMW	0.10011	0.7	0.36195	3.35***	0.35507	4.4***	0.33693	3.64***	0.36681	3.16***
RESTATE	0.12222	1.89*	−0.05578	−0.68	0.30322	4.21***	0.00742	0.1	0.05528	0.64
BHRET	0.03021	1.17	−0.00274	−0.1	−0.02006	−0.47	0.05932	1.52	0.08694	1.71*
IOS	−0.19744	−0.93	−0.0945	−0.39	−0.1163	−0.48	−0.17463	−0.8	0.21539	0.98
BIG4	0.0367	0.41	0.06193	0.65	−0.01612	−0.13	0.38536	2.51**	0.27333	1.67*
AUDCHG	0.18014	3.11***	−0.03882	−0.49	−0.08245	−0.85	0.08575	0.7	−0.04086	−0.28
POWER	−0.07403	−8.38***	−0.07521	−5.33***	−0.05186	−2.36**	0.02716	0.93	0.04289	1.37
ACOMP	−0.03214	−1.77*	−0.05977	−2.3**	−0.06416	−2.7***	−0.06343	−2.76***	−0.03937	−1.72*
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile5					
Industry dummies	Yes	Yes	Yes	Yes	Yes					
N	609	608	605	609	608					
F value	48.28***	22.68***	16.46***	20.98***	50.84***					
Adjusted R^2	0.70	0.52	0.43	0.50	0.71					

See Table 2 for variable definitions.
The following indicate statistical significance (two-tailed).
*** ⩽0.01 level.
** ⩽0.05 level.
* ⩽0.10 level.

Scott Bronson, Sean Dennis, Jim Heintz, Karla Johnstone, Susan Scholz, Han Yi, Elaine Mauldin, Kenny Reynolds, Scott Whisenant, and the participants at the 2012 AAA Annual meeting.

A. Fee models and real world engagement budgeting

In this appendix we provide a discussion of the correspondence between a generic, linear audit fee model and real world audit budgeting. The following timeline for an example client may be helpful. We assume that the client's fiscal year is the calendar year:

Discussions with audit partners provide the following insights about the budget process.[32] The auditor and the client's audit committee usually begin discussions about the next year's audit fee (2008, in the example) at a sign-off meeting that concludes the prior year's audit (2007, in the example). The audit committee reviews and approves audit fees for the upcoming year at its next meeting. The auditor's reappointment and fee are approved at the shareholders' meeting. The three dates shown for these meetings are assumed, but are realistic for a calendar-year company. Note that the client and auditor develop a preliminary fee for the 2008 audit early in that year (by the end of the first quarter, in the example).

The starting point for negotiating the preliminary 2008 fee is the fee for the 2007 audit just concluded. Let FEE07 denote the actual fee for 2007 for an example firm. We characterize FEE07 as a linear function of audit cost drivers (i.e. client characteristics) v, x, and z, measured in 2007 (i.e. v07, x07, and z07):

$$FEE07 = d1v07 + d2x07 + d3z07. \quad (a)$$

Parameters d1, d2, and d3 map client characteristics v, x and z into dollars of audit fee. Assume that v is a dichotomous variable, representing an event that occurs in some years but not others (for example, an SEC staff comment letter to the client). Assume that in 2007 the event v did not occur, so that d1v07 = 0. Think of x and z as measures of client size and complexity, respectively. The starting point for the preliminary 2008 audit fee for the example client therefore is:

$$FEE07 = d2x07 + d3z07 \quad (b)$$

Let P(FEE08) denote the preliminary fee for the 2008 audit. In planning, the prior year's actual fee is adjusted for expected changes in cost drivers in the coming year, such as client growth. Let E(Δx) denote expected growth in client size for 2008. Then expected client size in 2008, E(x08), is E(x08) = (x07 + E(Δx)). Let E(z08) = (z07 + E(Δz)) denote expected client complexity in 2008. We assume that expected v for 2008, E(v08), is zero. We also assume that the auditor does not knowingly negotiate a fee that is inadequate to assure audit quality, given expectations. The preliminary audit fee for 2008 then is:

$$P(FEE08) = d1^{*}0 + d2E(x08) + d3E(z08) \quad (c)$$

[32] We thank Scott Whisenant, who obtained this information about budgeting practices, for making it available to us.

Fees subsequently are adjusted only for unexpected developments (if then). Adjustments might or might not be adequate to assure good audit quality.

We assume that the actual level of cost driver x in 2008, x08, differs from E(x08) by an amount denoted as 'U(x08)', where 'U(...)' denotes 'unexpected'. U(x08) equals x08 - E(x08). Likewise U(z08) = z08 − E(z08). What amount of audit fee for 2008 would be adequate to assure audit quality? Since U(x08) is the unexpected amount of x08, assume that d2U(x08) is a sufficient fee increment to cover the effort deficit generated by U(x08), and that d3U(z08) is a sufficient fee increment for unexpected z. Assume also that an unforeseen event occurs: v08 = 1, and that d1(v08) is an adequate fee increment to cover the effort deficit associated with v08. A sufficient fee for 2008, denoted S(FEE08), therefore would equal:

$$S(FEE08) = d1(v08) + d2E(x08) + d2U(x08) + d3E(z08) + d3U(z08). \quad (d)$$

Given that E(x08) + U(x08) = x08, and that E(z08) + U(z08) = z08 by assumption, we can simplify (d) to get:

$$S(FEE08) = d1(v08) + d2(x08) + d3(z08). \quad (e)$$

Regarding audit quality, the question is whether actual FEE08 is greater than or equal to the quality-assuring sufficient fee, S(FEE08). We assume that among large samples of engagements, if not on every engagement, actual fees cover costs plus normal profit. This requires that auditors are able to negotiate adjustments to preliminary fees, so that actual fees cover unexpected factors such as v08, U(x08), and U(z08). It also requires that auditors not overcharge. Competitive and regulatory forces should drive actual FEE08 toward S(FEE08). Therefore we rewrite model (e) as the OLS model:

$$FEE08 = d0 + d1(v08) + d2(x08) + d3(z08). \quad (f)$$

Model (f) is derived from descriptions of audit budgeting practices, and includes realistic assumptions about pricing of expected and unexpected changes in client circumstances. Even so, it is essentially the same as the standard *Log–Log* model (after logging the dependent variable and x08).

References

Accounting Today. (2009). The recession's impact on CPA firms (June) <http://www.accountingtoday.com/>.

Beck, M., Mauldin, E. (2013). Who's really in charge? Audit committee versus CFO power and audit fees. Working paper, University of Missouri.

National Bureau of Economic Research (NBER). (2010). The business cycle dating committee (September).

Cahan, S. F., Godfrey, J. M., Hamilton, J., & Jeter, D. C. (2008). Auditor specialization, auditor dominance, and audit fees: The role of investment opportunities. *The Accounting Review, 83*(6), 1393–1423.

Castrella, J. R., Francis, J. R., Lewis, B. L., & Walker, P. L. (2004). Auditor industry specialization, client bargaining power, and audit pricing. *Auditing: A Journal of Practice and Theory, 23*(1), 123–140.

Cheffers, M., & Whalen, D. (2010). Audit fees and non-audit fees: A seven year trend. *Audit Analytics* (March).

Choi, J., Kim, J., & Zang, Y. (2010). Do abnormally high audit fees impair audit quality? *Auditing: A Journal of Practice and Theory, 29*(2), 115–140.

Public Company Accounting Oversight Board (PCAOB). (2007). Auditing standard No. 5, an audit of internal control over financial reporting that is integrated with an audit of financial statements. Release No. 2007-005A (27.07.07).

Public Company Accounting Oversight Board (PCAOB). (2010). Report on observations of PCAOB inspectors related to audit risk areas affected by the economic crisis. Release No. 2010-006 (29.09.10).

Public Company Accounting Oversight Board (PCAOB). (2008). Staff audit practice alert no. 3: Audit considerations in the current economic environment (05.12.08).

Coram, P., Ng, J., & Woodliff, D. R. (2004). The effect of risk of misstatement on the propensity to commit reduced audit quality acts under time budget pressure. *Auditing: A Journal of Practice and Theory, 23*(2), 159–167.

Ettredge, M., Bedard, J. C., & Johnstone, K. (2008a). Empirical tests of audit budget dynamics. *Behavioral Research in Accounting, 20*(2), 1–18.

Ettredge, M., Bedard, J. C., & Johnstone, K. (2008b). Fee pressure and the longitudinal dynamics of audit engagement budgeting and reporting. *Advances in Accounting, Incorporating Advances in International Accounting, 24*(June), 32–40.

Ettredge, M., Li, C., & Scholz, S. (2007). Audit fees and auditor dismissals in the Sarbanes-Oxley era. *Accounting Horizons, 21*(4), 371–386.

Fama, E., French, K. (2011). Detail for 12 Industry Portfolios. <http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_12_ind_port.html>.

Francis, J. R. (2011). A framework for understanding and researching audit quality. *Auditing: A Journal of Practice and Theory, 30*(2), 125–152.

Francis, J. R., Michas, P. N., & Yu, M. D. (2013). Office size of Big 4 auditors and client restatements. *Contemporary Accounting Research, 30*(4), 1626–1661.

Francis, J. R., & Simon, D. T. (1987). A test of audit pricing in the small-client segment of the U.S. audit market. *The Accounting Review, 62*(1), 145–157.

Goelzer, D. (2010). Speech presented at the 2010 AICPA National Conference on Current SEC and PCAOB Developments, Washington, D.C. (07.12.10). <http://pcaobus.org/News/Speech/Pages/12072010_GoelzerAICPAConference.aspx>.

Hennes, K. M., Leone A. J. Miller, B. P. (2013). Determinants and market consequences of auditor dismissals after accounting restatements. The Accounting Review.

Hogan, C. E., & Wilkins, M. S. (2008). Evidence on the audit risk model: Do auditors increase audit fees in the presence of internal control deficiencies? *Contemporary Accounting Research, 25*(1), 219–242.

Kanagaretnam, K., Krishnan, G. V., & Lobo, G. L. (2010). An empirical analysis of auditor independence in the banking industry. *The Accounting Review, 85*(6), 2011–2046.

Kinney, W. R., Palmrose, Z.-V., & Scholz, S. (2004). Auditor independence, non-audit services, and restatements: was the U.S. government right? *Journal of Accounting Research, 42*(3), 561–588.

Krishnan, J., Krishnan, J., & Song, H. (2011). The effect of auditing standard No. 5 on audit fees. *Auditing: A Journal of Practice and Theory, 30*(4), 1–27.

Kroeker, J. (2010). Speech presented at the 2010 AICPA National Conference on Current SEC and PCAOB Developments, Washington, D.C., December 6, 2010. <http://www.sec.gov/news/speech/2010/spch120610jlk.htm>.

Leone, A. J., Rice, S., Weber, J. P., & Willenborg, M. (2013). How do auditors behave during periods of market euphoria? The case of internet IPOs. *Contemporary Accounting Research, 30*(1), 182–214.

Lobo, G. J., & Zhao, Y. (2013). Relation between audit effort and financial report misstatements: Evidence from quarterly and annual restatements. *The Accounting Review, 88*(4), 1385–1412.

Neal, T. L., & Riley, R. R. (2004). Auditor industry specialist research design. *Auditing: A Journal of Practice and Theory, 23*(2), 169–177.

Newton, N. J., Wang, D., & Wilkins, M. S. (2013). Does a lack of choice lead to lower quality?: Evidence from auditor competition and client restatements. *Auditing: A Journal of Practice and Theory, 32*(3), 31–67.

Palmrose, Z.-V., & Scholz, S. (2004). The circumstances and legal consequences of non-GAAP reporting: Evidence from restatements. *Contemporary Accounting Research, 21*(1), 139–180.

Picconi, M., Reynolds, J. K. (2012). Audit fee theory and estimation: a consideration of the logarithmic audit fee model. Working paper, College of William and Mary, and Florida State University.

Pugh, T. (2008). Business bankruptcies keep rising; no relief in sight. McClatchy Washington Bureau (12.12.08).

Raghunandan, K., & Rama, D. V. (2006). SOX Section 404 material weakness disclosures and audit fees. *Auditing: A Journal of Practice and Theory, 25*(1), 99–114.

Richardson, S., Tuna, I., Wu, M. (2002). Predicting earnings management: The case of earnings restatements. Working paper.

Romanus, R. N., Maher, J. J., & Fleming, D. M. (2008). Auditor industry specialization, auditor changes, and accounting restatements. *Accounting Horizons, 22*(4), 389–413.

Shibano, T. (1990). Assessing audit risk from errors and irregularities. *Journal of Accounting Research, 28*(supplement), 110–140.

Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research, 18*(1), 161–190.

Stanley, J. D., & DeZoort, F. T. (2007). Audit firm tenure and financial restatements: An analysis of industry specialization and fee effects. *Journal of Accounting and Public Policy, 26*(2), 131–159.

Wall Street Journal (WSJ). (2008). Deloitte to cut 2% of U.S. staff. Eastern Edition (28.08.08).

Swamy, P. A. V. B., Tavlas, G. S., Hall, S. F. H., & Hondroyiannis, G. (2010). Estimation of parameters in the presence of model misspecification and measurement error. *Studies in Nonlinear Dynamics and Econometrics, 14*(3).

Whisenant, S., Sankaraguruswamy, S., & Raghunandan, K. (2003). Evidence on the joint determination of audit and non audit fees. *Journal of Accounting Research, 41*(4), 721–744.

Whitehouse, T. (2010). Audit firms told to step up their scrutiny. *Compliance Week* December 21. <http://www.complianceweek.com/>.

Zmijewski, M. E. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting Research, 22*(Supplement), 59–82.