# Audit Reaction on Financial Crisis

**Hanmei Chen**
Rowan University

**Mei Zhang**
Rowan University

## Abstract

In this paper, we examine auditors' reaction on financial crisis. We use audit fee, modified audit opinion, auditor turnover and auditor resignation to proxy auditor's reaction. Using 51,138 firm-year sample, we find that during financial crisis periods auditor charge higher audit fee. Moreover, auditor is less likely to issue modified audit opinions and resign. The result suggests that auditor spend more effort and charge higher audit fee to control audit risk during financial crisis.

## 1. Introduction

Auditors play a controversial role in the recent financial crisis of 2008. They are criticized a lot by the public for failing to detect risks and misstatements in some big companies. Our paper examines how this crisis impacts audit risk, and consequentially how auditors react on the change of audit risk caused by the recent financial crisis.

Audit risk model is commonly by practitioners and researchers. Current literature investigates the correlations among the three factors of this model, the inherent risk, control risk and detection risk. The results from prior researches show that the changes in the inherent risk and control risk will consequently impact auditors' perception of the whole audit risk and eventually affect their behavior to reduce the detection risk (Cahan and Zhang, 2006; Elder et al. 2009). Our work is part of the extended research of audit risk model. We use the financial crisis of 2008 as a unique setting to test the changes of the audit risk. We find that auditors would put more efforts in the audit process like increase engagement staff and hours to decrease the detection risk. The result of an increasing audit fees after the financial crisis is consistent with our hypothesis. We also find that the number of auditor change and the amount of modified opinions significantly decrease after the financial crisis. These results support the previous findings that more efforts from auditors would decrease audit risk and help clients to provide high-quality of financial information.

The remainder of this paper organizes as follows. In section 2, we discuss the background and literature on the audit risk model. That is followed by section 3 that develops the hypotheses. We present the research design and methodology in section 4. Results are reported in section 5. Section 6 concludes.

## 2. Background and Literature

### *Audit risk*

Auditors use an audit risk model in practice to assess the risk within a client. The audit risk model is required to be used as a guide of the audit planning process (AICPA 1997). The decomposition of auditors' assessments of the allowable risk is widely recognized in the auditing process. According to SAS No. 47, the model can be presented as

$$Acceptable\ Audit\ Risk = Inherent\ Risk \times Control\ Risk \times Detection\ Risk$$

Accounting practitioners commonly use this model as a useful tool for planning an effective and efficient audit. In this model, inherent risk is the probability that an account balance or class of transactions contains a material misstatement before considering the effectiveness of the internal control system. For example, a higher inherent risk exists with the valuation of accounts receivable because the allowance of doubtful accounts is subjective and is an accounting estimate. In contrast, the account of cash and cash equivalents would have a lower inherent risk as there is no estimation and thus less susceptible to manipulation. Control risk is the probability that a material misstatement is not detected on a timely basis by the internal control system. For example, a company without an adequate documentation and records system would have a higher control risk over a company with such a system. Both the inherent risk and control risk exist before an audit is performed. They are out of auditor's control and are referred as auditee risk. Prior literature examines both separate auditee risk assessments (Messier and Austen 2000; Dusenbury et al. 2000) and combined auditee risk assessments (Jiambalvo and Waller 1984; Daniel 1988; Vandervelde et al. 2009). Results from these researches help to depict and understand the cognitive process of auditors. Detection risk is the tolerable level of risk that auditing procedures will not detect material misstatements. To suppress audit risk to a certain level, auditors need to adjust the tolerable level of detection risk according to their estimate of the inherent risk and control risk of a client. Thus, when the inherent risk and control risk of a client increase during the financial crisis period, auditors can lower the tolerable level of detection risk to avoid future audit failures and lower the audit risk. Investments in would decrease the detection risk. Accordingly, more audit efforts are required. Auditors would use more personnel, make more detailed working paper and test a larger sample in a similar work to lower their audit risk.

### *The Impact of the Financial Crisis on the Profession of Auditor*

The financial crisis of 2008 has revealed many accounting problems and inadequacies. The failure of the audit industry to identify the banking crisis is regarded as one of the major reasons of the financial crisis. For example, in 2008, Ernst and Young, Lehman's auditor, was aware of the Repo 105[1] practice but did not question Lehman's failure to publicly disclose it. PricewaterhouseCooper, AIG's auditor, was also blamed not to issue a timely disclosure of AIG's material weakness in risk management. The magnitude of risks faced by auditors during

[1] Lehman understated its leverage through "Repo 105" transactions—an accounting maneuver to temporarily remove assets from the balance sheet before each reporting period.

the financial crisis period increased dramatically. The institute of internal auditors claims that "many of the risks in their specific organizations were rated with extremely low probability, and they were triggered by circumstances that could not have been anticipated – calling the crisis comparable to a 100-year-flood." There are also new challenges for auditors when problems like the recorded values of goodwill, other indefinite-lived intangible assets, and other long-lived assets emerged during the financial crisis. Auditors need to properly test the client company's decision regarding the timing and measurement of such items to avoid a failure to detect material misstatements. Public Company Accounting Oversight Board (PCAOB) inspected the audit risk areas affected by the economic and financial crisis and suggested that the current economic environment continues to exhibit many of the same risk factors present during the past three years. Thus, the board's inspection will focus on those audit risk areas in the future. And auditors should act accordingly to help reduce such audit risks.

There have been concerns and thoughts about the audit industry after the financial crisis begins. James L. Kroeker, the chief accountant of SEC explained the role of auditors and urged the industry to make improvements in his testimony in the Congress. He said: "When poorly performed audits contribute to or fail to detect financial reporting abuses, there are existing mechanisms for dealing with such misconduct, including SEC or PCAOB enforcement actions. For our part, we will continue to prosecute those who fail to comply with their obligations." Under such an environment, auditors would be more cautious when they estimate the audit risk in performing the audit work for companies after the financial crisis.

## 3. Hypothesis Development

We investigate the change of auditors' behavior and expect to observe the significant improvements of the efforts made by them. First, we focus on the change of effort level of auditors. Previous studies have well documented the effect of audit risk on audit fees. Bell et al (2001) find that high business risk increases the number of audit hours. Barron et al. (2001) in an experimental study document that an auditor's level of assessed litigation risk and planned audit investment are higher for clients where potential errors overstate financial performance. Bedard and Johnstone (2004) documents that auditors increase their engagement efforts and billing rates for clients when corporate governance is weak and when earnings manipulation risk is relatively high. Auditing firms increase both the planned personnel hours and planned hourly rate to adapt to the increased inherent risk and control risk, thus, audit fees required by the firms will accordingly increase. We have the following hypothesis:

*H1a*: Audit fees are higher in the post-financial crisis periods than in the pre-financial crisis periods.

Issuing modified opinions is another way for auditor to control audit risk. Following Elder etc.(2009), we define a modified audit opinion as an indicator variable that equals to zero for a standard unqualified opinion and one for any other modified opinion, including qualified, adverse, or unqualified with explanatory language. Previous literature shows that auditor opinions are related to audit risk. Elder etc. (2009) find that auditors more likely to issue modified opinion for firms with internal control weakness. Krishnan and Krishnan (1996) find that audit opinions are sensitive to firm's litigation risk. To examine auditors' reaction to higher audit risk during financial crisis, we propose the following hypothesis:

*H2*: Auditors are more likely to issue modified opinions during financial crisis.

We then consider the factors including auditing effectiveness and the client's reputation may cause an auditor change after the financial crisis. The inability to identify and assess the inherent risks and control risks before and in the financial crisis period would result in an auditor change initiated by the client. On the other hand, if the acceptable audit risk level cannot be reached when inherent risks and control risks are too high to be compressed by the low detection risk level, auditors would leave their clients voluntarily. For example, Bedard and Johnstone (2004) show that riskier clients are less likely to be accepted by auditors. Therefore, we have the following hypothesis:

*H3a*: There is a higher auditor turnover during financial crisis periods than in the pre-financial crisis periods.

Auditor turnover can be initiated by either the auditor or the client. This paper examines auditor reaction during financial crisis. We are particularly interested in the relation between auditor resignation and the financial crisis. Therefore, we test the following hypothesis:

*H3b*: There is a higher auditor resignation during financial crisis periods than in the pre-financial crisis periods.

## 4. Sample and Descriptive Statistic

In this paper we examine the audit reactions during financial crisis. We collect audit fees and auditor changes information from 2000 to 2010 from AuditAnalytic database. Auditor opinion and financial information is obtained from Compustat. The sample includes 51,138 firm-years. Following Ettredge, Li and Emeigh (2011), we define the period from 2008 to 2010 as financial crisis period.

Descriptive statistics for audit fees and firm specific control variables are provided in Table 1. Table 1 presents a comparison of during financial crisis periods (2008-2010) and before financial crisis periods (2000-2007). The mean of natural log of audit fees during financial crisis periods is 13.25, which is higher than that before financial crisis periods, 12.87. The average auditor change during financial crisis period is 0.09, lower than pre-financial crisis period 0.12. However, the auditor resignations during financial crisis period and pre-financial crisis are the same. The mean of modified audit opinions during financial crisis is also lower than pre-financial crisis. Averagely auditors issue fewer modified audit opinions during financial crisis. The mean of natural log of total assets during financial crisis periods is 5.91, which is also higher that before financial crisis periods, 5.71.

## 5. Methodology and Empirical Results

Based on our conceptual framework and hypotheses, we model auditor's reaction as a function of financial crisis, client business risk, and control variables. Following Elder etc. (2009), We use audit fee, audit opinion, and auditor resignation to proxy auditor's reaction.

***Audit Fee***

Since during financial crisis firms have higher business risk, auditor need to do more testing to control audit risk. Therefore, auditor need to charge higher audit fee. We model audit fee as a function of business risk in the following equation:

$$LNAFEE_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNTA_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 INV_{it} + \beta_6 REC_{it} + \beta_7 Loss_{it} + \beta_8 Big4_{it} + \varepsilon_{it} \quad (1)$$

Where,

| | |
|---|---|
| $LNAFEE_{it}$ | Natural log of audit fees. |
| $CRISIS_{it}$ | Indicator variable that equals to 1 for and after 2008 and 0 before that. |
| $LNTA_{it}$ | Natural log of total assets. |
| $LEV_{it}$ | Leverage ratio (long-term debts divided by total assets). |
| $ROA_{it}$ | Return on assets computed as net income divided by total assets. |
| $REC_{it}$ | Accounts receivable divided by total assets. |
| $INV_{it}$ | Inventory divided by total assets. |
| $Loss_{it}$ | Indicator variable that equals to 1 if firm incurred a loss and 0 otherwise. |
| $Big4_{it}$ | Indicator variable that equals to 1 if the firm's auditor is a Big four auditor and 0 otherwise. |

The dependent variable is natural log of audit fees for firm i in year t ($LAFEE_{it}$). The test variable of interest is the indicator variable $CRISIS_{it}$. $CRISIS_{it}$ is an indicator variable that equals to 1 for and after 2008 and 0 before that. If the audit risk perceived by auditors is higher during financial crisis periods than pre-financial crisis periods, auditor fees will be higher accordingly. Therefore, we expect $\beta_1$ to be significantly positive.

The model includes several firm-specific control variables, which account for cross-sectional difference in audit fees. The natural log of total assets (LNTA) controls for the effect of firm size on audit fees. We expect higher audit fee for bigger firms. We use leverage (LEV), return on asset (ROA), and loss (LOSS) to control firm's business risk. Higher leverage and loss imply higher risk. Therefore, we expect a positive relationship between audit fee and leverage as well as loss. Return on assets capture the profitability. REC and INV are used to proxy the firm complexity.

Table 2 shows the regression results of equation (1). Consistent with Hypothesis 1a, we find that audit fees are significantly higher during financial crisis period than pre-financial crisis period at the 1 percent level. Audit fee is significantly higher for bigger firms, higher leverage and loss firms. Consistent with previous research, the coefficient for BIG4 is significant positive.

***Modified Audit Opinion***

We test whether auditor is more likely to issue modified audit opinion during financial crisis period than pre-financial crisis period. We use the following logit model to examine the relationship between audit opinion and audit risk:

$$AUOPINION_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNAFEE_{it} + \beta_3 LNTA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 REC_{it} + \beta_8 Loss_{it} + \beta_9 Big4_{it} + \varepsilon_{it} \quad (2)$$

The modified audit opinion (AUOPINION) is an indicator which equals to 1 if the firm's audit opinion code is between two and five and 0 otherwise. Since firm has higher business risk during financial crisis, we expect auditors issue more modified audit opinion during financial crisis than pre-financial crisis.

Table 3 shows the regression result of equation (2). We find that during financial crisis period auditor is significantly less likely to issue modified audit opinions. The large firms and high leverage firms are less likely to receive modified audit opinions. Loss firms are more likely to be flagged with modified opinions. Big four's clients are less likely to have modified audit opinions.

***Auditor Turnover***

In this section, we study auditor turnover during financial crisis. We use the following model to test the relation between auditor change and financial crisis:

$$AUCH_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNAFEE_{it} + \beta_3 LNTA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 REC_{it} + \beta_8 Loss_{it} + \beta_9 Big4_{it} + \varepsilon_{it} \quad (3)$$

AUCH is an indicator variable which equals to 1 if firm change auditor and 0 otherwise. Previous research indicate that audit risk determine auditor's client management. Since during financial crisis firms have higher business risk, we expect there is higher auditor turnover. Table 4 presents the regression results of equation (3). The coefficient of CRISIS is significantly negative. The result suggests that the auditor turnover is lower during financial crisis than pre-financial crisis. The firms with higher audit fee are less likely to change auditors. In addition, large firms and loss firms have significantly higher auditor turnover.

Audit turnover is initiated by either firms or auditors. We are particularly interested in auditor resignation during financial crisis. The following equation is used to test the relation between auditor resignation and financial crisis:

$$AURESIGN_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNAFEE_{it} + \beta_3 LNTA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 REC_{it} + \beta_8 Loss_{it} + \beta_9 Big4_{it} + \varepsilon_{it} \quad (4)$$

AURESIGN equals to 1 if auditor resigned from the firm and 0 otherwise. We expect higher auditor resignation during financial crisis.

Table 5 reports the regression result of equation (4). We find that financial crisis is not a significant factor on auditor resignation. The auditors are less likely to resign from higher audit fee firms. Moreover, auditor resignations are significantly less likely for big four.

## 5. Conclusion

In this paper, we examine auditors' reaction on financial crisis. We use audit fee, modified audit opinion, auditor turnover and auditor resignation to proxy auditor's reaction. We find that during financial crisis periods auditor charge higher audit fee. Moreover, auditor is less likely to issue modified audit opinions and resign. The result suggests that auditor spend more effort and charge higher audit fee to control audit risk during financial crisis.

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Table 1
**Descriptive Statistics for Audit Fees and Control Variables**

| Variable | Full Sample Mean | 2000-2007 Mean | 2008-2010 Mean |
|---|---|---|---|
| LNAFEE | 13.00 | 12.87 | 13.25 |
| AUDCH | 0.11 | 0.12 | 0.09 |
| AURESIGN | 0.02 | 0.02 | 0.02 |
| AUOPINION | 0.42 | 0.44 | 0.38 |
| ROA | 0.02 | 0.02 | 0.01 |
| LEV | 0.54 | 0.52 | 0.57 |
| LNTA | 5.99 | 5.71 | 5.91 |
| REC | 0.18 | 0.17 | 0.19 |
| INT | 0.09 | 0.09 | 0.08 |
| LOSS | 0.36 | 0.34 | 0.41 |
| BIG4 | 0.23 | 0.25 | 0.20 |
| N | 51,138 | 33,395 | 17,743 |

| | |
|---|---|
| $LNAFEE_{it}$ | Natural log of audit fees. |
| AUCH | Indicator variable which equals to 1 if firm change auditor and 0 otherwise. |
| AURESIGN | Indicator variable which equals to 1 if auditor resigned from the firm and 0 otherwise. |
| AUOPINION | Indicator which equals to 1 if the firm's audit opinion code is between two and five and 0 otherwise. |
| $CRISIS_{it}$ | Indicator variable that equals to 1 for and after 2008 and 0 before that. |
| $LNTA_{it}$ | Natural log of total assets. |
| $LEV_{it}$ | Leverage ratio (long-term debts divided by total assets). |
| $ROA_{it}$ | Return on assets computed as net income divided by total assets. |
| $REC_{it}$ | Accounts receivable divided by total assets. |
| $INV_{it}$ | Inventory divided by total assets. |
| $Loss_{it}$ | Indicator variable that equals to 1 if firm incurred a loss and 0 otherwise. |
| $Big4_{it}$ | Indicator variable that equals to 1 if the firm's auditor is a Big four auditor and 0 otherwise. |

**Table 2**
**Audit Fees on Financial Crisis Year and Control Variables**

$$LNAFEE_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNTA_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 INV_{it} + \beta_6 REC_{it} + \beta_7 Loss_{it} + \beta_8 Big4_{it} + \varepsilon_{it}$$

| Variables | Coefficient Value | p-value |
|---|---|---|
| CRISIS | 0.289*** | <.0001 |
| LNTA | 0.494*** | <.0001 |
| LEV | 0.001*** | <.0001 |
| ROA | 0.000*** | <.0001 |
| INV | 0.633*** | <.0001 |
| REC | -0.902*** | <.0001 |
| LOSS | 0.187*** | <.0001 |
| BIG4 | 0.049*** | <.0001 |

**Table 3**
**Modified Audit Opinions on Financial Crisis Year and Control Variables**

$$AUOPINION_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNAFEE_{it} + \beta_3 LNTA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 REC_{it} + \beta_8 Loss_{it} + \beta_9 Big4_{it} + \varepsilon_{it}$$

| Variables | Coefficient Value | p-value |
|---|---|---|
| CRISIS | -0.099*** | <.0001 |
| LNAFEE | 0.113*** | <.0001 |
| LNTA | -0.043*** | <.0001 |
| LEV | 0.000*** | <.0001 |
| ROA | 0.000** | 0.007 |
| INV | -0.084*** | <.0001 |
| REC | -0.184*** | <.0001 |
| LOSS | 0.070*** | <.0001 |
| BIG4 | -0.032*** | <.0001 |

**Table 4**
**Auditor Change on Financial Crisis Year and Control Variables**

$$AUCH_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNAFEE_{it} + \beta_3 LNTA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 REC_{it} + \beta_8 Loss_{it} + \beta_9 Big4_{it} + \varepsilon_{it}$$

| Variables | Coefficient Value | p-value |
|---|---|---|
| CRISIS | -0.019*** | <.0001 |
| LNAFEE | -0.047*** | <.0001 |
| LNTA | 0.006*** | <.0001 |
| LEV | 0.000 | 0.8929 |
| ROA | 0.000 | 0.7118 |
| INV | 0.066*** | <.0001 |
| REC | 0.010 | 0.1809 |
| LOSS | 0.028*** | <.0001 |
| BIG4 | 0.002 | 0.4728 |

**Table 5**
**Auditor Resignations on Financial Crisis Year and Control Variables**

$$AURESIGN_{it} = \beta_0 + \beta_1 CRISIS_{it} + \beta_2 LNAFEE_{it} + \beta_3 LNTA_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 INV_{it} + \beta_7 REC_{it} + \beta_8 Loss_{it} + \beta_9 Big4_{it} + \varepsilon_{it}$$

| Variables | Coefficient Value | p-value |
|---|---|---|
| CRISIS | 0.001 | 0.503 |
| LNAFEE | -0.007*** | <.0001 |
| LNTA | 0.006*** | <.0001 |
| LEV | 0.000 | 0.749 |
| ROA | 0.000 | 0.906 |
| INV | 0.013 | 0.015 |
| REC | 0.010 | 0.004 |
| LOSS | 0.007*** | <.0001 |
| BIG4 | -0.008*** | <.0001 |