

**NON-AUDIT FEES, AUDITOR TENURE,  
AND AUDITOR INDEPENDENCE**

Ferdinand A. Gul<sup>1</sup>  
[ferdinand.gul@buseco.monash.edu.my](mailto:ferdinand.gul@buseco.monash.edu.my)  
(603) 5514-6000

Ilias G. Basioudis<sup>2\*</sup>  
[i.g.basioudis@aston.ac.uk](mailto:i.g.basioudis@aston.ac.uk)  
(44) 0-121-204-3024

Anthony C. Ng<sup>3\*</sup>  
[afang@inet.polyu.edu.hk](mailto:afang@inet.polyu.edu.hk)  
(852) 2766-4073

<sup>1</sup> School of Business, Monash University, Sunway, Malaysia

<sup>2</sup> Aston Business School, University of Aston, United Kingdom

<sup>3</sup> School of Accounting and Finance, Li Ka Shing Tower, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

---

\* Corresponding authors

We gratefully acknowledge the helpful comments from Steven Wei, Dan Simunic and participants at the accounting research seminar at the Hong Kong Polytechnic University.

## **Non-audit fees, auditor tenure, and auditor independence**

### **Abstract**

We examine whether high non-audit fees affect auditor independence, proxied by auditors' propensity to issue going concern modified audit opinions. Using U.S. data from 2000 to 2007, we find a non-linear negative relationship between non-audit fees and auditors' propensity to issue going concern audit opinions but this relationship only holds when audit tenure is long. Further analysis shows that the link between non-audit fees, long tenure and the going concern audit opinion is, however, stronger for low quality auditors (proxied by non-Big 4 and industry non-specialist auditors). Our findings are robust when controlling for unexpected fees and endogeneity among variables. We conclude that high non-audit fees are likely to affect auditor independence only when the auditor has a long tenure with the same client or when auditor quality is poor.

**Keywords:** Auditor independence, non-audit fees, going concern modified audit opinion, auditor tenure, audit quality

**Data availability:** Data are available from the sources identified in the paper

## **Non-audit fees, auditor tenure, and auditor independence**

### **1. Introduction**

In the light of the major corporate scandals at the beginning of this century, the issues of auditor independence, auditor tenure, and the provision of non-audit services have attracted considerable attention and become the focus of much debate. Several countries moved swiftly to pass legislation to curtail or eliminate many auditor-provided non-audit services and imposed compulsory auditor rotation. Such legislation has, in effect, reduced the auditor-client relationship, although it may potentially raise the cost to an auditor of expressing an independent opinion. As a result, questions have been raised about whether the regulators' actions were justified, and whether a company should be forced to replace its auditor on a regular basis, or whether the auditor should be allowed to build a long-term relationship with the client.

Before the recent prohibition of certain types of non-audit services, auditors could perform different types of non-audit services for their public company clients in the U.S. It had been argued that the fees for non-audit services had grown substantially and were more lucrative than fees from audit services, thus strengthening the economic bond and substantially increasing the threat of impaired auditor independence. A number of regulatory bodies in the U.S. like the Securities and Exchange Commission (SEC), the Public Oversight Board (POB) and the AICPA recently asserted that significant high non-audit fees can adversely affect auditor independence and impair auditor decision-making, especially when those decisions involve a substantial amount of professional judgment. Concerns over auditor independence and the magnitude of non-audit services have led to the reporting of these fees for public companies in the U.S., beginning in 2001, although they had already been reported for many years in countries such as the U.K. and Australia. Given the interests and importance of non-audit fees in terms of auditor independence, it is not surprising that several prior papers have examined this issue. Unfortunately, the research stream that evaluates the association between non-audit services and auditor independence, by examining the effect of non-audit fees on the auditor's propensity to issue a going concern modified opinion (hereafter GC), has produced rather mixed results. For example, while in an international context the results

are somewhat mixed and inconclusive (Lennox, 1999; Sharma, 2001; Sharma and Sidhu, 2001; Basioudis et al., 2008), contemporary researchers in the U.S. suggest that there is no relationship (DeFond et al., 2002; Geiger and Rama, 2003)<sup>1</sup>. Thus, despite the concerns of the regulators and the financial press, there is no clear evidence that higher non-audit fees negatively affect auditor independence.

We also consider another, until now separate, stream of research that focuses on the association between auditor independence and auditor tenure (e.g., Dopuch et al., 2001; Geiger and Raghunandan, 2002; Johnson et al., 2002; Myers et al., 2003; Gul et al., 2007). It is argued that long auditor tenure may result in a cozy relationship between the auditor and the client, with a potential loss (or appearance of loss) of auditor independence. This may lead to a reduction in the auditor's due-diligence, as the auditor becomes more prepared to "turn a blind eye" to inappropriate managerial actions. On the other hand, long auditor tenure can be beneficial, as auditors may need time to gain expertise in the businesses they audit (Gul et al., 2009). Regular auditor replacement may reduce the auditor's ability to detect irregularities or material misstatements. Section 203 of the Sarbanes-Oxley Act of 2002 (hereafter, SOX) on audit partner rotation, seems to imply that longer auditor tenure could impair auditor independence. However, the recovery of audit start-up costs over a shorter audit tenure (Johnson et al., 2002) and the competitive practice of low-balling (Dye, 1991; Geiger and Raghunandan, 2002) could also affect auditor independence. The empirical evidence generally supports the latter view – that shorter audit tenure may weaken auditor independence (Dopuch et al., 2001; Myers et al., 2003; Ghosh and Moon, 2005; Gul et al., 2007).

The above two streams of literature, however, should not be considered in isolation. When audit and non-audit fees are high, the economic bond between auditors and clients is strong. Since fees paid by clients are major sources of income for the auditors, auditors would try to avoid any possible auditor switch initiated by their clients and they may be more willing to compromise their independence when their in-depth

---

<sup>1</sup> Other streams of research investigate the association between non-audit services and auditor independence by examining the effect of non-audit fees on restatements (e.g., Raghunandan, et al., 2003), and earnings management, as proxied by discretionary accruals (Frankel et al. 2002; DeFond et al., 2002; Ashbaugh et al., 2003; Chung and Kallapur, 2003; Larcker and Richardson, 2004). The evidence from these streams is also rather inconclusive.

knowledge about their clients indicates that the problems are only temporary and their risk involved is low. Lim and Tan (2010) investigate whether the relation between auditor tenure and audit quality<sup>2</sup> is conditional on auditor specialization and fee dependence, and they show that extended auditor tenure only lowers audit quality when auditors are not specialists and when fee dependence is high.

There is evidence from the U.S. that the amount of non-audit fees is not related to the audit opinion (DeFond et al., 2002; Geiger and Rama, 2003). However, when auditor tenure is considered, prior findings from the U.S. show that there is a positive association between non-audit fees and earnings management (a proxy for auditor independence) for small firms with short auditor tenure (Gul et al., 2007). Thus, it seems that the association between non-audit fees and auditor independence may be contingent upon auditor tenure. Moreover, an auditor's propensity to issue GCs is somewhat different from earnings management because it is a decision that is made entirely by the auditor, while earnings management is a "joint product" of both the client and the auditor. Also, the decision to issue GCs depends on the joint probability of detecting errors and reporting such findings (DeAngelo, 1981; Watts and Zimmerman, 1986). Audit tenure affects these two probabilities. Auditors with short tenure may have difficulties detecting fraud and investment of time and effort in the auditor-client relationship is limited. As a result, potential loss due to auditor switch is likely to be less costly. To protect their reputation, auditors with short tenure may be more willing to issue GCs to distressed clients when they detect problems. On the other hand, auditors should not have any problem detecting fraud when auditor tenure is long, but the potential loss could be large if the client decides to switch an auditor, especially when non-audit fees are relatively high. In such situations, it may be likely that the decisions to issue GCs depend on auditor tenure.

Accordingly, this paper uses panel data from 2000-2007 to examine whether both high non-audit fees and auditor tenure affect auditor independence for publicly-listed companies in the U.S. Auditor independence is proxied in this study by auditors'

---

<sup>2</sup> Lim and Tan (2010) use the accrual quality measure developed by Dechow and Dichev (2002) as a proxy for accrual quality. They have also conducted sensitivity analysis using auditors' propensity to issue GCs as proxy for accrual quality and find that the interaction between a tenure dummy and fee variable is positive but insignificant.

propensity to issue GCs for distressed firms, which we argue is a more direct test of impairment of auditor independence than earnings management (Firth, 1997; Craswell, 1999; Lennox, 1999). Based on DeAngelo (1981), auditor independence is defined as both an auditor's ability to detect and willingness to report discovered material misstatements and fraud. The reporting ability of an auditor is captured by their willingness to issue a GC, and thus the outcome of the audit process.

Hence, we integrate in this paper the research stream on non-audit fees and auditor independence with the stream on auditor tenure. In contrast to the Gul et al. (2007) study in which auditor independence was measured by discretionary accruals, we extend the prior literature by examining whether high non-audit fees and auditor tenure jointly affect auditor independence, as proxied by auditors' propensity to issue GCs. Overall, our analysis is designed to ascertain the reasonableness of regulators' putative contention in SOX, that removing potential threats to auditor independence, prohibiting the provision of certain types of non-audit services, and restricting auditor tenure should improve the quality of audit and strengthen the fundamental principle of auditor independence.

Following prior literature (e.g., DeFond et al., 2002), we use the log of audit fees (LAF), the log of non-audit fees (LNAF), the log of total fees (LTOTALF), and the ratio of non-audit fees to total auditor fees (FEERATIO) as the metrics for the study. Further, we address the possible non-linear relationship between non-audit fees and auditors' propensity to issue GCs by using piece-wise regressions<sup>3</sup>. With respect to audit tenure, we use a cut-off point of four years for splitting the sample into short and long auditor tenure subsamples, following prior studies. We further test the sensitivity of this definition by using different numbers of years to split our sample (three and five years). In other sensitivity tests, we use the rank of fees and unexpected fees to test the relationship between non-audit fees and auditor independence. In additional tests, we also

---

<sup>3</sup> Figure 1 reported later shows a histogram of non-audit fees for the sample. The graph suggests that a non-linear relationship would be more appropriate to capture the relationship between non-audit fees and auditors' propensity to issue GCs.

examine the role of audit quality, as proxied by the Big 4<sup>4</sup> firms and those who are regarded as industry specialists, on the non-audit fee/auditor independence relationship.

Our results indicate, first, using logistic regression that distressed companies with high audit fees are more likely to receive GCs, whereas non-audit fees are not associated with the issuance of GCs. These results hold for the entire period 2000-2007, and are consistent with Lim and Tan (2008) and Geiger and Rama (2003) in their examinations of the U.S. market. Second, we find a non-linear relationship between non-audit fees and auditors' propensity to issue GCs when auditor tenure is long. Auditors are less likely to issue going concerns to their clients when non-audit fees are high and auditor tenures is long. In other words, our results show that the relation between high non-audit fees and auditor independence is conditional on auditor tenure. Third, when we consider the effect of auditor quality, as proxied by Big 4 or industry specialist auditors, we find that the non-linear relationship between non-audit fees and auditor independence is stronger for low quality auditors; there is no relationship between non-audit fees and auditors' propensity to issue GCs when the auditors are Big 4 or specialist auditors<sup>5</sup>.

For completeness, we also replicate the DeFond et al. (2002) model to use as a benchmark against our results. Using the same model and year data as DeFond et al. (2002), our tests confirm their findings of no association between both audit and non-audit fees and GCs. However, when we use piece-wise regression to address possible non-linearity, we find that high non-audit fees affect auditors' propensity to issue GCs when auditor tenure is long. This finding implies that the absence of significant results in the DeFond et al. (2002) study may be due to the lack of consideration of auditor tenure in their tests as well as the possible non-linear relationship between non-audit fees and auditors' propensity to issue GCs in their analyses. Such results reinforce our hypothesis that there is a link between non-audit fees, auditor tenure and auditor independence.

---

<sup>4</sup> For expositional convenience, we use "Big 4" to refer to both Big 4 and Big 5 auditors.

<sup>5</sup> Sample size restrictions (especially the number of GCs) do not allow us to consider the link between non-audit fees, long tenure and auditor independence for high quality and low quality auditors separately. Further, the use and interpretation of interaction terms together with a piece-wise coefficient is not straight forward.

Our study makes the following contributions to the existing literature on auditor independence. First, the findings provide evidence that the association between non-audit fees and auditor independence depends on auditor tenure. Second, the findings show that the concerns expressed by regulators and in the financial press regarding the role of non-audit fees on auditor independence are justified only when non-audit fees are high and auditor tenure is long. Third, the results support earlier findings that longer auditor tenure leads to reduced audit and financial reporting quality (e.g. Carey and Simnett, 2006). This suggests that the system of (voluntary or mandatory) auditor rotation, which results in shorter auditor tenure, is linked to better audit quality when non-audit fees are high.

The remainder of the paper is organized as follows. Part 2 presents a review of the literature and develops hypotheses, and part 3 discusses the research methodology. The results are discussed in part 4, followed by a section on sensitivity analyses. Conclusions are presented in the final part of the paper.

## **2. Review of Related Studies and Hypotheses Development**

Prior studies have used auditor litigation (Palmrose, 1988), earnings response coefficients (Teoh and Wong, 1993; Ghosh and Moon, 2005), accruals (Becker et al., 1998), and GC opinions (DeFond et al., 2002; Geiger and Rama, 2003; Basioudis et al., 2008) as proxies for audit quality/auditor independence. Recent studies investigating the relation between audit firm tenure and earnings/audit quality have used discretionary accruals as a proxy for earnings/audit quality (Johnson et al., 2002; Myers et al., 2003; Gul et al., 2007, 2009). Unlike the above studies, we use auditors' propensity to issue first-time GCs for distressed firms as a proxy for auditor independence, to test the joint effects of auditor tenure and non-audit fees on auditor independence. What follows is a discussion of the arguments and findings in related studies and research streams.

### **2.1 Auditor Independence and Non-Audit Fees**

Auditor independence is a fundamental principle in auditing and involves the joint probability of detecting and reporting errors (DeAngelo, 1981; Watts and Zimmerman, 1986). Prior research has indicated that auditors typically do not have difficulty detecting cases involving GC issues (Kida, 1980; Mutchler, 1984, 1986; Simnett and Trotman,

1989), hence the independence issue is more directly related to the willingness of the auditor to report such financial difficulties appropriately. Thus, Firth (1997), Craswell (1999), and Lennox (1999), among others, have argued that a direct test of the effects of non-audit services fees on auditor independence is the examination of auditor reporting decisions.

The decision on what type of opinion to render on the client's financial statements is the final, cumulative audit decision and is subjected to a considerable amount of professional judgment and negotiation between auditors and the client's management. Audit clients do not welcome the receipt of GCs (Kida, 1980; Mutchler, 1984), and the issuance of such opinions involves costs to both auditors and clients (Kida, 1980; Mutchler, 1984; Geiger et al., 1998; Blay and Geiger, 2001; Weil, 2001). For example, receiving a GC can lead to adverse consequences for the client in terms of stock price declines (Loudder et al., 1992; Blay and Geiger, 2001; Weil, 2001) and increased risk of business failure (Geiger et al., 1998). However, auditors have long been cognizant of the possibility of losing a disgruntled client after issuing a GC (Kida, 1980; Mutchler, 1984).

Prior research has documented that auditors are less likely to issue GCs for large companies, even after controlling for other factors (McKeown et al., 1991; Mutchler et al., 1997). Research on audit fees has also documented that client size is an important determinant of audit fees (Simunic, 1980; Francis, 1984), while recent research indicates that the relative magnitude of non-audit fees is also higher for larger clients (Abbott et al., 2002). Further, the provision of non-audit services by the incumbent auditor leads to better understanding of the client and knowledge spillovers (Simunic, 1984; Francis, 1984), and thus to a better informed audit reporting decisions. Together, these results suggest that audit opinions may be influenced by the magnitude of non-audit (and audit) fees received from clients.

The early studies on the relationship between non-audit services fees and auditor reporting behavior were conducted in Australia, where auditor fees have been publicly available for some time. However, the findings from such research have been mixed. For example, Wines (1994) finds evidence of a negative association between non-audit

fees and the issuance of any type of qualified report. Additionally, Sharma (2001) and Sharma and Sidhu (2001) conclude that higher non-audit fees are associated with a lower likelihood of receiving a GC. However, Barkess and Simnett (1994) and Craswell (1999) find no significant association between non-audit fee levels and audit report qualifications.

In the first published study of non-audit fees and audit reporting decisions in U.K. companies, Lennox (1999) suggests that, after controlling for prior-year GC audit reports, non-audit fees are not significantly associated with auditors' rendering of GCs to their clients. However, Lennox (1999) does not concurrently assess the effect of audit fee levels on opinions (DeFond et al., 2002), or control for firm-specific factors found to be significantly related to audit reporting decisions (Chen and Church, 1992; Behn et al., 2001). Firth (2002) finds a significant negative association between the ratio of non-audit fees to total assets and receiving a qualified opinion, but a non-significant association for the relationship between the ratio of audit service fees to total assets and receiving a qualified opinion. Additionally, a more recent study by Basioudis et al. (2008) examined audit opinions in the U.K. and the relationship between all audit qualification decisions and relative audit and non-audit fee levels. They focus on financially stressed companies in the U.K., and find evidence supporting the contention that companies paying high audit fees are more likely to receive GCs while companies paying high non-audit fees are less likely to receive GCs.

In a large sample study of non-audit fees and audit reporting decisions in the U.S., DeFond et al. (2002) conclude that there is no significant association between either audit fees or non-audit fees, and audit opinions on financially stressed companies. Using a small sample and matched-pairs methodology, Geiger and Rama (2003) find that audit fees are positively associated with GC modifications, but that non-audit fees are not significantly associated with GCs. Thus, prior research in the U.S. seems to be consistent in finding no significant association between non-audit fees and GC modification report decisions.

To summarize, the effect of non-audit fees on auditor independence, as measured by auditors' propensity to issue GCs, is somewhat inconclusive. Thus, despite regulators' concerns, there is no clear evidence that higher non-audit fees negatively affect auditor independence. We therefore propose the following hypothesis (in null form) concerning the association between non-audit fees and auditors' propensity to issue GCs:

***Hypothesis 1:** There is no association between audit and non-audit fees and auditors' propensity to issue GCs.*

## **2.2 Auditor Tenure and Audit/Earnings Quality**

The effect of auditor tenure on audit/earnings quality has been examined in the last few years. Because audit/earnings quality is not directly observable, various indicators have been developed as measures of audit/earnings quality.

Based on the idea that audit quality is inversely related to audit failures (Francis, 2004), Geiger and Raghunandan (2002) find that audit reporting failures are more likely to occur in the early years of the auditor-client relationship. This supports the argument that longer auditor tenure develops auditor expertise and increases the ability to detect fraud (the "learning curve" effect), and is contrary to the view that longer auditor tenure results in the auditor "turning a blind eye." In contrast, Carey and Simnett's (2006) study suggests a positive relationship between auditor tenure and audit failure in Australia; that is, audit quality deteriorates as audit tenure increases. Moreover, Carcello and Nagy (2004) find that accounting fraud is more likely to occur in the early years of auditor tenure (three years or less), compared with medium auditor tenures (four to eight years). However, they find no evidence that longer auditor tenure (i.e., nine years or more) is associated with fraudulent financial reports.

Other studies use earnings quality as a surrogate for audit quality. The implicit assumption is that high audit quality implies high earnings quality (Gul et al., 2009). Two recent studies use discretionary accruals as a proxy for audit/earnings quality and empirically examine the relationship between auditor tenure and accruals. Johnson et al. (2002) find that, relative to medium auditor tenure (of four to eight years), short auditor

tenure (of two to three years) is associated with larger absolute discretionary accruals and thus lower-quality financial reports. However, they find no evidence of reduced earnings quality for longer auditor tenure (nine years or more). Myers et al. (2003), using the dispersion and the magnitude of both the raw values and absolute values of discretionary accruals and current accruals as proxies for earnings quality, find that on average lower accruals (and thus, higher earnings quality) are correlated with longer auditor tenure. Similarly, Ghosh and Moon (2005), using investors' perceptions of earnings quality, find an increase in the magnitude of the earnings response coefficients as the length of auditor tenure increases, implying that investors perceive the earnings quality of companies with longer auditor tenure to be better.

In a more recent study, Gul et al. (2009) attempt to explain the above documented link between short auditor tenure and lower earnings quality by examining whether auditor industry specialization has a role to play in the early years of the auditor-client relationship. They find that the association between shorter auditor tenure and lower earnings quality is weaker for firms audited by industry specialists compared with non-specialists. These results suggest that the documented evidence linking short tenure to poor earnings quality may not be due to shorter tenure per se, but rather it may be due to the auditor's unfamiliarity with the client's business that could affect the auditor's ability to detect misrepresentations and/or misreporting.

Collectively, the existing literature on auditor tenure and audit/earnings quality seems to support the argument that audit quality is lower in the early years of an audit engagement, while the empirical evidence concerning the effects of long auditor tenure on audit/earnings quality provides equivocal results. Thus, contrary to regulators' concerns, longer auditor tenure does not seem to lead to impaired auditor independence in an unambiguous fashion.

### **2.3 Auditor Independence, Non-Audit Fees and Auditor Tenure**

While regulators and some financial commentators assume that longer auditor tenure may lead to eroded auditor independence, most empirical studies, on the contrary, find no direct link between longer auditor tenure and weakened auditor independence, as

discussed in the preceding subsection (for example, Myers et al., 2003; Ghosh and Moon, 2005). Nevertheless, auditor independence may be undermined in the early years of an audit engagement (Geiger and Raghunandan, 2002; Carcello and Nagy, 2004; Johnson et al., 2002).

Additionally, high non-audit fees, especially as a percentage of total auditor fees, may have a negative effect on stock market participants' perceptions of auditor independence. Prior research on the effect of non-audit fees on auditor independence is also inconclusive (for example, Wines (1994); Sharma (2001); DeFond et al. (2002); Basioudis et al. (2008), using GCs as proxy for auditor independence; and Frankel et al. (2002); Francis and Ke (2002); Ashbaugh et al. (2003); Chung and Kallapur (2003), using discretionary accruals as proxy for auditor independence).

Despite the inconclusive results in the studies mentioned in the preceding paragraphs, the question of whether and how auditor tenure relates to auditor independence remains largely unanswered. Another empirical question that remains to be tested is the combined effect of both non-audit services and auditor tenure on auditor independence. Both these issues have been both theoretically and empirically linked to auditor independence.

The only studies so far that have attempted to test the joint effect of auditor tenure and non-audit fees on auditor independence are by Gul et al. (2007) and Lim and Tan (2010). Using auditor discretionary accruals as a proxy for independence, Gul et al. (2007) find that U.S. companies with high non-audit fees and short auditor tenure are associated with lower auditor independence. They also provide evidence that high non-audit fees do not impair auditor independence when auditor tenure is long. Lim and Tan (2010), on the other hand, find the relation between audit tenure and audit quality is conditional on auditor specialization and fee dependence. Audit quality in such case is proxied by the accrual quality measure developed by Dechow and Dichev (2002). When audit tenure is long, they show that firms audited by specialists have higher audit quality, but such relation is moderated by auditors' fee dependence on clients.

Following Gul et al. (2007), we integrate the two strands of the audit literature to examine whether the link between non-audit fees and auditor independence is contingent on auditor tenure. However, unlike Gul et al. (2007), who measured auditor independence in terms of positive discretionary accruals, we proxy auditor independence as the auditor's propensity to issue a GC, which we believe is a better way of capturing the potential impairment of auditor independence. To test this proposition we use a GC modified empirical model based on DeFond et al. (2002) and split the sample based on auditor tenure. To test the relationship we propose the following null hypothesis:

***Hypothesis 2:** The association between non-audit fees and auditors' propensity to issue GCs does not depend on the tenure of the incumbent auditor.*

### **3. Going-Concern (GC) Model and Results**

#### **3.1 Sample**

Our sample includes all companies with available fee data on the Audit Analytics database. The sample period is from 2000 to 2007. The initial sample has 131,010 firm-year observations, with 23,324 GCs. As we are interested in first-time GCs only, we eliminate firm-year observations from the dataset that received a GC during the preceding fiscal year, thus reducing the sample to 117,218 observations with 9,532 first time GCs. The sample is further reduced after being merged with the Compustat database. After eliminating observations without control variables, the sample size drops to 34,201 firm-year observations. We then eliminate financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 4900 and 4999), which further reduces the sample size to 27,517 observations. As in prior research (Hopwood et al, 1994; Mutchler et al., 1997; Reynolds and Francis, 2001), we only focus on firms that are financially distressed. We define financially distressed firms as firms that report negative earnings or negative operating cash flows. After restricting our sample to distressed firms only, the sample size drops to 11,165 observations. Our final sample is 10,394 observations, after deleting firms that do not have audit tenure data.

[Insert Table 1 about here]

Table 1 provides definitions of the variables used in this paper and in the GC model. Descriptive statistics are shown in Table 2. Panel A of Table 2 reports the descriptive statistics for the variables used in this paper aggregated over the sample period. The means of FEERATIO and the non-audit fees are significantly lower in our sample (mean FEERATIO of 0.282 and mean non-audit fees of 471,000) than in DeFond et al. (2002) (mean FEERATIO of 0.49 and mean non-audit fees of 616,000) and Lim and Tan (2008)<sup>6</sup> (mean FEERATIO of 0.46 and mean non-audit fees of 578,000). The lower non-audit fees, both in absolute terms and relative to total fees, are expected, because our sample spans the years 2000 to 2007, which includes a significant proportion of time after the passage of SOX and the subsequent restriction in the provision of non-audit services by the incumbent auditors.

[Insert Table 2 about here]

Panel B reports the statistics for the GC subsample versus the non-GC subsample. With the exception of two variables (BETA and FUTFIN), mean and median values for all other control variables are significantly different between the two subsamples. Such significant differences highlight the importance of including these control variables in our GC model. Panel C of Table 2 reports the correlations between different variables used in the GC model. Although most of the correlations are significant, the magnitudes of these correlations are relatively small<sup>7</sup>. Conclusions drawn from our analysis are not likely to be affected by multi-collinearity problems.

### **3.2 Going Concern (GC) Model**

As pointed out earlier, our main tests focus on the non-linear relationship between non-audit fees and GC audit reports. However, for completeness we start with the following DeFond et al. (2002) logit model to test our hypotheses:

---

<sup>6</sup> The sample period for DeFond et al. (2002) is between February 5, 2001 and June 20, 2001, while the sample period for Lim and Tan (2008) is fiscal year 2000-2001.

<sup>7</sup> The only significant correlation with large magnitude is between LAF and LOGTA (Pearson (Spearman) correlation of 0.76 (0.73) and significant at 1%.

$$\begin{aligned}
GC = & \beta_0 + \beta_1 LAF + \beta_2 LNAF + \beta_3 FEERATIO + \beta_4 LTOTALF + \beta_5 ALTMAN \\
& + \beta_6 LOGTA + \beta_7 LOGAGE + \beta_8 BETA + \beta_9 RET + \beta_{10} VOL + \beta_{11} LEV \\
& + \beta_{12} \Delta LEV + \beta_{13} DLOSS + \beta_{14} INVEST + \beta_{15} FUTFIN + \beta_{16} BIG4 \\
& + \beta_{17} OPCF + \beta_{18} RPLAG + \sum_{i=2001}^{2007} Year_{dum}_i + \sum Inddum_1 + \varepsilon
\end{aligned} \tag{1}$$

where

GC	=	dummy variable: equals 1 for firms with first-time GC, 0 otherwise;
LAF	=	the natural logarithm of audit fees paid to the incumbent auditor;
LNAF	=	the natural logarithm of the sum of all non-audit fees paid to the incumbent auditor;
LTOTALF	=	the natural logarithm of the sum of audit and non-audit fees paid to the incumbent auditor;
FEERATIO	=	the ratio of non-audit fees to total fees paid to the incumbent auditor;
ALTMAN	=	Altman (1968) Z-score;
LOGTA	=	natural logarithm of total assets at the end of year (\$ mil);
LOGAGE	=	natural logarithm of number of years since the company was listed on the stock exchange;
BETA	=	the firm's beta estimate using the market model over the fiscal year;
RET	=	the firm's stock return over the fiscal year;
VOL	=	the variance of the residuals from the market model over the fiscal year;
LEV	=	total liabilities over total asset at the end of the fiscal year;
$\Delta LEV$	=	change in LEV during the fiscal year;
DLOSS	=	dummy variable: equals 1 when the firm reports a bottom-line loss for the previous fiscal year, and 0 otherwise;
INVEST	=	short- and long-term investment securities (including cash and cash equivalents) deflated by total assets at year-end;
FUTFIN	=	dummy variable: equals 1 when the firm issues equity or debt in the subsequent year, and 0 otherwise;
BIG4	=	dummy variable: equals 1 when the auditor is a member of the Big 4, and 0 otherwise;
OPCF	=	operating cash flow divided by total assets at fiscal year-end;
RPLAG	=	number of days between fiscal year-end and earnings announcement date;
Year <sub>dum</sub> <sub><i>i</i></sub>	=	fiscal year dummy variables;
Inddum <sub>1</sub>	=	industry dummy variables based on 1-digit SIC code.

Because our main hypotheses are related to the effect of different fee variables on the propensity of an auditor to issue a GC, it is important that we control for other possible reasons for the issuance of a GC. We control for financial distress by including an Altman (1968) Z-score. We also control for the size of the company by including the

logarithm value of total assets (LOGTA). Other control variables are mainly related to different aspects of risk faced by the firm. We include the logarithm value of the number of years that the company has been publicly traded (LOGAGE), because younger firms are subjected to higher uncertainties and are more likely to fail (Dopuch et al, 1987). We include BETA, RET and VOL, which capture the systematic as well as idiosyncratic risks of the company. LEV and  $\Delta$ LEV are variables that capture leverage and change in leverage of the companies respectively. Such variables are related to the leverage risk of the companies. INVEST and FUTFIN are related to the liquidity risk of the companies, while DLOSS and OPCF relate to the risks associated with the operations of companies. Finally, we include RPLAG, because prior research has shown that GCs are more likely to be associated with longer report lags (Raghunandan and Rama, 1995; Carcello et al., 1995). We also include year and industry dummy variables in the regressions to control for possible differences between the different years and different industries<sup>8</sup>.

#### **4. Results**

As in prior studies, we use different measures to capture the potential economic bond between auditors and clients: the natural logarithm of the sum of audit and non-audit fees (LTOTALF), the ratio of non-audit fees to total fees (FEERATIO), and the natural logarithm of both audit (LAF) and non-audit fees (LNAF) separately. Our main focus is on the logistic regressions that include both audit and non-audit fees, i.e., models (4) to (7) in Table 3.

[Insert Table 3 about here]

The results in Table 3 show that audit fees are positively related to the auditors' propensity to issue GCs. This is consistent with the notion that auditors that conduct additional audit work for distressed clients charge higher audit fees for the higher audit risk involved. Total fees (LTOTALF) are also positively associated with the dependent variable, consistent with the audit work and risk explanations. As shown in regression (6), the ratio of non-audit fees to total fees (FEERATIO) has a negative association (-

---

<sup>8</sup> We have also used industry dummies based on 2-digit SIC codes and the results are similar. We choose to report results with 1-digit SIC codes because they are more comparable to results in other sections of this paper, where sample size would be reduced and 2-digit SIC codes can no longer be used in those models.

0.596 with Wald  $\lambda^2$  of 3.82) with auditors' propensity to issue GCs. The coefficient is also significantly negative (-0.928 with Wald  $\lambda^2$  of 8.38) when total fees are included in the model. While these results are not consistent with DeFond et al. (2002), they are consistent with Lim and Tan (2008). In other words, while there is a significant positive (negative) relationship between LTOTALF (FEERATIO) and auditors' propensity to issue GCs, there is no association between non-audit fees and auditor independence.

#### **4.1 Auditor Tenure and the Going Concern Model**

Auditors' propensity to issue GCs depends on their in-depth knowledge about their clients and also their relationships with their clients. Due to these arguments, we hypothesize that audit tenure is an important factor influencing the relationship between economic bond and auditors' propensity to issue GCs, thus we separate the dataset into two subsamples by audit tenure. As suggested by previous studies (Geiger and Raghunandan, 2002; Gul et al., 2007), we define long audit tenure as longer than or equal to four years and short tenure otherwise<sup>9</sup>. We apply logistic regression (1) to the two subsamples separately and the results for long and short audit tenure are reported in Table 4, Panels A and B, respectively.

[Insert Table 4 about here]

As reported in Table 4 Panel A, results for firms with long audit tenure are similar to those reported in Table 3. Audit fee levels are still positively related to auditors' propensity to issue GCs, while non-audit fee levels have no relationship with auditor independence. The relationship between FEERATIO and auditors' propensity to issue GCs is significantly negative, both when individually included in the regression and in conjunction with total fees. The magnitudes of the coefficients for LAF, LTOTALF and FEERATIO are higher in Table 4 Panel A than in Table 3. This suggests that the effects of fee variables on the propensity to issue GCs are stronger when audit tenure is long. These results also suggest that long tenured auditors are likely to compromise their independence when non-audit fees are relatively high, compared with audit fees paid by

---

<sup>9</sup> We have conducted sensitivity analyses using three and five years as threshold years and the results (not reported) are qualitatively similar in both cases.

their audit clients. We find that both the coefficients for LTOTALF and FEERATIO are significant in the regression (7), but in different directions. Such results suggest that when audit tenure is long, the negative effect of FEERATIO is stronger than the positive effect of total fees on auditor independence, providing some preliminary results to reject H2. Panel B of Table 4 reports the regressions when audit tenure is short. None of the fee variables affect auditors' propensity to issue GCs. Overall, the results in Panels A and B of Table 4 suggest that audit tenure has an influence on the relationship between fees paid by clients to auditors and auditor independence.

We next test whether the relationship between non-audit fees and auditors' propensity to issue GCs is non-linear. The relationship that we explore in the following section is mainly between non-audit fees and auditors' propensity to issue GCs and we only report results for the piece-wise regressions for non-audit fees (after controlling for level of audit fees). Figure 1 shows the histogram of LNAF for the full sample. This histogram suggests a violation of assumptions of logistic regression; there is close to ten percent of the observations with zero LNAF. Equation (1) is thus not likely to capture the potential non-linearity and is likely to fail to show the true relationship between non-audit fees and auditors' propensity to issue GCs.

[Insert Figure 1 about here]

We use the following piecewise regression<sup>10</sup> (Quandt, 1958) to investigate the potential non-linear relationship.

$$\begin{aligned}
GC = & \gamma_0 + \gamma_1 LAF + \gamma_2 LNAF + \gamma_3 (LNAF - LNAF_{FirstDecile}) \times Break_{dum} + \gamma_4 LNAF \times TENDUM \\
& + \gamma_5 (LNAF - LNAF_{FirstDecile}) \times Break_{dum} \times TENDUM + \gamma_6 TENDUM + \gamma_7 LOGTA \\
& + \gamma_8 LOGAGE + \gamma_9 BETA + \gamma_{10} RET + \gamma_{11} VOL + \gamma_{12} LEV + \gamma_{13} ALEV + \gamma_{14} DLOSS \\
& + \gamma_{15} INVEST + \gamma_{16} FUTFIN + \gamma_{17} BIG4 + \gamma_{18} OPCF + \gamma_{19} RPLAG \\
& + \sum_{year=2001}^{2007} Dum_{year} + \sum Dum_{Industry} + \varepsilon
\end{aligned} \tag{2}$$

$LNAF_{FirstDecile}$  = First decile value of LNAF;  
 $Break_{dum}$  = Dummy variable: equals 1 if  $LNAF > LNAF_{FirstDecile}$ , 0 otherwise,

<sup>10</sup> Figure 1 suggests that we should use the first decile value of LNAF as the breakpoint. We ran the same regression without the inclusion of audit fees (LAF) and results are similar.

TENDUM = Dummy variable: equals 1 if audit tenure is longer than or equal to four years, 0 otherwise;

All other variables are defined as above.

To test the role of auditor tenure in the non-linear relationship we include a tenure dummy and the interaction between the tenure dummy and the piece-wise. Besides applying regression (2) to the full sample, we also use a similar logistic regression for the long and short tenure subsamples separately. Panel C of Table 4 reports the results for equation (2). Results for the full sample do not show any non-linear relationship between non-audit fees and auditors' propensity to issue GCs<sup>11</sup>. However, when we include the interaction term the results are negatively significant (coefficient is -0.317 with Wald  $\lambda^2$  of 5.70) and suggests that the non-linear relationship is stronger for long tenured auditors. Further, when we separate the sample into long and short tenure subsamples, only results in the long tenure subsample show that when non-audit fees are high, auditors are less likely to issue GCs (coefficient is -0.176 with Wald  $\lambda^2$  of 4.02). These results suggest that auditors are less likely to issue GCs for clients who are paying high non-audit fees and have long-tenure with the auditor, i.e., audit independence may be compromised when audit tenure is long and non-audit fees are high.

#### **4.2 Auditor Quality and the Going Concern Model**

In this section, we explore the possible mitigating effect of high auditor quality on the link between non-audit fees and GCs. We use equation (3) below to explore the differential effect of auditor quality, proxied by Big 4 and non-Big 4 auditors, on the possible non-linear relationship between non-audit fees and auditors' propensity to issue GCs. We also split the sample into Big 4 and non-Big 4 auditors and ran separate regressions.<sup>12</sup> Results are reported in Table 5.

---

<sup>11</sup> As a sensitivity test, we use the bottom quartile value of LNAF as the breakpoint in the piece-wise regressions and the results are qualitatively similar.

<sup>12</sup> In order to apply equation (3) to the two subsamples, we have to omit the terms in the equation that include BIG4.

$$\begin{aligned}
GC = & \gamma_0 + \gamma_1 LAF + \gamma_2 LNAF + \gamma_3 (LNAF - LNAF_{FirstDecile}) \times Break_{dum} \\
& + \gamma_4 LNAF \times BIG4 + \gamma_5 (LNAF - LNAF_{FirstDecile}) \times Break_{dum} \times BIG4 + \gamma_6 BIG4 \\
& + \gamma_7 ALTMAN + \gamma_8 LOGTA + \gamma_9 LOGAGE + \gamma_{10} BETA + \gamma_{11} RET + \gamma_{12} VOL \\
& + \gamma_{13} LEV + \gamma_{14} \Delta LEV + \gamma_{15} DLOSS + \gamma_{16} INVEST + \gamma_{17} FUTFIN \\
& + \gamma_{18} OPCF + \gamma_{19} RPLAG + \sum_{i=2001}^{2007} Year_{dum_i} + \sum Inddum_1 + \varepsilon
\end{aligned} \tag{3}$$

All other variables are defined as above.

[Insert Table 5 about here]

The first column of Table 5 shows results for the full model. The coefficient for  $(LNAF - LNAF_{FirstDecile}) \times Break_{dum}$  is negative (coefficient is -0.493 with Wald  $\lambda^2$  - 12.53) and significant but the coefficient for the interaction term  $(LNAF - LNAF_{FirstDecile}) \times Break_{dum} \times BIG4$  is positive and significant (0.528 with Wald  $\lambda^2$  of 11.34). These results suggest that auditors have a lower propensity to issue GCs when non-audit fees are high, but Big 4 auditors are less likely to compromise their independence. Results for the Non-Big 4 subsample are shown in the second column. The coefficient for LNAF is significantly positive (0.126 with Wald  $\lambda^2$  of 6.83) while the coefficient for  $(LNAF - LNAF_{FirstDecile}) \times Break_{dum}$  is significantly negative (-0.543 with Wald  $\lambda^2$  12.91). These results show that non-Big 4 auditors are less likely to issue GCs for distressed clients when non-audit fees are high. Results for Big 4 auditors (shown in third column) suggest that non-audit fees do not have any effect on auditors' propensity to issue GCs when the auditors are Big 4.

## 5. Additional Tests

To substantiate our results in the previous section, we conducted some additional tests to further confirm our findings. First, we conduct in subsection 1 below robustness and sensitivity tests with respect to our research design. In subsection two, we further explore the effect of high audit quality and use auditor specialization as proxy for auditor quality, and explore its effect on the relationship between non-audit fees and auditors' propensity to issue GCs. As stated in DeFond et al. (2002), the relationship between economic bonding and auditors' propensity to issue GCs could be driven by the unexpected component of fees, rather than the nominal values of fees. Following this

stream of research, we calculate the unexpected values of audit and non-audit fees in subsection 3 below, and we include the unexpected components of fee variables in our GC model. Since prior research has shown that auditors' willingness to compromise their independence could be driven by unexpected fees instead of nominal value of fees received, we also test our results by incorporating unexpected values of non-audit fee variables into our models for long and short tenure subsamples. Further, we revisit the effect of auditor quality, proxied by Big 4 auditors, and examine the relationship between unexpected non-audit fees and auditors' propensity to issue GCs. In subsection 4, we include audit tenure in the analysis to provide some further evidence for the differences in findings between our results and the results obtained by DeFond et al. (2002).

### **5.1 Robustness and Sensitivity Tests**

Prior research has shown that actual audit and non-audit fee data are extremely noisy, and it was suggested that ranks of fee variables should be used (Frankel et al., 2001). Thus, following prior research, we rerun equation 1 using ranks of fee variables and the results (not reported) show that our conclusions do not change. Second, we have chosen four years as a threshold to separate long and short tenure in our main analyses. Although prior research (e.g. Gul et al., 2009) has suggested that four years is an important breakpoint when considering length of audit tenure, we use an alternative threshold in defining long and short audit tenure to sensitivity test our results. We use three and five years as separation thresholds for long and short tenure. The results (not reported) show that the main conclusions remain unchanged, although the results are marginally weaker when we use five years as the threshold.

### **5.2 Using specialist auditors as proxy for auditor quality**

Besides using Big 4 auditors as a proxy for high auditor quality, we also explore the effect of auditor specialization (Craswell et al., 1995; Solomon et al., 1999; Owoso et al., 2002; Lim and Tan, 2008) on the link between non-audit fees and auditors' propensity to issue GCs. We apply equation (3) to our main sample replacing the Big 4 auditors variable with the SPEC variable<sup>13</sup>. Similar to prior section, we also test our

---

<sup>13</sup> Since there is a high correlation between BIG4 and SPEC (there is only one non-Big 4 industry specialist in the sample), we do not include the variable BIG4 in our piece-wise regression tests.

results by applying the piece-wise regression to two subsamples separated by our specialization measure. Previous research (e.g. Lim and Tan, 2008) defined auditor industry specialization based on client sales<sup>14</sup>, but following the recent literature on audit pricing using industry and city specializations, we believe that audit fees are more appropriate measures of auditor industry specialization (Francis et al., 2005; Basioudis and Francis, 2007, Reichelt and Wang 2010, among others). Therefore, industry-specific specialization in this paper is calculated based on an accounting firm's share of total audit fees per industry. We define specialist auditors as auditors having the specialization measure higher than the median value<sup>15</sup>, and non-specialist otherwise. Our tests are similar to equation (3) and Table 5.

The untabulated results show that the coefficient for the interaction term ( $LNAF - LNAF_{\text{FirstDecile}} \times Break_{\text{dum}} \times SPEC$ ) is negative and significant (-0.233 with Wald  $\lambda^2$  of 6.20) while the coefficient of the interaction term is positive and significant (0.29 with Wald  $\lambda^2$  of 5.55). These two coefficients together suggest that, auditors have a lower propensity to issue GCs when non-audit fees are high, but this relationship is weaker for specialist auditors. In the separate sample tests, we find that non-specialist auditors have a lower propensity to issue GC when they receive high non-audit fees from their clients (coefficient for the interaction term is -0.232 with Wald  $\lambda^2$  5.30). Therefore, high quality auditors, as proxied by auditor specialization, appear to moderate the link between high non-audit fees and auditors' lower propensity to issue GC reports.

### 5.3 Expected Fees

Economic bonding between auditors and clients could be affected by fees relative to their expected values, rather than the nominal amount of fees. Similar to DeFond et al., (2002), we also use unexpected fee variables as independent variables in the GC model.

---

<sup>14</sup> Lim and Tan (2008) have four definitions of auditor specialists by comparing a firm's sales with other firms in the same industry audited by the same auditor. First, they define the auditor with the largest industry market share as the industry specialist. Second, they use the continuous measure of market share as a measure of industry specialization. Third, they define an industry specialist as an auditor with the largest market share and a market share at least ten percent higher than the second largest auditor. Finally, they define an industry specialist as an auditor with a market share of 24 percent or more.

<sup>15</sup> We have also conducted sensitivity analyses by defining specialists as firms with specialization measures in the top third and results are similar.

Following prior research on expected audit and non-audit fees (Craswell et al., 1995; Whisenant et al., 2002; Firth, 1997; Parkash and Venable, 1993 and Frankel et al., 2002), we use equation (4) for audit fees and equation (5) for non-audit fees and FEERATIO to estimate the expected values of the fee variables<sup>16</sup>. The exact mathematical models are described in the Appendix A at the end of the paper.

Coefficients for regressions (4) and (5) (not tabulated) are comparable to the results of the expected fee models in DeFond et al. (2002). After calculating the unexpected values of the fee variables, we then include these residual values in our GC model in different combinations. The results (not tabulated) are comparable to the results in Table 3, namely all fee variables except non-audit fees are strongly related to the propensity of the auditor to issue a GC. We further explore the documented in this paper non-linear relationship between non-audit fees and auditors' propensity to issue GCs. As in the case of actual non-audit fees, we also plot the histogram of unexpected non-audit fees as shown in Figure 2. The diagram shows that there are some observations clustered at the lower end of the distribution. As a result, we use piece-wise regression with the break point being the lowest quartile in our analyses for unexpected non-audit fees.

[Insert Figure 2 about here]

To make use of the unexpected fee variables estimated using models 4 and 5 (presented in Appendix A), our GC model is adjusted as follows:

$$\begin{aligned}
 GC = & \gamma_0 + \gamma_1 \text{Unexp}(LAF) + \gamma_2 \text{Unexp}(LNAF) \\
 & + \gamma_3 (\text{Unexp}(LNAF) - \text{Unexp}(LNAF)_{\text{FirstQuartile}}) \times \text{Break}_{\text{dum}} + \gamma_4 \text{ALTMAN} \\
 & + \gamma_5 \text{LOGTA} + \gamma_6 \text{LOGAGE} + \gamma_7 \text{BETA} + \gamma_8 \text{RET} + \gamma_9 \text{VOL} + \gamma_{10} \text{LEV} \\
 & + \gamma_{11} \Delta \text{LEV} + \gamma_{12} \text{DLOSS} + \gamma_{13} \text{INVEST} + \gamma_{14} \text{FUTFIN} + \gamma_{15} \text{BIG4} + \gamma_{16} \text{OPCF} \\
 & + \gamma_{17} \text{RPLAG} + \varepsilon
 \end{aligned} \tag{6}$$

where

$\text{Unexp}(LAF)$  = unexpected LAF, calculated using equation (4);  
 $\text{Unexp}(LNAF)$  = unexpected LNAF, calculated using equation (5);  
 $\text{Unexp}(LNAF)_{\text{FirstQuartile}}$  = First quartile value of  $\text{Unexp}(LNAF)$ .

<sup>16</sup> For estimating the expected value of (log of) total fees, we combine all the independent variables in the two models that are used to estimate expected audit and non-audit fees.

All other variables are defined as above.

As in prior section, we apply regression (6) to two subsamples separated by audit tenure. Results are given in Table 6 Panel A. In the long tenure subsample, auditors are less likely to issue GCs to distressed clients when non-audit fees are high (coefficient is -0.315 with Wald  $\lambda^2$  of 5.15). No results are found for the short-tenure subsample.

[Insert Table 6 about here]

Besides addressing the issue of audit tenure, we also use unexpected non-audit fees in our piece-wise regressions after controlling for auditor quality using Big 4 auditors. Results in Table 6 Panel B show that Non-Big 4 auditors are less likely to issue GCs when unexpected non-audit fees are high (coefficient is -0.492 with Wald  $\lambda^2$  of 6.28). In separate tests, results show that non-specialists also demonstrate lower propensity to issue GCs when unexpected non-audit fees are high (coefficient is -0.254 with Wald  $\lambda^2$  of 3.25).

In summary, using economic bonding based on unexpected fees as an independent variable does not alter our conclusions in previous sections. Namely, auditor independence seems to be impaired when auditor tenure is long, non-audit fees are high and auditor quality is poor. In other words, our results reinforce our earlier suggestion that the relation between high non-audit fees and auditor independence is conditional on auditor tenure and auditor quality.

#### **5.4 DeFond et al. (2002) study**

Another objective in this study is to replicate the DeFond et al. (2002) model using the same regression equation and data from year 2000 only (as in DeFond et al.). In this way our results can be benchmarked against DeFond et al. findings, and in doing so it would help put our results into better perspective. Results are presented in Table 7 Panel A and are comparable to Table 5 of DeFond et al. (2002). This finding is consistent with their claim that economic bonding between auditors and clients does not affect auditors' independence.

[Insert Table 7 about here]

Further, we address the possible non-linearity of non-audit fees using the piece-wise regression technique with the breakpoint being the first quartile. Panel B of Table 7 shows the results for the various models used after incorporating the auditor tenure variable (except model 1 shown in column 1). When the piece-wise regression technique is used in DeFond et al's (2002) model, the coefficient for the non-audit fee variable is positive and significant (at 10% level). This is a result that deviates from DeFond et al. findings, and suggests that a positive non-linear relationship between non-audit fees and auditors' propensity to issue GCs possibly exists. Next, when the auditor tenure variable interacted with the piece-wise is incorporated into the model of the piece-wise regression, the (weak) results show a negative non-linear relationship suggesting auditor's independence may be compromised when audit tenure is long and non-audit fees are high. When the auditor tenure variable is also included separately in the model, the above weak relationship between non-audit fees and auditors' propensity to issue GCs disappears. Further, once we divide the sample into long and short tenure subsamples using a four-year tenure threshold, results in the long tenure sample confirm our earlier findings that auditors are less likely to issue a GC modified audit opinion when tenure is long and non-audit fees are high. Summarizing these results, we can conclude that the findings of DeFond et al. (2002) may be due to their failure to consider the non-linear relationship as well as the failure to consider auditor tenure, which appears to be an important determinant of auditors' propensity to issue GCs.

## **6 Conclusion**

In this study, we investigate whether high non-audit fees and auditor tenure jointly affect auditor independence. We use auditors' propensity to issue GCs for distressed firms to capture the potential impairment of auditor independence. We believe that using the outcome of the audit process – the auditor's reporting decision to issue a GC – provides a more direct test of auditor independence than research using other indirect proxies of auditor independence, such as earnings management (e.g. using discretionary accruals). Audit opinion effectively and directly communicates the auditor's

findings to outsiders and plays a crucial role in warning financial statement users about impending problems concerning a firm's financial reporting or internal controls.

Using a large sample of publicly listed corporations in the U.S. over the 2000-2007 period, we test whether there is a non-linear relationship between high non-audit fees and incidences of GCs. In support of the concerns raised by media and regulators, our findings suggest that auditors are willing to forgo their independence by issuing fewer GCs when non-audit fees are high and when auditor tenure is long. The results are robust to a number of different research designs – (1) when splitting the sample between long and short auditor tenure, (2) when including an indicator to represent long and short auditor tenure, and (3) when using three to five years as the threshold for splitting long and short tenure (instead of four years). These results are also insensitive to the inclusion of a large number of control variables and to numerous other sensitivity analyses that control for the expected amount of fees and use different sub-samples.

We also examine whether the relations between auditors' propensity to issue GCs and fee dependence are conditional on auditor quality. Auditor quality is proxied by the use of Big 4 or industry specialist auditors. Results show that any potential impairment of auditor independence due to high non-audit fees is moderated when clients are audited by Big 4 or industry specialist auditors (vs. non-Big 4 or non-specialist auditors respectively).

The major contribution of our study is that it calls into question the belief and prior evidence that high non-audit fees do not affect auditor independence. We show that the relationship is complex; the relationship is non-linear and holds only when auditor tenure is long or auditor quality is weak. This is the first study addressing these issues and we hope that future studies can provide some support for our preliminary findings. Our findings also provide some insights for regulators and standard setters regarding the benefits of mandatory auditor rotation. We show that benefits in terms of improved audit quality derived from mandatory auditor rotation are contingent on non-audit fees. However, the costs of imposing mandatory auditor rotation should not be underestimated. Mandatory auditor rotation would possibly lead to higher start-up costs and impede

auditors' learning curve, and would probably also lower audit firms' investment in enhancing their knowledge and expertise in certain industries.

## References

- ABBOTT, L., S. PARKER, G. PETERS, and K. RAGHUNANDAN. 'An empirical investigation of audit fees, nonaudit fees, and audit committees.' *Contemporary Accounting Research* 20, 2 (2003): 215-234.
- ALTMAN, E.I. 'Financial ratios, discriminant analysis and the prediction of corporate bankruptcy.' *Journal of Finance* 23, 4 (2968): 589-609.
- ASHBAUGH, H., R. LAFOND, and B. MAYHEW. 'Do nonaudit services compromise auditor independence? Further evidence.' *Accounting Review* 78, 3 (2003): 611-639.
- BARKESS, L., and R. SIMNETT. 'The provision of other services by auditors: independence and pricing issues.' *Accounting and Business Research* (1994): 99-108.
- BASIOUDIS, I., and J. FRANCIS. 'Big 4 audit fee premiums for national and office-level industry leadership in the United Kingdom.' *Auditing: A Journal of Practice & Theory* 26 (2007): 143-166.
- BASIOUDIS, I., E. PAPAKONSTANTINOY, and M. GEIGER. 'Audit fees, non-audit fees and auditor going-concern reporting decisions in the United Kingdom.' *Abacus* 44, 3 (2008): 284-309.
- BECKER, C., M. DEFOND, J. JIAMBALVO, and K. SUBRAMANYAM. 'The effect of audit quality on earnings management.' *Contemporary Accounting Research* 15, 1 (1998): 1-24.
- BEHN, B., S. KAPLAN, and K. KRUMWIEDE. 'Further evidence on the auditor's going-concern report: The influence of management plans.' *Auditing: A Journal of Practice & Theory* 20,1 (2001): 13 - 28.
- BLAY, A., and M. GEIGER. 'Market expectations for first-time going-concern recipients.' *Journal of Accounting Auditing and Finance* 16, 3 (2001): 209 -226.
- CARCELLO, J., and D. HERMANSON, and H. HUSS. 'Temporal changes in bankruptcy-related reporting.' *Auditing: A Journal of Practice and Theory* 14: (1995): 133-143.
- CARCELLO, J., and A. NAGY. 'Client size, auditor specialization and fraudulent financial reporting.' *Managerial Auditing Journal* 19, 5 (2004): 651-668.
- CAREY, P., and R. SIMNETT. 'Audit partner tenure and audit quality.' *The Accounting Review* 81, 3 (2006): 653-676.
- CHEN, K., and B. CHURCH. 'Default on debt obligations and the issuance of going-concern opinions.' *Auditing: A Journal of Practice and Theory* 11, 2 (1992): 30-50.
- CHUNG, H., and S. KALLAPUR. 'Client importance, nonaudit services, and abnormal accruals.' *Accounting Review* 78, 4 (2003): 931-955.
- CRASWELL, A. 'Does the provision of non-audit services impair auditor independence?' *International Journal of Auditing* 3,1 (1999): 29-40.

- CRASWELL, A., J. FRANCIS, and S. TAYLOR. 'Auditor brand name reputations and industry specializations.' *Journal of Accounting and Economics* 20, 3 (1995): 297-322.
- DEANGELO, L. 'Auditor independence, 'low balling', and disclosure regulation.' *Journal of Accounting and Economics* 3, 2 (1981): 113-127.
- DECHOW, P., and I. DICHEV. 'The quality of accruals and earnings: The role of accrual estimation errors.' *Accounting Review*, 77 (2002): 145-176
- DEFOND, M., K. RAGHUNANDAN, and K. SUBRAMANYAM. 'Do non-audit service fees impair auditor independence? Evidence from going concern audit opinions.' *Journal of Accounting Research* 40, 4 (2002): 1247-1274.
- DOPUCH, N., R. HOLTHAUSEN, and R. LEFTWICH. 'Predicting audit qualifications with financial and market variables.' *Accounting Review* 62, 3 (1987): 431-454.
- DOPUCH, N., R. KING, and R. SCHWARTZ. 'An experimental investigation of retention and rotation requirements.' *Journal of Accounting Research* 39,1 (2001): 93-117.
- DYE, R. 'Informationally motivated auditor replacement.' *Journal of Accounting and Economics* 14, 4 (1991): 347-374.
- FIRTH, M. 'The provision of non-audit services and the pricing of audit fees.' *Journal of Business Finance & Accounting* 24, 3 (1997): 511-525.
- FIRTH, M. 'Auditor provided consultancy services and their associations with audit fees and audit opinions.' *Journal of Business Finance & Accounting* 29, 5&6 (2002): 661-693.
- FRANCIS, J. 'The effect of audit firm size on audit prices: A study of the Australian Market.' *Journal of Accounting and Economics* 6, 2 (1984): 133-151.
- FRANCIS, J. 'What do we know about audit quality?' *The British Accounting Review* 36, 4 (2004): 345-368.
- FRANCIS, J., and B. KE. 'Further evidence on non-audit services and auditor independence,' Unpublished paper, University of Missouri-Columbia, 2002.
- FRANCIS, J., K. REICHELDT, and D. WANG. 'The pricing of national and city-specific reputations for industry expertise in the US audit market.' *The Accounting Review* 80,1 (2005): 113-136.
- FRANKEL, R., M. JOHNSON, and K. NELSON. 'The relation between auditors' fees for non-audit services and earnings quality.' *The Accounting Review* 77 (2002): 71-105.
- GEIGER, M., and K. RAGHUNANDAN. 'Auditor tenure and audit reporting failures.' *Auditing: A Journal of Practice and Theory* 21,1 (2002):67-78.
- GEIGER, M., K. RAGHUNANDAN, and D. RAMA. 'Costs associated with going-concern modified audit opinions: An analysis of auditor changes, subsequent opinions, and client failures.' *Advances in Accounting* 16,1 (1998): 117-139.

- GEIGER, M., and D. RAMA. 'Audit fees, nonaudit fees, and auditor reporting on stressed companies.' *Auditing: A Journal of Practice & Theory* 22, 2 (2003): 53-70.
- GHOSH, A., and D. MOON. 'Does auditor tenure impair audit quality?' *The Accounting Review* 80, 2 (2005): 585-612.
- GUL, F., S. FUNG, and B. JAGGI. 'Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise.' *Journal of Accounting and Economics* 47, 3 (2009): 265-287.
- GUL, F., B. JAGGI, and G. KRISHNAN. 'Auditor independence: Evidence on the joint effects of auditor tenure and nonaudit fees.' *Auditing: A Journal of Practice & Theory* 26, 2 (2007): 117-142.
- HOPWOOD, W., J. MCKEOWN, and J. MUTCHLER. 'A re-examination of auditor versus model accuracy within the context of the going-concern opinion decision.' *Contemporary Accounting Research* 10, 2 (1994): 409-431.
- JOHNSON, V., I. KHURANA, and J. REYNOLDS. 'Audit-firm tenure and the quality of financial reports.' *Contemporary Accounting Research* 19, 4 (2002): 637-660.
- JOHNSTON, J. *Econometric Methods*. McGraw-Hill College, 1984.
- KIDA, T. 'An investigation into auditors' continuity and related qualification judgments.' *Journal of Accounting Research* 18, 2 (1980): 506-523.
- LARCKER, D., and S. RICHARDSON. 'Fees paid to audit firms, accrual choices, and corporate governance.' *Journal of Accounting Research* 42, 3 (2004): 625-658.
- LENNOX, C. 'Non-audit fees, disclosure and audit quality.' *European Accounting Review* 8, 2 (1999): 239-252.
- LIM, C., and H. TAN. 'Non-audit service fees and audit quality: The impact of auditor specialization.' *Journal of Accounting Research* 46,1 (2008):, 199-246.
- LIM, C., and H. TAN. 'Does auditor tenure improve audit quality? Moderating effects of industry specialization and fee dependence.' *Contemporary Accounting Research* 27, 3 (2010): 923-957
- LOUDDER, M., I. KHURANA, R. SAWYERS, C. CORDERY, C. JOHNSON, J. LOWE, and R. WUNDERLE. 'The information content of audit qualifications.' *Auditing: A Journal of Practice & Theory* 11, 1 (1992): 69-82.
- MCKEOWN, J., J. MUTCHLER, and W. HOPWOOD. 'Towards an explanation of auditor failure to modify the audit opinions of bankrupt companies.' *Auditing: A Journal of Practice and Theory* 10 (1991): 1-13.
- MUTCHLER, J. 'Auditor's perceptions of the going-concern opinion decision.' *Auditing: A Journal of Practice and Theory* 3, 2 (1984): 17-30.
- MUTCHLER, J. 'Empirical evidence regarding the auditor's going-concern opinion decision.' *Auditing: A Journal of Practice & Theory* 6, 1 (1986): 148-163.
- MUTCHLER, J., W. HOPWOOD, and J. MCKEOWN. 'The influence of contrary information and mitigating factors on audit opinion decisions on bankrupt companies.' *Journal of Accounting Research* 35, 2 (1997): 295-310.

- MYERS, J., L. MYERS, and T. OMER. 'Exploring the terms of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation?' *Accounting Review* 78, 3 (2003): 779-799.
- OWHOSO, V., W. MESSIER Jr, and J. LYNCH Jr. 'Error detection by industry-specialized teams during sequential audit review.' *Journal of Accounting Research* 40, 3 (2002): 883-900.
- PALMROSE, Z.. 'Litigation and Audit Service Quality.' *The Accounting Review* 63, 1 (1988): 55-73.
- PARKASH, M., and C. VENABLE. 'Auditee incentives for auditor independence: The case of nonaudit services.' *Accounting Review* (1993): 113-133.
- QUANDT, R.E. 'The estimation of the parameters of a linear regression system obeying two separate regimes.' *Journal of the American Statistical Association* 53, 284 (1958): 873-880
- RAGHUNANDAN, K., and D. RAMA. 'Audit reports for companies in financial distress: Before and after SAS No. 59.' *Auditing: A Journal of Practice and Theory* 14 (1995): 50-63.
- RAGHUNANDAN, K., W. READ, and J. WHISENANT. 'Initial evidence on the association between nonaudit fees and restated financial statements.' *Accounting Horizons* 17, 3 (2003): 223-235.
- REICHEL, K., and D. WANG. 'National versus office-specific measures of auditor industry expertise and effects on client earnings quality.' *Journal of Accounting Research* 48, 3 (2010), 647-686.
- REYNOLDS, J., and J. FRANCIS. 'Does size matter? The influence of large clients on office-level auditor reporting decisions.' *Journal of Accounting and Economics* 30, 3 (2000): 375-400.
- SHARMA, D. 'The association between non-audit services and the propensity of going concern qualifications: Implications for audit independence.' *Asia Pacific Journal of Accounting and Economics* 8, 2 (2001): 143-155.
- SHARMA, D., and J. SIDHU. 'Professionalism vs commercialism: The association between non-audit services (NAS) and audit independence.' *Journal of Business Finance & Accounting* 28, 5-6 (2001): 563-594.
- SIMNETT, R., and K. TROTMAN. 'Auditor versus model: Information choice and information processing.' *Accounting Review* 64, 3 (1989): 514-528.
- SIMUNIC, D. 'The pricing of audit services: Theory and evidence.' *Journal of Accounting Research* (1980): 161-190.
- SIMUNIC, D. 'Auditing, consulting, and auditor independence.' *Journal of Accounting Research* 22, 2 (1984): 679-702.
- SOLOMON, I., M. SHIELDS, and O. WHITTINGTON. 'What do industry-specialist auditors know?' *Journal of Accounting Research* 37, 1 (1999): 191-208.
- TEOH, S., and T. WONG. 'Perceived auditor quality and the earnings response coefficient.' *Accounting Review* 68, 2 (1993): 346-366.

- WATKINS, A., W. HILLISON, and S. MORECROFT. 'Audit quality: A synthesis of theory and empirical evidence.' *Journal of Accounting Literature* 23,1 (2004):153-193.
- WATTS, R., and J. ZIMMERMAN. Positive theory of accounting. Englewood Cliffs, NY: Prentice-Hall, 1986.
- WEIL, B. 'Going concerns: Did accountants fail to flag problems at dot-com casualties?' *Wall Street Journal* 2 (2001): 09.
- WHISENANT, S., S. SANKARAGURUSWAMY, and K. RAGHUNANDAN. 'Evidence on the joint determination of audit and non-audit fees.' *Journal of Accounting Research* 41, 4 (2003): 721-744.
- WINES, Gs. 'Auditor independence, audit qualifications and the provision of nonaudit services: A note.' *Accounting & Finance* 34, 1 (1994): 75-86.

## Appendix A

$$\begin{aligned} LAF = & \beta_0 + \beta_1 LOGTA + \beta_2 BIG4 + \beta_3 ROA + \beta_4 RET + \beta_5 VOL + \beta_6 LEV \\ & + \beta_7 INVREC + \beta_8 INSTOWN + \beta_9 SPECIAL + \beta_{10} BVMV + \beta_{11} SEGS \\ & + \beta_{12} FOROPS + \beta_{13} EMPLAN + \beta_{14} RPLAG + \beta_{15} INITIAL \\ & + \sum_{i=2001}^{2007} Year_{dum}_i + \sum Inddum_2 + \varepsilon \end{aligned} \quad (4)$$

where

- ROA = return on assets defined as operating income divided by total assets at fiscal year-end;
- INVREC = inventory plus accounts receivables divided by total asset at fiscal year-end;
- INSTOWN = the percentage of institutional holdings at fiscal year-end;
- SPECIAL = equals the absolute value of negative special items divided by total assets at fiscal year-end, and 0 otherwise;
- BVMV = the book-to-market ratio at the fiscal year-end;
- SEGS = the number of segments disclosed in the segment footnote;
- FOROPS = dummy variable: equals 1 if the company has foreign operations, 0 otherwise;
- EMPLAN = dummy variable: equals 1 if the company has a pension or post-retirement plan, 0 otherwise;
- INITIAL = dummy variable: equals 1 if it is the initial two years of the audit engagement, 0 otherwise;
- Inddum<sub>2</sub> = industry dummy variables based on 2-digit SIC code.
- All other variables are defined as above.

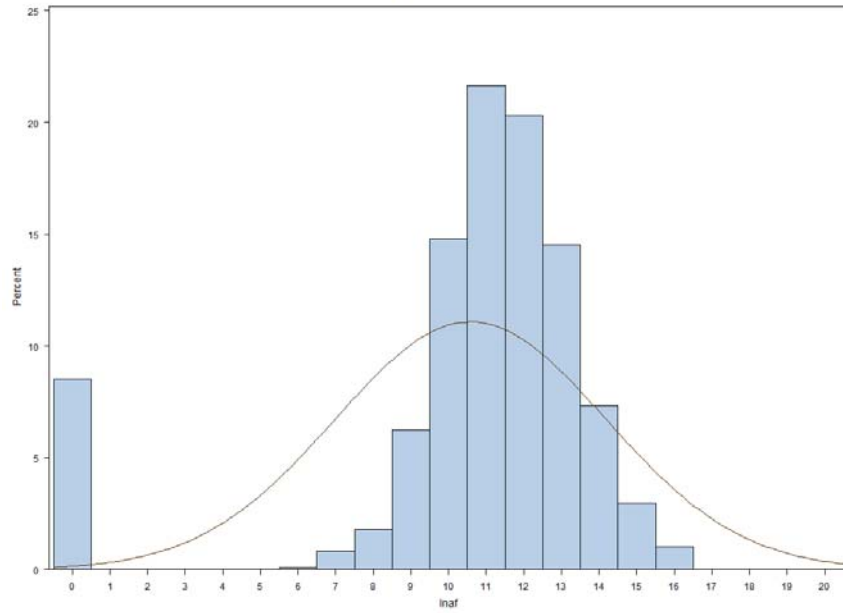
$$\begin{aligned} LNAForFEERATIO = & \beta_0 + \beta_1 LOGTA + \beta_2 BIG4 + \beta_3 ROA + \beta_4 RET + \beta_5 LEV \\ & + \beta_6 INSTOWN + \beta_7 SPECIAL + \beta_8 BVMV + \beta_9 SEGS + \beta_{10} FOROPS \\ & + \beta_{11} EMPLAN + \beta_{12} INITIAL + \beta_{13} MERGER + \beta_{14} FINANCE \\ & + \beta_{15} SALESGR + \sum_{i=2001}^{2007} Year_{dum}_i + \sum Inddum_2 + \varepsilon \end{aligned} \quad (5)$$

where:

- MERGER = dummy variable: equals 1 if the client acquired a company during the fiscal year, 0 otherwise;
- FINANCE = dummy variable: equals 1 if the firm issued equity or debt during the fiscal year, 0 otherwise;
- SALESGR = growth rate in sales over the preceding year.
- All other variables are defined as above.

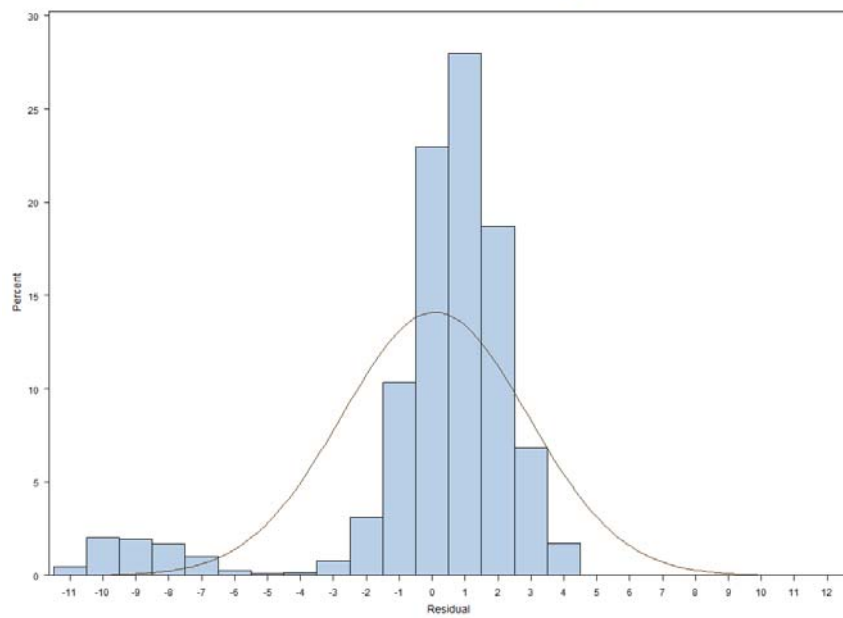
**Diagram 1**

**Histogram of LNAF**



**Diagram 2**

**Histogram of Unexp (LNAF)**



**Table 1**  
**Definitions of Variables**

Variable	Definition
GC	Dummy variable: equals 1 for firms with first-time GC, 0 otherwise.
ALTMAN	Altman (1968) Z-score.
TA	Total Assets (in \$mil).
LOGTA	Natural logarithm of TA.
AGE	Number of year since the firm was listed on the stock exchange.
LOGAGE	Natural logarithm of AGE.
BETA	The firm's beta estimated using the market model over the fiscal year.
RET	The firm's stock return over the fiscal year.
VOL	The variance of the residuals from the market model over the fiscal year.
LEV	Total liabilities over total assets at end of the fiscal year.
$\Delta$ LEV	Change in LEV during the fiscal year.
DLOSS	Dummy variable: equals 1 when the firm reports a bottom-line loss for the previous year, and 0 otherwise.
INVEST	Short- and long-term investment securities (including cash and cash equivalents) deflated by total assets at year-end.
FUTFIN	Dummy variable: equals 1 when the firm issues equity or debt in the subsequent year, and 0 otherwise.
BIG4	Dummy variable: equals 1 when the auditor is a member of the Big 4, and 0 otherwise.
OPCF	Operating cash flow divided by total assets at fiscal year-end.
RPLAG	Number of days between fiscal year-end and earnings announcement date.
Yeardummy	Fiscal year dummy variables.
Inddummy	Industry dummy variables based on 1-digit SIC code.
LAF	The natural logarithm of audit fees paid to the incumbent auditor.
LNAF	The natural logarithm of non-audit fees paid to the incumbent auditor.
LTOTALF	The natural logarithm of the sum of audit and non-audit fees paid to the incumbent auditor.
FEERATIO	The ratio of non-audit fees to total fees paid to the incumbent auditor.
Unexp (LAF)	Residual log of audit fees from expectation model.
Unexp (LNAF)	Residual log of non-audit fees from expectation model.
Unexp (LTOTALF)	Residual log of total fees from expectation model.
Unexp (FEERATIO)	Residual log of FEERATIO from expectation model.
TENDUM	Dummy variable: equals 1 if audit tenure is longer than or equal to four years; 0 otherwise.
SPEC	Dummy variable: equals 1 if the specialization measure is higher than median; 0 otherwise. The specialization measure is based on the industry market share of the auditors and calculated as the percentage of audit fees in a given industry (using two-digit SIC classification) for an auditor for a particular year. The minimum number of firms in an industry is 5.

**Table 2**  
**Descriptive statistics**

Panel A: Year 2000 – Year 2007 (N = 10394)

	Mean	Q1	Median	Q3	Std. Dev
FEERATIO	0.282	0.091	0.242	0.437	0.224
TOTALF (\$'000)	1245	192	413	1003	3862
LTOTALF	0.013	0.012	0.013	0.014	0.001
NAF (\$'000)	471	24	84	279	2259
LNAF	10.577	10.086	11.340	12.537	3.608
AF (\$'000)	774	131	273	650	2361
LAF	12.645	11.783	12.517	13.385	1.180
GC	0.040	0	0	0	0.196
TENDUM	0.741	0	1	1	0.438
ALTMAN	1.814	-1.735	-0.051	2.498	10.459
TA (\$M)	1096	37	108	397	6852
AGE	12.929	6	9	16	10.935
BETA	1.867	0.588	1.638	2.936	1.958
RET	0.033	-0.477	-0.161	0.243	0.830
VOL	0.045	0.011	0.024	0.049	0.064
LEV	0.466	0.227	0.422	0.650	0.300
ΔLEV	0.041	-0.021	0.027	0.093	0.154
DLOSS	0.700	0	1	1	0.458
INVEST	0.503	0.111	0.387	0.804	0.448
FUTFIN	0.895	1	1	1	0.306
BIG4	0.790	1	1	1	0.407
OPCH	-0.109	-0.169	-0.030	0.041	0.256
RPLAG	42.749	28	40	55	19.049
SPEC <sup>17</sup>	0.190	0.101	0.190	0.272	0.135

Panel B: By Going Concern Year 2000 – Year 2007 (N = 10394)

	Mean	T-Stat	Median	Z-Stat
GC	0	1	0	1
FEERATIO	0.28	0.25	0.24	0.19
TOTALF (\$'000)	1265.96	745.43	420.00	270.36
LTOTALF	13.06	12.65	12.95	12.51
NAF (\$'000)	479.63	257.10	86.00	51.00
LNAF	10.61	9.79	11.36	10.84
AF (\$'000)	786.33	488.33	276.20	183.00
LAF	12.66	12.32	12.53	12.12
TENDUM	0.74	0.71	1	1
ALTMAN	2.09	-4.78	0.04	-3.50
TA(\$M)	1124.18	439.15	113.85	34.00
LOGTA	4.93	3.78	4.73	3.53
AGE	13.01	11.08	9	8
LOGAGE	2.28	2.13	2.20	2.08
BETA	1.87	1.78	1.64	1.66
RET	0.05	-0.32	-0.15	-0.50
VOL	0.04	0.07	0.02	0.04
LEV	0.46	0.64	0.42	0.58
ΔLEV	0.04	0.13	0.03	0.10
DLOSS	0.69	0.85	1	1
INVEST	0.51	0.41	0.39	0.22
FUTFIN	0.90	0.87	1	1
BIG4	0.79	0.73	1	1
OPCH	-0.10	-0.38	-0.03	-0.23
RPLAG	42.15	57.02	39	63
SPEC <sup>18</sup>	0.19	0.18	0.190	0.180

<sup>17</sup> Sample size for SPEC is 10385.

Panel C: Pearson (Spearman) Correlations Above (Below) Diagonal (N=10394)

Variable	GC	LAF	LNAF	FEERATIO	LTOTALF	TENDUM	ALTMAN	LOGTA	LOGAGE	BETA
GC	N/A	-0.06***	-0.04***	-0.03***	-0.07***	-0.02	-0.13***	-0.13***	-0.04***	-0.01
LAF	-0.06***	N/A	0.35***	-0.08***	0.94***	0.09***	-0.16***	0.76***	0.21***	0.05***
LNAF	-0.06***	0.51***	N/A	0.62***	0.51***	0.15***	-0.05***	0.44***	0.04***	0.05***
FEERATIO	-0.03***	-0.09***	0.76***	N/A	0.25***	0.08***	0.02*	0.25***	-0.08***	0.04***
LTOTALF	-0.07***	0.94***	0.73***	0.21***	N/A	0.11***	-0.15***	0.82***	0.18***	0.07***
TENDUM	-0.02	0.09***	0.14***	0.09***	0.11***	N/A	0.04***	0.1***	0.06***	0.02**
ALTMAN	-0.2***	-0.09***	-0.02**	0.05***	-0.06***	0.07***	N/A	-0.04***	-0.1***	0.01
LOGTA	-0.14***	0.73***	0.64***	0.23***	0.79***	0.1***	0.09***	N/A	0.18***	0.03***
LOGAGE	-0.04***	0.18***	0.06***	-0.08***	0.13***	0.05***	-0.05***	0.13***	N/A	-0.13***
BETA	-0.01	0.07***	0.08***	0.05***	0.09***	0.02**	0.02*	0.06***	-0.13***	N/A
RET	-0.13***	0.04***	-0.04***	-0.09***	0	0.01	0.25***	0.03***	0.13***	-0.07***
VOL	0.11***	-0.32***	-0.07***	0.16***	-0.26***	-0.04***	-0.13***	-0.3***	-0.31***	0.26***
LEV	0.1***	0.33***	0.23***	0.02*	0.32***	-0.03***	-0.64***	0.29***	0.22***	-0.08***
ΔLEV	0.11***	0.05***	0.04***	0	0.05***	0	-0.32***	0.01	-0.06***	0.03***
DLOSS	0.07***	-0.11***	-0.14***	-0.07***	-0.14***	-0.04***	-0.1***	-0.21***	-0.21***	0.13***
INVEST	-0.05***	-0.19***	-0.19***	-0.06***	-0.21***	0.02**	0.24***	-0.3***	-0.28***	0.2***
FUTFIN	-0.02*	0.05***	0.04***	0.01	0.05***	0	0.04***	0.05***	-0.06***	0.07***
BIG4	-0.03***	0.28***	0.35***	0.22***	0.34***	0.21***	0.04***	0.38***	-0.11***	0.09***
OPCH	-0.13***	0.3***	0.29***	0.11***	0.33***	0.02	0.06***	0.46***	0.24***	-0.14***
RPLAG	0.16***	-0.22***	-0.33***	-0.25***	-0.29***	-0.1***	-0.12***	-0.38***	0.09***	-0.16***
SPEC <sup>19</sup>	-0.02*	0.31***	0.25***	0.13***	0.34***	0.16***	-0.01	0.35***	-0.01	0.05***

Variable	RET	VOL	LEV	ΔLEV	DLOSS	INVEST	FUTFIN	BIG4	OPCH	RPLAG	SPEC
GC	-0.09***	0.09***	0.12***	0.12***	0.07***	-0.04***	-0.02*	-0.03***	-0.22***	0.15***	-0.02*
LAF	-0.02**	-0.23***	0.32***	0.03***	-0.13***	-0.24***	0.05***	0.27***	0.27***	-0.17***	0.31***
LNAF	-0.03***	-0.02**	0.13***	0.01	-0.08***	-0.12***	0.04***	0.29***	0.14***	-0.26***	0.25***
FEERATIO	-0.06***	0.11***	0.01	0	-0.08***	-0.07***	0.01	0.22***	0.1***	-0.24***	0.13***
LTOTALF	-0.04***	-0.19***	0.31***	0.03***	-0.15***	-0.25***	0.05***	0.33***	0.29***	-0.24***	0.34***
TENDUM	0	-0.02**	-0.03***	0	-0.04***	0.02**	0	0.21***	0.01	-0.1***	0.16***
ALTMAN	0.17***	-0.02**	-0.48***	-0.25***	0.02**	0.27***	0.05***	0	0.05***	-0.01	-0.01
LOGTA	-0.03***	-0.22***	0.28***	-0.01	-0.2***	-0.32***	0.05***	0.36***	0.44***	-0.33***	0.35***
LOGAGE	0.03***	-0.22***	0.19***	-0.06***	-0.22***	-0.28***	-0.07***	-0.09***	0.22***	0.06***	-0.01
BETA	0.01	0.26***	-0.06***	0.02**	0.12***	0.15***	0.06***	0.07***	-0.11***	-0.13***	0.05***
RET	N/A	0.18***	-0.01	-0.15***	0.08***	0.06***	0.08***	0	0.08***	-0.03***	0
VOL	-0.08***	N/A	-0.03***	-0.01	0.18***	0.13***	0.02*	0	-0.21***	0.02**	-0.02
LEV	0	-0.07***	N/A	0.4***	-0.03***	-0.37***	0.05***	0.04***	0.07***	0.08***	0.06***
ΔLEV	-0.18***	0.02**	0.36***	N/A	0.04***	-0.04***	0.01	0.02**	-0.16***	0.04***	0
DLOSS	0.02**	0.26***	-0.08***	0.05***	N/A	0.31***	0.06***	-0.01	-0.31***	0.02**	-0.03***
INVEST	0	0.19***	-0.47***	-0.06***	0.32***	N/A	0.01	0.07***	-0.47***	-0.13***	-0.01
FUTFIN	0.08***	0.05***	0.05***	0.01	0.06***	0	N/A	0.03***	-0.04***	-0.05***	0.02**
BIG4	-0.02**	0	0.04***	0.02**	-0.01	0.08***	0.03***	N/A	0.05***	-0.33***	0.68***
OPCH	0.12***	-0.3***	0.23***	-0.08***	-0.36***	-0.48***	-0.05***	0.07***	N/A	-0.1***	0.1***
RPLAG	-0.01	0.03**	0.07***	0.04***	0.03***	-0.17***	-0.05***	-0.36***	-0.11***	N/A	-0.19***
SPEC	0	-0.02	0.06***	0	-0.03***	-0.01	0.02**	0.68***	0.1***	-0.19***	N/A

\*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

<sup>18</sup> Sample size for non-going concern and going concern samples are 9965 and 420 respectively.

<sup>19</sup> Sample size for SPEC is 10385.

**Table 3**  
**Going Concern Model with Auditor Fees Variables**  
**as Independent Variables: Year 2000 – 2007**

$$GC = \beta_0 + \beta_1 LAF + \beta_2 LNAF + \beta_3 FEERATIO + \beta_4 LTOTLAF + \beta_5 ALTMAN + \beta_6 LOGTA + \beta_7 LOGAGE + \beta_8 BETA + \beta_9 RET + \beta_{10} VOL + \beta_{11} LEV + \beta_{12} \Delta LEV + \beta_{13} DLOSS + \beta_{14} INVEST + \beta_{15} FUTFIN + \beta_{16} BIG4 + \beta_{17} OPCF + \beta_{18} RPLAG + \sum_{i=2001}^{2007} Year_{dum}_i + \sum IndDum + \varepsilon$$

Panel A: Year 2000 – 2007 (GC = 1: 421; GC = 0: 9973)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-3.363*** (27.47)	-6.583*** (38.25)	-3.337*** (26.36)	-6.578*** (38.29)	-5.475*** (26.35)	-3.16*** (23.64)	-5.979*** (30.66)
LAF		0.359*** (14.51)		0.367*** (15.02)			
LNAF			-0.004 (0.06)	-0.012 (0.55)			
LTOTALF					0.223** (6.18)		0.311*** (10.78)
FEERATIO						-0.596* (3.82)	-0.928*** (8.38)
ALTMAN	-0.024*** (8.60)	-0.019** (5.62)	-0.024*** (8.61)	-0.019** (5.60)	-0.021*** (6.67)	-0.023*** (8.41)	-0.019** (5.78)
LOGTA	-0.208*** (19.62)	-0.389*** (33.54)	-0.205*** (17.61)	-0.383*** (32.14)	-0.334*** (23.21)	-0.19*** (15.71)	-0.355*** (25.86)
LOGAGE	-0.118 (1.90)	-0.13 (2.30)	-0.118 (1.91)	-0.131 (2.35)	-0.12 (1.96)	-0.124 (2.11)	-0.131 (2.37)
BETA	-0.03 (1.05)	-0.034 (1.29)	-0.03 (1.05)	-0.034 (1.31)	-0.033 (1.21)	-0.03 (1.01)	-0.033 (1.22)
RET	-0.628*** (29.93)	-0.616*** (28.99)	-0.628*** (29.96)	-0.616*** (29.00)	-0.619*** (29.15)	-0.629*** (30.17)	-0.618*** (29.22)
VOL	2.622*** (11.97)	2.571*** (11.43)	2.625*** (12.00)	2.583*** (11.54)	2.596*** (11.69)	2.619*** (11.95)	2.576*** (11.48)
LEV	0.872*** (16.43)	0.788*** (13.32)	0.872*** (16.44)	0.787*** (13.29)	0.825*** (14.62)	0.867*** (16.26)	0.799*** (13.71)
ΔLEV	0.06 (0.03)	0.096 (0.09)	0.063 (0.04)	0.104 (0.10)	0.078 (0.06)	0.068 (0.04)	0.096 (0.09)
DLOSS	0.452*** (8.49)	0.422*** (7.36)	0.452*** (8.51)	0.423*** (7.39)	0.438*** (7.97)	0.445*** (8.25)	0.423*** (7.40)
INVEST	-1.499*** (69.62)	-1.53*** (71.72)	-1.5*** (69.66)	-1.532*** (71.87)	-1.513*** (70.66)	-1.511*** (70.34)	-1.539*** (72.28)
FUTFIN	-0.242 (2.12)	-0.265 (2.54)	-0.241 (2.11)	-0.263 (2.51)	-0.259 (2.43)	-0.237 (2.04)	-0.26 (2.44)
BIG4	0.39*** (7.49)	0.284** (3.87)	0.395*** (7.54)	0.297** (4.16)	0.325** (5.06)	0.395*** (7.70)	0.308** (4.54)
OPCF	-2.238*** (108.63)	-2.187*** (104.86)	-2.24*** (108.63)	-2.193*** (105.14)	-2.192*** (104.42)	-2.263*** (110.54)	-2.213*** (106.47)
RPLAG	0.025*** (79.60)	0.023*** (67.50)	0.025*** (78.97)	0.023*** (66.37)	0.024*** (74.02)	0.024*** (75.72)	0.023*** (66.09)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.2816	0.2861	0.2816	0.2863	0.2835	0.2828	0.2862

<sup>†</sup>See Table 1 for definitions of variables. Year dummies and industry dummies based on 1-digit SIC code are included in the regressions but are not tabulated. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

**Table 4**  
**Going Concern Model with Auditor Fees Variables as Independent Variables**  
**Controlling for Audit Tenure: Year 2000 – 2007**

$$GC = \beta_0 + \beta_1 LAF + \beta_2 LNAF + \beta_3 FEERATIO + \beta_4 LTOTLAF + \beta_5 ALTMAN + \beta_6 LOGTA + \beta_7 LOGAGE + \beta_8 BETA + \beta_9 RET + \beta_{10} VOL + \beta_{11} LEV + \beta_{12} \Delta LEV + \beta_{13} DLOSS + \beta_{14} INVEST + \beta_{15} FUTFIN + \beta_{16} BIG4 + \beta_{17} OPCF + \beta_{18} RPLAG + \sum_{i=2001}^{2007} Year_{dum_i} + \sum IndDum + \varepsilon$$

Panel A: Year 2000 – 2007 - Long Tenure (GC = 1: 298; GC = 0: 7407)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-3.981*** (23.43)	-8.245*** (37.70)	-4.017*** (23.21)	-8.246*** (37.73)	-6.786*** (25.60)	-3.698*** (19.76)	-7.468*** (30.20)
LAF		0.474*** (16.39)		0.478*** (16.43)			
LNAF			0.006 (0.07)	-0.006 (0.08)			
LTOTALF					0.295*** (7.09)		0.414*** (12.47)
FEERATIO						-0.852** (4.98)	-1.281*** (10.27)
ALTMAN	-0.024*** (6.79)	-0.018** (4.03)	-0.024*** (6.80)	-0.018** (4.01)	-0.021** (5.11)	-0.024** (6.41)	-0.018** (4.08)
LOGTA	-0.227*** (16.10)	-0.461*** (32.13)	-0.232*** (15.16)	-0.457*** (30.97)	-0.392*** (21.66)	-0.198*** (11.61)	-0.413*** (23.82)
LOGAGE	-0.103 (0.97)	-0.114 (1.18)	-0.102 (0.96)	-0.115 (1.20)	-0.102 (0.96)	-0.113 (1.16)	-0.118 (1.28)
BETA	-0.044 (1.56)	-0.05 (2.00)	-0.044 (1.57)	-0.05 (2.00)	-0.049 (1.92)	-0.041 (1.36)	-0.047 (1.77)
RET	-0.514*** (16.09)	-0.498*** (15.16)	-0.514*** (16.07)	-0.498*** (15.16)	-0.503*** (15.41)	-0.514*** (16.16)	-0.498*** (15.23)
VOL	2.806*** (10.03)	2.797*** (9.88)	2.805*** (10.01)	2.8*** (9.91)	2.807*** (9.99)	2.803*** (10.02)	2.794*** (9.90)
LEV	0.752*** (8.07)	0.627** (5.55)	0.749*** (8.00)	0.628** (5.57)	0.675** (6.44)	0.755*** (8.15)	0.645** (5.87)
ΔLEV	0.158 (0.16)	0.223 (0.31)	0.156 (0.15)	0.227 (0.32)	0.2 (0.25)	0.161 (0.16)	0.22 (0.30)
DLOSS	0.476** (6.48)	0.443** (5.57)	0.476** (6.48)	0.442** (5.55)	0.464** (6.14)	0.463** (6.12)	0.439** (5.47)
INVEST	-1.527*** (51.07)	-1.558*** (52.49)	-1.527*** (51.10)	-1.559*** (52.48)	-1.542*** (51.87)	-1.539*** (51.49)	-1.569*** (52.90)
FUTFIN	-0.305 (2.54)	-0.349* (3.31)	-0.305 (2.54)	-0.349* (3.31)	-0.333* (3.02)	-0.305 (2.53)	-0.348* (3.27)
BIG4	0.445** (6.05)	0.26 (1.96)	0.44** (5.87)	0.263 (2.00)	0.336* (3.30)	0.442** (5.97)	0.288 (2.41)
OPCF	-2.413*** (87.66)	-2.35*** (83.88)	-2.41*** (87.25)	-2.353*** (83.90)	-2.351*** (83.30)	-2.457*** (90.12)	-2.392*** (85.90)
RPLAG	0.028*** (65.30)	0.025*** (53.47)	0.028*** (65.37)	0.025*** (53.19)	0.027*** (59.34)	0.027*** (62.25)	0.025*** (52.72)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.2895	0.2966	0.2895	0.2966	0.2925	0.2917	0.297

\*See Table 1 for definitions of variables. Year dummies and industry dummies based on 1-digit SIC code are included in the regressions but are not tabulated. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

Panel B: Year 2000 – 2007 - Short Tenure (GC = 1: 123; GC = 0: 2566)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-2.317** (4.52)	-3.868** (4.58)	-2.18** (3.90)	-3.834** (4.54)	-3.428* (3.53)	-2.28** (4.27)	-3.592* (3.76)
LAF		0.176 (1.16)		0.191 (1.36)			
LNAF			-0.019 (0.57)	-0.022 (0.78)			
LTOTALF					0.12 (0.58)		0.148 (0.78)
FEERATIO						-0.114 (0.05)	-0.274 (0.25)
ALTMAN	-0.024 (1.94)	-0.022 (1.63)	-0.024 (1.98)	-0.022 (1.65)	-0.022 (1.68)	-0.024 (1.95)	-0.022 (1.65)
LOGTA	-0.164* (3.58)	-0.255** (4.41)	-0.152* (2.92)	-0.247** (4.14)	-0.233* (3.44)	-0.162* (3.39)	-0.242* (3.63)
LOGAGE	-0.133 (0.75)	-0.138 (0.79)	-0.134 (0.75)	-0.139 (0.81)	-0.134 (0.75)	-0.134 (0.75)	-0.136 (0.78)
BETA	0.002 (0.00)	0.002 (0.00)	-0.001 (0.00)	-0.001 (0.00)	0.003 (0.00)	0.001 (0.00)	0.002 (0.00)
RET	-0.983*** (15.47)	-0.978*** (15.35)	-0.981*** (15.50)	-0.974*** (15.34)	-0.979*** (15.36)	-0.984*** (15.49)	-0.98*** (15.39)
VOL	2.894* (3.49)	2.842* (3.35)	2.94* (3.60)	2.893* (3.46)	2.854* (3.38)	2.897* (3.50)	2.852* (3.37)
LEV	1.296*** (11.34)	1.258*** (10.61)	1.287*** (11.17)	1.245*** (10.40)	1.28*** (11.05)	1.292*** (11.24)	1.267*** (10.78)
ΔLEV	-0.204 (0.12)	-0.19 (0.10)	-0.192 (0.11)	-0.178 (0.09)	-0.204 (0.12)	-0.199 (0.11)	-0.193 (0.11)
DLOSS	0.389 (1.88)	0.368 (1.67)	0.398 (1.96)	0.378 (1.76)	0.373 (1.72)	0.39 (1.89)	0.372 (1.71)
INVEST	-1.457*** (18.03)	-1.474*** (18.33)	-1.465*** (18.23)	-1.484*** (18.59)	-1.465*** (18.17)	-1.46*** (18.06)	-1.473*** (18.31)
FUTFIN	-0.088 (0.07)	-0.093 (0.07)	-0.07 (0.04)	-0.072 (0.04)	-0.096 (0.08)	-0.084 (0.06)	-0.089 (0.07)
BIG4	0.271 (1.10)	0.25 (0.93)	0.299 (1.31)	0.282 (1.16)	0.255 (0.97)	0.273 (1.12)	0.257 (0.99)
OPCF	-1.743*** (18.27)	-1.718*** (17.91)	-1.751*** (18.40)	-1.725*** (18.04)	-1.72*** (17.81)	-1.746*** (18.32)	-1.722*** (17.91)
RPLAG	0.019*** (14.86)	0.019*** (13.34)	0.019*** (14.25)	0.018*** (12.59)	0.019*** (14.18)	0.019*** (14.53)	0.019*** (13.36)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.295	0.2963	0.2956	0.2971	0.2957	0.2951	0.2959

\*See Table 1 for definitions of variables. Year dummies and industry dummies based on 1-digit SIC code are included in the regressions but are not tabulated. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

Panel C: Piece-wise Regression

$$\begin{aligned}
 GC = & \gamma_0 + \gamma_1 LAF + \gamma_2 LNAF + \gamma_3 (LNAF - LNAF_{FirstDecile}) \times Break_{dum} + \gamma_4 LNAF \times TENDUM \\
 & + \gamma_5 (LNAF - LNAF_{FirstDecile}) \times Break_{dum} \times TENDUM + \gamma_6 TENDUM + \gamma_7 LOGTA \\
 & + \gamma_8 LOGAGE + \gamma_9 BETA + \gamma_{10} RET + \gamma_{11} VOL + \gamma_{12} LEV + \gamma_{13} ALEV + \gamma_{14} DLOSS \\
 & + \gamma_{15} INVEST + \gamma_{16} FUTFIN + \gamma_{17} BIG4 + \gamma_{18} OPCF + \gamma_{19} RPLAG \\
 & + \sum_{i=2001}^{2007} Year_{dum}_i + \sum IndDum + \varepsilon
 \end{aligned}$$

where  $Break_{dum} = 1$  if  $LNAF > LNAF_{FirstDecile}$ , 0 otherwise;

$TENDUM = 1$  if audit tenure is longer than and equal to four years, 0 otherwise.

Variable	Full Sample		Full Sample		Long Tenure		Short Tenure	
	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$
Intercept	-6.919***	(39.53)	-6.824***	(37.06)	-9.007***	(41.53)	-3.556*	(3.73)
LAF	0.389***	(16.29)	0.394***	(16.67)	0.528***	(19.16)	0.177	(1.15)
LNAF	0.018	(0.36)	-0.065	(1.75)	0.054	(2.13)	-0.051	(1.13)
(LNAF-LNAF <sub>Break</sub> ) $\times$ Break <sub>dum</sub>	-0.088	(1.44)	0.139	(1.33)	-0.176**	(4.02)	0.087	(0.49)
LNAF $\times$ TENDUM			0.119**	(4.00)				
(LNAF-LNAF <sub>Break</sub> ) $\times$ Break <sub>dum</sub> $\times$ TENDUM			-0.317**	(5.70)				
TENDUM			-0.177	(0.29)				
ALTMAN	-0.019**	(5.75)	-0.02**	(5.94)	-0.019**	(4.15)	-0.021	(1.60)
LOGTA	-0.362***	(26.75)	-0.364***	(26.95)	-0.416***	(24.12)	-0.272**	(4.62)
LOGAGE	-0.13	(2.32)	-0.13	(2.28)	-0.111	(1.12)	-0.141	(0.83)
BETA	-0.033	(1.26)	-0.032	(1.13)	-0.047	(1.80)	0.001	(0.00)
RET	-0.616***	(29.04)	-0.615***	(28.98)	-0.496***	(15.09)	-0.968***	(15.26)
VOL	2.582***	(11.53)	2.568***	(11.40)	2.783***	(9.78)	2.88*	(3.43)
LEV	0.791***	(13.41)	0.792***	(13.34)	0.635**	(5.66)	1.239***	(10.27)
$\Delta$ LEV	0.103	(0.10)	0.09	(0.08)	0.221	(0.30)	-0.185	(0.10)
DLOSS	0.421***	(7.34)	0.414***	(7.08)	0.44**	(5.48)	0.373	(1.71)
INVEST	-1.537***	(72.06)	-1.536***	(71.88)	-1.572***	(53.07)	-1.489***	(18.75)
FUTFIN	-0.261	(2.47)	-0.263	(2.50)	-0.348*	(3.27)	-0.074	(0.05)
BIG4	0.287**	(3.90)	0.276*	(3.47)	0.246	(1.76)	0.295	(1.26)
OPCF	-2.208***	(106.06)	-2.202***	(105.43)	-2.388***	(85.63)	-1.714***	(17.81)
RPLAG	0.023***	(66.16)	0.023***	(65.35)	0.025***	(53.04)	0.018***	(12.63)
Year Dummies	Yes		Yes		Yes		Yes	
Ind. Dummies	Yes		Yes		Yes		Yes	
Pseudo R <sup>2</sup>	0.2867		0.2885		0.2983		0.2977	
No. Obs. (GC=1)	421		421		298		123	
No. Obs. (GC=0)	9973		9973		7407		2566	

\*See Table 1 for definitions of variables. Year dummies and industry dummies based on 1-digit SIC code are included in the regressions but are not tabulated. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

**Table 5**  
**Going Concern Model with Audit and Non-Audit Fees Variables as Independent**  
**Variables**  
**Controlling for Audit Quality: Year 2000 – 2007**

$$\begin{aligned}
 GC = & \gamma_0 + \gamma_1 LAF + \gamma_2 LNAF + \gamma_3 (LNAF - LNAF_{Break}) \times Break_{dum} + \gamma_4 LNAF \times BIG4 \\
 & + \gamma_5 (LNAF - LNAF_{Break}) \times Break_{dum} \times BIG4 + \gamma_6 BIG4 + \gamma_7 ALTMAN \\
 & + \gamma_8 LOGTA + \gamma_9 LOGAGE + \gamma_{10} BETA + \gamma_{11} RET + \gamma_{12} VOL + \gamma_{13} LEV + \gamma_{14} \Delta LEV \\
 & + \gamma_{15} DLOSS + \gamma_{16} INVEST + \gamma_{17} FUTFIN + \gamma_{18} OPCF + \gamma_{19} RPLAG \\
 & + \sum_{i=2001}^{2007} Year_{dum}_i + \sum IndDum + \varepsilon
 \end{aligned}$$

where  $Break_{dum} = 1$  if  $LNAF > LNAF_{FirstDecile}$ , otherwise.

Variable	Full Sample		Non-Big 4		Big 4	
	Coef	Wald $\lambda$ 2	Coef	Wald $\lambda$ 2	Coef	Wald $\lambda$ 2
Intercept	-7.016***	(39.93)	-9.238***	(16.76)	-6.47***	(23.25)
LAF	0.395***	(16.68)	0.664***	(11.75)	0.364***	(9.86)
LNAF	0.124***	(7.53)	0.126***	(6.83)	-0.028	(0.48)
(LNAF-LNAF <sub>Break</sub> ) $\times$ Break <sub>dum</sub>	-0.493***	(12.53)	-0.543***	(12.91)	0.044	(0.23)
LNAF $\times$ BIG4	-0.152***	(6.65)				
(LNAF-LNAF <sub>Break</sub> ) $\times$ Break <sub>dum</sub> $\times$ BIG4	0.528***	(11.34)				
BIG4	0.48	(2.09)				
ALTMAN	-0.02**	(6.54)	-0.012	(0.90)	-0.026**	(6.03)
LOGTA	-0.385***	(29.75)	-0.54***	(10.89)	-0.367***	(20.91)
LOGAGE	-0.134	(2.44)	-0.356**	(4.57)	-0.046	(0.21)
BETA	-0.038	(1.60)	-0.106*	(3.41)	-0.012	(0.12)
RET	-0.617***	(29.07)	-0.649***	(8.42)	-0.594***	(19.71)
VOL	2.606***	(11.69)	2.356	(2.11)	2.58***	(8.39)
LEV	0.777***	(12.88)	0.639	(2.15)	0.817***	(10.03)
$\Delta$ LEV	0.057	(0.03)	0.864	(1.99)	-0.251	(0.40)
DLOSS	0.431***	(7.67)	0.063	(0.05)	0.54***	(8.43)
INVEST	-1.554***	(73.51)	-1.894***	(26.86)	-1.469***	(46.64)
FUTFIN	-0.244	(2.14)	0.573	(2.02)	-0.45**	(5.74)
OPCF	-2.221***	(107.63)	-2.027***	(23.49)	-2.29***	(77.58)
RPLAG	0.023***	(66.73)	0.023***	(11.66)	0.023***	(52.63)
Year Dummies	Yes		Yes		Yes	
Ind. Dummies	Yes		Yes		Yes	
Pseudo R2	0.2903		0.3144		0.2973	
Prob (GC=1)	421		115		306	
Prob (GC=0)	9973		2069		7904	

\*See Table 1 for definitions of variables. Year dummies and industry dummies based on 1-digit SIC code are included in the regressions but are not tabulated. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

**Table 6**  
**Piece-wise Regression for Unexpected Non-Audit Fees**

$$GC = \gamma_0 + \gamma_1 \text{Unexp}(LNAF) + \gamma_2 (\text{Unexp}(LNAF) - \text{Unexp}(LNAF)_{\text{FirstQuartile}}) \times \text{Break}_{\text{dum}} \\ + \gamma_3 \text{ALTMAN} + \gamma_4 \text{LOGTA} + \gamma_5 \text{LOGAGE} + \gamma_6 \text{BETA} + \gamma_7 \text{RET} + \gamma_8 \text{VOL} + \gamma_9 \text{LEV} \\ + \gamma_{10} \Delta \text{LEV} + \gamma_{11} \text{DLOSS} + \gamma_{12} \text{INVEST} + \gamma_{13} \text{FUTFIN} + \gamma_{14} \text{BIG4} + \gamma_{15} \text{OPCF} + \gamma_{16} \text{RPLAG} + \varepsilon$$

where  $\text{Break}_{\text{dum}} = 1$  if  $LNAF > LNAF_{\text{FirstQuartile}}$ , 0 otherwise.

Panel A: Long and Short Tenure

Variable	Long Tenure		Short Tenure	
	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$
Intercept	-5.079***	(43.03)	-5.951***	(22.21)
Unexp(LNAF)	0.147**	(6.02)	0.016	(0.06)
(Unexp(LNAF)-Unexp(LNAF) <sub>Break</sub> ) $\times$ Break <sub>dum</sub>	-0.315**	(5.15)	-0.101	(0.34)
ALTMAN	-0.041**	(4.52)	-0.057	(2.10)
LOGTA	-0.254***	(9.49)	-0.18	(2.17)
LOGAGE	-0.051	(0.13)	0.158	(0.47)
BETA	-0.084	(2.53)	-0.019	(0.05)
RET	-0.464***	(7.69)	-0.869***	(6.75)
VOL	2.111	(1.99)	6.051**	(6.15)
LEV	0.902**	(5.74)	1.536**	(6.49)
$\Delta$ LEV	-0.285	(0.21)	-0.821	(0.79)
DLOSS	0.599**	(5.88)	0.103	(0.08)
INVEST	-1.429***	(20.43)	-1.594***	(7.51)
FUTFIN	-0.012	(0.00)	0.098	(0.03)
BIG4	0.611**	(5.55)	0.511	(2.01)
OPCF	-2.018***	(23.77)	-1.493**	(5.59)
RPLAG	0.044***	(52.40)	0.036***	(13.84)
Pseudo R <sup>2</sup>	0.2657		0.2705	
No. Obs (GC=1)	140		57	
No. Obs (GC=0)	4172		1298	

\*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

Panel B: Big 4 and Non-Big 4 auditors

Variable	Big 4		Non-Big4	
	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$
Intercept	-5.153***	(51.15)	-4.729***	(8.72)
Unexp(LNAF)	0.077	(1.81)	0.116*	(3.13)
(Unexp(LNAF)-Unexp(LNAF) <sub>Break</sub> ) $\times$ Break <sub>dum</sub>	-0.079	(0.38)	-0.492**	(6.28)
ALTMAN	-0.048**	(4.94)	-0.028	(0.92)
LOGTA	-0.174**	(5.47)	-0.451**	(6.48)
LOGAGE	0.038	(0.08)	-0.076	(0.09)
BETA	-0.038	(0.54)	-0.121	(1.97)
RET	-0.6***	(12.04)	-0.403	(1.78)
VOL	3.163**	(4.78)	2.51	(0.86)
LEV	1.317***	(13.75)	0.652	(0.82)
$\Delta$ LEV	-0.835	(1.93)	0.437	(0.17)
DLOSS	0.467*	(3.79)	0.329	(0.70)
INVEST	-1.293***	(17.85)	-2.254***	(9.96)
FUTFIN	-0.213	(0.58)	0.835	(1.76)
OPCF	-2.081***	(24.64)	-1.699***	(6.88)
RPLAG	0.038***	(48.96)	0.052***	(13.64)
Pseudo R <sup>2</sup>	0.2685		0.2786	
No. Obs (GC=1)	147		50	
No. Obs (GC=0)	4323		1147	

\*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

**Table 7**  
**Going Concern Model with Auditor Fees Variables as Independent Variables: Year**  
**2000 (DeFond et al 2002 replication)**

$$GC = \beta_0 + \beta_1 LAF + \beta_2 LNAF + \beta_3 LTOTALF + \beta_4 FEERATIO + \beta_5 ALTMAN + \beta_6 LOGTA + \beta_7 LOGAGE + \beta_8 BETA + \beta_9 RET + \beta_{10} VOL + \beta_{11} LEV + \beta_{12} \Delta LEV + \beta_{13} DLOSS + \beta_{14} INVEST + \beta_{15} FUTFIN + \beta_{16} BIG4 + \beta_{17} OPCF + \beta_{18} RPLAG + \varepsilon$$

Panel A: Full Sample (GC = 1: 80; GC = 0: 965)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-3.46*** (12.30)	-4.526* (3.07)	-3.873*** (14.11)	-4.484* (2.95)	-4.442* (3.55)	-3.519*** (12.50)	-4.038 (2.41)
LAF		0.115 (0.20)		0.067 (0.07)			
LNAF			0.075 (2.59)	0.074 (2.48)			
LTOTALF					0.104 (0.21)		0.056 (0.05)
FEERATIO						0.366 (0.30)	0.284 (0.14)
ALTMAN	-0.059* (2.89)	-0.056 (2.59)	-0.054 (2.48)	-0.053 (2.31)	-0.056 (2.55)	-0.058* (2.82)	-0.057 (2.59)
LOGTA	-0.292** (6.38)	-0.341** (4.55)	-0.381*** (8.83)	-0.408** (6.02)	-0.351** (4.11)	-0.318** (6.46)	-0.344** (3.91)
LOGAGE	-0.242 (1.54)	-0.245 (1.58)	-0.229 (1.37)	-0.231 (1.40)	-0.241 (1.53)	-0.235 (1.45)	-0.236 (1.46)
BETA	-0.107 (1.62)	-0.109 (1.68)	-0.109 (1.70)	-0.111 (1.73)	-0.11 (1.71)	-0.109 (1.69)	-0.11 (1.72)
RET	-1.08*** (10.18)	-1.055*** (9.50)	-1.123*** (10.47)	-1.108*** (9.93)	-1.068*** (9.85)	-1.097*** (10.26)	-1.086*** (9.87)
VOL	0.502 (0.09)	0.444 (0.07)	0.323 (0.04)	0.295 (0.03)	0.443 (0.07)	0.482 (0.09)	0.455 (0.08)
LEV	1.111* (3.50)	1.105* (3.46)	1.205** (4.13)	1.199** (4.09)	1.131* (3.62)	1.148* (3.70)	1.151* (3.72)
$\Delta$ LEV	0.246 (0.09)	0.225 (0.07)	0.241 (0.09)	0.229 (0.08)	0.206 (0.06)	0.224 (0.07)	0.207 (0.06)
DLOSS	1.199*** (10.41)	1.19*** (10.23)	1.237*** (10.93)	1.232*** (10.80)	1.196*** (10.37)	1.21*** (10.58)	1.206*** (10.48)
INVEST	-1.356*** (7.96)	-1.369*** (8.05)	-1.455*** (8.90)	-1.461*** (8.94)	-1.375*** (8.10)	-1.375*** (8.14)	-1.381*** (8.17)
FUTFIN	-0.679* (3.63)	-0.679* (3.62)	-0.715** (3.98)	-0.714** (3.97)	-0.688* (3.70)	-0.693* (3.75)	-0.694* (3.76)
BIG4	0.506 (1.73)	0.476 (1.48)	0.467 (1.47)	0.451 (1.33)	0.483 (1.55)	0.507 (1.73)	0.494 (1.61)
OPCF	-1.082* (3.52)	-1.091* (3.62)	-1.096* (3.63)	-1.101* (3.68)	-1.085* (3.57)	-1.07* (3.43)	-1.075* (3.47)
RPLAG	0.022*** (8.13)	0.021*** (7.37)	0.021*** (7.52)	0.021*** (7.02)	0.021*** (7.61)	0.022*** (8.15)	0.021*** (7.71)
Pseudo R <sup>2</sup>	0.3295	0.3299	0.3352	0.3354	0.33	0.3301	0.3302

\*See Table 1 for definitions of variables. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.

Panel B: Piece-wise Regression

$$GC = \gamma_0 + \gamma_1 LAF + \gamma_2 LNAF + \gamma_3 (LNAF - LNAF_{Break}) \times Break_{dum} + \gamma_2 LNAF \times TENDUM + \gamma_3 (LNAF - LNAF_{Break}) \times Break_{dum} \times TENDUM \\ + \gamma_4 TENDUM + \gamma_4 ALTMAN + \gamma_5 LOGTA + \gamma_6 LOGAGE + \gamma_7 BETA + \gamma_8 RET + \gamma_9 VOL + \gamma_{10} LEV + \gamma_{11} \Delta LEV + \gamma_{12} DLOSS \\ + \gamma_{13} INVEST + \gamma_{14} FUTFIN + \gamma_{15} BIG4 + \gamma_{16} OPCF + \gamma_{17} RPLAG + \varepsilon$$

where  $Break_{dum} = 1$  if  $LNAF > LNAF_{FirstDecile}$ , 0 otherwise;

$TENDUM = 1$  if audit tenure is longer than and equal to four years, 0 otherwise.

Variable	Full Sample		Full Sample		Full Sample		Long Tenure		Short Tenure	
	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$	Coef	Wald $\lambda^2$
Intercept	-5.569*	(3.67)	-5.705*	(3.83)	-6.089**	(4.02)	-7.003*	(3.06)	-3.682	(0.65)
LAF	0.139	(0.25)	0.138	(0.25)	0.144	(0.27)	0.175	(0.20)	0.068	(0.03)
LNAF	0.111*	(2.90)	0.088	(1.36)	0.121	(1.32)	0.106	(1.65)	0.034	(0.09)
(LNAF-LNAF <sub>Break</sub> )×Break <sub>dum</sub>	-0.164	(0.73)	0.113	(0.20)	0.074	(0.07)	-0.548**	(4.43)	0.588	(2.71)
LNAF × TENDUM			0.039	(0.40)	-0.015	(0.01)				
(LNAF-LNAF <sub>Break</sub> )×Break <sub>dum</sub> × TENDUM			-0.464*	(2.84)	-0.408	(1.85)				
TENDUM					0.502	(0.22)				
ALTMAN	-0.055	(2.46)	-0.057	(2.50)	-0.056	(2.43)	-0.054	(1.14)	-0.058	(1.05)
LOGTA	-0.36**	(4.24)	-0.381**	(4.62)	-0.372**	(4.36)	-0.05	(0.04)	-0.821***	(8.14)
LOGAGE	-0.233	(1.43)	-0.17	(0.76)	-0.177	(0.82)	-0.248	(0.75)	-0.29	(0.87)
BETA	-0.104	(1.54)	-0.1	(1.36)	-0.1	(1.36)	-0.059	(0.30)	-0.259	(2.69)
RET	-1.109***	(9.99)	-1.088***	(9.51)	-1.096***	(9.62)	-1.108***	(6.85)	-1.541*	(3.63)
VOL	0.285	(0.03)	0.399	(0.06)	0.411	(0.06)	2.897	(2.04)	-6.636	(2.58)
LEV	1.163*	(3.82)	1.287**	(4.37)	1.305**	(4.48)	0.966	(1.27)	2.065**	(4.10)
ΔLEV	0.297	(0.13)	0.199	(0.06)	0.205	(0.06)	1.585	(2.09)	-2.462	(2.69)
DLOSS	1.231***	(10.74)	1.162***	(9.36)	1.161***	(9.33)	1.376***	(7.03)	1.03*	(2.98)
INVEST	-1.46***	(8.89)	-1.509***	(9.17)	-1.509***	(9.14)	-1.756**	(6.15)	-1.474*	(3.53)
FUTFIN	-0.706**	(3.89)	-0.704*	(3.79)	-0.708*	(3.82)	-1.22***	(7.03)	0.267	(0.15)
BIG5	0.434	(1.23)	0.506	(1.62)	0.471	(1.36)	0.341	(0.35)	0.604	(0.92)
OPCF	-1.128**	(3.85)	-1.113*	(3.52)	-1.158*	(3.71)	-1.591*	(3.57)	-1.372	(2.07)
RPLAG	0.02***	(6.97)	0.021***	(6.93)	0.021***	(6.96)	0.029***	(7.25)	0.013	(1.11)
Pseudo R2	0.3368		0.3518		0.3522		0.3808		0.3936	
Prob (GC=1)	80		80		80		45		35	
Prob (GC=0)	965		965		965		661		304	

\*See Table 1 for definitions of variables. \*\*\*, \*\* and \* indicate significance at a p-value of less than the 1% level (2-tailed), 5% level (2-tailed), and 10% level (2-tailed), respectively.