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# Audit Engagement Risk and the Propensity of Issuing Going-Concern Opinion – Does Audit Firm Tenure Matter?

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**Abstract**

Different from prior literature that focuses on the independence implications of extended auditor-client relationship on the propensity of issuing going-concern modified opinions (GCs), we adopt a risk perspective and argue that any association between auditor tenure and the propensity of issuing GCs should be conditional on auditor's assessment of audit engagement risk. Using corporate social responsibility performance (CSR risk) as a proxy for audit engagement risk, we find that the propensity of going-concern opinions (GCs) is muted when client firms have average level of CSR risk and decreases with CSR risk for client firms with average length of audit firm tenure. In contrast, the likelihood of GCs increases with CSR risk for client firms with above average audit firm tenure. Moreover, graphical evidence reveals that the propensity of GCs is a convex decreasing function of CSR risk for initial audit engagements but exhibits a convex increasing function of CSR risk for lengthy auditor-client engagements beyond 12 years. This study furthers our understanding on the effect of audit firm tenure on auditor's GC decisions as a function of audit engagement risk.

**Keywords:** Audit Engagement Risk, Audit Risk, Corporate Social Responsibility, Going-Concern Opinion, Business Risk, Audit Firm Tenure, Mandatory Auditor Rotation

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

## 1. Introduction

Auditing Standards require auditors to issue a modified going-concern opinion when substantial doubt exists regarding a client's ability to continue as a going-concern for one year beyond the financial statement date (SAS No. 59, AICPA 1988; SAS 126, AICPA 2012; IAS 570, International Auditing Practices Committee 1999). Recent corporate failures without early warning signals from external auditors on the impending bankruptcies have reignited heated debates on whether an extended auditor-client relationship impairs auditor independence (PCAOB 2011).

Yet, prior literature documents a positive association (Geiger and Raghunandan 2002), a negative association (Carey and Simnett 2006; Ye et al. 2011), or fail to find a systematic relation between auditor tenure and the propensity of issuing GCs to financially distressed clients (Francis and Yu 2009; Reichelt and Wang 2010; Ye et al. 2011; Knechel and Vanstraelen 2007; Ruiz-Barbadillo et al. 2009).[3]

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[3]Francis and Yu (2009) andReichelt and Wang (2010) use audit firm tenure as a control variable.Specifically, Knechel and Vanstraelen (2007)find no association between audit partner tenure and GCs for a sample of private companies in Belgium, an environment where partner tenure is more likely to have a negative effect on audit quality. Likewise, Ruiz-Barbadillo et al. (2009) find no evidence that mandatory partner rotation in Spain is associated with a higher propensity to issue GCs.

The seemingly mixed results could be explained partially by an omitted conditional variable – audit engagement risk. Auditors obtain audit evidence based on their risk assessment to formulate their opinions on client firms' going-concern assumptions. Following Khalil et al. (2011), we define audit engagement risk as the overall risk associated with an audit engagement and comprises of the client's business risk, audit risk, and the auditor's business risk.[4] As rational agents, auditors decide whether to issue GCs based on a tradeoff analysis of the benefits (e.g. future audit revenue from client retention) and the costs (e.g., litigation and reputational damage) (DeAngelo 1981; Watts and Zimmerman 1981). Auditors face different costs under Type I errors (incorrect going-concern reports) and Type II errors (incorrect clean opinions). For example, issuing a clean opinion without disclosing going-concern uncertainties to a subsequently insolvent client is usually followed by costly litigation (e.g., St. Pierre and Anderson 1984; Palmrose 1987, 1988; Carcello and Palmrose 1994; and Lys and Watts 1994) and strict regulations (SOX). In contrast, issuing a going-concern opinion to a surviving client increases the risk of "auditor switching" (e.g., Kida 1980; Chow and Rice 1982; Schwartz and Menon 1985) or professional reputation damage (Louwers 1998). It is reasonable to believe that the "costs of acquiescence" is higher for socially irresponsible firms than for socially responsible firms for several reasons.

To the extent that the institutional knowledge of the client, its industry, and its ability to survive difficult times may even help the auditor "see through" management attempts to conceal financial distress (Geiger and Raghunandan 2002), we predict a positive association between audit firm tenure and the propensity of GCs for client firms with high CSR risk. When CSR risk is low, however, a long-term experience with a profitable client will incentivize the auditor to give management the benefit of doubt when uncertainty exists (Louwers 1998). Consequently, we hypothesize a negative association between audit firm tenure and the propensity of GCs for client firms with low CSR risk. To the extreme, absent any *CSR risk*, audit firm tenure should have no systematic relation with the propensity of GCs.

Using the CSR performance rating from an independent third-party MSCI database as a proxy for audit engagement risk for the 11-year period spanning from 2003 to 2013 for financially stressed firms, we provide three major findings.[5] First, we find that audit firm tenure has no significant impact on the propensity of GCs when client firms have neither CSR strengths nor CSR concerns. Second, we find that the propensity for auditors to issue GCs decreases with the CSR risk for client firms with a short auditor-client relationship. Third, we find that the likelihood to issue GCs increases with CSR risk for client firms with an extended auditor-client relationship. Collectively, these results imply that whether and how audit firm tenure affects the propensity for auditors to issue GCs is conditional on their assessment of audit engagement risk. This study contributes to the literature in two ways. First, this study bridges the gap between CSR research stressing how a manager's behavior affects financial reporting quality (Kim et al. 2012) and auditing literature focusing on the auditor's economic incentives (DeFond et al. 2002; Geiger and Rama 2003; Li's 2009; Kao et al. 2014) influence auditor behavior.

This paper offers a risk perspective to reconcile the mixed and inconclusive evidence on the association between audit firm tenure and the propensity of issuing GCs. Second, this study provides a more direct and unambiguous measure to examine auditor independence, complementing earlier studies that focus on the tenure effect on financial reporting quality using abnormal accruals (e.g., Johnson, Khurana, and Reynolds 2002;Myers et al. 2003; Davis, Soo, and Trompeter 2009), accounting restatements (Stanley and DeZoort 2007), and alleged accounting frauds (Carcello and Nagy 2004) or perceived financial reporting quality using the cost of debt (Mansi, Maxwell, and Miller 2004), credit ratings, and ERCs (Ghosh and Moon 2005).[6] Auditor's influence on earnings quality is at best indirect and the measurement errors exist for discretionary accruals (e.g., Guay, Kothari, and Watts 1996; Dechow, Sloan, and Sweeney 1995; Hribar and Collins 2002) and perceived financial reporting quality are noisy proxies for audit quality (Bamber and Bamber 2009).

The rest of the paper is organized as follows: section 2 reviews the literature and presents hypotheses development; section 3 delineates the research design; section 4 presents the empirical results; and section 5 concludes the paper.

[4]Client's business risk is the probability that a client's business conditions will deteriorate. Audit risk is defined as the likelihood of an auditor expressing an inappropriate audit opinion when the financial statements are materially misstated. Auditor's business risk refers to the probability of incurring litigation costs, suffering reputation damage, or even destroying the audit firm if the audit firm issues an inappropriate opinion.

## Literature Review and Hypotheses Development

*2.1 CSR Risk and the Propensity of Issuing GCs*

Carroll (1979; p.500) defines CSR as "economic, legal, ethical and discretionary expectations that society has of organizations at a given point of time". Stakeholder theory of CSR posits that a company needs the support of all of its stakeholders in order to sustain long-term survival and success (Freeman 1984; Van der Laan Smith et al. 2005). Under this theory, CSR activities can improve firm performance and enhance firm value (e.g., Mackey et al. 2007) because corporations can enhance long-term sustainability by differentiating its products in its product market (McWilliams & Siegel, 2001; Waddock & Graves, 1997), improving employee productivity (Agell and Lundberg, 1995; Campbell and Kamlani, 1997),[7] and building stronger customer relationships (Mescon & Tilson, 1987; Varadarajan & Menon, 1988). Based on financially distressed firms in the U.S. manufacturing industry, Bruynseels and Willekens (2012) provide evidence that short-term and long-term cash flow potential can mitigate the auditors' GC decisions when they evaluate the strategic turnaround initiatives by the management. Hence, auditors may perceive a client's business risk as high for firms with irresponsible CSR performance. The Converse is true for client firms with good CSR performance.

Deterioration in financial performance may incentivize the managers to undertake earnings management activities to conceal bad news from auditors and investors, given the negative market reaction in stock prices for unexpected first-time GCs (Firth 1978; Fleak and Wilson 1994; Jones 1996; Menon and Williams 2010). For example, Kim et al. (2012) document that socially responsible firms are less likely to engage in earnings management and to be subject to SEC investigations. Conversely, client firms engaging in highly controversial activities are likely to have higher abnormal accruals (Koh and Tong 2013). Moreover, Lanis and Richardson (2012) and Hoi et al. (2013) provide evidence that low CSR disclosures/CSR performance are positively associated with tax aggressiveness/tax sheltering activities.[8] To the extent that financial reporting aggressiveness and tax reporting aggressiveness are highly correlated (Frank et al. 2009), auditors perceive the risk of material misstatement would be higher for socially irresponsible firms, which in turn, contribute to a higher audit risk. To adjust the audit risk to an acceptable level for client firms engaging in irresponsible activities, auditors will charge higher audit fees, exert higher audit efforts and issue more modified GCs (Koh and Tong 2013). This is consistent with the findings by Bruynseels and Willekens' (2012) who document that auditors' risk assessment on clients' business risk affects audit opinions. However, it is unknown whether the higher propensity of issuing GCs to client firms with high CSR risk is driven by short tenure firms or long tenure firms.

2.2 *Audit Firm Tenure and the Propensity of GCs*

Since the 1970s, in an attempt to improve auditor independence and familiarity threat associated with long-term relationships with clients (Hoyle 1978; Arel et al. 2005) and provide a "fresh view" (AICPA 1992), the AICPA SEC Practice Section has mandated audit partner rotation every seven years with a two-year cooling-off period (AICPA 1978). To further enhance auditor objectivity and professional skepticism, thus protecting investor confidence in audited financial information, Section 203 of SOX restricted the AICPA audit partner rotation requirements to every five years and the cooling-off period to every five years (Bamber and Bamber 2009), effective as of May 6, 2003 and is applied retroactively (SEC 2003; Office of the Chief Accountant 2003).

However, proponents of mandatory audit firm rotation contend that mandatory audit partner rotation may not be sufficient to combat the negative effect of auditor independence impairment associated with extended auditor-client relationship.

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7 For instance,engaging in socially responsible activities may enhance employee productivity in terms of intrinsic motivation, coworker behavior or working conditions, and by employee identification with firm goals, hence enhancing the ability to recruit and retain high-quality workers (Agell and Lundberg, 1995; *Campbell and Kamlani, 1997).*

8 Using Australian data, Lanis and Richardson (2012) note the social investment commitment and corporate and CSR strategy (including the ethics and business conduct) of a corporation are important elements of CSR activities that have a negative impact on tax aggressiveness.

First, a lengthy tenure may indicate that the close auditor-client relationship and potential future streams of audit revenues could prevent the auditor from issuing GCs in presence of a firing threat from the management. For instance, Carcello and Neal (2000), Lennox (2000) and Chen, Martin and Wang (2013) find that auditors are less likely to issue going-concern opinions when pressured by their client firms. This is because auditors' GCs can negatively affect stock prices by either providing a warning about the auditor's assessment of a company's potential viability or having a direct negative consequence for a firm's future cash flow – introducing a technical default on existing debts or a defective SEC registration statement (Fleak and Wilson 1994). Second, a long-term and profitable experience with the client will incentivize the auditor to give management the benefit of doubt when uncertainty exists (Louwers 1998). In an experimental setting, Rau and Moser (1999) document that auditors who performed tasks that reflected positively on the company's viability may bias their subsequent evaluation of going-concerns more positively towards the clients. A few international studies that focus on audit partner tenure under voluntary regimes (Carey and Simnett 2006; Ye et al. (2011) provide some support for this viewpoint. For instance, Carey and Simnett (2006), using Australian data in 1995, find that financially distressed clients are less likely to receive GCs and are more likely to meet or beat earnings benchmarks for audit partner tenure greater than 7 years. Ye et al. (2011), using Australia data in 2002, find that a long audit engagement partner tenure has a negative effect on the auditors' propensity to issue GCs. Nevertheless, international evidence from a voluntary audit partner rotation regime may not be readily generalizable to a U.S. setting where mandatory audit partner rotation has been in place since 1970s.[9]

In contrast, opponents of mandatory audit firm rotation argue that market-based institutional incentives (e.g., reputation and litigation costs) are sufficient to motivate auditors to act independently (DeFond et al. 2002). Auditor switching literature provides supporting evidence that audit firms tend to shed risky clients in response to increased litigation risk (Shu 2000; Landsman et al. 2009) and managers' 'opinion shopping' attempt to avoid unfavorable audit opinions are generally futile (Carcello and Neal 2000; Lennox 2000). Prior literature also fails to find any association between audit firm tenure and the propensity of issuing GCs (Ye et al. 2011; Francis and Yu 2009; Reichelt and Wang 2010).[10] Two international studies focusing on audit partner tenure also fail to find any association between audit partner tenure and the propensity of issuing GCs (Knechel and Vanstraelen 2007; Ruiz-Barbadillo et al. 2009). In contrast, a long tenure implies that the auditor has extensive knowledge of the client, its industry and its ability to survive difficult times. Such institutional knowledge may even help the auditor "see through" management attempts to conceal financial distress. As well, close relationships between an auditor and a client may even facilitate the audit process, since the familiarity and trust developed over time can increase the client's willingness to share important information that may not be disclosed otherwise (Arel, Brody, &Pany, 2005). Consistent with this viewpoint, Geiger and Raghunandan (2002) document a positive association between audit firm tenure and the propensity of issuing GCs prior to bankruptcy for 117 U.S. nonregulated and financially stressed firms that filed for bankruptcy for the time period of 1996 to 1998.

### *2.3 Hypotheses Development*

Based on the discussion above, we conjecture that the mixed results on the association between auditor tenure and the likelihood of GCs may point to the existence of a potential omitted conditional variable - audit engagement risk. After all, auditors' decision for GCs is a function of a client's business risk assessed based on collective evidence during their audits. Rather than a mediator that has a direct effect on the propensity of GCs, auditor tenure is a moderator variable that affects the direction and/or strength of the relation between audit engagement risk and the propensity of GCs (see differences between mediator and moderator in Baron and Kenny1986). Auditors face different costs under Type I errors (incorrect going-concern reports) and Type II errors (incorrect clean opinions). For example, issuing a clean opinion without disclosing going-concern uncertainties to a subsequently insolvent client is usually followed by costly litigation (e.g., St. Pierre and Anderson 1984; Palmrose 1987, 1988; Carcello and Palmrose 1994; and Lys and Watts 1994). In contrast, issuing a going-concern opinion to a surviving client increases the risk of "auditor switching" (e.g., Kida 1980; Chow and Rice 1982; Schwartz and Menon 1985) or professional reputation damage (Louwers 1998).

*Ceteris paribus*, without any audit engagement risk, there should be no systematic relation between audit firm tenure and the propensity of issuing GCs. The higher the overall engagement risk, the lower the audit risk audit firms would be willing to sustain.

For example, audit firms may feel comfortable to accept a 5% Type II error rate for a medium risk client. However, audit firms may decrease the acceptable Type II error rate to 1% for a high risk client. The converse is true for a Type I error rate. Consequently, the propensity for auditors to issue GCs to financially distressed firms would be higher for high CSR risk clients. In contrast, the likelihood for auditors to issue GCs to financially distressed firms would be lower for the low CSR risk clients. Based on the above discussions, we express our hypotheses formally as follows:

***H1* (*No Engagement Risk Hypothesis*):** Without any CSR risk, there is no association between the propensity of issuing GCs and audit firm tenure.

***H2* (*Low Engagement Risk Hypothesis*):** The propensity of issuing GCs is a decreasing function of audit firm tenure when the CSR risk is low.

***H3* (*High Engagement Risk Hypothesis*):** The propensity of issuing GCs is an increasing function of audit firm tenure when the CSR risk is high.

**Research Design**

To examine ***H1-H3*** on the moderating effect of auditor tenure on the impact of CSR risk on the likelihood of receiving GCs, we employ the following logistic regression model based on the determinants of GCs documented in prior literature (e.g., Dopuch et al. 1987; Mutchler et al. 1997; Reynolds and Francis 2000; DeFond et al. 2002; Koh and Tong 2013): $Pr(GC_{it}=1|x) = F(\beta_0 + \beta_1 logTEN_{it} + \beta_2 CRISK_{it} + \beta_3 CRISK_{it} * logTEN_{it} + \beta_4 SIZE_{it} + \beta_5 LIT_{it} + \beta_6 AGE_{it} + \beta_7 MtB_{it} + \beta_8 Zscore_{it} + \beta_9 LOSS_{it} + \beta_{10} LEV_{it} + \beta_{11} ISSUE_{it} + \beta_{12} L1GC_i + \beta_{13} BigN_i + \beta_{14} ReportLag_{it} + \beta_{15} GOV_{it})$ (1)

Where F ( ) is the cumulative distribution function of the logistic distribution. We estimate Equation (1) using a pooled logistic regression and the significance level of the coefficients is derived based on robust standard errors clustered by the client firm and the fiscal year. In equation (1), the key variables of interest are CSR risk (*CRISK*) and audit firm tenure (*logTEN)* and the interaction term between *CRISK* and *LogTEN* (*CRISK*logTEN*).[11] *CRISK* is a summary score for the total concerns minus total strengths for the following seven dimensions of MSCI corporate social responsibility ratings: environment (*ENV*), product (*PRO*), employment (*EMP*), diversity (*DIV*), community (*COM*), human rights (*HUM*), and corporate governance (*CGOV*). *logTEN* is the natural log of the number of years the auditor has consecutively served the same audit client. Prior literature has employed a linear (Myers et al. 2003), log transformation (Gul et al. 2009), a quadratic (Davis et al. 2009) and a piecewise model (Johnson et al. 2002) to examine the relation between audit firm tenure and audit outcomes. We have conducted diagnostic analyses and determined that the log transformation of audit firm tenure is the most appropriate for our sample.[12] *CRISK*logTEN*is the interaction term between *CRISK* and *logTEN*. Since *CRISK*logTEN* is the interaction term between two continuous variables, the coefficient on *CRISK* (*logTEN*) shows the effect of *CRISK* (*logTEN*) on the propensity of GCs when *logTEN* (*CRISK*) is at the value of zero without any transformation of the variables (see details from Kraemer and Blasey 2004). Therefore, the coefficient on *CRISK* (*logTEN*) provides the impact of *CRISK* (*logTEN*) on the propensity of GCs when *logTEN* (*CRISK*) is at audit firm tenure of year 1 (*CRISK* ranking at 0).

An insignificant (significant) coefficient on $logTEN$ ($\beta_1$) would support (reject) ***H1*** that predicts no tenure effect on the propensity of GCs absent any CSR risk. An insignificant (significant) coefficient on $CRISK$ ($\beta_2$) would reject (support) ***H2*** that predicts a negative association between *CRISK* and the propensity of GCs for initial audit engagements. To the extent that an extended auditor-client relationship facilitates (exacerbates) the auditor's risk assessment on the client business risk regarding going concerns, a significant positive (negative) coefficient on the interaction term between *CRISK*logTEN* ($\beta_3$) would support (reject) ***H3.***

[11]Francis and Yu (2009) define tenure as a dummy variable that takes the value of 1 if auditor tenure is three years or less, and 0 otherwise; Reichelt and Wang (2010) define tenure as the natural logarithm of the number of years that the auditor has audited the firm's financial statements. A mean (median) of 1.702 (1.946). Gul et al. (2009) report a mean (median) of 8.016 (7.000) for raw tenure and a mean (median) of 1.910 (1.946) for *logTEN*.

[12] The model using *LogTEN* presents higher ROC and lower AIC and BIC that the linear (*TEN*), piece-wise (*STEN* and *LTEN*), and quadratic (*TEN* and $TEN^2$) model for our sample.

Model (1) also includes year and industry fixed effects along with control variables that are common in the going-concern literature (Mutchler, 1985; Dopuch et al., 1987; Mutchler et al., 1997;Raghunandan and Rama 1995; Carcello et al. 1995; Carcello and Neal 2000; Carcello and Neal 2003; Chen, Martin, and Wang 2013; and others).[13]

## Empirical Results

### *4.1 Sample Selection*

The initial sample starts with the intersection among the MSCI database (formerly known as KLD database), the Compustat database and the Audit Analytics data for U.S. publicly listed companies for the period from 2003 to 2013. After deleting missing values to generate the dependent variable, interest variables and control variables for the main regression, we retain 30,533 firm-year observations. Then we limit the sample to financially distressed firms, because the decision to issue a going-concern opinion is most salient among these firms (Hopwood et al. 1994; Mutchler et al. 1997; Reynolds and Francis 2000; Carcello and Neal 2000; DeFond et al. 2002). As in DeFond et al. (2002), we classify a firm as financially distressed when it meets one of the following two criteria: 1) negative earnings during the current fiscal year; and 2) negative operating cash flow during the current fiscal year. These restrictions exclude 22,657 firm-year observations that are not financially distressed. Finally, we drop 64 observations in the utility industry because none of the firm-year observations in this industry have received any GC reports during our sample period.[14] This leaves our final sample with 7,812 observations with 211 going-concern opinions, of which 161 are first-time going-concern opinions.

4.2 Descriptive Statistics

Panel A of Table 1 presents descriptive statistics for all variables used in the main analyses. The mean GC in our sample is 0.029, suggesting that at around 2.9 percent of our sample firms receive a going-concern modified opinion. This is comparable to a mean GC of 0.026 reported in Francis and Yu (2009). The mean (median) of *CRISK* is 0.771 (1). The mean (median) tenure is 10.914 (7), indicating that the sample firms have an average (median) of about 11 (7) years of auditor-client relationship, comparable to the mean (median) value of 8 (7) in Gul et al. (2009). The mean (median) value of the log transformation of audit firm tenure (*logTEN*) is 2.119 (2.197), relatively higher than the 1.910 (1.946) documented in Gul et al. (2009). We find a negative mean value for *ROA* (-0.152) and a high proportion (87.60 percent) of client firms experiencing a loss. This is consistent with an increasing trend of loss incidences since the early 1990s in the U.S. documented by Givoly and Hayn (2000). The descriptive statistics for other control variables are similar to prior studies.

Panel B of Table 1 presents the yearly distribution of the final sample for the period of 2003 to 2013 period, which demonstrates an increasing trend of financially distressed firms from around 7%-8% over the period of 2003 to 2007 to roughly 14% during 2008 and 2009. Afterwards, the GC modified opinions show a gradual declining trend from around 10% in 2010 to around 9% in 2011 and 2012, followed by around 6% in 2013. Panel C of Table 1 reports the sample distribution over 11 industries. The business equipment industry has the highest percentage of firm-year observations (20.71%), followed by the healthcare industry (19.95%), finance industries (17.82%), other industries (11.57%), the manufacturing industry (7.77%), and retail industry (6.23%). The chemical industry has the lowest percentage of firm-year observations (1.48%).

Panel A and Panel B of Figure 1 graph the sample distributions for *CRISK* and *TEN* over our sample period from 2003 to 2013 and across the eleven industries, corroborating the descriptive statistics reported in Panel A, Panel B and Panel C of Table 1. Panel A of Figure 1 exhibits a decreasing trend of the average *TEN* from approximately 10 years in 2003 to around 9 years in 2005. However, the average *TEN* stays relatively stable at around 10 to 13 from 2006 and onward. On the other hand, the average *CRISK* remains positive across the years from 2003 to 2013 except for 2012 when the *CRISK* turns to negative. It is worth noting that *CRISK* stays relatively stable from 2003 to 2009 before it jumps to a high level in 2010 and 2011, and then decreases in 2012 to 2013. Panel B of Figure 1 demonstrates large variations of the average *CRISK* and average *TEN* across industries. We include year and industry fixed effects (*YearDum* and *IndDum*) and also mean-adjust all the continuous variables in all our regression analyses to control for the market- and industry-wide exogenous shocks to *CRISK* and *TEN*.

[13]Following Choi et al. (2004), we use the Shumway-weighted Altman model (*Zscore*) to measure financial risk(Shumway 2001). However, our results are qualitatively similar when we use the other measures in Choi et al. (2004).

[14] Stata automatically drops these observations because of perfect predictions on the propensity of GCs in this industry, if I include these observations into my sample.

**Table 1 Descriptive Statistics**

| Panel A: Sample Descriptive Statistics | | | | | | |
|---|---|---|---|---|---|---|
| Variable | N | Mean | Std. Dev. | p25 | p50 | p75 |
| GC | 7,218 | 0.029 | 0.168 | 0.000 | 0.000 | 0.000 |
| TEN | 7,218 | 10.914 | 11.740 | 4.000 | 7.000 | 14.000 |
| LogTEN | 7,218 | 2.119 | 0.864 | 1.609 | 2.197 | 2.708 |
| CRISK | 7,218 | 0.771 | 1.844 | 0.000 | 1.000 | 2.000 |
| CRISK*TEN | 7,218 | 7.471 | 42.515 | 0.000 | 3.000 | 15.000 |
| CRISK*logTEN | 7,218 | 1.592 | 4.732 | 0.000 | 1.386 | 3.892 |
| SIZE | 7,218 | 6.629 | 1.821 | 5.324 | 6.444 | 7.775 |
| LIT | 7,218 | 0.317 | 0.465 | 0.000 | 0.000 | 1.000 |
| AGE | 7,218 | 2.599 | 0.747 | 2.079 | 2.639 | 3.091 |
| MtB | 7,218 | 3.034 | 45.671 | 0.941 | 1.629 | 3.292 |
| Zmjewski | 7,218 | -1.315 | 2.477 | -2.815 | -1.336 | 0.000 |
| ROA | 7,218 | -0.152 | 0.366 | -0.182 | -0.048 | -0.009 |
| LOSS | 7,218 | 0.876 | 0.329 | 1.000 | 1.000 | 1.000 |
| LEV | 7,218 | 0.275 | 0.289 | 0.017 | 0.207 | 0.436 |
| L1GC | 7,218 | 0.019 | 0.138 | 0.000 | 0.000 | 0.000 |
| ISSUE | 7,218 | 0.528 | 0.499 | 0.000 | 1.000 | 1.000 |
| BigN | 7,218 | 0.852 | 0.355 | 1.000 | 1.000 | 1.000 |
| ReportLag | 7,218 | 51.867 | 33.442 | 35.000 | 49.000 | 62.000 |
| GOV | 7,218 | 1.825 | 1.155 | 1.000 | 1.000 | 3.000 |

| Panel B: Sample Distribution over Time | | | | |
|---|---|---|---|---|
| Year | Freq. | Cum. Freq. | Percentage | Cum. Percentage |
| 2003 | 574 | 574 | 7.95% | 7.95% |
| 2004 | 562 | 1,136 | 7.79% | 15.74% |
| 2005 | 521 | 1,657 | 7.22% | 22.96% |
| 2006 | 517 | 2,174 | 7.16% | 30.12% |
| 2007 | 581 | 2,755 | 8.05% | 38.17% |
| 2008 | 976 | 3,731 | 13.52% | 51.69% |
| 2009 | 1,000 | 4,731 | 13.85% | 65.54% |
| 2010 | 754 | 5,485 | 10.45% | 75.99% |
| 2011 | 640 | 6,125 | 8.87% | 84.86% |
| 2012 | 630 | 6,755 | 8.73% | 93.59% |
| 2013 | 463 | 7,218 | 6.41% | 100.00% |

| Panel C: Sample Distribution across Industries | | | | | |
|---|---|---|---|---|---|
| Industries | | Freq. | Cum. Freq. | Percentage | Cum. Percentage |
| 1 | Food | 218 | 218 | 3.02% | 3.02% |
| 2 | Durables | 148 | 366 | 2.05% | 5.07% |
| 3 | Manufacturing | 561 | 927 | 7.77% | 12.84% |
| 4 | Energy | 371 | 1,298 | 5.14% | 17.98% |
| 5 | Chemicals | 107 | 1,405 | 1.48% | 19.47% |
| 6 | Business Equipment | 1,495 | 2,900 | 20.71% | 40.18% |
| 7 | Telecommunication | 307 | 3,207 | 4.25% | 44.43% |
| 9 | Retail | 450 | 3,657 | 6.23% | 50.67% |
| 10 | Healthcare | 1,440 | 5,097 | 19.95% | 70.62% |
| 11 | Finance | 1,286 | 6,383 | 17.82% | 88.43% |
| 12 | Other | 835 | 7,218 | 11.57% | 100.00% |

This table reports sample descriptive statistics for 7,218 firm-year observations for the sample period of 2003 to 2013. See Appendix A for all variable definitions.

**Figure 1 Sample Distribution over Time and Industries**

**Panel A *CRISK* and *TEN* over Time Panel B *CRISK* and *TEN* over Industries**

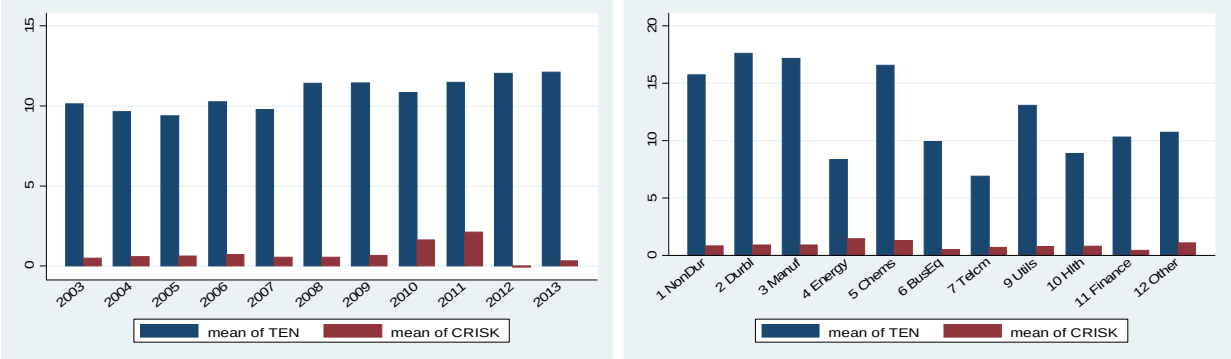


Table 2 reports the Spearman/Pearson correlation matrix among the variables for the sample of firm-year observations. *GC* has an insignificant negative correlation (-0.016) with *logTEN*, but a significant positive correlation with *CRISK* (0.032), suggesting that *GC* is directly influenced by CSR riskbut not by audit firm tenure. We find a significant positive correlation between GC and the interaction term *CRISK*logTEN* (0.036). This provides initial evidence to the conjecture that the audit firm tenure effect on GCs is a function of the perceived CSR risk. *GC* is negatively correlated with firm size (*SIZE*), litigation risk (*LIT*), market-to-book ratio (*MtB*), firm performance (*ROA*), and Big 4 auditors. In contrast, we find a positive correlation of GC with firm age (*AGE*), financial risk (*Zmjewski*), financial loss (*LOSS*), leverage (*LEV*), prior-year going-concern opinion (*L1GC*), the issuance of debt and equity (*ISSUE*), and the reporting lag of the financial statements (*ReportLag*). In summary, except for the insignificant correlation for *LIT*[15], *AGE*, and *MtB* with *GC*, all other control variables are significantly correlated with *GC* in a manner that is broadly consistent with prior literature.

**Table 2 Correlation Matrix**

| Variables | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| logTEN | 2 | -0.016 | | | | | | | | | | | | | | | |
| CRISK | 3 | 0.032 | -0.038 | | | | | | | | | | | | | | |
| CRISK*logTEN | 4 | 0.036 | 0.125 | 0.659 | | | | | | | | | | | | | |
| SIZE | 5 | -0.097 | 0.255 | -0.112 | -0.060 | | | | | | | | | | | | |
| LIT | 6 | -0.007 | -0.059 | -0.055 | -0.051 | -0.324 | | | | | | | | | | | |
| AGE | 7 | 0.001 | 0.491 | -0.012 | 0.066 | 0.321 | -0.112 | | | | | | | | | | |
| MtB | 8 | -0.008 | -0.005 | 0.001 | -0.005 | -0.028 | 0.024 | -0.006 | | | | | | | | | |
| Zmjewski | 9 | 0.247 | 0.028 | 0.042 | 0.014 | 0.154 | -0.127 | 0.074 | -0.013 | | | | | | | | |
| ROA | 10 | -0.236 | 0.078 | -0.019 | 0.0042 | 0.337 | -0.191 | 0.113 | -0.004 | -0.541 | | | | | | | |
| LOSS | 11 | 0.054 | -0.043 | -0.005 | 0.010 | -0.171 | 0.129 | -0.032 | 0.010 | 0.025 | -0.218 | | | | | | |
| LEV | 12 | 0.112 | 0.030 | 0.042 | 0.016 | 0.306 | -0.173 | 0.088 | -0.010 | 0.574 | 0.001 | 0.003 | | | | | |
| L1GC | 13 | 0.386 | -0.017 | 0.047 | 0.033 | -0.116 | 0.022 | -0.001 | -0.036 | 0.147 | -0.146 | 0.039 | 0.051 | | | | |
| Issue | 14 | 0.043 | -0.033 | 0.034 | 0.005 | 0.045 | -0.039 | -0.064 | 0.015 | 0.170 | -0.056 | -0.031 | 0.281 | 0.085 | | | |
| BigN | 15 | -0.050 | 0.182 | -0.054 | 0.015 | 0.203 | 0.068 | 0.049 | 0.007 | -0.006 | 0.054 | 0.016 | 0.060 | -0.054 | -0.008 | | |
| ReportLag | 16 | 0.122 | -0.082 | 0.074 | 0.051 | -0.197 | -0.010 | -0.067 | 0.001 | 0.050 | -0.072 | 0.039 | 0.056 | 0.065 | 0.069 | -0.101 | |
| GOV | 17 | -0.084 | 0.247 | -0.073 | -0.023 | 0.284 | -0.034 | 0.316 | -0.022 | -0.055 | 0.090 | -0.016 | -0.056 | -0.075 | -0.082 | 0.145 | -0.152 |

All coefficients in bold are significant at 5% level. The above corner of the table reports average Spearman correlation coefficients, and the below corner reports average Pearson correlation coefficients. Refer to Appendix A for all variable definitions.

In untabulated analyses, the correlations among the independent variables for the regression models are relatively low. The only exceptions are the correlations between *CRISK* and the interaction term *CRISK*logTEN* (0.659) and between the firm age (*AGE*) and the audit firm tenure (*logTEN*) (0.491). However, collinearity does not seem to be a concern in any of the hypothesis-testing models. The variance inflation factors (VIFs) from linear regression are all consistently well below the 10.00 cutoff, as suggested by Belsley et al. (1980).

[15] In the robustness test (unreported), we replace the industry-level litigation (*LIT*) with a firm-level litigation risk based on Shu (2000). The correlation between GC and the firm-level litigation risk becomes positive and significant. However, this firm-level litigation risk substantially decreases our sample to 6,515. However, our main inference does not change when this firm-level litigation risk is included.

### *4.3 Multivariate Analysis*

Table 3 Panel A presents the logistic regression results for the main hypothesis ***H1*** that audit firm tenure positively moderates auditors' sensitivity to CSR risk in their GC opinion decisions. Recall that we mean-adjust all the continuous variables before we run all the regressions. It is important to note, however, that the coefficient on *CRISK (logTEN)* only tests the association between CSR risk (audit firm tenure) and the dependent variable conditional on *logTEN* (*CRISK*) being zero because the interaction of two continuous variables: *CRISK* is interacted with *logTEN*.We observe an insignificant negative coefficient on *logTEN*(-0.170, p = 0.182), indicating that the propensity for auditors to issue GCs decreases with *logTEN* when the client firm has a sample mean value of approximately 1 in CSR risk.[16]

This is consistent with ***H1*** that audit firm tenure should have no bearing on the propensity of GCs when there is no CSR risk. In contrast, we observe a significant negative coefficient on *CRISK* (-0.247, p = 0.040), suggesting *CRISK* has a significant negative impact on the likelihood of GCs at an average *logTEN* year of zero (equivalent to raw tenure year *TEN* of 1), supporting ***H2*** that the propensity of GCs is a decreasing function of *CRISK* when the audit firm tenure is short. Importantly, we find a significant positive coefficient on the interaction term *CRISK*logTEN* (0.134, p = 0.007), rendering support for ***H3*** that the propensity of GCs is an increasing function of *CRISK* when audit firm tenure is long. The discriminatory power of the model is reasonably high (ROC = 0.905), provides evidence that our model exhibits sufficient ability to discriminate between the different companies. [Hosmer and Lemeshow (2000) suggest an acceptable performance for a statistic of ROC = 0.70]. Ai and Norton (2003) note that in non-linear models such as logit, the magnitude of an interaction does not equal the marginal effect of the interaction term and the statistical significance of the interaction should not be tested using a simple *Z* test. Following their recommended procedure, we compute the interaction effect for each of the 7,218 sample observations and find that the Z-statistic is positive and statistically significant for 99.02% of the sample observations (See Figure 1 below).

Taken together, these results generally show that both audit firm tenure and CSR risk are negatively associated with the probability of auditors issuing a modified going-concern report, but this negative association is attenuated when audit firm tenure and *CRISK* risk are interacted. However, to gain further insights on the marginal effects of a one-unit change in six levels of *logTEN* (*CRISK*) on a change in the probability of auditors issuing a GC report at six levels of *CRISK* (*logTEN*): at the mean less two standard deviation (i.e., relatively low), at the mean less one standard deviation, at mean, at the mean plus one standard deviation and at the mean plus two standard deviations (i.e., relatively high). See Panel B in Table 3.[17] These analyses show that the propensity of GCs decreases with *CRISK* when audit firm tenure is at a relatively low level (*LogTEN* is at mean *LogTEN* - 2 sd = 0.392 and at mean *LogTEN* - 1 sd = 1.260) and increases with *CRISK* when audit firm tenure is at relatively high level (*LogTEN* is at mean *LogTEN* = 2.120,at mean *LogTEN* + 2 sd = 2.980 and at mean *LogTEN* + 1 sd = 3.850) when audit firm tenure is relatively long. For example, holding *LogTEN* at two standard deviations below the mean *LogTEN* of 0.392 (equivalent to tenure year of around 1.5 years), the propensity of GCs drops from 2.10 percent (p >0.022) to 0.50 percent (p = 0.029) when *CRISK* jumps from two standard deviations below the mean *CRISK* (*CRISK* = -2.920) to two standard deviations above the mean *CRISK* (*CRISK* = 4.460).

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[16] A probability is the frequency of a given outcome divided by the total number of all possible outcomes. Odds are the frequency of a given event occurring compared to the frequency of the same event not occurring. Probabilities range between zero and one, while odds range from zero to infinity. For example, assume that eight in ten research papers are typically accepted by a conference in an exotic location. The probability of acceptance would be 0.8 (8/10), while the odds of acceptance would be four to one (8/2).

[17] A marginal effect of 50 percent or 0.50 in a nonlinear model is most accurately interpreted as ''y increases with x at a rate such that, if the rate were constant, y would increase by 0.5 if x increased by 1''. Allmarginal effects and p-values are calculated at the mean of the variable of interest using the Stata 12 marginscommand with the dydx option that appropriately recognizes when a covariate is used in a product term (e.g.,*CRISK*and *CRISK*LogTEN*). This command uses the actual observation-level values of covariates unlessotherwise specified and calculates the marginal effects using the sample average of individual marginal effects, is the method favored in current practice (Greene 2008, 775).

In contrast, holding *LogTEN* at two standard deviations above the mean *LogTEN* of 3.850 [47 years], the propensity of GCs increases from 0.30 percent to 2.20 percent when *CRISK* drops from two standard deviations below the mean *CRISK* (*CRISK* = -2.920) to two standard deviations above the mean *CRISK* (*CRISK* at 4.460). Column II of Panel B reports a one-unit change of *LogTEN* on the propensity of GCs while holding *CRISK* constant at six levels. The pattern is similar to that of Column I except that the propensity of GCs decreases with *LogTEN* at three levels of *CRISK*, namely at two standard deviations below the mean *CRISK* (*CRISK* = -2.920), at one standard deviation below the mean *CRISK* (*CRISK* = -1.070), and at mean *CRISK* (*CRISK* =0.771), but increases with *LogTEN* at two levels of *CRISK* – when *CRISK* is at one standard deviation (*CRISK* = 2.610) and two standard deviations (*CRISK* = 4.460) above the mean *CRISK*.

Figure 2 Panel A and Panel B present the changes of the propensity of GCs over the range of *CRISK* conditional on *LogTEN* and the changes of the propensity of GCs over the range of *LogTEN* conditional on *CRISK*, respectively. For exposition purposes, we convert *LogTEN* to raw tenure variable *TEN* in the graph. As illustrated in Panel A of Figure 2, when *LogTEN* is its mean value, the propensity of GCs appears to be a linear increasing function of *CRISK*. It seems that the dividing line that determines whether the propensity of issuing GCs is an increasing or decreasing function of *CRISK*. It appears that the propensity of issuing GCs is a linear (convex) decreasing function of *CRISK* when *LogTEN* is one (two) standard deviation(s) below its mean value, but is a linear (convex) increasing function of *CRISK* when *LogTEN* is at one (two) standard deviation(s) above its mean value. Similarly, Panel B of Figure 2 indicates that *CRISK* is at its mean value, the propensity of GCs is a linear decreasing function ofaudit firm tenure. It appears that it is the dividing line that determines whether the propensity of issuing GCs is a decreasing or increasing function of audit firm tenure. It seems to suggest that the propensity of issuing GCs is a linear (convex) increasing function of audit firm tenure when *CRISK* is at one (two) standard deviation(s) above its mean value, but is a linear (convex) decreasing function of audit firm tenurewhen *CRISK* is at one (two) standard deviation(s) below its mean value.

This figure (Figure 2 Panel C) produced by the ‘‘inteff’’ command in Stata (Norton et al. 2004) plots observation level z-statistics for the *CRISK*LogTEN* interaction effects by moving *CRISK*, *LogTEN*, and *CRISK*logTEN* with all other variables at their means. The figure illustrates that Model 1 interaction effect on Table 3 is predominantly positive (99.02 percent of z-statistics are positive).

**Table 3 CSR Risk, Audit Firm Tenure and the Propensity of GCs**

Panel A: Regression Analysis (N = 7, 218, McFadden's $R^2$= 33.77% and ROC=0.9050)

| Variables | Predicted Sign | Coeff. | P | Odds Ratio | Econ. | Econ. |
|---|---|---|---|---|---|---|
| logTEN | ? | -0.170 | 0.182 | 0.844 | 0.79% | -2.63% |
| CRISK | - | -0.247 | 0.040 | 0.781 | 0.58% | -2.36% |
| CRISK*logTEN | + | 0.134 | 0.007 | 1.143 | 1.71% | 4.58% |
| SIZE | - | -0.153 | 0.026 | 0.858 | 0.69% | -2.28% |
| LIT | + | -0.258 | 0.378 | 0.772 | 0.77% | -2.57% |
| AGE | ? | 0.127 | 0.352 | 1.134 | 1.00% | 3.14% |
| MtB | ? | 0.000 | 0.739 | 1.000 | 0.92% | 2.95% |
| Zmjewski | + | 0.133 | 0.006 | 1.142 | 1.27% | 3.26% |
| ROA | - | -0.671 | 0.024 | 0.511 | 0.72% | -2.24% |
| LOSS | + | 1.554 | 0.012 | 4.730 | 1.11% | 3.06% |
| LEV | + | 0.639 | 0.047 | 1.894 | 1.10% | 3.20% |
| L1GC | + | 3.460 | 0.000 | 31.819 | 21.44% | 27.68% |
| ISSUE | - | -0.162 | 0.364 | 0.850 | 0.84% | -2.79% |
| BigN | + | 0.081 | 0.720 | 1.084 | 0.92% | 2.96% |
| ReportLag | + | 0.006 | 0.000 | 1.006 | 1.13% | 3.26% |
| GOV | ? | -0.483 | 0.000 | 0.617 | 0.53% | -1.74% |
| Year and Industry Fixed Effects | | Includedd | | | | |

Panel B: Interaction Term Analysis

Positive Value of Z-Statistics for the interaction term: 99.02%

| LogTEN | CRISK | Marginal Effect Pr (GC=1) | P | CRISK | LogTEN | Marginal Effect Pr(GC=1) | P |
|---|---|---|---|---|---|---|---|
| 0.392 | -2.920 | 2.10% | 0.022 | -2.920 | 0.392 | 2.10% | 0.022 |
| 0.392 | -1.070 | 1.50% | 0.001 | -2.920 | 1.260 | 1.30% | 0.001 |
| 0.392 | 0.771 | 1.00% | <0.001 | -2.920 | 2.120 | 0.80% | 0.000 |
| 0.392 | 2.610 | 0.70% | 0.001 | -2.920 | 2.980 | 0.50% | 0.003 |
| 0.392 | 4.460 | 0.50% | 0.029 | -2.920 | 3.850 | 0.30% | 0.043 |
| 1.260 | -2.920 | 1.30% | 0.001 | -1.070 | 0.392 | 1.50% | 0.001 |
| 1.260 | -1.070 | 1.10% | <0.001 | -1.070 | 1.260 | 1.10% | <0.001 |
| 1.260 | 0.771 | 1.00% | <0.001 | -1.070 | 2.120 | 0.90% | <0.001 |
| 1.260 | 2.610 | 0.80% | <0.001 | -1.070 | 2.980 | 0.70% | <0.001 |
| 1.260 | 4.460 | 0.70% | 0.002 | -1.070 | 3.850 | 0.50% | 0.004 |
| 2.120 | -2.920 | 0.80% | <0.001 | 0.771 | 0.392 | 1.00% | <0.001 |
| 2.120 | -1.070 | 0.90% | <0.001 | 0.771 | 1.260 | 1.00% | <0.001 |
| 2.120 | 0.771 | 0.90% | <0.001 | 0.771 | 2.120 | 0.90% | <0.001 |
| 2.120 | 2.610 | 1.00% | <0.001 | 0.771 | 2.980 | 0.90% | <0.001 |
| 2.120 | 4.460 | 1.00% | <0.001 | 0.771 | 3.850 | 0.80% | <0.001 |
| 2.980 | -2.920 | 0.50% | 0.003 | 2.610 | 0.392 | 0.70% | 0.001 |
| 2.980 | -1.070 | 0.70% | <0.001 | 2.610 | 1.260 | 0.80% | <0.001 |
| 2.980 | 0.771 | 0.90% | <0.001 | 2.610 | 2.120 | 1.00% | <0.001 |
| 2.980 | 2.610 | 1.10% | <0.001 | 2.610 | 2.980 | 1.10% | <0.001 |
| 2.980 | 4.460 | 1.50% | <0.001 | 2.610 | 3.850 | 1.30% | <0.001 |
| 3.850 | -2.920 | 0.30% | 0.043 | 4.460 | 0.392 | 0.50% | 0.029 |
| 3.850 | -1.070 | 0.50% | 0.004 | 4.460 | 1.260 | 0.70% | 0.002 |
| 3.850 | 0.771 | 0.80% | <0.001 | 4.460 | 2.120 | 1.00% | <0.001 |
| 3.850 | 2.610 | 1.30% | <0.001 | 4.460 | 2.980 | 1.50% | <0.001 |
| 3.850 | 4.460 | 2.20% | 0.009 | 4.460 | 3.850 | 2.20% | 0.009 |

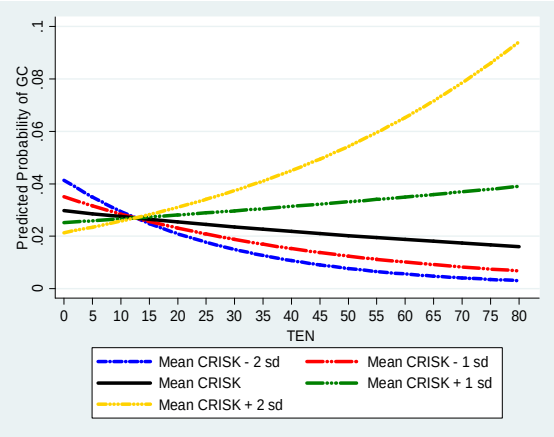
This table reports logistic regression results for 7,218 firm-year observations (161distinct firms) for the sample period from 2003 to 2013. The dependent variable is GC, an indicator variable equal to 1 if the client firm received a going-concern opinion for the current year, and zero otherwise. CRISK, measured as total concerns minus total strengths in seven social rating categories of MSCI ratings data: community (COM), diversity (DIV), employee relations (EMP), environment (ENV), product (PRO); logTEN is audit firm tenure, measured as the number of years the auditor has consecutively served as external auditor for the client firm.

Fixed year and industry fixed effects are included, but not presented for brevity. Economic effects for continuous

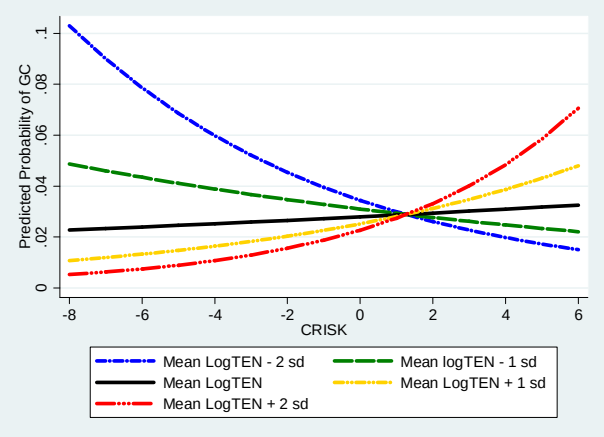
independent variables represent the effect of a one standard deviation increase from the mean (including adjusting the interaction term) has on the predicted probability of the dependent variable being 1 and for indicator variables represent the effect a change from 0 to 1 has on the predicted probability of the dependent variable being 1. The calculations include the constant, as well as all other model variables at their means. The economic effect for the interaction term represents the effect of a one standard deviation increase from the mean in both CRISK and logTEN, as well as the associated increase in the interaction of the two terms. The calculations include the constant, as well as all other model variables at their means. Refer to Appendix A for all variable definition.

**Figure 2 CSR Risk, Audit Firm Tenure and the Propensity of GC Opinions**

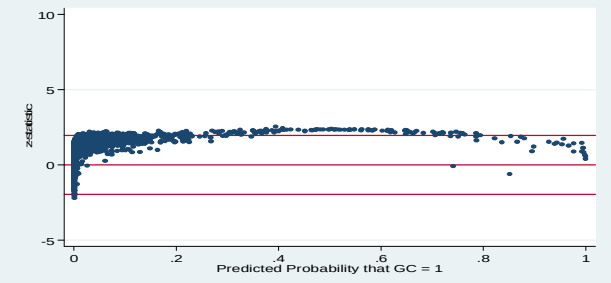
**Panel A: *CRISK* and *GCs* – Conditional on *TEN***




**Panel B: *TEN* and *GCs* – Conditional on *CRISK***




**Panel C Z-statistic for the interatction term *CRISK*logTEN***



### 4.4 Additional Analyses and Sensitivity Tests

#### *4.4.1 Alternative Measures of Audit Firm Tenure*

As indicated in the research design section, prior literature has employed other functional forms to model the relation between audit firm tenure and audit outcomes. For comparative purposes, we replicate our main results using a linear model (Myers et al. 2003; Ghosh and Moon 2005), a quadratic model (Davis et al. 2009), and a dummy variable approach (Johnson et al. 2002). Model I, II and III of Table 4 present the results using these three alternative measures of audit firm tenure, respectively. In model I, we find an insignificant negative coefficient on both *CRISK* (-0.054, p = 0.421) and *TEN* (-0.015, p = - 0.255), but a significant positive coefficient on the interaction term *CRISK*TEN* (0.008, p = 0.019). These results suggest that the likelihood of increasing GCs decreases with both audit firm tenure and CSR risk when *CRISK* (*TEN*) is at 0 (0), but the propensity of issuing GCs significantly increases with *CRISK* as *TEN* lengthens. Column II of Table 4 presents the results for the quadratic model with *TEN* and its squared term of $TEN^2$ and their interaction terms with CSR risk (*CRISK*TEN* and $CRISK*TEN^2$). None of the interest variables are significant at the conventional level, suggesting that a symmetrically increasing and decreasing function of audit firm tenure is not descriptive of the data in this study. In model III, we find an insignificant negative coefficient on both short tenure (*STEN*) (-0.015, p = -0.957), long tenure (*LTEN*) (-0.239, p = -0.297) and *CRISK* (-0.058, p = -0.483).

However, we find that an insignificant negative coefficient on the interaction term *CRISK*STEN* (-0.018, p = -0.909), but a significant positive coefficient on *CRISK*LTEN* (0.213, p = 0.045). These results suggest that the impact of *CRISK* on the propensity of issuing GCs does not significantly differ between the short tenure subgroup and the medium tenure subgroup, but the impact of *CRISK* on the likelihood of GCs significantly increases for long tenure subgroup as compared to the medium tenure subgroup. Collectively, these results further support our conclusion that audit firm tenure has a positive moderating effect on the association between *CRISK* and the propensity of GCs. The results also highlight that the log transformation of audit firm tenure is the most powerful model to detect the association between *CRISK* and the propensity of GCs for our sample. Therefore, we conclude that our main results on the interaction between CSR risk and audit firm tenure in Table 3 are generally robust to alternative assumptions on the functional form of audit firm tenure.

**Table 4 CSR Risk, Audit Firm Tenure and the Propensity of GCs – Alternative Measures of Tenure**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coeff. | P | Econ. | Coeff. | P | Econ. | Coeff. | P | Econ. |
| CRISK | -0.054 | 0.421 | 2.76% | -0.092 | 0.313 | -0.76% | -0.058 | 0.483 | -2.75% |
| TEN | -0.015 | 0.255 | -2.57% | -0.002 | 0.958 | -0.88% | | | |
| $TEN^2$ | | | | 0.001 | 0.590 | 0.69% | | | |
| STEN | | | | | | | -0.015 | 0.957 | -2.90% |
| LTEN | | | | | | | -0.239 | 0.297 | -2.68% |
| CRISK*TEN | 0.008 | 0.019 | 3.61% | 0.012 | 0.215 | 1.48% | | | |
| $CRISK*TEN^2$ | | | | -0.000 | 0.899 | -0.86% | | | |
| CRISK*STEN | | | | | | | -0.018 | 0.909 | -2.90% |
| CRISK*LTEN | | | | | | | 0.213 | 0.045 | 3.58% |
| SIZE | -0.155 | 0.025 | -2.28% | -0.153 | 0.028 | -0.68% | -0.146 | 0.034 | -2.31% |
| LIT | -0.273 | 0.350 | -2.56% | -0.288 | 0.327 | -0.74% | -0.269 | 0.361 | -2.56% |
| AGE | 0.134 | 0.331 | 3.15% | 0.111 | 0.433 | 0.98% | 0.122 | 0.365 | 3.13% |
| MtB | 0.001 | 0.773 | 2.94% | 0.001 | 0.780 | 0.91% | 0.001 | 0.764 | 2.95% |
| Zmjewski | 0.133 | 0.006 | 3.26% | 0.136 | 0.005 | 1.26% | 0.137 | 0.005 | 3.28% |
| ROA | -0.668 | 0.024 | -2.24% | -0.65 | 0.029 | -0.71% | -0.656 | 0.028 | -2.26% |
| LOSS | 1.575 | 0.011 | 3.06% | 1.558 | 0.011 | 1.09% | 1.546 | 0.012 | 3.06% |
| LEV | 0.657 | 0.041 | 3.21% | 0.633 | 0.049 | 1.08% | 0.592 | 0.065 | 3.17% |
| L1GC | 3.441 | <0.000 | 27.46% | 3.449 | <0.000 | 21.00% | 3.470 | <0.001 | 27.90% |
| ISSUE | -0.160 | 0.370 | -2.79% | -0.157 | 0.380 | -0.83% | -0.172 | 0.338 | -2.78% |
| BigN | 0.091 | 0.682 | 2.97% | 0.053 | 0.815 | 0.91% | 0.050 | 0.826 | 2.95% |
| ReportLag | 0.006 | <0.000 | 3.26% | 0.001 | <0.001 | 1.11% | 0.001 | <0.001 | 3.26% |
| GOV | -0.483 | <0.000 | -1.74% | -0.484 | <0.001 | -0.52% | -0.489 | <0.001 | -1.73% |
| N | 7,218 | | | 7,218 | | | 7,218 | | |
| McFadden's $R^2$ | 33.70% | | | 33.76% | | | 33.66% | | |
| ROC | 0.9047 | | | 0.9045 | | | 0.9034 | | |
| AIC | 1337.956 | | | 1340.828 | | | 1342.777 | | |
| BIC | 1592.676 | | | 1609.317 | | | 1611.266 | | |
| Positive Value of Z-Statistics for the interactionterm: | | | 98.72% | | | 99.09% | | | 100% |

### *4.4.2 Alternative Measures of CSR Risk*

We use *CRISK*, a summary measure of CSR risk based on the net score of total concerns minus total strengths reported by the MSCI database. However, the equal weighting of each dimension of strength or concern may not be necessarily correct. To overcome the weakness in this equal weighting scheme, we substitute a *CRISK* risk factor (*CRISKFactor* ) from the first principal factors obtained from a principal components analysis on seven CSR dimensions (e.g., *COM*, *DIV*, *ENV*, *EMP*, *HUM*, *CGOV* and *PRO*) and rerun our main analysis in Table 3. The results using this *CRISKFactor* are presented in Table 5 below. We find that the negative coefficient on *LogTEN* (-0.154, p = -0.234) is insignificant and the negative coefficient on *CRISKFactor* (-0.539, p = -0.131) is marginally significant at one-tailed test. However, we find a significant positive coefficient on the interaction term *CRISKFactor*TEN* (0.342, p = 0.026). These results are generally consistent with our main conclusion that the association between audit firm tenure and the propensity for auditors to issue GC modified report is a function of CSR risk.

**Table 5 CSR Risk, Audit Firm Tenure and the Propensity of GCs – Alternative Measures of CSR Risk**

| Panel A: Alternative Measure of CSR Risk = CRISKFactor | | | | | |
|---|---|---|---|---|---|
| | Predicted Sign | Coefficient | P-Value | Odds-Ratio | Econ. |
| LogTEN | ? | -0.154 | 0.234 | -0.857 | 2.65% |
| CRISKFactor | - | -0.539 | 0.131 | -0.583 | 2.42% |
| CRISKFactor*logTEN | + | 0.342 | 0.026 | 1.408 | 4.54% |
| SIZE | - | -0.134 | 0.055 | -0.875 | 2.35% |
| LIT | ? | -0.255 | 0.384 | -0.775 | 2.58% |
| AGE | ? | 0.129 | 0.344 | 1.138 | 3.14% |
| MtB | ? | -0,001 | 0.787 | -1.000 | -2.94% |
| Zmjewski | + | 0.133 | 0.006 | 1.142 | 3.26% |
| ROA | - | -0.695 | 0.019 | -0.499 | -2.22% |
| LOSS | + | 1.566 | 0.011 | 4.789 | 3.06% |
| LEV | + | 0.624 | 0.052 | 1.867 | 3.19% |
| L1GC | + | 3.451 | 0.000 | 31.545 | 27.58% |
| ISSUE | - | -0.175 | 0.328 | -0.840 | -2.78% |
| BigN | + | 0.066 | 0.769 | 1.068 | 2.95% |
| ReportLag | + | 0.006 | 0.000 | 1.006 | 3.26% |
| GOV | ? | -0.482 | 0.000 | -0.618 | -1.74% |
| Year and Industry Fixed Effects | | Included | | | |
| N | | 7,218 | | | |
| McFadden's $R^2$ | | 33.30% | | | |
| ROC Area | | 90.25 | | | |
| Positive Value of Z-Statistics for the interaction term: | 98.94% | | | | |
| 99.02% | | | | | |

| Panel B – Alternative Measure of CSR Risk = PCRISK | | | | |
|---|---|---|---|---|
| Variables | Coefficient | P-Value | Odds-Ratio | Econ. |
| logTEN | -1.372 | 0.007 | 0.254 | 0.28% |
| PCRISK | -0.247 | 0.040 | 0.781 | 0.58% |
| PCRISK*logTEN | 0.134 | 0.007 | 1.143 | 3.19% |
| SIZE | -0.153 | 0.026 | 0.858 | 0.69% |
| LIT | -0.258 | 0.378 | 0.772 | 0.77% |
| AGE | 0.127 | 0.352 | 1.136 | 1.00% |
| MtB | -0.001 | 0.739 | 1.000 | 0.92% |
| Zmjewski | 0.133 | 0.006 | 1.142 | 1.27% |
| ROA | -0.671 | 0.024 | 0.511 | 0.72% |
| LOSS | 1.554 | 0.012 | 4.730 | 1.11% |
| LEV | 0.639 | 0.047 | 1.894 | 1.10% |
| L1GC | 3.46 | <0.001 | 31.819 | 21.44% |
| ISSUE | -0.162 | 0.364 | 0.850 | 0.84% |
| BigN | 0.081 | 0.720 | 1.084 | 0.92% |
| ReportLag | 0.006 | <0.000 | 1.006 | 1.13% |
| GOV | -0.483 | <0.000 | 0.617 | 0.53% |
| Year and Industry Fixed Effects | Included | | | |
| N | 7,218 | | | |
| McFadden's $R^2$ | 33.80% | | | |
| ROC | 88.89 | | | |
| Positive Value of Z-Statistics for the interaction term: | | 97.82% | | |

*****,**,*** indicate that the coefficients are statistically significant from zero at 1%, 5%, and 10% of significance (two-tailed). Z statistics with standard error clustered by firm (to control for serial correlation and heteroskedasticity according to Rogers 1993) are presented in parentheses and in *italics*. This table reports sample descriptive statistics for 7,218 firm-year observations (161 distinct firms) for the full sample. The dependent variable is *GC*, an indicator variable equal to 1 if the client firm received a going-concern opinion for the current year, and zero otherwise. *CSR*, measured as total strengths in seven social rating categories of ESG ratings data: community (*COM*), diversity (*DIV*), employee relations (*EMP*), environment (*ENV*), product (*PRO*); *Tenure* is audit firm tenure, the number of years the auditor has consecutively served as external auditor for the client firm. Fixed year and industry fixed effects are included, but not presented for brevity. Economic effects for continuous independent variables represent the effect of a one standard deviation increase from the mean (including adjusting the interaction term) has on the predicted probability of the dependent variable being 1 and for indicator variables represent the effect a change from 0 to 1 has on the predicted probability of the dependent variable being 1. The calculations include the constant, as well as all other model variables at their means. The economic effect for the interaction term represents the effect of a one standard deviation increase from the mean in both *CSR* and *Tenure*, as well as the associated increase in the interaction of the two terms. The calculations include the constant, as well as all other model variables at their means. Refer to Appendix A for all variable definitions.

### *4.4.3 First-Time Going-Concern Opinions and Random Sampling Method*

Prior studies suggest that the decision for an auditor to issue a first-time going-concern opinion may be more difficult than issuing a modified opinion in a subsequent period (Kida 1980; Mutchler 1984; Geiger et al. 1998; Carcello and Neal 2003; Geiger and Rama 2003). As well, non-GC firms may be fundamentally different from GC firms. One may be concerned that our results are potentially driven by some correlated omitted variables. To address this issue, we employ a random sampling method with replacements to perform 5 random draws of 121 non-GC firms to match with 121 first-time GC firms in our sample. This results in a random sample of 1,210 firm-year observations (5*2*121). Table 6 presents the results with this random sample.

Similar to the main results reported in Table 3, we find an insignificant negative coefficient on *LogTEN* (-0.012, p = -0.923) and a significant negative coefficient on *CRISK* (-0.707, p < 0.001). Furthermore, the coefficient on the interaction term *CRISK*LogTEN* (0.255, p < 0.001) is positive and significant, supporting the conjecture that audit firm tenure positively moderates the negative association between CSR risk and the propensity of issuing GCs. Therefore, we conclude that our results are robust to this alternative specification. The regression McFadden's $R^2$ increases to 38.20%, which suggests that the model performance improves with the first-time going-concern restriction. Following Ai and Norton (2003), we compute the interaction effect for each of the 1,338 sample observations and find that the Z-statistic is positive and statistically significant for 96.46% of the sample observations.

**Table 6 CSR Risk, Audit Firm Tenure and the Propensity of GCs – Additional Controls**

| Variables | Coefficient | P-Value | Odds-Ratio | Econ. |
|---|---|---|---|---|
| logTEN | -0.166 | 0.246 | 0.867 | 2.62% |
| CRISK | -0.195 | 0.154 | 0.708 | 2.49% |
| CRISK*logTEN | 0.130 | 0.020 | 1.798 | 4.23% |
| SIZE | -0.236 | 0.004 | 0.667 | 2.00% |
| LIT | -0.224 | 0.455 | 0.799 | 2.62% |
| AGE | 0.107 | 0.478 | 1.083 | 3.07% |
| MtB | 0.001 | 0.461 | 1.026 | 2.95% |
| Zmjewski | 0.106 | 0.067 | 1.313 | 3.09% |
| ROA | -0.491 | 0.141 | 0.833 | 2.37% |
| LOSS | 1.335 | 0.043 | 3.799 | 2.99% |
| LEV | 0.902 | 0.024 | 1.301 | 3.24% |
| L1GC | 3.439 | <0.001 | 31.159 | 24.20% |
| ISSUE | -0.132 | 0.519 | 0.936 | 2.80% |
| BigN | 0.215 | 0.521 | 1.240 | 2.99% |
| ReportLag | 0.006 | <0.001 | 1.216 | 3.15% |
| GOV | -0.512 | <0.001 | 0.560 | 1.68% |
| absDA | 1.000 | 0.202 | 1.103 | 3.06% |
| CI | 0.768 | 0.427 | 2.156 | 4.78% |
| SPEC | 0.001 | 0.675 | 1.088 | 2.99% |
| Officesize | -0.009 | 0.907 | 0.986 | 2.86% |
| RET | -0.486 | 0.002 | 0.644 | 2.13% |
| RVOL | 1.374 | 0.002 | 1.342 | 3.30% |
| BETA | -0.061 | 0.747 | 0.968 | 2.83% |
| DumRET | 0.798 | 0.010 | 2.221 | 4.43% |
| Year and Industry Fixed Effects | Included | | | |
| N | 6,387 | | | |
| McFadden's R2 | 39.00% | | | |
| ROC | 92.65 | | | |
| Positive Value of Z-Statistics for the interaction term: | 97.82% | | | |

*****,**,*** indicate that the coefficients are statistically significant from zero at 1%, 5%, and 10% of significance (two-tailed). Z statistic with standard error clustered by firm (to control for serial correlation and heteroskedasticity according to Rogers 1993) are presented in parentheses and in *italics*. This table reports sample descriptive statistics for 6,387 firm-year observations (139 distinct firms). The dependent variable is *GC*, an indicator variable equal to 1 if the client firm received a going-concern opinion for the current year, and zero otherwise. *CRISK*, measured as total concernss in seven social rating categories of MSCI ratings data: community (*COM*), diversity (*DIV*), employee relations (*EMP*), environment (*ENV*), product (*PRO*); *logTEN* is audit firm tenure, the natural logarithm of the number of years the auditor has consecutively served as external auditor for the client firm. Fixed year and industry fixed effects are included, but not presented for brevity.

Economic effects for continuous independent variables represent the effect of a one standard deviation increase from the mean (including adjusting the interaction term) has on the predicted probability of the dependent variable being 1 and for indicator variables represent the effect a change from 0 to 1 has on the predicted probability of the dependent variable being 1. The calculations include the constant, as well as all other model variables at their means. The economic effect for the interaction term represents the effect of a one standard deviation increase from the mean in both *CRISK* and *logTEN*, as well as the associated increase in the interaction of the two terms.
The calculations include the constant, as well as all other model variables at their means. Refer to Appendix A for all variable definition.

*4.4.4 Additional Controls*

It is possible that the association between CSR risk and the propensity of GCs conditional on audit firm tenure is due to some omitted variables that we have not adequately controlled for in our previous analyses. Auditors' incentives to issue GCs may be affected by managers' incentives to engage in earnings management. Therefore, we explicitly control for earnings management, where earnings management is proxied by signed performance-matched discretionary accruals following Kothari et al. (2005). Prior literature[18] documents that fee dependence may have a positive (Li's 2009), a negative, or no relation (DeFond et al. 2002; Kao et al. 2014; Geiger and Rama 2003; Reynolds and Francis 2000) with the auditor's GC reporting decisions. Further, we include client importance (*CI*), calculated as the ratio of total revenues (audit and non-audit fees) received from a single client to total revenues received from all the clients of an audit firm.

Moreover, we include other auditor characteristics such as auditor industry specialization (*SPEC*) and audit office size (*OfficeSize*) because Chen, Martin, and Wang (2013) argue that high quality auditors have greater concerns about litigation costs and reputational harm and are more likely to act independently.[19,20] *SPEC* is an indicator variable equal to 1 if the incumbent auditor is a joint national and city-level industry specialist, and 0 otherwise (e.g., Reichelt and Wang 2010). *OfficeSize* is the natural logarithm of the total audit fees of a local practice office in a given fiscal year because Francis and Yu (2009) document that larger offices are more likely to issue going-concern audit reports, and clients in larger offices evidence less aggressive earnings management behavior. Finally, we include three market-based variables that may affect audit opinions, as suggested by prior studies (e.g., DeFond, Raghunandan, &Subramanyam, 2002; Dopuch, Holthausem, &Leftwich, 1987). They are the company's stock return (*RET*), return volatility (*RVOL*) and the company's beta estimate using a market model (*BETA*). After adding these additional variables to the model, we continue to find a negative coefficient on *LogTEN* (-0.183, p = -0.197), *CRISK* (-0.207, p = -0.119) and the interaction term *CRISK*LogTEN* (0.125, p = 0.022). Therefore, we conclude that the tenor of our results does not change with these additional controls.

[18] Ashbaugh et al. (2003) use a ratio of non-audit fees to total fees (NAF_TF) to control for audit independence due to the provision of non-audit service fees. My results are not sensitive to this alternative measure of auditor fee dependence.

[19] Other studies documenting that higher quality auditors are more likely to issue a going concern audit report include: Reynolds and Francis (2000); Craswell et al. (2002); DeFond et al. (2002); Weber and Willenborg(2003); Lim and Tan (2008); Francis and Yu (2009); Reichelt and Wang (2010).

[20] An alternative explanation for higher quality provided by industry specialists when confronted with strategic initiatives by distressed firms could be that they are not only better in interpreting strategic information, but are also more conservative because of concerns with respect to reputation losses and litigation exposure. This conjecture is consistent with recent evidence reported by Lim and Tan (2008) that industry specialists are more likely to issue a going-concern report for distressed companies than non-specialists under certain conditions, i.e., when the fees earned from supplying non-audit services are high.

**Table 7 CSR Risk, Audit Firm Tenure and the Propensity of GCs – Random Sampling Methods**

| | Significant Coefficient | Coefficient | P-Value | Odds-Ratio | Econ. |
|---|---|---|---|---|---|
| LogTEN | ? | -0.012 | 0.923 | 0.988 | 1.83% |
| CRISK | - | -0.707 | <0.001 | 0.493 | 2.43% |
| CRISK*logTEN | + | 0.255 | <0.001 | 1.290 | 2.78% |
| SIZE | - | -0.105 | 0.169 | 0.901 | 2.07% |
| LIT | ? | -0.982 | 0.003 | 0.374 | 3.52% |
| AGE | ? | 0.159 | 0.290 | 1.172 | 1.86% |
| MtB | ? | 0.001 | 0.915 | 1.001 | 1.58% |
| Zmjewski | + | 0.409 | <0.000 | 1.506 | 2.93% |
| ROA | - | -0.281 | 0.358 | 0.755 | 1.98% |
| LOSS | + | 2.408 | <0.000 | 11.115 | 1.10% |
| LEV | + | 0.077 | 0.855 | 1.080 | 2.45% |
| L1GC | + | 0.789 | 0.322 | 0.454 | 10.47% |
| ISSUE | - | 0.040 | 0.813 | 1.041 | 1.60% |
| BigN | + | -0.429 | 0.118 | 0.651 | 1.11% |
| ReportLag | + | 0.024 | <0.000 | 1.024 | 3.12% |
| GOV | ? | -0.307 | <0.000 | 0.736 | 1.71% |
| Year and Industry Fixed Effects | | Included | | | |
| N | | 1,338 | | | |
| McFadden's $R^2$ | | 38.20% | | | |
| ROC | | 0.9008 | | | |
| Positive Z-Statistic for the interaction term: | | 96.46% | | | |

*****,**,*** indicate that the coefficients are statistically significant from zero at 1%, 5%, and 10% of significance (two-tailed). Z statistics with standard error clustered by firm (to control for serial correlation and heteroskedasticity according to Rogers 1993) are presented in parentheses and in *italics*. This table reports sample descriptive statistics for 7,803 firm-year observations (2,197 distinct firms). The dependent variable is *GC*, an indicator variable equal to 1 if the client firm received a going-concern opinion for the current year, and zero otherwise. *CRISK*, measured as total concernss in seven social rating categories of MSCI ratings data: community (*COM*), diversity (*DIV*), employee relations (*EMP*), environment (*ENV*), product (*PRO*); *logTEN* is audit firm tenure, the natural logarithm of the number of years the auditor has consecutively served as external auditor for the client firm. Fixed year and industry fixed effects are included, but not presented for brevity. Economic effects for continuous independent variables represent the effect of a one standard deviation increase from the mean (including adjusting the interaction term) has on the predicted probability of the dependent variable being 1 and for indicator variables represent the effect a change from 0 to 1 has on the predicted probability of the dependent variable being 1. The calculations include the constant, as well as all other model variables at their means. The economic effect for the interaction term represents the effect of a one standard deviation increase from the mean in both *CRISK* and *logTEN*, as well as the associated increase in the interaction of the two terms. The calculations include the constant, as well as all other model variables at their means. Refer to Appendix A for all variable definition.

*4.4.5 Two-Stage Regression to Identify Financially-distressed Firms*

In the previous analyses, we identify financially stressed firms based on whether the client firm has either negative earnings or negative operating cash flow during the current fiscal year, following DeFond et al. (2002). As an alternative to identify financially stressed firms and the potential recipients for GC opinions, we follow prior literature (Krishnan and Krishnan 1996; Fargher and Jiang 2008) using a two-stage regression to predict the potential GC recipients in the first-stage equation based on the financial ratios, industry, market risk, and auditor-related variables as follows:

$$PGC_{it} = \beta_0 + \beta_1 LogTEN_{it} + \beta_2 CRISK_{it} + \beta_4 SIZE_{it} + \beta_5 LIT_{it} + \beta_6 AGE_{it} + \beta_7 MtB_{it} + \beta_8 Zscore_{it} + \beta_9 LOSS_{it} + \beta_{10} LEV_{it} + \beta_{11} ISSUE_{it} + \beta_{12} L1GC_i + \beta_{13} BigN_i + \beta_{14} ReportLag_{it} + \beta_{15} GOV_{it} + \beta_{15} Beta_{it} + \beta 15 RET_{it} \quad (2)$$

where:

*PGC* = potential going-concern modification indicator variable; a potential going-Concern is inferred from the joint estimation of the two equations and is a function of the probability of receiving a going-concern modification based upon the level of the variables in Equation (2); The dependent variable (*PGC*) denotes the predicted probability of issuing GCs for the clients. The clients considered as potential going-concern recipients cannot be observed and therefore *PGC* is estimated from the above equation from all the firm-year observations without restricting to financially-stressed client firms.

A potential going-concern opinion (*PGC*) is identified from the logistic regression if the probability of receiving a going-concern from the logistic estimation of Equation (2) is greater than 0.01, and 0 otherwise. Then we rerun equation (1) conditional on firm-year observations with *PGC* = 1. This limits the potential GC recipients to 5,920 firm-year observations. In untabulated results, we continue to find an insignificant negative coefficient on *LogTEN* (-0.189, p = -0.136), suggesting that audit firm tenure has no significant impact on the propensity of GCs without any CRISK risk. However, we find a significant negative coefficient on *CRISK* (-0.296, p = 0.006) and a significant positive coefficient on *CRISK*LogTEN* (0.162, p < 0.001). An analysis of the interaction effect suggests that 90.58% of the Z-statistics is positive. These results confirm that our inferences are robust to an alternative specification to identify financially-distressed firms.

*4.4.6 Sensitivity Tests*

We conduct a number of sensitivity analyses. First, we add back the observations deleted for client firms without financial distress but remove 6,447 observations with audit firm tenure[21] less than five years to ensure that the going-concern decision is not systematically different for firms with a short tenure, such as start-up firms (Argenti 1976) and firms that frequently engage in "opinion shopping" (Carcello and Neal 2000; Lennox 2000). Including non-financial distress firms increases the power of my tests, but does not alter my inferences. Second, we limit our sample to a Big4 only Sample. Big 4 auditors have international reputations and are generally perceived to be more independent and provide better quality service than are non-Big 4 auditors (e.g. Simon, Ramanan, and Dugar 1986; Simon, Teo, and Trompeter 1992; DeFond and Jiambalvo 1993; Teoh and Wong 1993). If Big 4 auditors provide a higher quality service due to higher reputation concerns and litigation costs involved with Type I errors (incorrect going-concern reports), the impact of audit firm tenure on the likelihood of going-concern opinions would be less pronounced for firms with Big 4 auditors than for firms with non-Big 4 auditors. Therefore, we replicate our main results in Table 3 for a reduced sample with Big4 auditors only (untabulated). The results show a significantly positive coefficient on the interaction term *CRISK*logTEN*. Finally, we add back the observations prior to 2003 since prior literature indicates that auditors are more conservative and are more likely to issue GCs to bankrupt firms after 2001 in order to enhance their reputation, reduce insurance and litigation costs, or to reduce government intervention. To explore this possibility, we add back the observations before 2003. Results (untabulated) from using the full data from 2000 to 2013 yield qualitatively similar results as the main test. Therefore, we conclude that our main inference does not alter with all these alternative methods.

## Conclusion

The sweeping regulatory changes to the auditing profession after recent corporate failures underscore the costs of corporate irresponsible activities on various stakeholders (including auditors). The debate on mandatory audit firm rotation centers on whether a long-term auditor-client relationship hinders the auditor's assessment on the going concern status of a client firm.[22]

[21] I measure auditortenure as the number of years that the firm has retained the auditor, with auditor changes due to audit-firm mergers as a continuation of the prior auditor.

[22]The mandatory rotation of auditors has been a subject of debate for decades by practitioners (AICPA 1978), academicians (Geiger and Raghunandan 2002), and regulatory bodies (GAO 2003).

To examine whether the association between audit firm tenure and the propensity of issuing GCs is conditional on audit engagement risk is important because investors rely on auditors' report in making capital allocation decisions. As a direct measure of audit quality (Knechel et al. 2013), the auditor's opinion plays a pivotal role in warning market participants of impending going-concern problems. If a long-term auditor-client relationship indeed hinders professional skepticism and clouds the auditor's judgment in audit opinion formulation process, then a mandatory audit firm tendering or a mandatory audit firm rotation may be necessary. Conversely, if client-specific knowledge developed over time helps the auditor better assess the client's business risk, evaluate audit risk and minimize auditor's business risk, then mandatory audit firm tendering or rotation may not be necessary.

Using CSR performance as a measure for audit engagement risk for the sample period of 2000 to 2013, we provide three major findings. First, we find that, absent CSR risk, audit firm tenure has no systematic impact on the propensity of GCs. Second, we find a significant negative impact of CSR risk on the propensity of GCs for initial audit engagements. Third, we find that the propensity of issuing GCs increases with CSR risk as audit firm tenure lengthens.

Graphical evidence indicates a convex decreasing curve for the propensity of GCs over the range of the CSR risk as audit firm tenure lengthens. For new audit engagements, however, we observe a convex increasing curve for the likelihood of GCs over the range of CSR risk. It appears that 12 years is a dividing line between a convex increasing curve and a convex decreasing curve. These results imply that auditors with in-depth client-specific knowledge are better able to use the forward-looking information contained in CSR performance to evaluate a client firm's going-concern assumption.

This study contributes to the literature in two ways. First, our results reconcile the seemingly mixed findings in prior literature on the association between auditor tenure and GCs. The moderating effect of auditor tenure on CSR and GCs provides evidence as to when a positive, negative, and muted relationship between auditor tenure and GCs is most likely. This result complements the growing literature on the value relevance of non-financial CSR performance. Second, we extend the audit tenure literature beyond examining the effect of audit tenure on earnings properties to the moderating effect of auditor tenure on the association between non-financial CSR information on a direct and unambiguous audit quality measure. Thus, this study has important policy implications for regulators, audit committees, academics, and investors. The results of this study provide support for the decision to foregone the requirement of mandatory audit firm rotation in the U.S. (U.S. House of Representatives. 2013).

Current study certainly has its limitations. First, one maintained assumption of this study is that corporate social responsibility is a valid proxy for audit engagement risk. Future studies may perform validations on this assumption by investigating the impact of corporate social responsibility performance on bankruptcies, financial restatements, and lawsuits against corporations and auditors. Second, this study focuses on the propensity for auditors to issue going-concern opinions without distinguishing the error rate between type I and type II errors in going-concern opinions. This opens the door for future studies to examine how audit engagement risk impacts auditor's behavior in audit reporting accuracy.

## References

Ai, C., and E. C. Norton. 2003. Interaction terms in logit and probit models. Economic Letters 80 (2003): 123–129.

Agell, Jonas, and Lundborg Per. 1995. Theories of pay and unemployment: Survey evidencefromswedish manufacturing firms. *Scandinavian Journal of Economics*, 97, 295-307.

American Institute of Certified Public Accountants (AICPA). 1978. Division for CPA Firms SEC Practice Section Peer Review Manual. New York, NY: AICPA.

American Institute of Certified Public Accountants (AICPA). 1992. Statement of Position Regarding Mandatory Rotation of Audit Firms of Publicly Held Companies. New York, NY: AICPA.

American Institute of Certified Public Accountants (AICPA). 2012. The Auditor's Considerationof an Entity's Ability to Continue as a Going Concern. Statement on Auditing Standards No. 126. New York, NY: AICPA.

American Institute of Certified Public Accountants (AICPA). 1988. *The Auditor's Consideration of an Entity's Ability to Continue as a Going-Concern*. Statement on Auditing Standards No. 59. New York, NY: AICPA.

Andersen, Margaret L., Hong, Yongtao, and Olsen, Lori. 2012. Accruals Quality and Corporate Social Responsibility: The Role of Industry. *Journal of Accounting & Finance* 12 (2): 65-79.

Arel, B., Brody, R. G., and Pany, K. 2005. Audit firm rotation and audit quality. *The CPA Journal* 75(1): 36—39.

Argenti, J. 1976. *Corporate collapse: The causes and the symptoms*. Berks: McGraw-Hill, Maidenhead.

Ashbaugh, H., R. LaFond, and B. W. Mayhew, 2003. Do nonaudit services compromise auditor independence? Furthure evidence. *Accounting Review* 78 (3): 611-639.

Auerbach, J. Hines and J. Slemrod. Cambridge, U.K.: Cambridge University Press, 307-334.

Bamber, E. M., and L. S. Bamber, 2009. Discussion of "Mandatory Audit Partner Rotation, Audit Quality, and Market Perception: Evidence from Taiwan". *Contemporary Accounting Research* 26 (2), 393-402.

Baron, R. M., and D. A. Kenny. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology 51*: 1173-1182.

Beneish, M., and E. Press. 1993. Costs of technical violation of accounting-based debt covenants. *The Accounting Review* 68 (2): 233–257.

Belsley, D. A., E. Kuh, and R. E. Welsch. 1980. Regression Diagnostics Identifying Influential Data and Sources of Collinearity. New York, NY: John Wiley and Sons.

Bruynseels, L., and M. Willekens. 2012. The effect of strategic and operating turnaround initiatives on audit reporting for distressed companies. *Accounting, Organizations and Society* 37 (4): 223–241.

Campbell, C. M., &Kamlani K. S. 1997. The reasons for wage rigidity: Evidence from a survey of Firms. *Quarterly Journal of Economics,* 112, 759-789.

Carcello, J. V., and A. L. Nagy. 2004. Audit firm tenure and fraudulent financial reporting. *Auditing: A Journal of Practice & Theory* 23 (2): 55-69.

Carcello, J., and T. Neal. 2000. Audit committee composition and auditor reporting. *The Accounting Review*75 (4): 453–467.

Carcello, J., and T. Neal. 2003. Audit committee characteristics and auditor dismissals following ''new'' going-concern reports. *The Accounting Review*78 (1): 95–117.

Carcello, J., and Z.-V. Palmrose. 1994. Auditor litigation and modified reporting on bankrupt clients. *Journal of Accounting Research*(Supplement): 1–30.

Carcello, J., D. Hermanson, and F. Huss. 1995. Inappropriate audit partner behavior: Views of partners and senior managers. *Behavioral Research in Accounting*(Supplement): 245–268.

Carey, P., and R. Simnett, 2006. Audit partner tenure and audit quality. *Accounting Review*81 (3), 653-676.

Carroll, A.B. 1979. A three-dimensional conceptual model of corporate performance. *Academy of Management Review*4 (4): 497-505.

Cassell, Cory A., Gary A. Giroux, Linda A. Myers, and Thomas C. Omer. 2012. The Effect of Corporate Governance on Auditor-Client Realignments. *Auditing: A Journal of Practice and Theory* 31(2): 167-188.

Chen, C., X. Martin, and X. Wang. 2013. Insider Trading, Litigation Concerns, and Auditor Going-Concern Opinions. *Accounting Review*88(2): 365-393.

Chow, C. W. and Rice, S.J. 1982. Notes: qualified audit opinions and auditor switching. *The Accounting Review* 57 (2): 326-335.

Craswell, A., Stokes, D., and J. Laughton. 2002. Auditor independence and fee dependence. *Journal of Accounting and Economics*33 (2): 253-275.

Davis, L. R., B. S. Soo, and G. M. Trompeter, 2009. Auditor tenure and the ability to meet or beat earnings forecasts. *Contemporary Accounting Research*26 (2), 517-548.

DeAngelo, L. 1981. Auditor size and audit quality. *Journal of Accounting and Economics*3 (3): 183–199.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (2): 193-225.

DeFond, M.L. and J. Jiambalvo, 1993. Factors Related to Auditor-Client Disagreements Over Income-Increasing Accounting Methods. *Contemporary Accounting Research* 9 (1): 1-431.

DeFond, M., K. Raghunandan, and K. Subramanyam. 2002. Do non-audit service fees impairauditor independence? Evidence from going-concern audit opinions. *Journal of Accounting Research*40 (4): 1247–1274.

Dopuch, N., R. Holthausen, and R. Leftwich. 1987. Predicting audit qualifications with financial and market variables. *The Accounting Review* 62 (3): 431–454.

Firth, M. 1978. Qualified audit reports: Their impact on investment decisions. *The Accounting Review* 53 (3): 642–650.

Fleak, S., and E. Wilson. 1994. The incremental information content of the going concern audit opinion. *Journal of Accounting, Auditing and Finance* 9 (1): 149–166.

Francis, J., and M. Yu. 2009. The effect of Big 4 office size on audit quality. *The Accounting Review* 84 (5): 1521–1552.
Frank, Mary Margaret, Luann J. Lynch, Luann, Olhoft Sonja. 2009. Tax Reporting Aggressiveness and Its Relation to Aggressive Financial Reporting. *The Accounting Review* 84 (2): 467-496.
Frankel, R. M., M. F. Johnson, and K. K. Nelson, 2002. The relation between auditors' fees for nonaudit services and earnings management. *Accounting Review* 77 (Supplement), 71-105.
Freeman, R. E. 1984. Strategic management: A stakeholder approach. Boston: Pitman.
Frost, C.A. 1994. Uncertainty-Modified Audit Reports and Future Earnings. *Auditing: A Journal of Practice and Theory* 13 (1): 22-35.
Geiger, M. A., K. Raghunandan, and D. V. Rama. 1998. Costs associated with going-concern modified audit opinions: An analysis of auditor changes, subsequent opinions, and client failures. *Advances in Accounting*16: 117–139.
Geiger, M. A., and K. Raghunandan. 2002. Auditor tenure and audit reporting failures. *Auditing: A Journal of Practice & Theory* 21 (1): 67-68.
Geiger, M. A., and D.V. Rama. 2003. Audit Fees, Nonaudit Fees, and Auditor Reporting on Stressed Companies. *Auditing: A Journal of Practice & Theory* 22(2): 53-69.
Ghosh, A., and Moon D. 2005. Auditor tenure and perceptions of audit quality. *Accounting Review* 80 (2): 585-612.
Givoly, Dan, Carla Hayn. 2000. The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics* 29 (3): 287-320.
Greene, W. H. 2008. Econometric Analysis. 5th edition. Upper Saddle River, NJ: Prentice Hall.
Guay, W., Kothari, S., Watts, R. 1996. A market-based evaluation of discretionary accrual Models. *Journal of Accounting Research*34 (Supplement): 83-105.
Gul, F. A., S. Y. K. Fung, B. Jaggi. 2009. Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise. *Journal of Accounting and Economics* 47(3): 265-287.
Hoi, C.K, Q. Wu, and H. Zhang. 2013. Is corporate social responsibility (CSR) associated with tax avoidance? Evidence from irresponsible CSR activities. *The Accounting Review* 88(6): 2025-2059.
Hosmer, D., and S. Lemeshow. 2000. *Applied Logistic Regression*. 2nd edition. Hoboken, NJ: John Wiley & Sons, Inc.
Hopwood, W., J. McKeown, and J. Mutchler. 1994. Reexamination of auditor versus model accuracy within the context of the going-concern opinion decision. *Contemporary Accounting Research* 11 (2): 295–310.
Hoyle, J. 1978. Mandatory auditor rotation: The arguments and an alternative. *The Journal of Accountancy* 145 (5): 69–78.
Hribar, P. and D. Collins. 2002. Errors in estimating accruals: implications for empirical research. *Journal of Accounting Research* 40 (1): 105-134.
International Auditing Practices Committee. 1999. Going-Concern. International Standards on Auditing 570. New York, NY: IFAC.
Johnson, V. E., I. K. Khurana, and J. K. Reynolds, 2002. Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research* 19 (4): 637-660.
Jones, F. 1996. The information content of the auditor's going concern evaluation. *Journal of Accounting and Public Policy* 15 (1): 1–27.
Kao, J. L., Y. Li, and W. Zhang. 2014. Did SOX Influence the Association between Fee Dependence and Auditors' Propensity to Issue Going-Concern Opinions? *Auditing: A Journal of Practice & Theory* 33(2): 165-185.
Kida, T. 1980. An investigation into auditors' continuity and related qualification judgments. *Journal of Accounting Research* 18 (2): 506-523.
Kim, Y., M. S. Park, et al. 2012. Is Earnings Quality Associated with Corporate Social Responsibility? *Accounting Review* 87 (3): 761-796.
Knechel, W. R., and A. Vanstraelen. 2007. The relationship between auditor tenure and audit quality implied by going concern opinions. *Auditing: A Journal of Practice & Theory* 26 (1): 113-131.
Knechel, W. R., G. V. Krishnan, M. Pevzner, L. B. Shefchik, and U. K. Velury. 2013. Audit quality: Insights from the academic literature. *Auditing: A Journal of Practice & Theory* 32 (1): 385–421.
Koh, K., and Y.H. Tong. 2013. The effects of clients' controversial activities on audit pricing. *Auditing: A Journal of Practice & Theory* 32 (2): 67-96.
Kothari, S. P., A. Leone, and C. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1): 163–197.
Kraemer, H. C., and C. M. Blasey. 2004. Centring in regression analyses: a strategy to prevent errors in statistical inference. *International Journal of Methods in Psychiatric Research 13(3)*: 141-151.
Landsman, W. R., K. K. Nelson, B. R. Rountree. 2009. Auditor Switches in the Pre- and Post-

Enron Eras: Risk or Realignment? *Accounting Review* 84 (2): 531-558.
Lanis, R., and G.A. Richardson. 2012. Corporate social responsibility and tax aggressiveness. *Journal of Accounting and Public Policy* 31: 86-108.
Lennox, C. 2000. Do companies successfully engage in opinion-shopping? Evidence from the UK. *Journal of Accounting and Economics* 29 (3): 321–337.
Li, C. 2009. Does client importance affect auditor independence at the office level? Empirical evidence from going-concern opinions. *Contemporary Accounting Research* 26 (1): 201–230.
Lim, C., and H. Tan. 2008. Non-audit service fees and audit quality: The impact of auditor specialization. *Journal of Accounting Research* 46 (1): 199–246.
Louwers, T. 1998. The relation between going-concern pinions and the auditor's loss function. *Journal of Accounting Research* 36 (1): 143-156.
Lys, T., and Watts, R. L. 1994. Lawsuits against auditors. *Journal of Accounting Research 32 (Supplement) 65-93.*
Mackey, A., T.B. Mackey, and J.B. Barney. 2007. Corporate social responsibility and firm performance: Investor preferences and corporate strategies. *Academy of Management Review* 32 (3): 817-835.
Mansi, S., W. Maxwell, and D. Miller. 2004. Does auditor quality and tenure matter to investors? Evidence from the bond market. *Journal of Accounting Research* 42 (4): 755–793.
McWilliams, A., and D.S. Siegel. 2001. Corporate social responsibility and financial performance: Correlation or misspecification? *Strategic Management Journal* 21 (5): 603-609.
Menon, K., and D. Williams. 2010. Investor reaction to going concern audit reports. *The Accounting Review* 85 (6): 2075–2105.
Mescon, T., &Tilson, D. 1987. Corporate philanthropy: A strategic approach to the bottomline. *California Management Review*, 29 (2), 49-61.
Mutchler, Jane F. 1984. Auditor's Perceptions of the Going-Concern Opinion Decision. *Auditing: A Journal of Practice & Theory* 3 (2): 17-30.
Mutchler, J. F. 1985. A Multivariate Analysis of The Auditor's Going-Concern Decision. *Journal of Accounting Research* 23 (2): 668-682.
Mutchler, J. F., W. Hopwood, and J. C. McKeown. 1997. The influence of contrary information and mitigating factors on audit opinion decisions on bankrupt companies. *Journal of AccountingResearch* 35 (3): 295–310.
Myers, J. N., L. A. Myers, and T. C. Omer, 2003. Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation? *Accounting Review* 78 (3): 779-799.
Nogler, G. E. 1995. The resolution of auditor going concern opinions. *Auditing: A Journal of Practice and Theory* (Fall): 54-73.
Office of the Chief Accountant. 2003. Application of the January 2003 Rules on Auditor Independence: Frequently Asked Questions. Available at: http://www.sec.gov/info/accountants/ocafaqaudind080703.htm
Palmrose, Z. 1987. Litigation and independent auditors: The role of business failures and management fraud. *Auditing: A Journal of Practice & Theory* 6 (2): 90-103.
Palmrose, Z.-V. 1988. An analysis of auditor litigation and audit service quality. *The Accounting Review*63(1): 55–73.
Public Company Accounting Oversight Board (PCAOB), 2011. *Concept release on auditor independence and audit firm rotation*. PCAOB Release No. 2011-006, August 16, 2011. Washington: PCAOB.
Raghunandan, K., and D. Rama. 1995. Audit reports for companies in financial distress: Beforeand after SAS No. 59. *Auditing: A Journal of Practice & Theory* 14 (1): 50–63.
Rau, Stephen E. and Donald V. Moser. *1999*. Does Performing Other Audit Tasks Affect Going-Concern Judgments? *The Accounting Review*: October 1999, Vol. 74, No. 4, pp. 493-508.
Reichelt, K. J., and D. Wang, 2010. National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research* 48: 647-686.
Reynolds, K., and J. Francis. 2000. Does size matter? The influence of large clients on office-level auditor reporting decisions. *Journal of Accounting and Economics* 30 (3): 375–400.
Richardson, S., S. Teoh, and P. Wysocki. 2004. The walk-down to beatable analyst forecasts: The role of equity issuance and insider trading incentives. *Contemporary Accounting Research* 21 (4): 885–924.
Ruiz-Barbadillo, E., N. Gomez-Aguilar, and N. Carrera. 2009. Does mandatory audit firm rotation enhance auditor independence? Evidence from Spain. *Auditing: A Journal of Practice & Theory* 28 (1): 113-135.

Sabbaghi, Omid and Min, Xu. 2013. ROE and Corporate Social Responsibility: Is There a Return on Ethics? *Journal of Accounting & Finance* 13 (4): 82-95.

Schwartz, K. and Menon, K. 1985. Executive Succession in Family Firms. *Academy of Management Journal* 28: 680-686.

Securities and Exchange Commission (SEC). 2003. Strengthening the Commission's Requirements Regarding Auditor Independence. Final Rule 68, File No. S7-49-02. Washington, DC: SEC.

Shu, S. 2000. Auditor resignations: Clientele effects and legal liability. *Journal of Accounting and Economics* 29 (2): 173–205.

Simon, D., R. Ramanan, and A. Dugar, 1986. The Market for Audit Services in India: AnEmpirical Examination. *International Journal of Accounting* 21 (1): 285-295.

Simon, D., S. Teo, and G. Trompeter, 1992. A comparative study of the market for services in Hong Kong, Malaysia And Singapore. *The International Journal of Acconting* 27 (3): 234-240.

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

St. Pierre, K., and J.A. Anderson. 1984. An analysis of the factors associated with lawsuits against public accountants. *Accounting Review* 59 (2): 242-263.

Teoh, S. H. and T.J. Wong, 1993. Perceived Auditor Quality and the Earnings Response Coefficient. *The Accounting Review* 68 (2): 346-367.

U.S. House of Representatives. 2002. The Sarbanes-Oxley Act of 2002. Public Law 107-204 (H. R. 3763). Washington, D.C.: Government Printing Office.

U.S. House of Representatives. 2013. H.R. 1564. 113th Congress. Washington, DC: Government Printing Office.

Van der Laan Smith, Joyce, Adhikari A, Tondkar RH. 2005. Exploring differences in social disclosures internationally: A stakeholder perspective. *Journal of Accounting and Public Policy* 24 (2): 123-151.

Varadarajan P. R, Menon A. 1988. Cause related marketing: a coalignment of marketing strategy and corporate philanthropy. *Journal of Marketing*, 52 (3), 58-74.

Waddock, S.A. and S.A. Graves. 1997. The corporate social performance-financial performance link, *Strategic Management Journal* 18 (4): 303-319.

Watts, R., and J. Zimmerman. 1981. Auditor Independence. Unpublished paper, University of Rochester.

Weber, J., and M. Willenborg. 2003. Do expert informational intermediaries add value? Evidence from auditors in microcap initial public offerings. *Journal of Accounting Research* 41(4): 681-720.

Ye, P., E. Carson, and R. Simnett. 2011. Threats to auditor independence: The impact of relationship and economic bonds. *Auditing: A Journal of Practice & Theory* 30 (1): 121-148.

| **APPENDIX A VARIABLE DEFINITIONS** | | |
|---|---|---|
| Dependent Variable (Going-Concern Opinion) | | |
| GC | = | An indicator equal to 1 if the client firm receives a going-concern audit report in the current year, and 0 otherwise; |
| Interest Variables | | |
| TEN | = | The number of years the auditor has served the same client firm subtracted from1, with first-year audit engagement taking the value of zero; |
| CRISK | = | The sum of the total concerns in seven social rating categories of MSCI ratings data: environmental, community, diversity, employee relations, environment, product, human rights and corporate governance; |
| CRISK*TEN | = | An interaction term between CRISK and TEN; |
| Control Variables | | |
| SIZE | = | Firm size, measured as the natural logarithm of total assets (TA); |
| LIT | = | An indicator variable equal to 1 for the firm operates in a high-litigation industry, and 0 otherwise. High-litigation industries are industries with SIC codes of 2833–2836, 3570–3577, 3600–3674, 5200–5961 and 7370–7370 (Ashbaugh et al., 2003); |
| AGE | = | Firm age, measured as the natural logarithm of the number of years the client firm has appeared in Compustat; |
| MtB | = | Market-to-Book, calculated as market value (PRCC_F*CSHO) plus debt (AT-CEQ) to assets (AT); |
| Zmjewski | = | Probability of failure calculated using Zmijewski's (1984) coefficients; higher values of Zmjewski indicate a higher probability of bankruptcy. |
| ROA | = | The ratio of earnings before interest and tax (IB –XINT-TXT)( to total assets (AT); |
| LOSS | = | An indicator variable set to 1 if the client firm has negative net income, and zero otherwise; |
| LEV | = | Leverage, calculated as total long-term liabilities (DLTT+DLC) divided by total assets (AT). |
| L1GC | = | Prior-year going-concern opinion, an indicator variable equal to 1 if the client firm receives a going-concern opinion in prior-year and zero otherwise; |
| ISSUE | = | An indicator equals to 1 if the sum of long-term debt (DLTT) or equity (CEQ) issued during the past three years is more than 5 percent of the total assets, and 0 otherwise; |
| BigN | = | An indicator equals 1 if the auditor is one of the Big 4/5/6 auditors, and 0 otherwise; |
| ReportLag | = | The natural logarithm of the number of days between the fiscal year end and the annual 10-K filing with SEC; |
| GOV | = | A summary measure for seven governance attributes: percentage of board independence (pctDIRIND), CEO and chairman of the board of director (Duality), board diligence (ATTEN75), anti-entrenchment index (AntiEindex); audit committee diligence (AUDATTEN75), and the existence of audit committee accounting expert (AUDEXPT). pctDIRIND is an indicator variable equal to 1 when majority of the board members are independent directors, and zero otherwise; Duality is dummy variable equal to 1 when the CEO also serves as the chairman of the board of director. ATTEN75 is an indicator variable equal to 1 when the all the member attend at least 75 percentage of the board meeting and zero otherwise; AntiEindex, is an indicator variable equal to 1 when the client firm has AntiEindex greater than sample median and zero otherwise; AUDATTEN75 is an indicator variable equal to 1 when the audit committee member attend at least 75 percentage of the meetings and zero otherwise; AUDEXPT is an indicator variable equal to 1 for the existence of audit committee accounting expert and zero otherwise. An anti-entrenchment index (AntiEindex) is a proxy for corporate governance. Bebchuk et al. (2009) create an entrenchment index (Eindex) based on six provisions – four constitutional provisions that prevent a majority of shareholders from having their way (e.g., staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, and supermajority requirements for charter amendments), and two takeover-readiness provisions - poison pills and golden parachutes. This Eindex ranges from 0 to 6, with a higher value indicating stronger managerial entrenchment. I negate Eindex to generate AntiEindex so that higher value of AntiEindex refers to higher corporate governance. |
| Additional Control Variables | | |
| absDA | = | Absolute value of performance-matched discretionary accruals (Kothari et al. 2005); |
| CI | = | Client importance, calculated as the ratio of an audit firm's audit revenues from a single client to the sum of the total audit revenues of all the clients of an auditor in a local office level; |
| SPEC | = | Joint national industry and city industry specialist, where national industry specialist as an auditor with at least 30% market share and city industry specialist is defined as an auditor with at least 50% market share on MSA (e.g., following Reichelt and Wang 2010); |

| | | |
|---|---|---|
| OfficeSize | = | Office size, measured based on the natural log aggregated client audit fees of a practice office in a specific fiscal year (e.g., following Francis and Yu 2009); |
| RET | = | Stock return over the fiscal year; |
| RVOL | = | The variance of the residual from the marketmodel over the fiscal year. |
| BETA | = | The company's beta estimate using a marketmodel over the fiscal year; |
| Variables Unique to First-Stage Regression to Predict Audit Firm Tenure | | |
| absL1DA | = | Previous year's absolute value of discretionary accruals; |
| CATA | = | The ratio of current assets to total assets (ACT/AT); |
| Quick | = | The quick ratio, measured as the ratio of current assets (excluding inventories) to current liabilities [(ACT-INVT)/LCT]; |
| DE | = | DE is the debt-asset ratio, calculated as long-term debt (LT) divided by total assets (AT); |
| ROA*LOSS | = | The interaction term between ROA and LOSS; |
| Growth | = | Firm-level sales growth; |
| Foreign | = | An indicator variable equal to 1 if the client firm has foreign sales, and zero otherwise; |
| SEG | = | The natural logarithm of the number of business segment. |
| Alternative Measures of Tenure | | |
| logTEN | = | The natural log of the number of years the auditor has served the same client firm; |
| STEN | = | Short tenure, an indicator variable equal to 1 for client firms with TEN greater than 2 years, and zero otherwise; |
| MTEN | = | Medium tenure, an indicator variable equal to 1 for client firms with TEN greater than 2 years and less than 8 years, and zero otherwise; |
| LTEN | = | Long tenure, an indicator variable equal to 1 for client firms with TEN greater than 8 years, and zero otherwise; |
| $TEN^2$ | = | Squared term of audit firm tenure TEN; |
| Alternative Measures of CRISK | | |
| CRISKFactor | = | CSR risk factor, measured as (-1) times one of the first principal factor from a component analysis on all seven individual dimension of CSR ratings, measured as total strengths minus total concerns in each of the following seven social rating categories of MSCI ratings data: community (COM), diversity (DIV), employee relations (EMP), environment (ENV), product (PRO), human rights (HUM), and corporate governance (CGOV); where COM is net score (the number of strengths minus the number of concerns) of MSCI ratings in the community category; DIV is net score of MSCI ratings in the diversity category; EMP is net score of MSCI ratings in the employee category; HUM is net score of MSCI ratings in the human rights category; PRO is net score of ESG ratings in the product category; ENV is net score of MSCI ratings in the environment category; CGOV is net score of MSCI ratings in the corporate governance category; |
| PCRISK | = | Positive CSR risk, measured as (CSRc - CSRs + 8) so that PCRISK would have a downside risk bounded at zero. |