



Managerial Finance

The cost of debt and the characteristics of audit firms

Yong-Sang Woo, Minjung Kang, Ho-Young Lee,

Article information:

To cite this document:

Yong-Sang Woo, Minjung Kang, Ho-Young Lee, (2018) "The cost of debt and the characteristics of audit firms", *Managerial Finance*, Vol. 44 Issue: 1, pp.27-45, <https://doi.org/10.1108/MF-08-2016-0233>

Permanent link to this document:

<https://doi.org/10.1108/MF-08-2016-0233>

Downloaded on: 06 March 2018, At: 22:05 (PT)

References: this document contains references to 54 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 143 times since 2018*

Users who downloaded this article also downloaded:

(2018), "Controlling shareholders and financial constraints around the world", *Managerial Finance*, Vol. 44 Iss 1 pp. 92-108 <<https://doi.org/10.1108/MF-08-2016-0228>>

(2018), "Advances in the corporate finance literature: a survey of recent studies on Korea", *Managerial Finance*, Vol. 44 Iss 1 pp. 5-25 <<https://doi.org/10.1108/MF-10-2017-0390>>

Access to this document was granted through an Emerald subscription provided by emerald-srm:320271 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

The cost of debt and the characteristics of audit firms

Characteristics
of audit firms

Yong-Sang Woo

School of Business, Ewha Womans University, Seoul, South Korea

Minjung Kang

College of Business, Incheon National University, Incheon, South Korea, and

Ho-Young Lee

School of Business, Yonsei University, Seoul, South Korea

27

Received 22 August 2016
Revised 2 January 2017
Accepted 29 January 2017

Abstract

Purpose – Audit firm bankruptcy can have significant negative impacts on the stock prices of client firms. The purpose of this paper is to identify determinants of audit firm bankruptcy risk as measured by costs of debt.

Design/methodology/approach – Using audit firm data publicly available in Korea, this study empirically examines whether client portfolio, financial, and organizational characteristics are associated with the weighted average interest rates assumed by auditors.

Findings – The authors find empirical evidence that audit firms' client portfolio characteristics, including the incidence (or number) of lawsuits against the auditor, the proportion of audit clients under surveillance, the proportion of initial audit engagements, and the proportion of listed companies of audit clients, are positively associated with the cost of debt. The authors also find several financial and organizational characteristics associated with the cost of debt.

Practical implications – The findings of this study suggest that client portfolio characteristics as well as financial and organizational characteristics are important determinants of the cost of debt in audit firms, and that these characteristics are different from those of firms in other industries. Identifying the determinants of audit firms' cost of debt provides insight to regulators, client firms, and capital market participants.

Originality/value – This study examines the default risk of audit firms that play an important monitoring role in capital markets. By utilizing unique data about audit firms available in Korea, this study is the first study to empirically examine the effect of detailed audit firm characteristics on audit firm's default risk.

Keywords Cost of debt, Default risk, Audit firm characteristics

Paper type Research paper

1. Introduction

This study examines the association between the characteristics of audit firms and their costs of debt. Financial institutions are concerned about the likelihood of debtor's default when making loan decisions. Although audit firms are limited liability partnerships, they are not free from the possibility of bankruptcy. When audit firms require capital, they openly borrow money from financial institutions. Audit firm bankruptcy can have significant negative impacts on the stock prices of client firms and, thus, on the capital market (Chaney and Philipich, 2002). Therefore, identifying the determinants of audit firm bankruptcy provides insight to regulators, client firms, and capital market participants. Prior studies have, however, focused on the determinants of litigation against audit firms from the client's perspective and have not directly examined audit firm's default risk, mainly because financial statement data for audit firms is not publicly available.

The cost of debt is determined by outside creditors. Outside creditors assess *ex ante* default risk in audit firms and determine the cost of debt for audit firms accordingly. These outsiders may have a different viewpoint on *ex ante* default risk of audit firms, a viewpoint which may be useful to interested parties surrounding audit firms because the cost of debt can affect the quality of services auditors provide. If audit firms assume a high



Managerial Finance
Vol. 44 No. 1, 2018
pp. 27-45

© Emerald Publishing Limited
0307-4358
DOI 10.1108/MF-08-2016-0233

cost of debt, they may experience financial distress. In order to avoid this distress, audit firms are likely to have incentives to lowball their clients, which, in turn, can lower audit quality (DeAngelo, 1981; Lee and Gu, 1998; Magee and Tseng, 1990; Dopuch and King, 1996; Gul *et al.*, 2009). Thus, understanding the outsider viewpoint and the determinants of the cost of debt is important to regulators, clients, and investors.

Using audit firm data publicly available in Korea, we examine the association between audit firm characteristics and the cost of debt as a proxy for audit firm's default risk. Audit firm's default risk is evaluated by financial institutions in the form of interest rates specific to each borrowing; in Korea, this information is made available to the general public in the footnotes of their financial statements. The Financial Supervisory Service (FSS) of Korea (the equivalent of the US SEC) requires audit firms to disclose their financial statements and information about loans from financial institutions and the respective interest rates charged by each institution. When an accounting firm has many separate borrowings, the interest rate can be estimated by the weighted average of the disclosed interest rates for each borrowing. For example, two separate borrowings are disclosed as follows in the annual report of Ernst & Young (2011) (Table I). In this case, the weighted average interest rate is 6.03 percent $[(3,293 \times 5.98 \text{ percent} + 5,528 \times 6.06 \text{ percent}) / (3,293 + 5,528) = 6.03 \text{ percent}]$. Utilizing these data, we examine the association between audit firm characteristics and interest rates as a proxy for audit firm's default risk. Our study has implications for audit firms, financial institutions, regulators, and the investors and creditors of client firms.

Since firm bankruptcy severely affects every interested party, the likelihood of a firm's bankruptcy concerns all capital market participants, including investors, creditors, and regulators. Bankruptcies are commonly caused by excessive borrowing and slow sales. In performing their evaluations, financial institutions look for characteristics that affect the risk of audit firm's default in making their lending decisions and determining the appropriate interest rates to cover the risk. Thus, interest rates charged to audit firms are affected by the likelihood of default as evaluated by financial institutions. Thus, the interest rates disclosed in the footnotes of the financial statements of audit firms can be utilized as a proxy for an audit firm's default risk. By utilizing the data from audit firms' annual reports in this study, we examine the association between audit firm's default risk and characteristics of audit firms' client portfolios, along with financial and organizational characteristics.

We find empirical evidence that client portfolio characteristics, including the incidence (or amount) of lawsuits against the auditor, the proportion of audit clients under surveillance, the proportion of initial audit engagements to all audit engagements, and the proportion of listed companies of audit clients, are positively associated with interest rates. We also find evidence that audit firms' financial and organizational characteristics, including the interest coverage ratio, the proportion of receivables to total revenue, firm size (measured as the natural logarithm of total revenue), the ownership percentage of the CEO, and whether or not the audit firm has a local office, are associated with interest rates. However, we find no evidence of an association between the cost of debt and the debt ratio, return on assets, or the proportion of audit fees to total revenue.

This study contributes to the extant literature on auditing in three respects. First, unlike most prior studies that have examined the role of auditors in the default of audit clients

Table I.
Borrowings of Ernst
& Young in 2010

Bank	Amount (unit: million Korean won)	Interest rate (%)
Kookmin Bank	3,293	5.98
Woori Bank	5,528	6.06

(e.g. Carcello and Palmrose, 1994), this study examines the default risk of audit firms themselves. Understanding the determinants of audit firms' cost of debt is important for regulators and capital market participants given the significance of the monitoring role of audit firms. These determinants can also help clients and their investors better understand determinants of audit risk as assessed by financial institutions. Second, this study provides evidence that the determinants of the cost of debt in audit firms are different from those of firms in other industries. The results of our analyses show that unlike other industries, the determinants of the cost of debt in audit firms include the incidence of litigation and surveillance sanctions, initial engagement, number of listed clients, and existence of local office. In particular, by utilizing unique data about audit firms publicly available in Korea, we show that client portfolio and organizational characteristics are critical in determining the default risk of audit firms. This evidence underscores the importance of client acceptance and continuity of the decision-making process in ensuring the sustainability of audit firms. Third, the findings of this study suggest that regulators recognize the role of organizational structure in audit firm's default, as this factor may affect the independence of audit firms.

The remainder of our study is organized as follows. We present the findings of prior studies related to audit firm's default, after which we develop our hypotheses. We then present the results of our empirical analysis, which is followed by the conclusion.

2. Literature review and hypothesis development

Many prior studies have examined the determinants of bankruptcies or default risk by studying firms in industries other than auditing. Seminal studies include those of Beaver (1966), Altman (1968), and Ohlson (1980). Additionally, many studies examined the determinants of the cost of debt. For example, Ziebart and Reiter (1992) reported that the leverage ratio is positively associated with the cost of debt, as indicated by the increased risk of default for firms with high leverage. Francis, Khurana and Pereira (2005) and Francis, Reichelt and Wang (2005) reported that low interest coverage, low return on assets ratios, and high leverage increase the cost of debt and decrease credit ratings. Many prior finance studies also suggest that default risk is directly related to the cost of debt (Chen, 1978; Fama and French, 1993; Longstaff *et al.*, 2005; Almeida and Philippon, 2007; Van Binsbergen *et al.*, 2010; Mansi *et al.*, 2012). Also, optimal debt level decreases as business risk increases. This is because business risk is positively associated with the variability of cash flows which in turn lowers optimal debt level. In addition, Kale *et al.* (1991) reported that there is a U-shaped relation between optimal debt and business risk.

Audit firms are subject to high risk of lawsuits from investors and creditors of client firms when they fail to detect material errors or misstatements in clients' financial statements (Shu, 2000; Ewert, 2000; Casterella *et al.*, 2010; Kaplan and Williams, 2013). They may go bankrupt when they are unable to pay litigation damages to plaintiffs. Utilizing 68 claims by audit firms on an insurance company, Casterella *et al.* (2010) reported that certain audit firm characteristics including size and growth are associated with the likelihood of audit firm litigation. The most significant reason that audit firms go bankrupt is their inability to pay damages liable to pay to plaintiffs due to the large amount of litigation (Palmrose, 1988; Linville and Thornton, 2001). The size of damage awards paid to plaintiffs has dramatically increased. For example, Eigelbach (2011) reported that Deloitte agreed to pay \$50 million to settle a lawsuit associated with Adelphia Communications Corp. and KPMG agreed to pay \$22 million to settle a lawsuit associated with Xerox. PricewaterhouseCoopers LLP agreed to pay \$225 million to settle a lawsuit associated with Tyco International Ltd.

To our knowledge, the determinants of default risk for audit firms have yet to be examined. Further, very few studies have investigated the risk of litigation against audit firms, which may

be closely related to default risk. For example, Schultz and Gustavson (1978) reported that audit firm size is a determinant of litigation risk for audit firms. Palmrose (1988) reported that non-Big 8 audit firms are more likely to experience higher litigation risk. Stice (1991) reported that the likelihood of litigation against audit firms is negatively associated with audit tenure and positively associated with the proportion of revenue from a given client compared to total revenue. In a univariate analysis, Carcello and Palmrose (1994) reported that the likelihood of issuing modified reports prior to client bankruptcy is negatively related to litigation against audit firms. However, they found no evidence of a relationship between issuing modified reports and litigation using multivariate analysis. Lys and Watts (1994) found that litigation against audit firms is related to qualified audit opinions and the proportion of revenue from a given client compared to total revenue.

Bonner *et al.* (1998) explored the relationship between financial statement fraud of various types and litigation against audit firms. In their analysis of several malpractice insurance forms, Linville and Thornton (2001) identified the determinants of litigation against a non-Big 5 audit firm using data from an insurance company. They found that litigation is associated with several audit firm-specific factors. Using data from one insurance company, Casterella *et al.* (2010) examined several factors that affect litigation risk against audit firms. They reported that the size and growth rate of audit firms and their history of problems with clients or taking clients to court are positively associated with litigation risk.

In this empirical study, we examine the association between audit firm characteristics and their cost of debt, as proxied by the interest rate determined by financial institutions. Financial institutions consider various factors, including potential recovery of principal amounts and whether interest will be paid on time. Creditors of audit firms are primarily financial institutions that are capable of evaluating their default risk. Thus, the interest rate associated with loans taken by audit firms can be considered as a reasonable proxy for default risk.

Auditor characteristics associated with the client portfolio

The default risk of audit firms can be affected by the client portfolio, and the business risk of audit firms is directly related to the default risk. An audit failure is the most important factor affecting business risk. As proxies for business risk, we use the incidence (or total amount) of lawsuits, the proportion of clients under surveillance by the FSS compared to the total number of audit clients, the proportion of initial audit engagements to all audit engagements, and the proportion of listed clients to all audit clients.

As the incidence (or total amount) of lawsuits (*SUIT_N* or *SUIT_A*) increases, business risk is also expected to increase. Thus, audit firms with many lawsuits experience high default risk and are charged higher interest rates by financial institutions. As the proportion of clients under surveillance by the FSS to the total number of audit clients (*SURV*) increases, the business risk also increases. The FSS conducts supervisory activities to verify that external audits are properly conducted following the Generally Accepted Auditing Standards and that audited financial statements are properly presented following the Generally Accepted Accounting Principles (GAAP). If an audit failure or a violation of the GAAP is found, audit and/or client firms are subject to restrictions to audit services, monetary penalties, and/or civil or criminal action. Thus, the proportion of clients under surveillance is expected to increase the likelihood of audit firm's default, which in turn increases interest rates.

The proportion of initial audit engagements to total audit engagements (*FIRST*) may increase audit firm's default risk because, in the early period of client engagement, the chances of audit failure and litigation against auditors are greater (St Pierre and Anderson, 1984; Stice, 1991). Geiger and Raghunandan (2002) reported that audit tenure is

negatively associated with audit failure. Therefore, we expect a positive association between the proportion of initial audit engagements to the total number of audit engagements and auditor interest rates.

Client firms that are listed in the stock markets have more stakeholders and more diverse stakeholders compared to unlisted firms. Litigation is more likely for listed clients when audit failure occurs. Thus, audit firm's default risk is expected to increase when the proportion of listed clients to the total number of audit clients (*NLIST*) is high. Financial institutions, therefore, are expected to charge higher interest rates for audit firms with a greater proportion of listed clients compared to unlisted clients.

As such, our hypotheses associated with client portfolio characteristics are stated as follows:

- H1.* The incidence (or total amount) of lawsuits against an audit firm is positively associated with the auditor's interest rate.
- H2.* The number of surveillance sanctions applied to an audit firm by the FSS of Korea compared to the total number of audit clients is positively associated with the auditor's interest rate.
- H3.* The proportion of initial audit engagements to the total number of audit engagements is positively associated with the auditor's interest rate.
- H4.* The proportion of listed clients to the total number of audit clients is positively associated with the auditor's interest rate.

Auditor characteristics associated with financial status and operating results

Additional factors that affect audit firms' cost of debt include characteristics associated with the financial condition of the firm and operating results. The leverage ratio is frequently stated as a primary factor that affects the likelihood of firm default (Beaver, 1966; Altman, 1968; Ohlson, 1980). As the leverage ratio (*LEV*) increases, the burden of interest payment also increases; therefore, default risk is expected to increase. Thus, we expect that the leverage ratio of audit firms is positively associated with interest rates.

Prior studies report that profitability is directly associated with the likelihood of default (Beaver, 1966; Altman, 1968; Ohlson, 1980). When profitability (*ROA*) is high, firms are in a better position to assume interest expenses, and default risk is lower. Financial institutions charge profitable debtors a lower risk premium, which, in turn, lowers the interest rate. Thus, we expect a negative association between profitability and interest rates.

When firms have sufficient operating income to pay interest expenses, the default risk is lower. Thus, a negative association between the auditor's interest coverage ratio (*INTCOV*) and the auditor's interest rate is expected (Francis, Khurana and Pereira, 2005; Francis, Reichelt and Wang, 2005).

Francis and Simon (1987) suggested that audit fees are positively related to clients' audit risk. Consistent with their suggestion, they found that audit fees increase as the proportion of receivables to total assets increases. Similar to companies in other industries, audit firms are also expected to experience higher default risk as the proportion increases because of difficulty in collecting cash from receivables. When the proportion of receivables to total revenue (*REC*) is high, firms are less likely to collect the full amount of receivables. Thus, firms incur high bad debt-related expenses and their financial status is likely to deteriorate. Additionally, audit firms with a higher proportion of receivables to total revenue may have difficulty actively collecting the receivables because of their incentive to maintain engagements. Thus, we expect a positive association between the proportion of receivables to total revenue and interest rates.

The proportion of audit fees to total revenue (*AFR*) also affects audit firm's default risk. A higher proportion of audit fees to total revenue implies a greater dependence on audit services. A greater dependence on a specific source of revenue may also increase default risk. Thus, the default risk of audit firms may increase if the proportion of audit fees to total revenue is high (Palmrose, 1988; Lys and Watts, 1994). However, a higher proportion of audit fees to total revenue improves audit quality by minimizing the negative effect on auditor independence of the provision of non-audit services (Swanger and Chewning, 2001). Higher audit quality lowers the likelihood of litigation, thereby decreasing default risk. Also, the profitability of an audit firm may be considered stable when *AFR* is high. Thus, the association between the proportion of audit fees to total revenue and interest rates is an empirical question.

Lastly, Botosan and Plumlee (2002) reported that firm size (*SIZE*) is negatively associated with the cost of debt because market risk decreases as the size of the firm increases. Audit firms are also likely to experience low default risk as their revenue increases. Thus, financial institutions are likely to demand lower interest rates from firms with high revenue.

As such, our hypotheses associated with the financial status and operating results of audit firms are stated as follows:

- H5.* The leverage ratio is positively associated with the auditor's interest rate.
- H6.* The return on assets is negatively associated with the auditor's interest rate.
- H7.* The interest coverage ratio is negatively associated with the auditor's interest rate.
- H8.* The proportion of receivables to total revenue is positively associated with the auditor's interest rate.
- H9.* The proportion of audit fees to total revenue is not associated with the auditor's interest rate.
- H10.* The amount of audit firm revenue is negatively associated with the auditor's interest rate.

Auditor characteristics associated with organizational structure

In 2002, the FSS began actively overseeing the governance structure and quality control of audit firms. Following this movement, Maijoor and Vanstraelen (2012) emphasized the importance of the research on the organizational structure of audit firms. In this study, we analyze the effects of governance structure, year of establishment, and other aspects of organizational structure of audit firms on interest rates.

Big 4 audit firms (*BIG*) have different organizational structures than non-Big 4 audit firms. Big 4 audit firms are affiliated with the global entities (i.e. PwC, KPMG, Ernst & Young, and Deloitte). These firms adhere to global quality control policies and are expected to have a lower risk of audit failure. Prior studies report that big audit firms provide higher quality audit (Francis and Wilson, 1988; Palmrose, 1988; Davidson and Neu, 1993; Teoh and Wong, 1993; Francis, 2004, among others). Big 4 audit firms also earn relatively more stable income from non-audit services than other audit firms due to their global reputation. Because Big 4 audit firms have a lower risk of audit failure, their rate of returns is lower.

The governance structure of audit firms is estimated in this study by the percentage of firm ownership by the CEO (*OWN*). It is expected that CEOs with a high ownership percentage manage cost savings more effectively and pay more attention to risk control than CEOs with low ownership percentages. Generally, an increase in ownership by managers has a positive effect on the company's value, as agency costs decrease (Jensen and Meckling, 1976; Ang *et al.*, 2000). Therefore, it is expected that interest rates will

decrease as the ownership percentage of the CEO increases. Further, older audit firms are likely to possess more structured internal organizational systems, making revenue more stable and quality control more effective. Thus, it is expected that interest rates will decrease as the ownership percentage of the CEO increases in audit firms.

Firms that have developed their reputations over time will eventually enjoy the benefits of customer loyalty and stable income. Thus, the number of years since establishment of the audit firm (*FTEN*) is expected to affect the cost of debt. We also consider the presence or absence of branch offices (*BRANCH*). Prior auditing studies suggest that office-level audit quality is more relevant than firm-level audit quality in examining the effect of client characteristics on audit quality (e.g. Reynolds and Francis, 2000; Reichelt and Wang, 2010; Lawrence *et al.*, 2011; Minutti-Meza, 2013) and audit fees (e.g. Ferguson *et al.*, 2003; Francis, Khurana and Pereira, 2005; Francis, Reichelt and Wang, 2005). When a branch office is operated separately from the main firm, quality control of the audit firm is more difficult. However, revenue gains stability because the audit firm can comply with requests from clients in various regions. Therefore, the effect of audit firms that operate their branch offices separately on interest rates is an empirical question. As such, our hypotheses associated with audit firms' organizational structure are as follows:

- H11.* The indicator representing a Big 4 audit firm is negatively associated with the auditor's interest rate.
- H12.* The ownership percentage of an audit firm's CEO is negatively associated with the auditor's interest rate.
- H13.* The number of years after establishment of an audit firm is negatively associated with the auditor's interest rate.
- H14.* The presence of branch office(s) is associated with the auditor's interest rate.

3. Research design and sample selection

Model

Our hypotheses are tested using Model 1 below:

$$\begin{aligned}
 INT_t = & \beta_0 + \beta_1 SUIT_N(\text{or } SUIT_A)_{t-1} + \beta_2 SURV_{t-1} + \beta_3 FIRST_{t-1} + \beta_4 NLIST_{t-1} \\
 & + \beta_5 LEV_{t-1} + \beta_6 ROA_{t-1} + \beta_7 INTCOV_{t-1} + \beta_8 REC_{t-1} + \beta_9 AFR_{t-1} \\
 & + \beta_{10} SIZE_{t-1} + \beta_{11} BIG_{t-1} + \beta_{12} OWN_{t-1} + \beta_{13} FTEN_{t-1} \\
 & + \beta_{14} BRANCH_{t-1} + \sum YEAR_t + \varepsilon_t
 \end{aligned} \tag{1}$$

where INT_t is the weighted average interest rate in year t of an audit firm:

$$\frac{\sum_{j=1}^{J_{ik}} [\text{Audit firm } j\text{'s interest rate } i \text{ on each borrowing} \times \text{final balance } k \text{ of each borrowing}]}{\text{Total borrowing of audit firm } J};$$

$SUIT_N_{t-1}$ the 1 if an audit firm faces a lawsuit in year $t-1$ or $t-2$, otherwise 0; $SUIT_A_{t-1}$ the natural logarithm of the amount of lawsuits in year $t-1$ or $t-2$; $SURV_{t-1}$ the number of audit clients under surveillance in year $t-1$ or $t-2$ /the total number of audit clients in year $t-1$; $FIRST_{t-1}$ the proportion of initial audit engagements to total audit clients (the number of initial audit clients in year $t-1$ /the total number of audit clients in year $t-1$); $NLIST_{t-1}$ the proportion of listed companies among audit clients to total audit clients (the number of listed companies among audit clients in year $t-1$ /the total number of audit clients in year $t-1$);

LEV_{t-1} the debt ratio in year $t-1$ (total debts/total assets); ROA_{t-1} the net income in year $t-1$ /total assets in year $t-1$; $INTCOV_{t-1}$ the [operating income in year $t-1$ /total interest expenses in year $t-1$]/100; REC_{t-1} the accounts and notes receivable in year $t-1$ /total revenue in year $t-1$; AFR_{t-1} the audit fee revenue in year $t-1$ /total revenue in year $t-1$; $SIZE_{t-1}$ the natural logarithm of total revenue in year $t-1$; BIG_{t-1} the 1 if an audit firm is one of the Big 4 audit firms in year $t-1$, otherwise 0; OWN_{t-1} the ownership percentage of audit firm's CEO; $FTEN_{t-1}$ the number of years after establishment of the audit firm scaled by the sample mean value (i.e. 13.5) of audit firm years; $BRANCH_{t-1}$ the 1 if an audit firm has a local office(s), otherwise 0; and $YEAR$ the year dummy.

To test $H1$ through $H4$, $SUIT_N$ (or $SUIT_A$), $SURV$, $FIRST$, and $NLIST$ are included in Model 1 to represent the characteristics of the client portfolio. These variables are expected to be positively associated with INT , as discussed previously. To test $H5$ through $H10$ representing the financial condition of audit firms, LEV , ROA , $INTCOV$, REC , AFR , and $SIZE$ are included. LEV and REC are expected to have a positive relationship with INT , while ROA , $INTCOV$, and $SIZE$ are expected to be negatively associated with INT , as discussed previously. To test $H11$ through $H14$ representing the organizational structure of audit firms, BIG , OWN , $FTEN$, and $BRANCH$ are included in Model 1 and are expected to be negatively associated with INT , as discussed previously.

Sample selection

Our sample consists of Korean audit firms that audited listed companies. Audit firm data spanning 2005-2011 are used to test our hypotheses. There were 125 audit firms in Korea at the end of 2011 that disclosed their financial data and governance structures on the homepage of the FSS. The number of sample firm years is 733 since the number of audit firms differs each year. However, disclosure of interest rates occurs for only 161 firm years; these observations can be used for our analysis. Further, when $SUIT_A$ is used as the main independent variable, the sample decreases to 155 because the amount of lawsuits is not disclosed for six firm years.

4. Empirical results

Descriptive statistics and Pearson correlations

Table II, Panel A, presents the descriptive statistics for the variables included in the model. All variables used in this study, except for dummy variables, are winsorized at the 1 and 99 percent levels to reduce the effects of extreme values. The mean value of INT is 7.277 and the median is 7.000. This result indicates that the weighted average interest rate is about 7 percent during the sample period. The maximum and minimum values of INT are 11.9 and 4.5 percent, respectively. This result indicates large differences in interest rates in the audit firms in our sample, although interest rates are estimated by the weighted average value. This result also shows large differences in default risk between firms in our sample as estimated by financial companies. The mean value of $SUIT_N$ is 0.137 and that of $SUIT_A$ is 0.953. This result indicates that almost 14 percent of the sample audit firms faced lawsuits and that 1.6 million Korean won was claimed on average during the study period. Thus, 86 percent of the sample audit firms did not face lawsuits. The lawsuits, however, vary across year (see Table II, Panel B). Exponential (mean of $SUIT_A$)-1 = 1.6 million. The mean (median) value of $SUIT_A$ for firms facing lawsuits is 9.23 (9.32). This value represents 10,198 (11,158) million Korean won (about 10.198 million US dollars).

The mean and median values of $SURV$ are 0.004 and 0.000, respectively. This result indicates that only a few firms in our sample were under surveillance by the FSS. The mean value of $FIRST$ is 0.181, indicating that 18 percent of the audit engagements were initial

Panel A: descriptive statistics of variables used in empirical models

n = 161

Variables	Mean	Std.	Median	Min.	Max.
INT	7.277	1.408	7.000	4.500	11.900
SUIT_N	0.137	0.345	0.000	0.000	1.000
SUIT_A	0.953	3.099	0.000	0.000	14.084
SURV	0.004	0.008	0.000	0.000	0.035
FIRST	0.181	0.164	0.143	0.000	1.000
NLIST	0.119	0.091	0.095	0.000	0.357
LEV	0.614	0.126	0.631	0.172	0.847
ROA	0.042	0.071	0.037	-0.623	0.290
INTCOV	5.768	17.127	0.103	0.000	59.000
REC	0.340	0.119	0.341	0.015	0.881
AFR	0.366	0.148	0.350	0.015	0.819
SIZE	8.772	1.157	8.456	6.971	12.399
BIG	0.087	0.283	0.000	0.000	1.000
OWN	0.322	0.291	0.180	0.004	0.996
FTEN	0.590	0.449	0.444	0.074	2.593
BRANCH	0.702	0.459	1.000	0.000	1.000

Panel B: descriptive statistics of means by year

Variables	2005	2006	2007	2008	2009	2010	2011
INT	6.994	7.279	7.860	7.827	7.488	7.054	6.732
SUIT_N	0.176	0.158	0.200	0.211	0.040	0.091	0.143
SUIT_A	0.507	2.184	2.776	1.688	0.000	0.078	0.524
SURV	0.005	0.005	0.007	0.001	0.002	0.003	0.006
FIRST	0.200	0.235	0.156	0.172	0.208	0.179	0.137
NLIST	0.135	0.162	0.140	0.151	0.100	0.097	0.085
LEV	0.665	0.612	0.653	0.598	0.618	0.582	0.603
ROA	0.037	0.057	0.032	0.015	0.060	0.044	0.042
INTCOV	3.693	18.933	6.259	3.504	7.179	1.998	2.468
REC	0.267	0.324	0.338	0.325	0.339	0.383	0.357
AFR	0.386	0.380	0.400	0.359	0.372	0.342	0.348
SIZE	8.860	8.724	8.828	8.977	8.509	8.631	8.972
BIG	0.118	0.053	0.100	0.158	0.040	0.061	0.107
OWN	0.192	0.350	0.332	0.352	0.381	0.336	0.283
FTEN	0.610	0.456	0.530	0.608	0.530	0.611	0.730
BRANCH	0.824	0.632	0.800	0.684	0.640	0.667	0.714

Panel C: descriptive statistics before and after the financial crisis

Variables	Before financial crisis		After financial crisis		Mean diff.	Pr > t	Median diff.	Pr > Z
	Mean	Median	Mean	Median				
INT	7.508	7.135	7.075	6.913	0.433	0.051	0.222	0.072
SUIT_N	0.187	0.000	0.093	0.000	0.094	0.085	0.000	0.086
SUIT_A	1.839	0.000	0.204	0.000	1.635	0.001	0.000	0.009
SURV	0.005	0.000	0.004	0.000	0.001	0.483	0.000	0.811
FIRST	0.190	0.143	0.174	0.139	0.016	0.534	0.004	0.475
NLIST	0.147	0.159	0.094	0.070	0.053	0.000	0.089	< 0.000
LEV	0.632	0.665	0.599	0.598	0.032	0.105	0.066	0.029
ROA	0.035	0.035	0.048	0.039	-0.013	0.242	-0.003	0.398
INTCOV	8.190	13.700	3.657	7.632	4.533	0.094	6.068	0.112
REC	0.315	0.309	0.362	0.358	-0.047	0.013	-0.049	0.030
AFR	0.381	0.353	0.353	0.344	0.029	0.222	0.009	0.363
SIZE	8.847	8.456	8.707	8.470	0.140	0.445	-0.014	0.682
BIG	0.107	0.000	0.070	0.000	0.037	0.410	0.000	0.411
OWN	0.310	0.178	0.332	0.206	-0.022	0.638	-0.028	0.766
FTEN	0.549	0.370	0.626	0.519	-0.077	0.279	-0.148	0.034
BRANCH	0.733	1.000	0.674	1.000	0.059	0.418	0.000	0.418

Notes: The sample size for *SUIT_A* is 155 because 6 observations do not disclose the amount of lawsuit. See the Appendix for variable definitions

Table II.
Descriptive statistics

audit engagements. The mean value of *NLIST* is 0.119, showing that approximately 12 percent of the clients of the audit firms in our sample are listed companies.

The mean value of *LEV* is 0.614 and the median is 0.631 (no significant difference). The average debt ratio is about 61 percent. The mean and median values of *ROA* are 0.042 and 0.037, respectively. This result indicates that the average *ROA* is approximately 4 percent. The mean and median values for the interest coverage ratio are 5.768 and 0.103, respectively. The mean and median values of *REC* are 0.340 and 0.341, respectively. This result indicates that on average, 34 percent of total revenue is in the form of receivables in the audit firms in our sample. The mean value of *AFR* is 0.366 and the median is 0.350, meaning that 37 percent of total revenue comes from audit fees (conversely, 63 percent of total revenue is non-audit fee revenue). The mean and median values of *SIZE* are 8.772 and 8.456, respectively, suggesting that Korean audit firms earn 6.5 billion Korean won on average (around 5.9 million US dollars), or a mean of 4.7 billion Korean won (around 4.3 million US dollars) in terms of annual sales revenues.

The mean of *BIG* is 0.087, showing that 8.7 percent of the audit firms in our sample are Big 4 firms. The mean value of *OWN* is 0.322, suggesting that CEOs possess 32 percent of the shares in their companies on average. The minimum and maximum values of *OWN* are 0.004 and 0.996, respectively, showing that a large variation exists across audit firms. The mean value of *FTEN* is 0.590, suggesting that these audit firms have operated for about eight years since their establishment. The mean value of *BRANCH* is 0.702, suggesting that about 70 percent of the sample has a branch office or offices.

Table II, Panel B, presents the descriptive statistics for the variables by year. *INT* tends to increase until 2008 and decrease after 2009. *SUIT_N* and *SUIT_A* tend to decrease after the crisis. After the crisis, *INTCOV* and *LEV* decrease while *REC* increases. This suggests that audit firms generally experienced financial difficulty after the crisis probably because of difficulty in collecting receivables from their clients. There are no significant variations in other variables over the sample period. Table II, Panel C, shows differences in the variables before and after the crisis. *INT*, *SUIT_N*, and *SUIT_A* decreased after the crisis. The base interest rates in Korea were between 2 and 3 percent after the crisis while 3-5 percent before the crisis[1].

Table III shows the Pearson correlation coefficients of our variables. The coefficients for the variables *FIRST* and *NLIST* are significantly and positively correlated with *INT*, which corresponds with our expectations. The coefficients for the variables *ROA* and *AFR* are significantly and negatively correlated with *INT*. Additionally, those for *SIZE*, *BIG*, *FTEN*, and *BRANCH* are significantly and negatively associated with *INT*. The coefficients for the variables *SUIT_N*, *SUIT_A*, *SURV*, *LEV*, *INTCOV*, *REC*, and *OWN* are not significantly correlated with *INT*. According to the results of our Pearson correlation analysis, some variables are correlated with *INT*, which corresponds with expectations. However, some are not significantly correlated with *INT*. Thus, it is necessary to conduct a multivariate analysis[2].

Regression results

We categorize the variables of interest in terms of the client portfolio, financial condition, and organizational structure of audit firms. The first column of Table IV presents the results for financial characteristics of audit firms, while the second column presents the results when both financial characteristics and organizational structure of audit firms are included in the model. Columns (3) and (4) of Table IV show the results of the full models used to test *H1* through *H14*; the results include all three categories of audit firm characteristics.

In column (3) of Table IV, values for *SUIT_N* and *SURV* are significantly and positively associated with *INT*, supporting *H1* and *H2*. Column (4) of Table IV presents the results with *SUIT_A* included instead of *SUIT_N*; the results are qualitatively the same as those in

	SUIT_N	SUIT_A	SURV	FIRST	NLIST	LEV	ROA	INTCOV	REC	AFR	SIZE	BIG	OWN	FTEN	BRANCH
<i>INT</i>	-0.007	0.064	0.113	0.286	0.158	-0.042	-0.130	-0.103	0.076	-0.170	-0.299	-0.216	0.015	-0.247	-0.361
	0.925	0.426	0.153	0.000	0.045	0.601	0.099	0.193	0.340	0.031	0.000	0.006	0.847	0.002	< 0.0001
<i>SURV_N</i>		0.758	0.069	-0.121	0.257	0.212	-0.057	0.119	-0.096	0.405	0.518	0.519	-0.255	0.469	0.062
		< 0.0001	0.381	0.127	0.001	0.007	0.473	0.134	0.226	< 0.0001	< 0.0001	< 0.0001	0.001	< 0.0001	0.437
<i>SURV_A</i>		0.043	0.043	-0.116	0.201	0.234	-0.044	0.095	-0.061	0.372	0.409	0.332	-0.195	0.335	0.009
		0.596	0.150	0.102	0.003	0.003	0.585	0.239	0.454	< 0.0001	< 0.0001	< 0.0001	0.015	< 0.0001	0.912
<i>SURV</i>				-0.147	0.197	0.119	-0.044	-0.037	-0.060	0.113	0.093	-0.036	-0.053	0.086	0.087
				0.063	0.013	0.132	0.580	0.641	0.451	0.154	0.242	0.655	0.508	0.278	0.275
<i>FIRST</i>				0.176	0.046	-0.210	0.064	0.064	-0.210	-0.223	-0.185	-0.068	0.201	-0.218	-0.244
				0.026	0.563	0.008	0.418	0.007	0.005	0.019	0.388	0.011	0.005	0.005	0.002
<i>NLIST</i>					0.024	-0.081	0.032	-0.433	0.137	0.326	0.370	0.370	-0.066	0.294	0.010
					0.762	0.306	0.684	< 0.0001	0.084	0.084	< 0.0001	< 0.0001	0.406	0.000	0.895
<i>LEV</i>						-0.276	0.164	0.164	-0.170	0.248	0.303	0.121	-0.294	0.078	0.273
						0.000	0.037	0.037	0.031	0.002	< 0.0001	0.127	0.000	0.323	0.001
<i>ROA</i>							0.019	0.019	0.037	-0.059	0.026	-0.005	0.057	-0.048	0.000
							0.814	0.814	0.640	0.459	0.744	0.951	0.469	0.546	0.997
<i>INTCOV</i>									0.037	0.099	0.033	0.055	-0.041	-0.089	0.122
									0.642	0.210	0.674	0.486	0.609	0.264	0.124
<i>REC</i>										0.099	-0.313	-0.257	0.156	-0.079	-0.192
										0.211	< 0.0001	0.001	0.049	0.322	0.015
<i>AFR</i>											0.381	0.260	-0.118	0.442	0.073
											< 0.0001	0.001	0.136	< 0.0001	0.361
<i>SIZE</i>											< 0.0001	0.811	-0.379	0.774	0.311
											< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
<i>BIG</i>												< 0.0001	-0.222	0.731	0.201
													0.005	< 0.0001	0.011
<i>OWN</i>														< 0.0001	-0.315
														< 0.0001	< 0.0001
<i>FTEN</i>															0.208
															0.008

Notes: $n = 161$. p -Values are presented below the main values for each variable. See the Appendix for variable definitions

Table III.
Pearson correlations

$$INT_t = \beta_0 + \beta_1 S_{UIT_N}(\text{or } S_{UIT_A})_{t-1} + \beta_2 SURV_{t-1} + \beta_3 FIRST_{t-1} + \beta_4 NLIST_{t-1} + \beta_5 LEV_{t-1} + \beta_6 ROA_{t-1} + \beta_7 INTCOV_{t-1} + \beta_8 REC_{t-1} + \beta_9 AFR_{t-1} + \beta_{10} SIZE_{t-1} + \beta_{11} BIG_{t-1} + \beta_{12} OWN_{t-1} + \beta_{13} FTEN_{t-1} + \beta_{14} BRANCH_{t-1} + \sum YEAR_t + \varepsilon_t$$

Variables	Expected sign	Dependent variable: INT_t			
		(1)	$S_{UIT_N}_{t-1}$ (2)	(3)	$S_{UIT_A}_{t-1}$ (4)
Intercept	+/-	9.414 (8.49)***	10.896 (6.69)***	9.542 (6.11)***	10.082 (6.27)***
$S_{UIT_N}(\text{or } A)_{t-1}$	+			0.614 (1.79)*	0.071 (1.87)*
$SURV_{t-1}$	+			31.279 (2.15)**	33.703 (2.24)**
$FIRST_{t-1}$	+			1.870 (2.05)**	2.044 (2.30)**
$NLIST_{t-1}$	+			2.928 (2.18)**	2.386 (1.78)*
LEV_{t-1}	+	0.429 (0.46)	0.907 (1.02)	0.505 (0.56)	0.361 (0.39)
ROA_{t-1}	-	-2.040 (-1.55)	-1.424 (-1.13)	-0.255 (-0.25)	-0.150 (-0.15)
$INTCOV_{t-1}$	-	-0.010 (-1.99)**	-0.007 (-1.37)	-0.010 (-1.95)*	-0.009 (-1.84)*
REC_{t-1}	+	0.586 (0.54)	0.192 (0.18)	1.918 (1.89)*	1.922 (1.93)*
AFR_{t-1}	+/-	-1.053 (-1.11)	-1.188 (-1.42)	-1.348 (-1.65)	-1.422 (-1.62)
$SIZE_{t-1}$	-	-0.298 (-2.95)***	-0.371 (-2.01)**	-0.339 (-1.96)*	-0.397 (-2.24)**
BIG_{t-1}	+/-		0.283 (0.46)	-0.039 (-0.07)	0.095 (0.16)
OWN_{t-1}	-		-1.011 (-2.88)***	-1.142 (-3.17)***	-1.255 (-3.43)***
$FTEN_{t-1}$	-		0.093 (0.24)	-0.164 (-0.48)	-0.004 (-0.01)
$BRANCH_{t-1}$	+/-		-1.081 (-4.50)***	-0.822 (-3.69)***	-0.757 (-3.34)***
Year fixed		Included	Included	Included	Included
F-value		3.11***	4.23***	5.27***	5.38***
Adjusted R^2 (%)		13.65	24.40	34.80	36.28
Sample		161	161	161	155

Table IV. Determinants of cost of debt in audit firms

Notes: t -Values are presented in parentheses and are based on standard errors adjusted for heteroskedasticity (White, 1984). See the Appendix for variable definitions. *, **, *** Significant at the 10, 5, and 1 percent levels, respectively (based on a two-tailed test)

column (3). Interest rates increase as the incidence (or total amount) of lawsuits increases. This indicates that financial institutions estimate high audit firm's default risk when the incidence (or total amount) of lawsuits increases. The positive value for $SURV$ suggests that when the proportion of firms under surveillance is high, financial institutions estimate high audit firm's default risk and demand high interest rates. Since the median value of INT is 7.000, increases in $SUIT_A$ and $SURV$ by one standard deviation increase 3.14 percent ($= 3.099 \times 0.071/7.000$) and 3.85 percent ($= 0.008 \times 33.703/7.000$) of INT , which is economically significant.

The values for the variables $FIRST$ and $NLIST$ are also significantly and positively associated with INT , supporting $H3$ and $H4$. These results indicate that financial institutions consider client portfolio characteristics when determining interest rates for audit firms. More specifically, interest rates increase as the proportion of initial audit engagements to total audit engagements ($FIRST$) increases, suggesting that the likelihood of audit failure is high for initial audit engagements. Thus, financial institutions evaluate audit firms with a high proportion of initial audit engagements to total audit engagements as having high default risk. The positive value for $NLIST$ indicates that financial institutions charge higher risk premiums when the proportion of listed clients to total audit clients is greater. This result suggests that audit firms face greater litigation risk when they have a greater proportion of listed clients compared to unlisted clients because listed clients have more stakeholders and varied stakeholders than unlisted clients.

Regarding $H5$ - $H10$, as shown in columns (3) and (4) of Table IV, the coefficients for $INTCOV$ and $SIZE$ are negative and significant at least at the 10 percent level, thereby supporting $H7$ and $H10$. These results suggest that financial institutions charge lower

interest rates when large audit firms are solvent enough to cover interest expenses using operating income, possibly because large audit firms generate stable income from auditees across various industries. The coefficient of *REC* is positive and significant at the 10 percent level, supporting *H8*. This result suggests that a high proportion of receivables to total revenue increases the likelihood of audit failure and, thus, default risk, and that financial institutions reflect this in the interest rates that they charge. However, values for the variables *LEV*, *ROA*, and *AFR* are not significantly associated with *INT*, possibly because audit firms are limited partnerships. Partnerships have different organizational structures and different operating methods in terms of risk management, performance evaluation, and compensation.

In the analysis of the organizational characteristics of audit firms, we find that *BIG* is not significantly associated with *INT*. This suggests that being one of the Big 4 does not affect default risk. Thus, interest rates charged by financial institutions are also unaffected. The coefficient of *OWN* is significantly and negatively associated with *INT*, supporting *H12*. This result suggests that when the CEOs of audit firms own lots of shares in the company, they run their firms effectively and thoroughly in order to control audit risk. This may also suggest an association between high ownership by the CEO and lower agency costs. In these firms, the default risk is estimated as low and a low interest rate is charged. Additionally, *FTEN* is not associated with *INT*. This result suggests that the age of the audit firms does not affect the interest rates. Furthermore, interest rates are significantly lower when a branch office is established separately (*BRANCH*) from the main company, supporting *H14*. This may suggest that financial institutions expect branch offices to improve operating efficiency, meet local client demands, and help create a stable income stream.

When the organizational structure, client portfolio, and financial characteristics are all included in the model, the goodness-of-fit significantly improves, as indicated by the increase in adjusted R^2 values[3].

The default risk may be affected by base interest rates over the sample period. Base interest rate is decided by the central bank of Korea as a basis of interest rates used by commercial banks. In order to control for the effect of changes in base interest rates, we run the model using adjusted weighted interest rates as the dependent variable. In particular, we utilize two variations: dividing *INT* by the base interest rate (*INT_adj1*) and subtracting the base interest rate from *INT* (*INT_adj2*). Table V presents the results of the regression analysis with the adjusted *INT*s. The results are qualitatively the same as those presented in Table IV.

The sample period includes years after the 2008 financial crisis in Korea. After the crisis, the government regulations were revised to demand changes in such governance structure as board of directors and audit committees (e.g. Choi *et al.*, 2014). We, thus, provide the results with sub-sample partitioned by before and after the financial crisis in Table VI[4]. The results show that *SUIT_N*, *SURV*, and *NLIST* become insignificant after the crisis while *FIRST*, *INTCOV*, and *REC* become more significant. We conjecture that in deciding interest rates, creditors are more concerned with *ex ante* measures of default risk rather than such *ex post* measures of default risk as lawsuits and surveillance sanctions after the crisis. In addition, *SIZE* is negatively associated with *INT* before the crisis while *SIZE* becomes insignificant after the crisis. These results together suggest that creditors use different approaches in assessing the default risk of audit firms after the crisis. Since this paper uses a very small sample to test the differences, the implications of the results are limited. While investigating underlying reasons for the differences across the variables is beyond the scope of this study, future study is needed to examine more detailed reasons for the differences with a larger sample. This study is the first one, to our knowledge, examining various audit firm characteristics that may affect *INT*.

5. Conclusion

Considering the publicity associated with audit services and the number and variety of audit report users, the ripple effect of default by audit firms is significant. Therefore, it is

$$INT_adj1(or_adj2)_t = \beta_0 + \beta_1SUIT_N(or\ SUIT_A)_{t-1} + \beta_2SURV_{t-1} + \beta_3FIRST_{t-1} + \beta_4NLIST_{t-1} + \beta_5LEV_{t-1} + \beta_6ROA_{t-1} + \beta_7INTCOV_{t-1} + \beta_8REC_{t-1} + \beta_9AFR_{t-1} + \beta_{10}SIZE_{t-1} + \beta_{11}BIG_{t-1} + \beta_{12}OWN_{t-1} + \beta_{13}FTEN_{t-1} + \beta_{14}BRANCH_{t-1} + \sum YEAR_t + \epsilon_t$$

Variables	Expected sign	Dependent variable: <i>INT_adj_t</i>			
		<i>INT_adj1_t</i> (1) <i>SUIT_N</i> _{t-1}	<i>INT_adj1_t</i> (2) <i>SUIT_A</i> _{t-1}	<i>INT_adj2_t</i> (3) <i>SUIT_N</i> _{t-1}	<i>INT_adj2_t</i> (4) <i>SUIT_A</i> _{t-1}
Intercept	+/-	2.859 (5.60)***	3.029 (5.75)***	6.292 (4.03)***	6.832 (4.25)***
<i>SUIT_N(or_A)</i> _{t-1}	+	0.258 (2.36)**	0.024 (2.17)**	0.614 (1.79)*	0.071 (1.87)*
<i>SURV</i> _{t-1}	+	8.448 (2.09)**	9.329 (2.25)**	31.279 (2.15)**	33.703 (2.24)**
<i>FIRST</i> _{t-1}	+	0.920 (2.25)**	0.974 (2.41)**	1.870 (2.05)**	2.044 (2.30)**
<i>NLIST</i> _{t-1}	+	0.867 (1.61)	0.676 (1.25)	2.928 (2.18)**	2.386 (1.78)*
<i>LEV</i> _{t-1}	+	0.045 (0.13)	0.017 (0.05)	0.505 (0.56)	0.361 (0.39)
<i>ROA</i> _{t-1}	-	0.153 (0.34)	0.189 (0.43)	-0.255 (-0.25)	-0.150 (-0.15)
<i>INTCOV</i> _{t-1}	-	-0.003 (-2.02)**	-0.003 (-1.83)*	-0.010 (-1.95)*	-0.009 (-1.84)*
<i>REC</i> _{t-1}	+	0.841 (2.40)**	0.836 (2.38)**	1.918 (1.89)*	1.922 (1.93)*
<i>AFR</i> _{t-1}	+/-	-0.531 (-1.68)	-0.546 (-1.57)	-1.348 (-1.65)	-1.422 (-1.62)
<i>SIZE</i> _{t-1}	-	-0.101 (-1.79)*	-0.120 (-2.08)**	-0.339 (-1.96)*	-0.397 (-2.24)**
<i>BIG</i> _{t-1}	+/-	-0.039 (-0.20)	0.021 (0.11)	-0.039 (-0.07)	0.095 (0.16)
<i>OWN</i> _{t-1}	-	-0.352 (-2.59)**	-0.398 (-2.81)***	-1.142 (-3.17)***	-1.255 (-3.43)***
<i>FTEN</i> _{t-1}	-	-0.026 (-0.21)	0.038 (0.32)	-0.164 (-0.48)	-0.004 (-0.01)
<i>BRANCH</i> _{t-1}	+/-	-0.261 (-3.31)***	-0.244 (-2.99)***	-0.822 (-3.69)***	-0.757 (-3.34)***
Year fixed		Included	Included	Included	Included
F-value		31.10***	30.24***	10.10***	10.11***
Adjusted R ² (%)		79.00	79.16	53.23	54.20
Sample		161	155	161	155

Table V. Determinants of cost of debt in audit firms: adjusted *INT*

Notes: *t*-Values are presented in parentheses and are based on standard errors adjusted for heteroskedasticity (White, 1984). *INT_adj1* = *INT*/base interest rate; *INT_adj2* = *INT* - base interest rate. See the Appendix for other variable definitions. *, **, ***Significant at the 10, 5, and 1 percent levels, respectively (based on a two-tailed test)

important to identify the determinants of audit firms' cost of debt. Although the cost of debt may not be directly related to the default risk of audit firms, examining the cost of debt is important because the resulting information can be useful to regulators, audit clients, and investors. Audit firms may have a significant amount of debt, which may lead to financial distress. Also, financial expenses that must be paid within a short time period increase audit firms' incentives to lowball their clients in order to increase liquidity. This practice can increase the likelihood of opinion shopping, thereby reducing audit quality. Thus, examining determinants of default in audit firms can help interested parties understand the potential risk associated with audit quality.

Prior studies report that capital market reacts negatively for those clients with Arthur Anderson when Andersen closed their business (see Krishnamurthy *et al.*, 2006). Andersen's failure also affected the audit quality of former Andersen clients (Nagy, 2005) and audit fees (Kealey *et al.*, 2007). Thus, this study provides useful implications to capital market participants including investors and regulators and adds to the literature on the effect of characteristics of a unique service industry on the cost of debt.

In this study, we examine the association between audit firm and client portfolio characteristics and the cost of debt in audit firms. Financial institutions determine the interest rates for audit firms based on their evaluation of the likelihood of default. Furthermore, interest rates reflect the risk premiums for debtors required by creditors. Risk premiums are determined based on independent evaluations by financial institutions of the debtor's ability to repay. When default risk is estimated as low (high), risk premiums are low (high); therefore, low (high) interest rates are applied.

$$INT_t = \beta_0 + \beta_1 S_{UIT_N(or_A)_{t-1}} + \beta_2 SURV_{t-1} + \beta_3 FIRST_{t-1} + \beta_4 NLIST_{t-1} + \beta_5 LEV_{t-1} + \beta_6 ROA_{t-1} + \beta_7 INTCOV_{t-1} + \beta_8 REC_{t-1} + \beta_9 AFR_{t-1} + \beta_{10} SIZE_{t-1} + \beta_{11} BIG_{t-1} + \beta_{12} OWN_{t-1} + \beta_{13} FTEN_{t-1} + \beta_{14} BRANCH_{t-1} + \sum YEAR_t + \varepsilon_t$$

Dependent variable: INT_t

Variables	Expected sign	SUIT_N_{t-1} / SUIT_A_{t-1}			
		(1) Before	(2) After	(3) Before	(4) After
Intercept	+/-	15.658 (7.44)***	5.821 (3.29)***	15.592 (7.30)***	6.115 (3.45)***
SUIT_N(or_A)_{t-1}	+	1.224 (2.35)**	0.539 (1.50)	0.094 (2.59)**	0.053 (0.48)
SURV_{t-1}	+	54.576 (3.03)**	-3.216 (-0.25)	57.230 (3.02)***	-3.019 (-0.22)
FIRST_{t-1}	+	-0.057 (-0.07)	4.140 (5.09)***	0.224 (0.30)	4.142 (4.97)***
NLIST_{t-1}	+	5.225 (2.72)**	1.315 (0.87)	4.499 (2.45)**	1.006 (0.63)
LEV_{t-1}	+	0.908 (0.80)	-0.531 (-0.39)	0.989 (0.80)	-0.323 (-0.23)
ROA_{t-1}	-	-1.667 (-1.67)	3.106 (1.03)	-1.296 (-1.26)	3.016 (0.99)
INTCOV_{t-1}	-	-0.007 (-1.14)	-0.014 (-2.21)**	-0.008 (-1.29)	-0.011 (-1.90)*
REC_{t-1}	+	1.381 (0.85)	4.219 (4.08)***	0.845 (0.53)	4.171 (4.04)***
AFR_{t-1}	+/-	-1.018 (-1.19)	-1.484 (-1.53)	-1.352 (-1.26)	-1.438 (-1.42)
SIZE_{t-1}	-	-0.883 (-3.62)***	-0.032 (-0.15)	-0.825 (-3.39)***	-0.088 (-0.38)
BIG_{t-1}	+/-	0.818 (1.05)	-1.250 (-1.60)	1.077 (1.42)	-1.209 (-1.56)
OWN_{t-1}	-	-1.829 (-3.74)***	-0.626 (-1.45)	-1.858 (-3.67)***	-0.686 (-1.53)
FTEN_{t-1}	-	-0.302 (-0.57)	0.410 (0.78)	-0.217 (-0.45)	0.648 (1.11)
BRANCH_{t-1}	+/-	-1.262 (-3.88)***	-0.407 (-1.74)*	-1.271 (-3.96)***	-0.420 (-1.78)*
Year fixed		Included	Included	Included	Included
F-value		3.92***	5.68***	3.86***	5.40***
Adjusted R ² (%)		40.12	46.84	40.97	45.87
Sample		75	86	71	84

Table VI. Additional test: before and after financial crisis

Notes: *t*-Values are presented in parentheses and are based on standard errors adjusted for heteroskedasticity (White, 1984). See the Appendix for other variable definitions. *, **, ***Significant at the 10, 5, and 1 percent levels, respectively (based on a two-tailed test)

In this study, we assess the determinants of audit firms' cost of debt from two perspectives. First, we consider the characteristics associated with clients as determinants of the cost of debt. These characteristics are more directly related to business risk in audit firms. Other determinants of this cost of debt are the financial and organizational characteristics of the audit firm.

This study provides evidence that several client portfolio and financial characteristics are significantly associated with audit firms' cost of debt, as proxied by interest rates charged by financial institutions. In particular, interest rates increase as the following factors increase: the incidence (or total amount) of lawsuits, the proportion of firms under surveillance by the FSS compared to the total number of audit clients, the proportion of initial audit engagements to total audit engagements, and the proportion of listed clients to total audit clients. Regarding financial characteristics, interest rates increase with increases in the proportion of receivables to total revenue, while interest rates decrease with increases in the interest coverage ratio and the size of the audit firm. However, no evidence is found in the study that the leverage ratio, return on assets, or the proportion of audit fees to total revenue are associated with interest rates.

In terms of the organizational structure of audit firms, we provide evidence that interest rates decrease as the extent of CEO ownership increases and for audit firms that have a local branch or branches. However, being one of the Big 4 audit firms does not affect interest rates, nor does the age of audit firms.

In this study, we examine determinants of the cost of debt, default risk assessed from the creditor's perspective. The cost of debt may not directly affect the default risk for audit

firms, but financial institutions as creditors objectively assess audit firms' default risk and determine respective interest rates for them. Thus, interest rates are a good proxy for *ex ante* default risk in audit firms. Our findings provide useful implications to regulators, clients, and investors.

Unlike prior studies on audit firms that examine the determinants of litigation using client firm-level data or proprietary data, our study utilizes public data of audit firms. Using the interest rates charged by financial institutions as a proxy for audit firm's default risk is a unique way of looking at the problem. The determinants of the cost of debt identified in this study can also help interested parties predict the insolvency or bankruptcy of audit firms. Future studies may investigate the impact of audit firm characteristics on audit quality.

Notes

1. In order to consider this structural change in the base interest rates, we provide the results using the adjusted interest rates as a robustness analysis in Table V and the results by partitioning the sample by before and after the crisis in Table IV.
2. The highest correlations are between *SIZE* and *BIG* ($\rho = 0.811$), *SIZE* and *FTEN* ($\rho = 0.774$), *BIG* and *FTEN* ($\rho = 0.731$), and *SURV_N* and *BIG* ($\rho = 0.519$). Excluding one or two of these variables does not change our findings for other variables. In fact, the omission increases the significance of other variables. The highest VIF in the regression models is 5.82, suggesting that the multicollinearity problem is not severe.
3. We find that using a firm fixed effect model in our paper generally provides similar results (not reported) to those reported in the regression tables. However, the statistical power of the models decreases due to the small sample size. Thus, the interpretation of the results is subject to limitation.
4. We also considered an indicator variable representing sample years after the financial crisis (not reported). While the indicator is negative and significant at the one percent level in the models, the results with other variables do not change our conclusion. Thus, we report only the results with year indicators in the empirical models instead of using an indicator representing the sample period after the crisis. The negative sign is consistent with the Korean Government policy that the government lowered the base interest rates after the crisis to reduce the cost of capital for Korean firms.

References

- Almeida, H. and Philippon, T. (2007), "The risk-adjusted cost of financial distress", *The Journal of Finance*, Vol. 62 No. 6, pp. 2557-2585.
- Altman, E. (1968), "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy", *The Journal of Finance*, Vol. 23 No. 4, pp. 589-609.
- Ang, J., Cole, A. and Lin, J. (2000), "Agency costs and ownership structure", *The Journal of Finance*, Vol. 55 No. 1, pp. 81-106.
- Beaver, W. (1966), "Financial ratios as predictors of failure, empirical research in accounting", *Journal of Accounting Research*, Vol. 4 No. 1, pp. 71-111.
- Bonner, S., Palmrose, Z. and Young, S. (1998), "Fraud type and auditor litigation: an analysis of SEC accounting and auditing enforcement releases", *The Accounting Review*, Vol. 73 No. 4, pp. 503-532.
- Botosan, C. and Plumlee, M. (2002), "A re-examination of disclosure level and the expected cost of equity capita", *Journal of Accounting Research*, Vol. 40 No. 1, pp. 21-40.
- Carcello, J. and Palmrose, Z. (1994), "Auditor litigation and modified reporting on bankrupt clients", *Journal of Accounting Research*, Vol. 32 No. 1, pp. 1-30.
- Casterella, J., Jensen, R. and Knechel, W. (2010), "Litigation risk and audit firm characteristics", *Auditing: A Journal of Practice & Theory*, Vol. 29 No. 2, pp. 71-82.

- Chaney, P. and Philipich, K. (2002), "Shredded reputation: the cost of audit failure", *Journal of Accounting Research*, Vol. 40 No. 4, pp. 1221-1245.
- Chen, A.H. (1978), "Recent developments in the cost of debt capital", *The Journal of Finance*, Vol. 33 No. 3, pp. 863-877.
- Choi, Y., Han, S. and Lee, S. (2014), "Audit committees, corporate governance, and shareholder wealth: evidence from Korea", *Journal of Accounting and Public Policy*, Vol. 33 No. 5, pp. 470-489.
- Davidson, R.A. and Neu, D. (1993), "A note on the association between audit firm size and audit quality", *Contemporary Accounting Research*, Vol. 9 No. 2, pp. 479-488.
- DeAngelo, L. (1981), "Auditor independence, 'low balling', and disclosure regulation", *Journal of Accounting & Economics*, Vol. 3 No. 2, pp. 113-127.
- Dopuch, N. and King, R. (1996), "The effects of lowballing on audit quality: an experimental markets study", *Journal of Accounting, Auditing & Finance*, Vol. 11 No. 1, pp. 45-68.
- Eigelbach, K. (2011), "Accounting firms' need for liability insurance increases as down economy results in unhappy clients", *Louisville Business First*, September 30, available at: www.bizjournals.com/louisville/print-edition/2011/09/30/accounting-firms-need-for-liability.html?page=all (accessed January 2, 2017).
- Ernst & Young (2011), "30th Annual report of HanYoung Accounting Firm".
- Ewert, R. (2000), "Auditor liability rules under imperfect information and costly litigation", *European Accounting Review*, Vol. 9 No. 3, pp. 371-385.
- Fama, E.F. and French, K.R. (1993), "Common risk factors in the returns on stocks and bonds", *Journal of Financial Economics*, Vol. 33 No. 1, pp. 3-56.
- Ferguson, A., Francis, J. and Stokes, D. (2003), "The Effects of firm-wide and office-level industry expertise on audit pricing", *The Accounting Review*, Vol. 78 No. 2, pp. 429-448.
- Francis, J. (2004), "What do we know about audit quality?", *The British Accounting Review*, Vol. 36 No. 1, pp. 345-368.
- Francis, J. and Simon, D. (1987), "Test of audit pricing in the small client segment of the US audit market", *The Accounting Review*, Vol. 62 No. 1, pp. 145-157.
- Francis, J.R. and Wilson, E.R. (1988), "Auditor changes: a joint test of theories relating to agency costs and auditor differentiation", *The Accounting Review*, Vol. 43 No. 4, pp. 663-682.
- Francis, J., Khurana, I. and Pereira, R. (2005), "Disclosure incentives and effects on cost of capital around the world", *The Accounting Review*, Vol. 80 No. 4, pp. 1125-1162.
- Francis, J., Reichelt, K. and Wang, D. (2005), "The pricing of national and city-specific reputations for industry expertise in the US audit market", *The Accounting Review*, Vol. 80 No. 1, pp. 113-136.
- Geiger, M. and Raghunandan, K. (2002), "Auditor tenure and audit reporting failures", *Auditing: A Journal of Practice & Theory*, Vol. 21 No. 1, pp. 67-78.
- Gul, F., Fung, S. and Jaggi, B. (2009), "Earnings quality: some evidence on the role of auditor tenure and auditors' industry expertise", *Journal of Accounting & Economics*, Vol. 47 No. 3, pp. 265-287.
- Jensen, M. and Meckling, W. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.
- Kale, J., Noe, T.H. and Ramirez, G.G. (1991), "The effect of business risk on corporate capital structure: theory and evidence", *Journal of Finance*, Vol. 46 No. 5, pp. 1693-1715.
- Kaplan, S. and Williams, D. (2013), "Do going concern audit reports protect auditors from litigation? A simultaneous equation approach", *The Accounting Review*, Vol. 38 No. 1, pp. 199-232.
- Kealey, B., Lee, H.-Y. and Stein, M. (2007), "The association between audit-firm tenure and audit fees paid to successor auditors: evidence from Arthur Andersen", *Auditing: A Journal of Practice & Theory*, Vol. 26 No. 2, pp. 95-116.
- Krishnamurthy, S., Zhou, J. and Zhou, N. (2006), "Auditor reputation, auditor independence, and the stock-market impact of Anderson's indictment on its client firms", *Contemporary Accounting Research*, Vol. 23 No. 2, pp. 465-490.

- Lawrence, A., Minutti-Meza, M. and Zhang, P. (2011), "Can Big 4 versus non-Big 4 differences in audit quality proxies be attributed to client characteristics?", *The Accounting Review*, Vol. 86 No. 1, pp. 259-286.
- Lee, C. and Gu, J. (1998), "Low balling, legal liability and auditor independence", *The Accounting Review*, Vol. 73 No. 4, pp. 533-555.
- Linville, M. and Thornton, J. (2001), "Litigation risk factors as identified by malpractice insurance carriers", *Journal of Applied Business Research*, Vol. 17 No. 4, pp. 93-105.
- Longstaff, F.A., Mithal, S. and Neis, E. (2005), "Corporate yield spreads: default risk or liquidity? New evidence from the credit default swap market", *The Journal of Finance*, Vol. 60 No. 5, pp. 2213-2253.
- Lys, T. and Watts, R. (1994), "Lawsuits against auditors", *Journal of Accounting Research*, Vol. 32 No. S1, pp. 65-93.
- Magee, R. and Tseng, M. (1990), "Audit pricing and independence", *The Accounting Review*, Vol. 65 No. 2, pp. 315-336.
- Majoor, S. and Vanstraelen, A. (2012), "Research opportunities in auditing in the EU revisited", *Auditing: A Journal of Practice & Theory*, Vol. 31 No. 1, pp. 115-126.
- Mansi, S., Maxwell, W. and Zhang, A. (2012), "Bankruptcy prediction models and the cost of debt", *The Journal of Fixed Income*, Vol. 21 No. 4, pp. 25-42.
- Minutti-Meza, M. (2013), "Does auditor industry specialization improve audit quality?", *Journal of Accounting Research*, Vol. 51 No. 4, pp. 779-817.
- Nagy, A. (2005), "Mandatory audit firm turnover, financial reporting quality, and client bargaining power: the case of Arthur Anderson", *Accounting Horizon*, Vol. 19 No. 2, pp. 51-68.
- Ohlson, J. (1980), "Financial ratios and the probabilistic prediction of bankruptcy", *Journal of Accounting Research*, Vol. 18 No. 1, pp. 109-131.
- Palmrose, Z. (1988), "An analysis of auditor litigation and audit service quality", *The Accounting Review*, Vol. 63 No. 1, pp. 55-73.
- Reichelt, K. and Wang, D. (2010), "National and office-specific measures of auditor industry expertise and effects on audit quality", *Journal of Accounting Research*, Vol. 48 No. 3, pp. 647-686.
- Reynolds, K. and Francis, J. (2000), "Does size matter? The influence of large clients on office level auditor reporting decisions", *Journal of Accounting and Economics*, Vol. 30 No. 3, pp. 375-400.
- Schultz, J. and Gustavson, S. (1978), "Actuaries' perceptions of variables affecting the independent auditor's legal liability", *The Accounting Review*, Vol. 53 No. 3, pp. 624-641.
- Shu, S. (2000), "Auditor resignations: clientele effects and legal liability", *Journal of Accounting and Economics*, Vol. 29 No. 2, pp. 173-205.
- Stice, J. (1991), "Using financial and market information to identify pre-engagement factors associated with lawsuits against auditors", *The Accounting Review*, Vol. 66 No. 3, pp. 516-534.
- St Pierre, K. and Anderson, J. (1984), "An analysis of the factors associated with lawsuits against public accountants", *The Accounting Review*, Vol. 59 No. 2, pp. 242-263.
- Swanger, S. and Chewning, E. (2001), "The effect of internal audit outsourcing on financial analysts' perceptions of external auditor independence", *Auditing: A Journal of Practice & Theory*, Vol. 20 No. 2, pp. 115-129.
- Teoh, S.H. and Wong, T.J. (1993), "Perceived auditor quality and the earnings response coefficient", *The Accounting Review*, Vol. 68 No. 2, pp. 346-366.
- Van Binsbergen, J.H., Graham, J.R. and Yang, J. (2010), "The cost of debt", *The Journal of Finance*, Vol. 65 No. 6, pp. 2089-2136.
- White, H. (1984), *Asymptotic Theory for Econometricians*, Academic Press, Orlando, FL.
- Ziebart, D. and Reiter, S. (1992), "Bond ratings, bond yields and financial information", *Contemporary Accounting Research*, Vol. 9 No. 1, pp. 252-282.

Appendix. Variable definitions

INT_t is the weighted average interest rate in year t of an audit firm:

$$\frac{\sum_{j=1}^{Jik} [\text{Audit firm } j\text{'s interest rate } i \text{ on each borrowing} \times \text{final balance } k \text{ of each borrowing}]}{\text{Total borrowing of audit firm } J};$$

$SUIT_N_{t-1}$ the 1 if an audit firm faces a lawsuit in year $t-1$ or $t-2$, otherwise 0; $SUIT_A_{t-1}$ the natural logarithm of the amount of lawsuits in year $t-1$ or $t-2$; $SURV_{t-1}$ the number of audit clients under surveillance in year $t-1$ or $t-2$ /the number of audit clients in year $t-1$; $FIRST_{t-1}$ the proportion of initial audit engagements to total audit clients (the number of initial audit clients in year $t-1$ /the total number of audit clients in year $t-1$); $NLIST_{t-1}$ the proportion of listed companies among audit clients to total audit clients (the number of listed companies among audit clients in year $t-1$ /the total number of audit clients in year $t-1$); LEV_{t-1} the debt ratio in year $t-1$ (total debts/total assets); ROA_{t-1} the net income in year $t-1$ /total assets in year $t-1$; $INTCOV_{t-1}$ the [operating income in year $t-1$ /total interest expenses in year $t-1$]/100; REC_{t-1} the accounts and notes receivable in year $t-1$ /total revenue in year $t-1$; AFR_{t-1} the audit fee revenue in year $t-1$ / total revenue in year $t-1$; $SIZE_{t-1}$ the natural logarithm of total revenue in year $t-1$; BIG_{t-1} the 1 if an audit firm is one of the Big 4 audit firms in year $t-1$, otherwise 0; OWN_{t-1} the ownership percentage of audit firm's CEO; $FTEN_{t-1}$ the number of years after the establishment of the audit firm scaled by the sample mean value (i.e. 13.5) of audit firm years; and $BRANCH_{t-1} = 1$ if an audit firm has a local office(s), otherwise 0.

Corresponding author

Ho-Young Lee can be contacted at: hylee@yonsei.ac.kr

This article has been cited by:

1. LeeHongbok, Hongbok Lee, ParkKwangwoo, Kwangwoo Park. 2018. Introduction to the special issue on the Korean financial markets. *Managerial Finance* 44:1, 2-4. [[Citation](#)] [[Full Text](#)] [[PDF](#)]