Voluntary Audits and the Cost of Debt Capital for Privately Held Firms: Korean Evidence*

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1. Introduction

Since DeAngelo (1981) and Dopuch and Simunic (1980) first argued that the market for audit services is characterized by quality-differentiated suppliers, many studies have investigated the value of large (currently Big 4) audits versus non–Big 4 audits in various contexts and documented that large auditors provide higher audit quality than non–Big 4 auditors.[1] These studies have typically relied upon samples of publicly traded companies in various countries that are subject to statutory audit requirements and compared the implications of hypothesized differences in audit quality between Big 4 and non–Big 4 audit firms. While this line of research provides evidence on quality differentiation between classes of audit firms, there is very little empirical evidence on the value of an external audit per se, a gap we address in this study using a large sample of private Korean companies.

The Korean environment provides a useful setting in which to examine the economic value of an external audit for several reasons. First, to assess the value of an external audit

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1. In particular, the literature finds that an audit by the Big 4 — the largest, most prestigious audit firms — leads to lower litigation rates (Palmrose 1988), less initial public offering (IPO) underpricing (Beatty 1989), fewer accounting errors and irregularities (DeFond and Jiambalvo 1991), stronger return–earnings relations (Teoh and Wong 1993), less opportunistic earnings management (Becker, DeFond, Jiambalvo, and Subramanyam 1998; Kim, Chung, and Firth 2003; Lee, O'Keefe, and Stein 2003), higher market valuation during the Asian financial crisis (Mitton 2002), greater predictive ability of pre-IPO audit opinions (Weber and Willenborg 2003), more timely recognition of economic loss (Chung, Firth, and Kim 2003), better credit ratings and lower bond yields (Mansi, Maxwell, and Miller 2004), lower interest rates on the firm's debt (Pittman and Fortin 2004), and lower stock price synchronicity (Gul, Kim, and Qiu 2010). In contrast, a recent study by Fortin and Pittman 2007 finds that there is no significant difference in yield spreads or credit ratings on 144A bonds issued by U.S. private companies, suggesting that auditor quality differentiation between Big 4 and non–Big 4 auditors plays no significant role in debt pricing in private companies.

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per se, researchers must observe a similar no-audit case as the reference point of comparison. However, the no-audit base case is not available for the usual sample of public companies, because all publicly traded companies are subject to the statutory requirement of mandatory external audits.[2] In Korea, however, the no-audit base case is available for privately held companies. Currently, private Korean companies with total assets of less than 7 billion South Korean won (about U.S. $7 million) are not required to have their financial statements audited by independent auditors. Nevertheless, some private companies voluntarily purchase external audit services. As a result, we observe three distinct groups of privately held companies: small companies with no audit, small companies with voluntary audits, and large companies with mandatory audits.

Second, private Korean companies rely heavily on bank financing. The majority of short- and long-term debt and interest expenses reported in a private Korean company's financial statements represents the amount of borrowings from commercial banks and other private lenders and associated interest expenses, respectively. This allows us to approximate the interest rate on borrowing for each company, using the ratio of aggregate interest expenses to the average of short- and long-term debt during the year.[3] Finally, Korea is one of the few countries (of which we are aware) for which detailed financial statement data are publicly available for a large sample of privately held companies.

Using this unique setting, we aim to provide systematic evidence on the value of an external audit per se in the pricing of private debt. Our primary objective is to investigate whether voluntary audits by independent auditors are associated with a reduction in the interest rate on the company's debt. For this purpose, we construct a sample of private Korean companies over the 16-year period of 1987–2002, which includes 1997, the year in which the Asian (and Korean) financial crisis took place.[4] We then assess the interest rate differentials between private companies with voluntary audits and those with no audit, after controlling for other relevant factors that are known to affect the borrowers' credit quality. Next, for the sample of private companies with voluntary audits, we also investigate whether voluntary audits by Big 4 auditors are associated with lower borrowing costs than those by non–Big 4 auditors. Finally, we investigate whether a *change* in the audit engagement status from being unaudited to being audited leads to a decrease in the interest rate on debt, after controlling for other changes in company characteristics.

Briefly, we find that private companies with voluntary audits pay significantly lower interest rates on their debt than do private companies with no audit. The results of our regressions show that the average interest cost savings from a voluntary audit range from about 56 to 124 basis points for the full sample (Table 4) and from about 16 to 36 basis points for the reduced sample (Table 5), depending on the regression method used, and these amounts are economically significant. We also find that the appointment of a Big 4 auditor does not lead to a greater reduction in the interest cost of borrowing, compared with the appointment of non–Big 4 auditors. This result is consistent with the view that

2. This is a major reason why previous auditing research using a sample of public companies has focused on examining differences in audit quality for Big 4–audited companies using non–Big 4–audited companies as a benchmark, rather than differences in economic effects between audited and unaudited companies. To our knowledge, Chow (1982) was the first to pay attention to external audits per se. Unlike our study, however, he focused on the factors determining the demand for external audits, and not the economic consequences or value of external audits. He used a sample of 165 firms in 1926, that is, in the period prior to the enactment of the U.S. Securities Acts in 1933 and 1934, and thus his sample firms were not subject to the statutory audit requirement.
3. In Korea, private companies are not allowed to issue corporate bonds to arm's-length investors in the public bond market.
4. Our sample period ends in 2002 because the database to which we have access provides the data only up to 2002.

what matters more to banks and other private lenders is audit presence (audit versus no audit) rather than auditor choice (Big 4 versus non–Big 4).

Using a sample of companies that changed their audit status, for the first time, from no audit to either a voluntary or a mandatory audit, we also find that such initial audits lead to a significant reduction in the interest rate on debt. Consistent with the findings of cross-sectional, levels-based regressions, the results of our changes-based regressions also show that the appointment of Big 4 auditors does not lead to greater interest cost savings than the appointment of non–Big 4 auditors. Furthermore, we provide new evidence that the engagement status change from no audit to a voluntary audit yields greater interest cost savings than the change from no audit to a mandatory audit, suggesting that the former enhances the credibility of audited financial statements more than the latter. Finally, we provide evidence suggesting that voluntary audits play a more important role in helping credit stakeholders overcome information uncertainty about the borrower in the post-crisis period of 1997–2002, compared with the same role in the pre-crisis period of 1987–1996. This evidence supports the view that the improved institutional infrastructure during the post-crisis period reinforces the value of an external audit per se.

Our study adds to the existing literature in the following ways: First, examining the impact of an external audit for privately held companies on the interest rate on debt is an interesting and important pursuit in its own right. Privately held companies constitute a major portion of any free-market economy, and private debts such as bank loans are the most important source of external financing in virtually all countries, including the United States (Cole, Wolken, and Woodburn 1996; Ang, Cole, and Lin 2000; Graham, Li, and Qiu 2008; Kim, Song, and Zhang 2009; Kim, Tsui, and Yi Forthcoming). Nevertheless, previous research has paid little attention to the role of an external audit for private companies and its effect on the cost of private debt. For example, Fortin and Pittman (2007) examine the role of Big 4 versus non–Big 4 auditor choice by private U.S. companies in pricing public bonds issued to qualified institutional buyers under U.S. Securities and Exchange Commission (SEC) Rule 144A and find no significant difference in the bond yield spread or credit rating between Big 4 and non–Big 4 client companies.[5] However, their samples are all subject to the statutory audit requirement, and their focus is not on the value of being audited compared to being unaudited but, rather, on audit quality differentiation between Big 4 and non–Big 4 auditors. Given the scarcity of evidence on the issue, our results provide useful insights into the role of an external audit in private debt pricing in a *voluntary* audit environment.

Second, our study complements and extends Blackwell, Noland, and Winters 1998, who investigated the economic value of voluntary audits using a small sample of privately held companies. To our knowledge, their study is the only study that has investigated the value of an external audit per se in the credit market using archival data.[6] The authors examined a sample of 212 revolving credit arrangements or loan commitments with six banks from two bank holding companies located within a single state in the United States in 1988. Their essential finding was that providing audited financial statements to bankers (as opposed to auditor-reviewed, auditor-compiled, or management-prepared financial statements) was associated with a reduction of 25 basis points in the interest rate charged. However, their results could have been influenced by specific loan commitment policies

5. Chaney, Jeter, and Shivakumar (2004) examine the impact of auditor choice on audit fees using a sample of private U.K. companies and find no significant audit fee premium for Big 4 auditors. To the extent that audit fees reflect audit quality, their finding suggests no audit quality differentiation between Big 4 and non–Big 4 auditors for their sample of privately held companies.

6. Johnson, Pany, and White (1983) provide experimental evidence suggesting that auditor association is not a significant factor affecting interest rates on loans.

idiosyncratic to the two bank holding companies and may thus be limited in generalizing to different situations. Our study complements that of Blackwell et al. by using a large cross-sectional sample of privately held companies that have financial transactions with a variety of private lenders, including commercial banks called city banks, development banks, investment banks, saving institutions, insurance companies, and other private lenders. Our study also extends that of Blackwell et al. by testing whether the value of voluntary audits varies with auditor quality (Big 4 versus non–Big 4), an issue that their study does not examine. Unlike their study, which used data from a single sample year, that is, 1988, our study covers the 16-year period of 1987–2002, which allows us to conduct change analyses.

Finally, we confirm our cross-sectional results by examining a sample of companies that change their engagement status from being unaudited to being audited and find that being audited results in a significant reduction in the interest rate paid. The findings of our change analyses lend further support to the view that, when assessing borrowers' credit quality, banks and other private lenders take into account whether financial statements are audited or not. Furthermore, our change analyses also provide evidence suggesting that voluntary audits are better able to enhance the credibility of audited financial statements than mandatory audits in the market for private debts such as bank loans. To our knowledge, our study is the first to provide systematic evidence on this issue.

The remainder of the paper is organized as follows. In section 2, we provide a brief description of the financial reporting and auditing environment in Korea and develop our research hypotheses. Section 3 describes our sample and data sources and reports descriptive statistics on major variables and the results of univariate tests. Section 4 explains our empirical procedures and presents our empirical results. Section 5 discusses the results of our change analyses. The final section, section 6, presents our conclusions.

2. Institutional environments and hypothesis development

Financial reporting and auditing environments in Korea

In Korea, all incorporated companies with limited liability, whether their shares are publicly traded or privately held, are required to produce financial statements using Corporate Accounting Standards promulgated by the Ministry of Finance and Economy.[7] In addition, all listed companies are required to provide additional disclosures (e.g., information on ownership structures, related party transactions, and consolidated or combined financial statements) in their annual reports in accordance with the Securities and Exchange Act. All incorporated companies in Korea, whether private or public, are subject to the same tax laws.

Statutory audits of financial statements are regulated by the Act on External Auditing (AEA), first enacted in 1980. Under the AEA, all listed companies are required to have their annual financial statements audited by independent certified public accountants (CPAs).[8] This requirement also applies to all limited liability incorporated companies if a company's total assets at the beginning of the fiscal year exceed 7 billion Korean won or if more than 50 percent of total outstanding shares are held by local governments.[9] While

7. Since 2000, the authority of establishing accounting standards has been delegated to the Korea Accounting Standards Board, an independent professional private organization established by agreement between the Korean government and the International Bank of Reconstruction and Development.
8. The Korean Institute of Certified Public Accountants had 5,309 CPAs registered in 2000. In addition, 32 audit firms were practicing in South Korea as of 2000, with several of these having a member firm relationship with international public accounting firms, including the Big 4. In addition to the provision of audit services, audit firms in Korea provide various nonaudit services, including tax, information technology, innovation, valuation, and other management consulting and advisory services. For a more detailed discussion of the auditing environment in Korea, see Kim and Yi 2009.
9. During our sample period, the regulatory limit with respect to firm size increased from 4 billion to 7 billion Korean won.

companies below these thresholds are not subject to the AEA requirement, some private companies voluntarily purchase financial statement audits by CPAs. The discretionary nature of these audits implies that the benefits are greater than the costs. Consequently, the Korean regulatory environment provides an interesting research setting with three distinct samples of private companies: those with no audit, those with a voluntary audit, and those with a mandatory audit.

Extant research and hypothesis development

Previous research provides evidence that the demand for accounting information differs significantly between publicly traded and privately held companies (e.g., Ball and Shivakumar 2005; Beatty, Ke, and Petroni 2002; Peek, Cuijpers, and Buijink 2006). When compared with public companies, ownership in private companies tends to be concentrated in the hands of a small number of large shareholders, and agency conflicts among stakeholders are more likely to be resolved via private channels (Ang et al. 2000; Kim and Yi 2006). Shareholders of private companies are more directly involved in monitoring business operations, and thus have more informational advantages, compared with the more widely dispersed, arm's-length shareholders of public companies. Information asymmetries between corporate insiders and outsiders are lower for private companies than for public companies. For private companies, the demand for external audits arises mainly from the need for debt contracting with banks and other private lenders, not from the need for equity financing from arm's-length investors in the stock market.

When no statutory audit is required, a firm's decision to have external audits can be viewed as a voluntary commitment to a better reporting strategy that improves the credibility and quality of financial statements. This commitment is credible because voluntary audits involve nontrivial costs to the company, such as audit fees, and potential losses of proprietary information. A credible commitment via voluntary audits is of information value to outside stakeholders (Diamond and Verrecchia 1991; Leuz and Verrecchia 2000). In the context of debt contracting, voluntary audits may thus alleviate ex ante information uncertainty faced by banks and other private lenders and reduce ex post debt monitoring and renegotiation costs, thereby facilitating debt contracting (Jensen and Meckling 1976; Blackwell et al. 1998; Bharath, Sunder, and Sunder 2008; Kim et al. 2009; Kim et al. Forthcoming). Further, Fan and Wong (2005) provide evidence suggesting that in East Asia external auditors play an important role in monitoring agency problems. One may therefore expect that private companies that voluntarily decide to have their financial statements audited by independent auditors enjoy a lower interest rate on debt compared with those with no audit. In this paper, we call this view the *information perspective*.

On the other hand, one may argue that external audits, whether voluntary or mandatory, play at best a limited role in the lending market, compared with their role in the equity or bond market, for the following reasons. Private Korean companies rely heavily on bank loans, because they have no access to the stock market for external financing and are not allowed to issue public bonds to arm's-length investors. In bank-centered economies such as Korea, banks may play a special role in monitoring the business operations and performance of private companies on behalf of nonmanaging shareholders. Banks also provide management consulting and/or advisory services to their client companies.[10] In Korea, when a client company faces financial distress, the bank oftentimes appoints, and

10. The relationship banking literature examines the benefits and costs of close relationships between banks and client firms. Two earlier studies that examine the benefits and costs of relationship banking are Diamond 1991 and Rajan 1992. For more recent research on the issue from the bank's perspective, see Bharath et al. 2008 and Kim et al. 2009.

dispatches, its representatives to the private company's board as directors to help restructure the company's business (Bae, Kang, and Lim 2002). The relationship banking literature suggests that the close relationship between private companies and banks facilitates informal information flow between the two parties via direct communication (Fama 1985; Rajan 1992; Denis and Mihov 2003). More specifically, compared with arms-length investors in the equity and bond markets, banks and other private lenders have an advantage in gaining access to private information and have the superior ability to collect and process both private and public information useful in mitigating pre-contract uncertainty and post-contract monitoring problems (Bharath et al. 2008; Graham et al. 2008; Kim et al. 2009). Banks may thus be able to overcome information problems associated with poor-quality financial reporting at a relatively low cost. This suggests that the information role of external audits is of second-order importance. Banks may even engage in proprietary information production, particularly because, unlike arm's-length investors in the public debt markets, banks are not faced with free-rider problems (Diamond 1991; Rajan 1992).[11] The above arguments, taken together, suggest that direct communication via informal channels may be more important than indirect communication via audited financial statements in resolving information problems faced by banks. In such a case, external audits may play an insignificant role or at best a limited role in mitigating lenders' information problems (and thus reducing the interest cost of borrowing). We call this view the *relationship banking perspective*.

Given the two conflicting perspectives on the information role of external audits in the pricing of private debt, the information value of external audits per se is an empirical issue. To provide empirical evidence on this issue, we test the following hypothesis in an alternative form:

HYPOTHESIS 1. *The interest rate on debt is lower for private companies with voluntary audits than for those with no audit, all else being equal.*

Using a measure of the interest rate on debt similar to that employed in this study, Pittman and Fortin (2004) report that the interest rate is significantly lower for *public* companies with Big 4 auditors than for public companies that use non–Big 4 auditors. Their results suggest that retaining a Big 4 auditor enhances the credibility of financial statements and reduces ex ante information uncertainty and ex post debt monitoring costs. Because the demand for external audits could differ between private and public companies, it is uncertain whether Pittman and Fortin's finding using a sample of public companies generalizes to a sample of *private* companies in a different country and therefore in a different audit environment.[12]

Bharath et al. (2008) discuss the nontrivial institutional differences between public and private debt and note that in the public debt market audited financial statements play an important role in the ex post monitoring of borrowers' credit quality. Mansi et al. (2004) and Fortin and Pittman (2007) explicitly control for the informational role of external audits in their studies of the impact of auditor choices on the pricing of bonds issued by

11. In public debt markets, arm's-length debt holders have little incentive to produce proprietary information owing to free-rider problems (Diamond 1984, 1991).

12. Because during our sample period external auditors in Korea provided little or no insurance value to private companies, the use of Korean data also allows us to make a cleaner inference on the differences in the information value between Big 4 and non–Big 4 audits. Evidence on audit quality differentiation between Big 4 and non–Big 4 auditors for Korean listed firms is mixed. Mitton's (2002) study of five East Asian countries, including Korea, shows that firms with higher disclosure quality, proxied by Big 6 auditors, had better stock price performance during the Asian financial crisis. However, Jeong and Rho (2004) find no significant difference in discretionary accruals between Big 4 and non–Big 4 auditor clients.

public companies and private companies via private placements under SEC Rule 144A, respectively. Mansi et al. find that the yield spreads of public bonds are significantly lower for Big 4 clients than for non–Big 4 clients even after controlling for the information role of external audit, a result they attribute to the difference in the insurance role between Big 4 and non–Big 4 auditors.[13] However, Fortin and Pittman provide evidence that retaining Big 4 auditors does not lead to a significant reduction in the yield spread of Rule 144A bonds. In short, empirical evidence on auditor quality differentiation in the debt market is at best mixed. We therefore address the following question: To what extent does auditor quality matter in the pricing of private debt owned by private companies? Given the mixed evidence on the role of auditor quality in debt pricing, we formulate our second hypothesis in an alternative form with no directional prediction:

HYPOTHESIS 2. *For private companies with a voluntary audit, the interest rate on debt differs systematically between Big 4–audited companies and non–Big 4–audited companies, all else being equal.*

3. Sample, descriptive statistics, and univariate tests

Sample and data sources

The initial sample for this study consists of all privately held companies that are included in the KIS-DATA database, developed by the largest credit rating agency in Korea, Korea Investors Services, a recent affiliate of Moody's Investors Services. This database includes financial statement data on most limited liability companies that were incorporated in Korea since the early 1980s, regardless of their listing status. Our sample period covers the 16-year period from 1987 to 2002. We include only those companies that never went public. We exclude companies in the financial services industry (commercial banking, private credit services, investment brokerage, insurance, etc.) from the sample because the nature of their accounting reports differs from that of reports in other industries. We also exclude all companies required by the AEA to obtain mandatory external audits. Included in our sample are private companies with no audit and those with voluntary audits. We also exclude companies that have insufficient data to measure the variables included in our regression model. To alleviate potential outlier problems, we winsorize all continuous variables at the 1st and 99th percentiles.[14]

As outlined in panel A of Table 1, after applying the above selection criteria we obtain a total of 72,577 firm–year observations over the 1987–2002 period, of which 69,661 have no audit and 2,916 have voluntary audits. It is interesting to note that the number of observations with no audit increases substantially over the 16-year period, with some decreases observed in 1988, 2000, and 2002, while the number of observations with voluntary audits fluctuates in the period up to 1998 and then monotonically increases during the post-crisis period of 1999–2001. Panel B of Table 1 provides information about the distribution of our sample across different industries, where industries are classified using

13. Mansi et al. (2004) also provide evidence that Big 4 audits provide a greater information role than non–Big 4 audits in that the former improve credit rating of auditees to a greater extent than the latter.

14. With respect to our dependent variable, *Interest Rate Spread*, we also consider several alternative procedures to examine the robustness of our results. We consider the following alternative procedures: (1) observations in the top and bottom 5 percent of the distribution for *Interest Rate Spread* are deleted, (2) observations in the top and bottom 1 percent of the distribution for *Interest Rate Spread* are deleted, and (3) observations are winsorized at the 5th and 95th percentiles. While applying these procedures led to some observations with a negative *Interest Rate Spread* or *Interest Rate Spread* greater than 1,000 basis points being included in the sample, all of these alternative procedures produced qualitatively similar results to those reported in the paper.

TABLE 1
Distribution of samples by year and industry

Panel A: Sample distribution by year

Year	Voluntary audit sample	Unaudited sample
1987	184	188
1988	158	135
1989	38	203
1990	99	345
1991	62	356
1992	31	364
1993	155	635
1994	91	833
1995	75	1,200
1996	43	3,973
1997	120	7,779
1998	82	10,801
1999	257	11,347
2000	469	10,408
2001	568	11,169
2002	484	9,925
Firm-years	2,916	69,661

Panel B: Sample distribution by industry

	Unaudited sample (N = 69,661)		VAudit sample (N = 2,916)	
Industry	No.	%	No.	%
Agriculture, Food, and Beverages	1,895	2.72	89	3.05
Textile and Apparel	2,060	2.98	156	5.35
Paper and Wood	1,728	2.48	96	3.29
Chemicals	3,048	4.38	237	8.13
Medical Supplies	229	0.33	39	1.34
Non-Metallic	2,094	3.01	64	2.19
Iron and Metals	4,697	6.74	132	4.53
Machinery	8,857	12.72	270	9.26
Electrical and Electronic Equipments	5,994	8.60	523	17.94
Medical and Precision Machines	1,655	2.38	136	4.66
Transport Equipment	2,226	3.20	96	3.29
Other Manufacture	1,556	2.23	60	2.06
Distribution	8,865	12.73	230	7.89
Electricity and Gas	30	0.04	4	0.14
Construction	17,638	25.32	171	5.86
Transport and Storage	2,369	3.40	72	2.47
Communication	62	0.09	32	1.10
Services	4,658	6.69	509	17.46
Total	69,661	100	2,916	100

the two-digit Korea Standard Industry Classification (KSIC). While our sample companies are widely dispersed across different industries, we note that unaudited (audited) observations are highly concentrated in the construction, distribution, and machinery (electrical and electronic equipments and services) industries.

Descriptive statistics

Panel A of Table 2 presents descriptive statistics for our full sample of 72,577 firm-year observations over the 16-year sample period of 1987–2002. The definitions of all the variables in the table are provided in the Appendix. The mean (median) *Interest Rate Spread* is about 2.40 (1.66 percent), with a relatively large standard deviation of 5.76 percent,[15] suggesting that the variable is skewed. On average, the financial statements of 4.0 percent of the companies in the sample are audited voluntarily by external auditors. The *Size* variable has a mean (median) of 14.48 (14.46), with a relatively small standard deviation of 0.97. This small variation in firm size is not surprising, given that our sample consists of relatively small privately held companies. The mean and median values of profit margin (*Profitability*), measured by income before extraordinary items (but after interest expenses) divided by sales, are 1.7 percent and 2.1 percent, respectively, suggesting that private Korean companies experienced a low profit margin during the sample period. The financial leverage of the companies is relatively high, with debt amounting to 71.7 percent of total assets, which is consistent with our expectations that debt financing is important to small, privately held Korean firms. Our sample firms have a relatively low level of tangible assets (about 26 percent of total assets) and experienced a significant growth in sales, with a growth rate of about 35 percent. Finally, on average, about 2.7 percent of private companies in our sample had negative equity during the sample period.

Panel B of Table 2 reports the Pearson correlation coefficients. While only suggestive of the underlying relationships among our research variables, these correlations appear to be reasonable. For example, the correlation between *Interest Rate Spread* and the *VAudit* dummy (which is an indicator variable that equals 1 for companies with voluntary audits and 0 otherwise) is −0.024, and the correlation is highly significant. This suggests that companies with external audits are likely to have lower borrowing costs. Consistent with our expectations, *Interest Rate Spread* is negatively correlated with *Size*, suggesting that banks perceive larger firms to be less risky. However, this negative correlation contrasts with the U.S. findings of Pittman and Fortin 2004, who report a positive correlation between their measure of interest rate and firm size. In our case, *Interest Rate Spread* is negatively correlated with *Tangible,* while it is positively correlated with *Leverage* and *Negative Equity Dummy*. All of these relations seem reasonable and are consistent with our expectation that the interest cost of borrowing increases with the degree of credit risk assessed by lenders. We find, however, that *Interest Rate Spread* is insignificantly correlated with *Profitability* and *Sales Growth* at conventional significance levels. Correlations among our explanatory variables appear to be reasonable as well: The highest correlation, 0.327, is observed between *Leverage* and *Negative Equity Dummy*, suggesting that multicollinearity is not a concern in our regression analyses.

15. During the 16-year sample period of 1987–2002, the mean (annual) prime rate in Korea ranged from a low of 6.17 percent in 2002 to a high of 15.24 percent in 1998. The mean (annual) prime rate was over 10 percent in the pre-crisis period of 1987–1996 (in the range of 10.39–11.87 percent), with the exception of it being 9.54 percent in 1993, and it was 11.87 percent and 15.24 percent during the crisis years of 1997 and 1998, respectively. During the post-crisis period, the prime rate dropped continuously: It was 9.28 percent, 8.75 percent, 7.69 percent, and 6.17 percent in 1999, 2000, 2001, and 2002, respectively.

TABLE 2
Descriptive statistics for the full sample

Panel A: Distributional properties (N = 72,577)

Variable	Mean	Std. Dev.	Q1	Median	Q3
Interest Rate Spread	2.403	5.761	−1.203	1.662	5.167
VAudit	0.040	0.196	0	0	1
Size	14.484	0.973	13.670	14.469	15.186
Profitability	0.017	0.067	0.010	0.021	0.038
Leverage	0.717	0.251	0.558	0.736	0.871
Tangible	0.258	0.223	0.063	0.194	0.413
Sales Growth	0.352	0.877	−0.094	0.137	0.485
Negative Equity Dummy	0.027	0.164	0	0	1

Panel B: Pearson correlation matrix (N = 72,577)

Variable	*Spread*	*VAudit*	*Size*	*Profit*	*Lev*	*Tan*	*SG*	*NED*
Interest Rate Spread (Spread)	1.00							
VAudit	−0.024 (0.000)	1.00						
Size	−0.012 (0.000)	0.220 (0.000)	1.00					
Profitability (Profit)	0.001 (0.660)	−0.020 (0.000)	0.055 (0.000)	1.00				
Leverage (Lev)	0.036 (0.000)	0.034 (0.000)	0.218 (0.000)	−0.194 (0.000)	1.00			
Tangible (Tan)	−0.132 (0.000)	0.024 (0.000)	0.257 (0.000)	−0.076 (0.000)	0.215 (0.152)	1.00		
Sales Growth (SG)	−0.003 (0.368)	0.069 (0.000)	−0.023 (0.000)	0.095 (0.000)	0.142 (0.000)	−0.014 (0.029)	1.00	
Negative Equity Dummy (NED)	0.042 (0.000)	0.035 (0.000)	−0.069 (0.000)	−0.315 (0.000)	0.327 (0.000)	0.076 (0.000)	−0.010 (0.004)	1.00

Note:

Numbers in parentheses are p-values.

Univariate tests

In panel A of Table 3, we split our full sample (N = 72,577) into two subsamples of firm-years with no audit (N = 69,661) and those with voluntary audits (N = 2,916). As shown in the first row of the panel, the interest rate spread is significantly lower for the *VAudit* sample than for the unaudited sample, which is consistent with Hypothesis 1. The results of both t-tests and Wilcoxon z-tests clearly indicate that both the mean and median of most other variables also differ significantly between the unaudited sample and the *VAudit* sample. Thus, the difference in *Interest Rate Spread* between the two subsamples is only suggestive, because other differences between the companies in the two subsamples are not controlled for.

In panel B of Table 3, we split the sample of companies with voluntary external audits into Big 4 and non–Big 4–audited samples. The results show a significant (insignificant) difference in the median (mean) *Interest Rate Spread* between the two subsamples. Compared with non–Big 4–audited companies, Big 4–audited companies are larger and more leveraged, have greater tangible assets, and are more likely to have negative equity.

4. Empirical procedures and results

Model specification

To formally test Hypotheses 1 and 2, we posit the following regression model:

$$\begin{aligned} \textit{Interest Rate Spread} = {} & \beta_0 + \beta_1 \textit{VAudit} + \beta_2 \textit{VAudit} * \textit{Big4} + \sum \gamma_k \textit{Control}_k \\ & + (\textit{Year Dummies}) + (\textit{Industr Dummies}) + \textit{error} \qquad (1), \end{aligned}$$

where the dependent variable, *Interest Rate Spread*, represents the difference between the interest rate on the firm's debt and the average annual prime rate. Similar to Pittman and Fortin 2004, Francis, Khurana, and Pereira 2005, and Francis, LaFond, Olsson, and Schipper 2005,[16] we measure the average interest rate as the aggregate interest expenses in year t divided by the average of short- and long-term debt at the beginning and end of each fiscal year.[17] For private Korean companies, short- and long-term debts consist mainly of: (a) loans from commercial banks, called city banks; (b) loans from other financial institutions such as development banks, saving banks; investment banks, and insurance companies[18,19]; and (c) borrowings through the issuance of commercial paper.

16. All three of these studies use the average interest rate instead of the interest rate spread as their dependent variable with the benchmark rate included as an explanatory variable. We report the results using the difference between the interest rate and the benchmark rate, that is, an interest rate spread, so that our results could be easily compared with Blackwell et al. 1998 who use the interest rate spread as the dependent variable.
17. Replacing the denominator of the interest expense variable with long-term debt and rerunning our tests, we obtain similar results to those reported in the paper.
18. The Bank of Korea classifies other financial institutions into five categories based on their business activities: development, savings, investment, insurance, and other financial institutions. For more details, see Bae et al. 2002.
19. These loans include private placement loans by banks and insurance companies. Private placement loans are typically made in exchange for the corporate bonds of private firms. Private companies can issue corporate bonds through private placement (but not through the public bond market) if they are registered with the Korea Financial Supervisory Commission, which is equivalent to the SEC in the United States. All corporate bonds issued by private companies carry bank credit guarantees and are distributed mainly to banks and financial institutions.

TABLE 3
Results of univariate comparisons

Panel A: Tests for mean and median differences between unaudited and voluntary audit samples

Variable	(A) Unaudited sample (N = 69,661)	(B) VAudit sample (N = 2,916)	t- (z-) stat. for testing diff. in the mean and median (H0: A − B = 0)	
Interest Rate Spread	2.432 (1.698)	1.708 (0.986)	8.52 (6.80)	*** ***
Size	14.340 (14.416)	15.433 (15.549)	−95.92 (−61.17)	*** ***
Profitability	0.017 (0.021)	0.010 (0.029)	3.30 (−6.80)	*** ***
Leverage	0.715 (0.735)	0.760 (0.758)	−8.97 (−7.12)	*** ***
Tangible	0.257 (0.191)	0.285 (0.250)	−6.91 (−8.75)	*** ***
Sales Growth	0.339 (0.129)	0.650 (0.319)	−15.72 (−22.50)	*** ***
Negative quity Dummy	0.026 (0)	0.056 (0)	−6.95 (−9.67)	*** ***

Notes:

Numbers in parentheses are medians. *** denotes significance at the 1% level.

Panel B: Tests for mean and median differences between Big 4–audited and non–Big 4–audited companies

Variable	(A) Big 4–audited sample (N = 987)	(B) non–Big 4–audited sample (N = 1,929)	t- (z-) stat. for testing diff. in mean and med. (H0: A − B = 0)	
Interest Rate Spread	1.536 (0.818)	1.796 (1.052)	−1.50 −1.99	**
Size	15.500 (15.586)	15.399 (15.527)	4.66 3.68	*** ***
Profitability	0.006 (0.029)	0.012 (0.029)	−1.34 −0.45	
Leverage	0.779 (0.770)	0.750 (0.752)	2.86 2.44	*** **
Tangible	0.296 (0.262)	0.279 (0.244)	2.12 1.86	** *
Sales Growth	0.710 (0.334)	0.620 (0.312)	2.00 1.61	**
Negative Equity Dummy	0.081 (0)	0.044 (0)	3.75 4.09	*** ***

Notes:

Numbers in parentheses are medians. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Similar to Blackwell et al. 1998, we use the interest rate spread over the prime rate rather than the raw rate to control for economy-wide interest rate fluctuations over time.[20]

Unlike Blackwell et al. 1998, who use actual interest rates on revolving credit arrangements to compute the interest rate spread, our measure of the spread is not based on actual interest rates charged by lenders but, rather, on recorded interest expenses.[21] As in Pittman and Fortin 2004, Francis et al. 2005a, and Francis et al. 2005b the use of *Interest Rate Spread* as a proxy for the actual interest rate charged may suffer from a potential measurement error. However, unless the measurement error in the dependent variable is systematically correlated with measurement errors of our test variables — that is, *VAudit* and *VAudit*Big4* — this error does not affect the magnitude and significance of the test variables, while it may inflate the residual variance and thus lower the explanatory power of the regression model (Greene 1990).[22]

Our main variable of interest, *VAudit*, is an indicator variable that equals one for private companies with voluntary audits and zero otherwise. The *Big4* variable is also an indicator variable that equals one if a company's financial statements are audited by one of the Big 4–affiliated audit firms[23] and zero otherwise. We first estimate (1) both with and without the interaction term, *VAudit*Big4*. When (1) is estimated without the interaction term, the β_1 coefficient captures the difference in the interest cost between companies with voluntary audits and those with no audit. Note that this estimation is comparable to the test performed by Blackwell et al. 1998, because those authors do not control for the class identity of the audit firm.[24] A significantly negative β_1 coefficient is consistent with Hypothesis 1 and supports the information perspective (as opposed to the relationship banking perspective) that voluntary audits have informational value to banks and other private lenders, thereby lowering the interest cost of borrowing.

When (1) is estimated after including the interaction term, the coefficient of *VAudit* (i.e., β_1) captures the interest rate differential between companies with voluntary audits by non–Big 4 auditors and those with no audit, while the coefficient of *VAudit*Big4* (i.e., β_2) captures the incremental difference in the interest rate charged for Big 4–audited companies relative to the rates charged for non–Big 4–audited clients. The interest rate differential between Big 4–audited and unaudited companies is thus captured by $\beta_1 + \beta_2$.

In (1), we include six firm-specific variables as our control variables to isolate the effect of voluntary audits on the cost of borrowing from the associated effects of other borrower-specific credit risk factors. The literature on cross-sectional determinants of loan

20. Most prior studies on bank loan pricing measure the interest cost of borrowing using the drawn all-in spread (i.e., the interest rate plus the upfront fee and annual fee, if any) in basis points in excess of the benchmark rate. For outstanding loan commitments, all-in spread (*AIS*) is measured based on all drawn lines of credit. Commercial banks typically assess the risk of a loan based on information about the business nature and performance of borrowing firms and then set a markup over a prevailing benchmark rate, such as LIBOR, to compensate for credit risk. The *AIS* variable thus reflects the banks' perceived level of risk on a loan facility provided to a specific borrower (Bharath et al. 2008; Graham et al. 2008; Kim et al. 2009). This study uses the *Interest Rate Spread* variable (instead of the raw rate) because, in Korea, most bank loans during the sample were priced in terms of the floating rate against the prime rate rather than the fixed rate.

21. Data on actual interest rates on borrowings by Korean private companies are not available to us.

22. This could be one reason why adjusted R^2 statistics for our regression models in Tables 4 to 8 are relatively low. Because *VAudit* and *Big4* are categorical variables based on actual facts, it is unlikely that these variables are measured with errors.

23. Big 4 audit firms have a member firm relationship with large local audit firms. In Korea, Big 4 audit firms are not allowed to have their own audit assurance services without partnering with local audit firms. Local audit firms affiliated with Big 4 firms receive technical expertise, training, and quality control services from the Big 4 audit firms (Kim and Yi 2006).

24. In (1), we do not include the *Big4* dummy variable itself because it applies only to companies with external audits, but our sample includes unaudited companies as well.

pricing, in general, finds that firm size is inversely related to credit risk.[25] For example, Petersen and Rajan (1994) and Blackwell et al. (1998) find that bank loan spread (i.e., the difference between loan rates and benchmark rates) is inversely related to firm size.[26] We include *Profitability* because banks and other private lenders are likely to charge lower interest rates to firms that are more profitable because such firms are better able to service their debt.[27] *Leverage* is used to proxy for the risk of bankruptcy. The loan pricing literature also suggests that owning tangible assets is inversely related to credit risk and, thus, the interest rate that lenders charge (e.g., Bharath et al. 2008; Kim et al. Forthcoming). We therefore include the variable *Tangible* in (1) as an additional control variable. We expect its coefficient to be negative. We include *Sales Growth* to control for potential effects of a firm's growth potential on the interest rate. *Negative Equity Dummy* is an indicator variable that equals one for companies with negative equity and zero otherwise. Because about 2.7 percent of private Korean companies in our sample experienced negative equity during the sample period, we include the *Negative Equity Dummy* variable as an additional control for credit risk.[28] Finally, we include *Industry Dummies* and *Year Dummies* to control for industry and year fixed effects. *Industry Dummies* are based on the two-digit KSIC.

Potential self-selection bias and fixed-effects regression

Equation 1 is estimated, first, using the ordinary least squares (OLS) regression procedure. However, the OLS estimates of our test variables, *VAudit* and *Big4*, may suffer from a potential self-selection bias, because these variables are the outcome of a firm's voluntary decisions to have external audits and, then, to choose Big 4 versus non–Big 4 auditors. To address this self-selection bias and other concerns such as reverse causality and correlated omitted variables, we also estimate (1) by applying the (firm) fixed-effects regression procedure rather than the Heckman 1979 two-stage treatment effects approach for the following reasons. First, while the Heckman two-stage approach has been popularly used in contemporary accounting and auditing research, recent studies have cast serious doubts about its effectiveness in addressing potential self-selection bias associated with a firm's auditor choice.[29] Francis and Lennox (2008) find that the results of the Heckman approach are fragile and sensitive to minor changes in model specification. Second, the Heckman approach requires researchers to identify appropriate instruments. However, Larcker and Rusticus (2010) show that, unless researchers are able to identify the appropriate instruments, the Heckman two-stage approach could produce more biased and unreliable estimates of regression coefficients of the variables of interest than the OLS method.[30] These

25. We also estimate (1) after including firm age. Though not reported, we find that the inclusion of firm age does not alter our statistical inferences on the main variables of interest, that is, *VAudit* and *VAudit*Big4*. In the results reported in the paper, we excluded firm age, because it is highly correlated with firm size.
26. A notable exception is Pittman and Fortin 2004, who find a positive association between the interest rate on the firm's debt and firm size.
27. We measure *Profitability* using the ratio of income before extraordinary items to the dollar amount of sales rather than return on assets (*ROA*) to avoid a mechanical correlation between *ROA* and *Tangible*. Unreported results show, however, that the use of *ROA* in lieu of *Profitability* does not alter our statistical inferences on the variables of interest.
28. Our approach of including companies with negative equity rather than excluding them is consistent with Pittman and Fortin 2004. Though not tabulated, repeating our analyses after dropping companies with negative equity from our sample leads to results that are qualitatively similar to those reported in this paper.
29. Earlier research in the accounting literature uses the two-stage treatment effects model to address the self-selection bias problem. Examples include Leuz and Verrecchia 2000 and Kim et al. 2003.
30. Though not reported, the regression results using the Heckman two-stage approach produce qualitatively similar inferences on our test variables.

authors suggest that the inclusion of firm fixed effects or additional control variables may alleviate concerns about the self-selection bias or the associated reverse causality. Furthermore, the fixed-effects regression allows us to mitigate potential problems of correlated omitted variables by controlling for unobservable, time-invariant firm-specific characteristics.

Full-sample results of main regressions: Tests of Hypotheses 1 and 2

Table 4 reports the results of both pooled OLS and firm fixed-effects regressions for our full sample of 72,577 firm-years. Reported *t*-statistics are on an adjusted basis using standard errors corrected for firm-level clustering. Columns 1 and 3 of Table 4 report the estimated coefficients, along with their *t*-values, for the pooled OLS regressions, while columns 2 and 4 report the same for the fixed-effects regressions. The pooled OLS regressions include year and industry dummies to control for year and industry fixed effects, respectively, but the firm fixed-effects regressions include year dummies but exclude industry dummies.

As shown in columns 1 and 2 of Table 4, when the interaction term *VAudit*Big4* is omitted, the coefficient of *VAudit* (i.e., β_1) is highly significant with a negative sign, regardless of the regression method used. For the pooled OLS (fixed-effects) regression in column 1 (column 2), β_1 is −1.240 with $t = -11.87$ (−0.562 with $t = -3.69$). This finding implies that, depending on the regression method used, the average interest cost savings from a voluntary audit ranges from 56 to 124 basis points after controlling for other credit risk factors, which is consistent with Hypothesis 1. These magnitudes are economically significant and greater than the 25 basis points reported in Blackwell et al. 1998 for their sample of revolving credit arrangements in the United States in 1988.[31]

We now turn to the test of Hypothesis 2. When the interaction term is included (columns 3 and 4), the coefficient of *VAudit* (i.e., β_1) remains significant with a negative sign for both pooled OLS and fixed-effects regressions. This finding is consistent with Hypothesis 1 and supports the information perspective that voluntary audits have informational value to credit stakeholders, thereby lowering the interest cost of borrowing. In contrast, the coefficient of *VAudit*Big4* (i.e., β_2) is insignificant for both the pooled OLS and fixed-effects regressions ($\beta_2 = -0.261$ with $t = -1.41$ and $\beta_2 = -0.195$ with $t = -0.68$, respectively). These insignificant interaction terms do not support Hypothesis 2, suggesting that what does matter in the pricing of private debt held by private companies is whether or not a company voluntarily appoints an external auditor, rather than whether a firm appoints a Big 4 or non–Big 4 auditor.[32] These results corroborate the finding of Fortin and Pittman 2007, that the appointment of Big 4 versus non–Big 4 auditors does not lead to any significant difference in the yield spread or credit rating on privately placed bonds issued to qualified institutional buyers by private U.S. companies under SEC Rule 144A. An important similarity between the two studies is that they both use a sample of *private* companies. A salient difference between the two studies is that our study examines the role of auditor choices in the voluntary audit environment, whereas Fortin and Pittman

31. One possible reason we observe a relatively larger magnitude of interest cost savings associated with voluntary audits in Korea than in the United States is because the interest rate in Korea was significantly higher than that in the United States during the sample period.

32. In our tests for Hypothesis 2, the identity of audit firms (and thus Big 4 versus non–Big 4) is known to us only if a formal financial statement audit is performed. It is, however, possible that unaudited companies in our sample hired audit firms to have their financial statements reviewed and/or compiled. To the extent that banks and other private lenders have access to the information about Big 4 auditors' review and/or compilation engagements for unaudited companies (which is not known to us) and perceive that Big 4 review and/or compilation engagements are as valid as, if not more than, formal financial statement audits by non–Big 4 auditors, our results could be potentially biased.

TABLE 4
Regression results using the combined sample of unaudited companies and companies with voluntary audits

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
VAudit (β_1)	−1.240	−11.87***	−0.562	−3.69***	−1.151	−9.52***	−0.501	−2.83**
*VAudit*Big4* (β_2)					−0.261	−1.41	−0.195	−0.68
Size	−0.013	−0.41	−0.120	−1.71*	−0.013	−0.40	−0.118	−1.68*
Profitability	−0.277	−0.90	−1.565	−4.29***	−0.278	−0.90	−1.566	−4.30***
Leverage	1.025	8.07***	−1.776	−12.30*	1.024	8.07***	−1.777	−12.31***
Tangible	−4.205	−31.18***	−3.658	−16.85***	−4.205	−31.18***	−3.657	−16.85***
Sales Growth	−0.135	−5.19***	0.269	10.57***	−0.135	−5.18***	0.269	10.57***
Neg Eq. Dummy	1.654	12.01***	1.297	7.19	1.657	12.04***	1.298	7.20***
Intercept	4.080	7.81***	6.786	6.80***	4.076	7.81***	6.763	6.77***
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		No		Yes		No	
Adj. R^2	0.075		0.065		0.075		0.065	
N (years)	72,577		72,577		72,577		72,577	

Notes:

All variables are as defined in the appendix. Columns 1 and 3 report the results of pooled ordinary least squares regressions. Columns 2 and 4 report the results of firm fixed effects regressions. Reported *t*-values are on an adjusted basis using standard errors corrected for firm-level clustering. ***, **, and * denote the 1%, 5%, and 10% levels of significance, respectively.

address the same issue in the mandatory audit environment. It should be pointed out, however, that our Korean results using a sample of privately held companies are in sharp contrast with the findings of Pittman and Fortin 2004 and Mansi et al. 2004: Those two studies document a significant difference between *public* companies audited by Big 4 and non–Big 4 auditors with respect to the interest cost of borrowing and bond yield spread, respectively, under mandatory audit environments.

With respect to the estimated coefficients of the control variables, we note the following. First, the coefficient of *Size* is marginally significant, with an expected negative sign in the fixed-effects regressions, while the coefficient of *Tangible* is highly significant, with an expected negative sign. This suggests that banks and other private lenders charge lower interest rates to larger firms and firms with higher asset tangibility. Second, we find the coefficient of *Profitability* is negatively significant at the 1 percent level for the fixed-effects regressions (columns 2 and 4), but it is insignificant with an expected negative sign for the pooled OLS regressions (columns 1 and 3). Third, the effects of *Leverage* and *Sales Growth* on the interest rate on debt is mixed, depending on the regression method used. Finally, firms with negative equity pay a higher interest cost of borrowing, which is consistent with our expectations.

Further tests of Hypotheses 1 and 2 using the reduced samples

As mentioned earlier, our dependent variable, *Interest Rate Spread*, is measured not based on actual interest rates charged by lenders but, rather, based on actual interest expenses paid relative to the average of short- and long-term debt at the beginning and end of the fiscal year. As shown in panel A of Table 2, the empirical distribution of *Interest Rate Spread* suggests that our full sample ($N = 72{,}577$) includes observations with a negative value of interest rate spread. Further, the third quartile point of the distribution is 5.167, indicating that *Interest Rate Spread* is greater than 500 basis points for more than 25 percent of observations in our sample.[33] To check the sensitivity of these seemingly extreme observations on our reported results, we construct two reduced samples: (1) a reduced sample of 39,884 observations, achieved after removing observations with a negative spread or a spread greater than 1,000 basis points and (2) a reduced sample of 28,712 observations, obtained after removing observations with a negative spread or a spread greater than 500 basis points.

The first reduced sample consists of 1,669 observations with no audit and 38,215 observations with voluntary audits. For this reduced sample, the mean and median values of *Interest Rate Spread* are 3.609 and 3.067, respectively, with a standard deviation of 2.583. The first and third quartile points are 1.484 and 5.342, respectively. The second reduced sample consists of 27,404 observations with no audit and 1,308 observations with voluntary audits. For this reduced sample, the mean and median values of *Interest Rate Spread* are 2.254 and 2.139, respectively, with a standard deviation of 1.387. The first and third quartile points are 1.074 and 3.365, respectively.

Panels A and B of Table 5 report the regression results using the first and second reduced samples, respectively. As shown in panel A of Table 5, we find that the results using the first reduced sample are, overall, qualitatively similar to the full-sample results reported in Table 4. When (1) is estimated without the interaction term, *VAudit*Big4* (columns 1 and 2), the coefficients of *VAudit* are −0.323 ($t = -4.80$) and −0.368 ($t = -3.09$) for the pooled OLS and fixed-effects regressions, respectively. This suggests that the interest cost savings associated with voluntary audits (relative to no audit) ranges from about 32 to 37 basis points. This range of interest cost savings is much smaller

33. Nevertheless, we report the full-sample results as our main results, because the existence of unusual observations is simply a fact underlying the data, and the reduced sample results after applying ad hoc trimming procedures may suffer a loss of generality. We therefore use the reduced sample results as part of our sensitivity checks.

TABLE 5
Regression results using the reduced sample

Panel A: Results using observations with 0 ≤ *Interest Rate Spread* ≤ 1,000 basis points

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
VAudit (β_1)	−0.323	−4.80***	−0.368	−3.09***	−0.268	−3.39***	−0.324	−2.33**
VAudit *Big4 (β_2)					−0.171	−1.35	−0.153	−0.67
Size	−0.105	−5.82***	−0.412	−7.23***	−0.105	−5.81***	−0.411	−7.21***
Profitability	0.380	1.93*	0.420	1.53	0.378	1.92 *	0.420	1.52
Leverage	0.137	1.91*	−0.200	−1.70*	0.137	1.91*	−0.200	−1.71*
Tangible	−1.478	−19.23***	−1.408	−8.30***	−1.478	−19.24 ***	−1.408	−8.29***
Sales Growth	0.030	1.78*	0.110	5.020***	0.030	1.79 *	0.109	5.01***
Neg Eq. Dummy	0.171	2.13**	0.169	1.35	0.173	2.16**	0.169	1.35
Intercept	5.035	17.90***	9.761	12.05***	5.032	17.89***	9.745	12.03***
Year Dummies	Yes		Yes		Yes		Yes	
Ind. Dummies	Yes		No		Yes		No	
Adj. R^2	0.044		0.029		0.044		0.029	
N (firm-years)	39,884		39,884		39,884		39,884	

Panel B: Results using observations with 0 ≤ *Interest Rate Spread* ≤ 500 basis points

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
VAudit (β_1)	−0.214	−5.22 ***	−0.162	−1.95 **	−0.167	−3.38 ***	−0.173	−1.82 *
VAudit *Big4 (β_2)					−0.081	−0.99	0.042	0.26
Size	−0.032	−3.43***	−0.081	−2.05 **	−0.034	−3.56 ***	−0.082	−2.05 **
Profitability	−0.072	−0.59	0.341	1.76 *	−0.067	−0.54	0.341	1.76 *
Leverage	0.215	5.46 ***	0.043	0.50	0.257	6.18 ***	0.043	0.50
Tangible	−0.449	−11.74 ***	−0.540	−4.36 ***	−0.457	−10.78 ***	−0.540	−4.36 ***
Sales Growth	−0.017	−1.62	0.027	1.71*	−0.017	−1.66 *	0.027	1.71*
Neg Eq. Dummy	0.296	5.97 ***	0.313	3.45 ***	0.263	5.26 ***	0.313	3.45 ***
Intercept	2.687	20.33***	3.530	6.16 ***	2.690	17.97 ***	3.534	6.17 ***
Year Dummies	Yes		Yes		Yes		Yes	
Ind. Dummies	Yes		No		Yes		No	

(The table is continued on the next page.)

TABLE 5 (Continued)

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
Adj. R^2	0.016		0.011		0.016		0.011	
N (firm-years)	28,712		28,712		28,712		28,712	

Notes:

All variables are as defined in the appendix. Columns 1 and 3 report the results of pooled ordinary least squares regressions. Columns 2 and 4 report the results of firm fixed-effects regressions. Reported *t*-values are on an adjusted basis using standard errors corrected for firm-level clustering. ***, **, and * denote the 1%, 5%, and 10% levels of significance, respectively.

than the range of 56 to 124 basis points observed for the full sample, and appears to be more reliable and reasonable, compared with the full sample results reported in Table 4. When (1) is estimated with the interaction term included (columns 3 and 4), the coefficients of *VAudit* are significant at the conventional level, which is consistent with Hypothesis 1, but the coefficients of *VAudit*Big4* are insignificant, which does not support Hypothesis 2. These results are, overall, consistent with the full-sample results reported in columns 3 and 4 of Table 4.

Panel B reports the regression results using our second reduced sample. Columns 1 and 2 show that the coefficients of *VAudit* are −0.214 ($t = -5.22$) and −0.162 ($t = -1.95$) for the pooled OLS and fixed-effects regressions, respectively, which is much smaller in magnitude than the same coefficients reported in Table 4. With the interaction term included (columns 3 and 4), the coefficients of *VAudit* remain significant but the coefficients of *VAudit*Big4* are insignificant. Overall, the results reported in Table 5 suggest that our full-sample results reported in Table 4 are robust to unusual observations included in the full sample, that is, those with negative or very large positive values of *Interest Rate Spread*.

Further tests of Hypotheses 1 and 2 using size-matched samples

Given that firm size is often viewed as a proxy for a host of economic factors and that, as reported in Table 3, companies with voluntary audits (Big 4 audits) are significantly larger than unaudited companies (non–Big 4 audits), we stress test our Table 4 results using size-matched pair designs.[34] For this purpose, we construct three size-matched samples: (1) 5,832 observations from the (unrestricted) full sample, (2) 3,338 observations from the reduced sample with $0 \leq$ *Interest Rate Spread* $\leq$ 1,000 basis points, and (3) 2,616 observations from the reduced sample with $0 \leq$ *Interest Rate Spread* $\leq$ 500 basis points. At the beginning of each sample year, we match a firm with voluntary audits to a firm with no audit as closely as possible on total assets in the same industry and year. Note that our

34. To see if the interest-rate-reducing effect of a voluntary audit is sensitive to firm size, we also construct three size-stratified subsamples (i.e., samples of small firms, medium firms, and large firms) with each sample consisting of one-third of sample firms. We then estimate (1) for each of the three size-stratified samples. We find that the results for each size-stratified sample (unreported) are similar to those reported in Table 4. To further investigate whether our full sample results are influenced by unequal distributions of larger and smaller companies between the audited and unaudited subsamples, we construct a size-truncated sample as in Blackwell et al. 1998. To do so, we first delete from the audited sample those firms with *Size* greater than the maximum *Size* for the unaudited sample and delete from the unaudited sample those firms with *Size* less than the minimum *Size* for the audited sample. We also find that the results (unreported) using the size-truncated sample remain qualitatively similar to our full-sample results.

(unrestricted) full sample of 72,777 firm-years includes 2,916 unaudited firm-years. Our matching procedures yield the first size-matched sample of 5,832 (= 2 times 2,916) firm-year observations. We apply the same procedures to the two (restricted) reduced samples and obtain the two other size-matched samples of 3,338 and 2,616 observations. We then reestimate (1) using the three size-matched samples of 5,832, 3,338, and 2,616 firm-years and report the results in panels A through C of Table 6, respectively.

As shown in columns 1 and 2 of panel A of Table 6, when the interaction term is omitted from the regressions the coefficient of *VAudit* (i.e., β_1) is significantly negative at less than the 1 percent level, irrespective of whether the pooled OLS or fixed-effects regression is applied. As shown in columns 1 and 2 of both panels B and C of Table 6, we find similar results for the two other size-matched samples: The β_1 coefficient is significantly negative in both columns, though its magnitude becomes smaller. The above results suggest that our test results reported in Tables 4 and 5 are robust to potential differences in firm size between (relatively small) unaudited companies and (relatively large) companies with voluntary audits. The results using the matched-pair samples lend further support to Hypothesis 1. As shown in columns 3 and 4 of all three panels of Table 6, when the interaction term is included in the regressions the coefficient of *VAudit* (i.e., β_1) remains negatively significant, which is consistent with Hypothesis 1. However, the coefficient of *VAudit*Big4* (i.e., β_2) is insignificant, which is inconsistent with Hypothesis 2 but consistent with the full-sample results reported in Tables 4 and 5.

In sum, the results using the three size-matched samples presented in Table 6 are consistent with those shown in Tables 4 and 5. Overall, our results in Table 6 reconfirm the information perspective that voluntary audits by independent auditors are of information value to credit stakeholders, but there is no significant difference between Big 4 and non–Big 4 audits with respect to the interest-rate-reducing effect of voluntary audits. In other words, what matters more to credit stakeholders is an external audit per se rather than auditor quality (Big 4 versus non–Big 4).

5. Results of change analyses

The regression results presented in Tables 4 to 6 reveal that adjusted R^2 is less than 10 percent for all cases, while Blackwell et al. (1998) report adjusted R^2 values of more than 50 percent for their private company sample.[35] This relatively low R^2 raises the concern that our regression results may suffer from potential problems of correlated omitted variables. To alleviate this concern and independently evaluate the effect of *changes* in a company's audit status on *changes* in the interest cost of borrowing, we examine the economic impact of a change in borrower status, from being unaudited to being audited, on the interest rate spread, after controlling for changes in control variables. Furthermore, the change analysis alleviates concerns about potential endogeneity or reverse causality with respect to the coefficient estimates of our test variables in (1).[36]

35. Pittman and Fortin (2004) report adjusted R^2 values of about 10–13 percent for their unbalanced panel sample (which is similar in nature to the sample used in our study). As mentioned earlier, one of the possible reasons for the relatively low adjusted R^2 for our study and that of Pittman and Fortin is that the dependent variable, *Interest Rate Spread* or *Interest Rate*, can be measured with errors. Unlike Blackwell et al. 1998, who use actual loan rates, both our study and that of Pittman and Fortin use an aggregate proxy for the interest cost of borrowing. In addition, Blackwell et al. have access to their banks' proprietary measures of borrower risk (i.e., a high-risk loan dummy and whether the loan is collateralized) that are not available to us.

36. Because we measure the interest rate on debt using financial statement variables and then assess cross-sectional associations of the interest rate spread (over the average annual prime rate) with audit engagement characteristics, auditor types, and other financial statement variables, our levels regressions may be subject to an endogeneity problem. Estimating change regressions allows us to evaluate more reliably a *causal* relation between the cost of debt and our test variables, thereby alleviating potential endogeneity concerns.

TABLE 6
Regression results using size-matched samples

Panel A: Results using the full sample

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
VAudit (β_1)	−1.059	−8.78 ***	−0.712	−2.82 ***	−0.984	−7.34 ***	−0.632	−2.33 **
VAudit Big4* (β_2)					−0.224	−1.27	−0.239	−0.81
Size	−0.390	−3.66 ***	−0.234	−1.09	−0.384	−3.61***	−0.223	−1.04
Profitability	−0.886	−1.32	−3.508	−3.70 ***	−0.889	−1.32	−3.530	−3.72 ***
Leverage	−0.234	−0.87	−1.813	−3.44 ***	−0.233	−0.86	−1.798	−3.41***
Tangible	−4.379	−14.46 ***	−3.621	−4.38 ***	−4.373	−14.44 ***	−3.590	−4.34 ***
Sales Growth	−0.037	−0.65	0.318	3.44***	−0.035	−0.61	0.316	3.41***
Neg Eq. Dummy	1.206	3.36 ***	0.237	0.45	1.228	3.42 ***	0.229	0.43
Intercept	9.823	5.99 ***	8.662	2.63 ***	9.723	5.92 ***	8.473	2.57 ***
Adj. R^2	0.086		0.062		0.099		0.062	
N (years)	5,832		5,832		5,832		5,832	

Panel B: Results using the reduced sample where 0 ≤ *Interest Rate Spread* ≤ 1000 basis points

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
VAudit (β_1)	−0.262	−3.36***	−0.388	−2.58***	−0.262	−3.03***	−0.324	−2.02**
VAudit Big4* (β_2)					0.001	0.01	−0.237	−1.14
Size	−0.273	−3.52***	−0.482	−3.30***	−0.273	−3.52***	−0.464	−3.16***
Profitability	−0.038	−0.09	−0.786	−1.24	−0.038	−0.09	−0.818	−1.29
Leverage	0.179	0.94	−0.906	−2.42**	0.179	0.94	−0.882	−2.35**
Tangible	−1.354	−6.50***	−0.641	−1.03	−1.354	−6.50***	−0.635	−1.07
Sales Growth	0.041	1.03	0.274	4.21***	0.041	1.03	0.273	4.19 ***
Neg Eq. Dummy	0.409	1.81*	0.388	1.19	0.409	1.81*	0.408	1.25
Intercept	7.509	6.37***	11.450	5.07***	7.509	6.36***	11.151	4.90***
Adj. R^2	0.068		0.080		0.068		0.083	
N	3,338		3,338		3,338		3,338	

(The table is continued on the next page.)

TABLE 6 (Continued)

Panel C: Results using the reduced sample where 0 ≤ *Interest Rate Spread* ≤ 500 basis points

	(1)		(2)		(3)		(4)	
	Pooled		Fixed effects		Pooled		Fixed effects	
Variable	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
VAudit (β_1)	−0.114	−2.21**	−0.259	−2.40**	−0.126	−2.21**	−0.251	−2.20**
VAudit *Big4 (β_2)					0.039	0.51	−0.33	−0.22
Size	−0.056	−1.08	−0.110	−1.02	−0.056	−1.09	−0.107	−0.98
Profitability	−0.645	−2.34**	−0.495	−1.20	−0.644	−2.34**	−0.501	−1.21
Leverage	0.093	0.73	−0.763	−2.92***	0.090	0.72	−0.762	−2.91***
Tangible	−0.512	−3.80***	−0.432	−0.93	−0.511	−3.80***	−0.433	−0.94
Sales Growth	0.039	1.52	0.049	0.99	0.039	1.52	0.049	0.99
Neg Eq. Dummy	0.181	1.14	−0.165	−0.70	0.177	1.11	−0.161	−0.63
Intercept	2.967	3.75***	4.729	2.77***	2.984	3.76***	4.678	2.72***
Adj. R^2	0.031		0.049		0.031		0.049	
N (years)	2,616		2,616		2,616		2,616	

Notes:

All variables are as defined in the appendix. Columns 1 and 3 report the results of pooled ordinary least squares regressions. Columns 2 and 4 report the results of firm fixed-effects regressions. Reported *t*-values are on an adjusted basis using standard errors corrected for firm-level clustering. ***, **, and * denote the 1%, 5%, and 10% levels of significance, respectively.

As noted earlier, private Korean companies can change their audit status voluntarily, or they can become sufficiently large to trigger a mandatory audit under the AEA. Recall that our levels-based tests involve only voluntary audits. Our data allow us to distinguish companies that for the first time appoint an external auditor voluntarily (not triggered by the size threshold) from companies mandated to appoint an external auditor for the first time (triggered by the size threshold). We consider both types of engagement status changes in our change analyses to obtain insights into any differences in voluntary and mandatory audits with respect to their effects on the interest rate on debt. Specifically, our changes-based tests address the hitherto unexplored question of whether the interest cost-reducing effects of an engagement status change from no audit to a *voluntary* audit differ systematically from those of the change from no audit to a *mandatory* audit. For this purpose, we estimate the following regression:

$$\begin{aligned}\Delta\ \textit{Interest Rate Spread} = {} & \beta_0 + \beta_1 \Delta\ \textit{Engagement}(N,V) + \Delta\ \textit{Engagement}(N,M) \\ & + \sum \gamma_k \Delta \textit{Control}_k + (\textit{Industry \& YearDummies}) \\ & + \textit{error} \qquad (2),\end{aligned}$$

where *Δ Engagement*(*N*, *V*) is a dummy variable that equals one when the engagement status changes from no audit in year *t* – *1* to a voluntary audit in year *t* and zero otherwise; *ΔEngagement*(*N*, *M*) is a dummy variable that equals one when the engagement status changes from no audit in year *t* – *1* to a mandatory audit in year *t* and zero otherwise; *Δ*

Interest Rate Spread and *ΔControl* represent the changes in *Interest Rate Spread* and in control variables, respectively, from year $t - 1$ (with no audit) to year t (with either a voluntary or a mandatory audit). In the above, year and industry dummies are included to control for year and industry fixed effects, respectively.

To estimate (2), we identify a sample of 5,722 firm-year observations consisting of (a) 2,284 observations with changes in engagement status from no audit in year $t - 1$ to voluntary or mandatory audits in year t and (b) 3,483 observations with no audit in year $t - 1$ and year t (and thus no changes in engagement status). Out of 2,284 observations, we identify 182 (2,102) with a change in engagement status from no audit to voluntary (mandatory) audits.

We first estimate (2) after including, one by one, *ΔEngagement*(N, V) and *ΔEngagement*(N, M), and report the results in columns 1 and 2, respectively, of Table 7. Second, we estimate (2) after including both variables together and report the results in column 3 of the Table 7. As shown in columns 1 and 2 of Table 7, the coefficient of *ΔEngagement*(N, V) is −0.674 ($t = -2.09$), while the coefficient of *ΔEngagement* (N, M) is −0.361 ($t = -2.77$). The significantly negative coefficients of both variables are consistent with Hypothesis 1, suggesting that borrowing firms who provide audited financial statements to their banks and other private lenders for the first time pay a significantly lower interest rate on borrowing compared with those who supply unaudited financial statements. Moreover, our results suggest that the engagement status change from being unaudited to being audited leads to a significant reduction in the interest rate on debt, irrespective of whether the status change is voluntary or is triggered by a mandatory audit requirement. Stated differently, external audits are of information value to credit stakeholders, irrespective of the reasons for the engagement status change (voluntary versus mandatory).

When both *ΔEngagement*(N, V) and *ΔEngagement*(N, M) are included together (column 3 of Table 7), the coefficients of both *ΔEngagement*(N, V) and *ΔEngagement*(N, M), that is, β_1 and β_2, respectively, are significantly negative ($\beta_1 = -0.877$ with $t = -2.69$; $\beta_2 = -0.432$ with $t = -3.25$). Further, we find that the absolute magnitude of the β_1 coefficient is more than twice greater than that of the β_2 coefficient. A partial F-test indicates that the difference is statistically significant at the 10 percent level ($F = 3.01$; $p = 0.081$), suggesting that the interest-rate-reducing effect is greater for voluntary audits than for mandatory audits.

To further test whether a status change from being unaudited to being Big 4–audited leads to an additional interest cost saving to the borrowing firm over and beyond the interest cost savings associated with the status change from being unaudited to being non–Big 4–audited, we estimate the following change regression:

$$\begin{aligned}\Delta\ \textit{Interest Rate Spread} = {} & \beta_0 + \beta_1 \Delta\ \textit{Engagement}(N, V) \\ & + \beta_2 \Delta\ \textit{Engagement}(N, V) * \textit{Big4} \\ & + \beta_3 \Delta \textit{Engagement}(N, M) \\ & + \beta_4 \Delta \textit{Engagement}(N, M) * \textit{Big4} + \sum \gamma_k \Delta \textit{Control}_k \\ & + (\textit{Industry} \,\&\, \textit{YearDummies}) + \textit{error} \qquad (3),\end{aligned}$$

where all variables are as defined earlier. In column 4 of Table 7, we estimate (3) after excluding the mandatory audit-related variables, that is, *ΔEngagement*(N, M), and its interaction with the *Big4* dummy, while in column 5, we estimate (3) after excluding the voluntary audit-related variable, that is, *ΔEngagement*(N, V), and its interaction with the *Big4* dummy. In column 6 of Table 7, we estimate a full-model version of (3) with both voluntary and mandatory audit-related variables included together.

TABLE 7
Effects of changes in audit engagements on changes in interest costs of borrowing

	(1)		(2)		(3)		(4)		(5)		(6)	
	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
Δ Engagements (N, V)	−0.674	−2.09 **			−0.887	−2.69 ***	−0.738	−1.98 **			−0.966	−2.55 ***
*Δ Engagements (N, V)*Big4*							0.246	0.34			0.277	0.39
ΔEngagements (N, M)			−0.361	−2.77 ***	−0.432	−3.25 ***			−0.323	−2.43**	−0.441	−2.91***
*ΔEngagements (N, M)*Big4*									−0.430	−1.39	−0.390	−1.43
ΔSize	−0.917	−4.41***	−0.988	−4.75 ***	−0.957	−4.59***	−0.921	−4.42***	−0.990	−4.76***	−0.964	−4.62 ***
ΔProfitability	−2.373	−4.24***	−2.525	−4.51***	−2.508	−4.47 ***	−2.368	−4.23***	−2.564	−4.56***	−2.543	−4.53***
ΔLeverage	−1.161	−2.86***	−1.275	−3.12***	−1.297	−3.18***	−1.158	−2.85***	−1.312	−3.21***	−1.332	−3.26***
ΔTangible	−5.120	−8.44***	−5.082	−8.38***	−5.116	−8.44***	−5.130	−8.44***	−5.069	−8.36***	−5.115	−8.43***
ΔSales Growth	0.196	3.53***	0.187	3.38***	0.192	3.46***	0.105	3.53***	0.186	3.36***	0.190	3.44***
ΔNegative Equity Dummy	0.625	1.63	0.622	1.62	0.681	1.77*	0.622	1.62	0.611	1.59	0.667	1.63
Intercept	−0.002	−0.01	0.211	0.69	0.291	0.94	−0.001	−0.01	0.228	0.75	0.310	1.01
Adj. R^2	0.027		0.027		0.027		0.031		0.031		0.031	
N	5,722		5,722		5,722		5,722		5,722		5,722	

Notes:

All variables are as defined in the appendix. Reported *t*-values are on an adjusted basis using standard errors corrected for firm-level clustering. ***, **, and * denote the 1%, 5%, and 10% levels of significance, respectively.

As shown in both columns 4 and 6 of Table 7, the coefficient of *ΔEngagement*(*N*, *V*) is significantly negative, but the coefficient of *ΔEngagement*(*N*, *V*) **Big4* is insignificant. This is in line with the information perspective, that a voluntary audit per se is of information value, in that the first-time change in engagement status from being unaudited to being voluntarily audited leads to significant savings in the interest cost of borrowing. However, we find again that there is no significant difference between the values of Big 4 and non–Big 4 voluntary audits. In short, the results of our changes-based regressions reconfirm the levels-based results reported in Tables 4 to 6.

We now turn our attention to the information value of mandatory audits. As presented in both columns 5 and 6 of Table 7, the coefficient of *ΔEngagement*(*N*, *M*) is significantly negative, but the coefficient of *ΔEngagement*(*N*, *M*) **Big4* is insignificant. This suggests that a first-time change in engagement status from being unaudited to being mandatorily audited leads to a significant reduction in the interest rate on debt, but there is no significant difference between the values of Big 4 and non–Big 4 mandatory auditors. This finding is in line with Fortin and Pittman 2007, who find no significant difference in the yield spread of Rule 144A bonds between private U.S. companies audited by Big 4 and non–Big 4 auditors in a mandatory audit environment. Moreover, as shown in column 6 of Table 7, we find that the interest cost savings associated with the engagement status change from no audit to voluntary audits, captured by the coefficient of *ΔEngagement*(*N*, *V*) ($\beta_1 = -0.966$ with $t = -2.55$), is more than two times larger than that associated with the status change from no audit to mandatory audits, captured by the coefficient of *ΔEngagement*(*N*, *M*) ($\beta_2 = -0.441$ with $t = -2.91$). The difference between β_1 and β_2 is statistically significant at the 10 percent level. These results are similar to those reported in column 3 of Table 7.

In short, a comparison of levels-based and changes-based regression results suggests that the results of levels-based regressions reported in Tables 4 to 6 are, overall, robust to potential problems associated with omitted correlated variables and/or endogeneity concerns. The results of changes-based regressions in Table 7 buttress our earlier finding that an external audit per se, whether voluntary or mandatory, is of information value to credit stakeholders. Our results also indicate that what matters more to credit stakeholders is whether or not the financial statements of private companies are audited by independent auditors rather than whether they are audited by Big 4 or non–Big 4 auditors.

Finally, the results reported in Table 7 provide us with useful insight into a hitherto underresearched question of whether the value of an external audit per se under a voluntary audit environment differs from its value under a mandatory audit environment. Given the lack of evidence on the issue, our finding that voluntary audits are of greater value for debt pricing than mandatory audits contributes to an evolving stream of the literature on incentives versus standards (e.g., Ball, Robin, and Wu 2003) in a different context, that is, from an auditing perspective. This stream of research provides evidence suggesting that the quality of financial reporting is influenced more critically by the reporting incentives of the financial statement issuers (managers and auditors) rather than by the mandatory adoption of high-quality reporting standards, such as the International Financial Reporting Standards, particularly in emerging markets with weak legal regimes (Ball 2001; Ball et al. 2003; Bushman and Piotroski 2006). Our study provides further insight into the issue from an auditing perspective: Voluntarily motivated audits (or underlying reporting incentives) play a more important role in enhancing the creditability of financial reporting than mandatorily required audits (or the adoption of more stringent standards or rules governing information production or verification).

Impact of the 1997 Asian financial crisis

In this section, we investigate whether the 1997 Asian (and Korean) financial crisis led to a significant change in the information value of external audits. For this purpose, we

partition our full sample into three subperiods: (i) the pre-crisis period of 1987–1996, (ii) the post-crisis period of 1997–2002, and (iii) the post-crisis period of 1999–2002 (excluding 1997–1998).[37] We then estimate (1) for each subperiod. In so doing, we employ fixed-effect regression because it allows us to better control for the effect of changes in within-firm dynamics before and after the crisis (and the associated regulatory reforms) on our results (Atanasov, Black, Ciccotello, and Gyoshev 2010). Table 8 reports the results of firm fixed-effects regressions for each subperiod.

We first conduct a Chow 1960 test to examine whether the relation as specified in (1) is invariant over the pre- and post-crisis periods. As shown in the third last row of Table 8, the *F*-statistics for Chow tests are significant at the 1 percent level across all cases, suggesting that there was a structural change in the relation from the pre-crisis period to the post-crisis period. To assess the impact of the crisis on the value of voluntary audits, we also conduct *t*-tests for differences in the coefficients of *VAudit* between the pre-crisis and post-crisis periods. As shown in columns 1 to 3 of Table 8, the coefficient of *VAudit* is negative but weakly significant or insignificant for the pre-crisis period (−0.344 with $t = -1.31$), while it is significantly negative for the post-crisis period (−0.825 with $t = -4.37$ for the period 1997–2002; −0.687 with $t = -3.18$ for the 1999-2002 period excluding 1997 and 1998).[38] The coefficient differences between the pre- and post-crisis periods are statistically significant at the 1 percent level based on a two-tailed *t*-test.

As shown in columns 4 to 6 of Table 8, when the interaction term *VAudit*Big4* is included in the regression, we find that the coefficient of *VAudit* is negative but insignificant in the pre-crisis period, but it is significantly negative in the post-crisis period. We find, however, that the coefficient of *VAudit*Big4* is insignificant in both the pre- and post-crisis periods. This is consistent with the view that the crisis did not influence the incremental value of Big 4 audits significantly.

In short, the results reported in Table 8, taken together, support the view that external audits played a more important role for credit stakeholders in the post-crisis period than in the pre-crisis period. Though the question of why the information value of external audits increases in the post-crisis period is beyond the scope of this study, our results are in line with the view that the improved institutional infrastructure subsequent to the crisis (e.g., improved disclosure standards and/or stronger legal protection of corporate stakeholders) reinforces (rather than substitutes for) the value of voluntary audits to banks and other credit stakeholders.[39] Put differently, we conjecture that external audits play a more important role in helping credit stakeholders overcome information uncertainty about borrowers in the better institutional environment of the post-crisis period. The above results are more in line with the reinforcement view of firm-level versus country-level governance that strong institutional infrastructure reinforces voluntary improvements in firm-level governance (Doidge, Karolyi, and Stulz 2004; Leuz, Lins, and Warnock 2009). However, our results are not in line with the substitution view that voluntary improvements in firm-level governance serves as a substitute for weak institutional infrastructures in a country (e.g., Durnev and Kim 2005; Francis, Khurana, Martin, and Pereira Forthcoming; Kim and Shi 2010).

37. To check the robustness of our results, we estimate (1) excluding observations in 1997 and 1998 that might have been heavily influenced by the 1997 Asian financial crisis.

38. We also reestimate regressions in Table 8 using the pooled OLS procedures with industry fixed effects included, but with firm fixed effects excluded, and find that the coefficients of *VAudit* are significantly negative in both pre-crisis and post-crisis periods and are more negative in the post-crisis period than in the pre-crisis period.

39. Choi, Kim, and Lee (forthcoming) provide useful discussions on post-crisis institutional reforms in Korea.

TABLE 8
Effect of the Asian financial crisis on regression results using the full sample of unaudited companies and companies with voluntary audits—before and after the 1997 Asian financial crisis

	(1)		(2)		(3)		(4)		(5)		(6)	
	Pre-crisis period		Post-crisis period		Post-crisis period excluding 1997 and 1998		Pre-crisis period		Post-crisis period		Post-crisis period excluding 1997 and 1998	
Variable	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
VAudit (β_1)	−0.344	−1.31	−0.825	−4.37***	−0.687	−3.18***	−0.274	−0.93	−0.786	−3.56***	−0.687	−2.76***
*VAudit*Big4* (β_2)							−0.250	−0.54	−0.122	−0.34	−0.001	−0.01
Size	−0.292	−1.56	0.192	2.74	−0.534	−4.86***	−0.292	−1.56	0.192	2.75***	−0.534	−4.86***
Profitability	−2.759	−2.31**	−1.890	−4.81***	−1.559	−3.18***	−2.774	−2.32**	−1.890	−4.81***	−1.559	−3.18***
Leverage	−3.528	−3.84***	−2.210	−15.91***	−1.233	−6.63***	−3.509	−3.81***	−2.211	−15.91***	−1.233	−6.63***
Tangible	−6.682	−8.99***	−3.395	−14.22***	−3.024	−10.63***	−6.693	−9.00***	−3.393	−14.21***	−3.024	−10.63***
Sales Growth	−0.043	−0.50	0.303	11.04***	0.412	13.03***	−0.043	−0.50	0.304	11.04***	0.412	13.03***
Neg Eq. Dummy	1.638	2.88***	1.336	11.18***	1.356	4.78***	1.649	2.90***	1.336	6.69***	1.356	4.78***
Intercept	12.179	4.50 ***	2.237	6.77***	12.346	8.02***	12.170	4.50***	2.225	2.26**	12.346	8.02***
Firm-fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Coefficient difference (t-stat): β_1 (pre-crisis) = β_1 (post-crisis)			−2.67***		−3.50***				−2.72***		−3.39***	
Coefficient difference (t-stat): β_2 (pre-crisis) = β_2 (post-crisis)									0.80		0.76	
Chow test (*F*-statistics):			6.70***		6.55***				5.63***		5.53***	
Adj. R^2	0.052		0.043		0.020		0.053		0.043		0.021	
N	9,168		63,409		44,627		9,168		63,409		44,627	

Notes:

All variables are as defined in the appendix. Reported *t*-values are on adjusted basis using standard errors corrected for firm-level clustering. ***, **, and * denote the 1%, 5%, and 10% levels of significance, respectively.

7. Summary and concluding remarks

In this paper, we take advantage of the institutional setting in Korea to assess the value of an external audit per se and the possible value differences between Big 4 and non–Big 4 audits in the context of the pricing of private debt such as bank loans. Using a sample of privately held companies with either no audit or voluntary audits, we find that private companies with voluntary audits pay significantly lower interest rates on their debt than private companies with no audit. The results of both pooled OLS and fixed-effects regressions show that the interest cost savings associated with voluntary audits per se ranges from about 56 to 124 basis points, depending on the regression method used. We find, however, no significant difference in the amount of interest cost savings between Big 4 and non–Big 4 audits. The above findings are robust to alternative regression methods and the use of size-matched samples. Moreover, the results of change analyses are, in general, consistent with those of levels-based regressions, which mitigates concerns over the possibility that the results of our main (levels-based) regressions might be driven by correlated omitted variables, potential endogeneity bias, and/or reverse causality. We also find that a first-time audit status change from no audit to voluntary audits leads to a greater interest cost saving than a first-time status change from no audit to mandatory audits (triggered by the size threshold). This finding suggests that voluntary audits play a more important role in enhancing the credibility of audited financial statements than mandatory audits triggered by legislative requirements. Finally, we provide evidence that the improved institutional infrastructure resulting from the post-crisis regulatory reforms enhances the information value of voluntary audits to credit stakeholders during the post-crisis period of 1997–2002 (or 1999–2002).

In conclusion, our results show that an external audit is of information value in the pricing of private debt such as bank loans, presumably because it enhances the credibility of audited financial statements and thus helps banks and other private lenders overcome information problems related to borrower credit quality. Overall, our evidence helps us better understand the role of auditing institutions in an environment that has not been studied much, that is, where the voluntary demand for external audits arises mainly from a need for private debt financing.

Appendix

Variable definitions

Variable		Definition
1. Dependent variable		
Interest Rate Spread	=	Interest rate – the average prime rate for the year. The interest rate in year *t* is measured as interest expenses in year *t* divided by the average of short-term and long-term debt at the beginning and end of year *t*.
2. Test variables		
VAudit	=	1 if a company has voluntary audits in year *t* and 0 otherwise.
Big4	=	1 if a company is audited by one of the Big 4 (previous 5, 6, and 8) auditors and 0 otherwise.
3. Firm-specific control variables		
Size	=	Log (total assets at the end of the fiscal year).
Profitability	=	Ratio of profit to sales. Profit represents income before extraordinary items.
Leverage	=	Ratio of total liabilities to total assets.
Tangible	=	Ratio of tangible assets to total assets. Tangible assets represent the difference between non-current assets and intangible assets.
Sales Growth	=	Percentage change in sales dollars in year *t*.
Negative Equity Dummy	=	1 if a company has negative equity and 0 otherwise.

References

Ang, J. S., R. A. Cole, and J. W. Lin. 2000. Agency costs and ownership structure. *The Journal of Finance* 55 (1): 81–106.

Atanasov, V., B. Black, C. Ciccotello, and S. Gyoshev. 2010. How does law affect finance? An examination of equity tunneling in Bulgaria *Journal of Financial Economics* 96 (1): 155–73.

Bae, K.-H., J.-K. Kang, and C.-W. Lim. 2002. The value of durable bank relationships: Evidence from Korean banking shocks. *Journal of Financial Economics* 64 (5): 181–214.

Ball, R. 2001. Infrastructure requirements for an economically efficient system of public financial reporting and disclosure. Brookings–Wharton Papers on Financial Services, pp. 127–69.

Ball, R., A. Robin, and J. S. Wu. 2003. Incentives versus standards: Properties of accounting income in four East Asian countries and implications for acceptance of IAS. *Journal of Accounting and Economics* 36 (1–3): 235–270.

Ball, R., and L. Shivakumar. 2005. Earnings quality in U.K. private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83–128.

Beatty, R. 1989. Auditor reputation and the pricing of initial public offerings. *Accounting Review* 64 (4): 693–709.

Beatty, A., B. Ke, and K. Petroni. 2002. Earnings management to avoid earnings declines across publicly and privately held banks. *Accounting Review* 77 (3): 547–70.

Becker, C., M. DeFond, J. Jiambalvo, and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1–24.

Bharath, S., J. Sunder, and S. V. Sunder. 2008. Accounting quality and debt contracting. *Accounting Review* 83 (1): 1–28.

Blackwell, D. W., T. R. Noland, and D. B. Winters. 1998. The value of auditor assurance: Evidence from loan pricing. *Journal of Accounting Research* 36 (1): 57–70.

Bushman, R., and J. Piotroski. 2006. Financial reporting incentives for conservative accounting: The influence of legal and political institutions. *Journal of Accounting and Economics* 42 (1–2): 107–48.

Chaney, P., D. C. Jeter, and L. Shivakumar. 2004. Self-selection of auditors and audit pricing in private firms. *Accounting Review* 79 (1): 51–72.

Choi, J. H., J.-B. Kim, and J. Lee. Forthcoming. Value relevance of discretionary accruals in the Asian financial crisis of 1997–1998. *Journal of Accounting and Public Policy*.

Chow, C. 1982. The demand for external auditing: Size, debt and ownership influences. *Accounting Review* 57 (2): 272–91.

Chow, G. C. 1960. Tests of equality between sets of coefficients in two linear regressions. *Econometrica* 28 (3): 591–603.

Chung, R., M. Firth, and J.-B. Kim. 2003. Auditor conservatism and reported earnings. *Accounting and Business Research* 33 (1): 19–32.

Cole, R. A., J. D. Wolken, and L. Woodburn. 1996. Bank and non-bank competition for small business credit: Evidence from the 1987 and 1993 National Surveys of Small Business Finances. *Federal Reserve Bulletin* 82 (11): 983–95.

DeAngelo, L. E. 1981. Auditor size and audit quality. *Journal of Accounting and Economics* 3 (3): 183–99.

DeFond, M., and J. Jiambalvo. 1991. Incidence and circumstances of accounting errors. *Accounting Review* 66 (3): 643–55.

Denis, D., and V. Mihov. 2003. The choice between bank debt, non-bank private debt and public debt: Evidence from new corporate borrowings. *Journal of Financial Economics* 70 (1): 3–28.

Diamond, D. 1984. Financial intermediation and delegated monitoring. *Review of Economic Studies* 62 (3): 393–414.

Diamond, D. 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. *Journal of Political Economy* 99 (4): 689–721.

Diamond, D., and R. Verrecchia. 1991. Disclosure, liquidity, and the cost of capital. *Journal of Finance* 46 (4): 1405–36.

Doidge, C., A. Karolyi, and R. Stulz. 2004. Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics* 71 (2): 205–38.

Dopuch, N., and D. A. Simunic. 1980. Competition in auditing: An assessment. *Proceedings of the Symposium on Auditing Research IV*, University of Illinois at Urbana-Champaign, pp. 403–50.

Durnev, A., and E. H. Kim. 2005. To steal or not to steal: Firm attributes, legal environment and valuation. *The Journal of Finance* 60 (3): 1461–93.

Fama, E. 1985. What's different about banks? *Journal of Monetary Economics* 15 (1): 29–39.

Fan, J., and T. J. Wong. 2005. Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia. *Journal of Accounting Research* 43 (1): 35–72.

Fortin, S., and J. A. Pittman. 2007. The role of auditor choice in debt pricing in private firms. *Contemporary Accounting Research* 24 (3): 859–96.

Francis, J. R., I. K. Khurana, X. Martin, and R. Pereira. Forthcoming. The relative importance of firm incentives versus country factors in the demand for audits by private entities. *Contemporary Accounting Research*.

Francis, J. R., I. K. Khurana, and R. Pereira. 2005a. Disclosure incentives and effects on cost of capital around the world. *Accounting Review* 80 (4): 1125–62.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2005b. The market pricing of accruals quality. *Journal of Accounting and Economics* 39 (2): 295–327.

Francis, J., and C. Lennox. 2008. Selection models in accounting research. Unpublished paper, University of Missouri-Columbia. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1120796.

Graham, J. R., S. Li, and J. Qiu. 2008. Corporate misreporting and bank loan contracting. *Journal of Financial Economics* 89 (1): 44–61.

Greene, W. 1990. *Econometric analysis*. New York: Macmillan.

Gul, F., J.-B. Kim, and A. Qiu. 2010. Ownership concentration, foreign shareholding, audit quality and stock price synchronicity: Evidence from China. *Journal of Financial Economics* 95 (3): 425–42.

Heckman, J. 1979. The sample selection bias as a specification error. *Econometrica* 47 (1): 153–62.

Jensen, M., and W. Meckling. 1976. Theory of firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (2): 305–60.

Jeong, S. W., and J. Rho. 2004. Big 6 auditors and audit quality: The Korean evidence. *International Journal of Accounting* 39 (2): 175–96.

Johnson, D., K. Pany, and R. White. 1983. Audit report and the loan decision: Actions and perceptions. *Auditing: Journal of Practice and Theory* 3: 38–51.

Kim, J.-B., R. Chung, and M. Firth. 2003. Auditor conservatism, asymmetric monitoring and discretionary accrual choices. *Contemporary Accounting Research* 20 (2): 323–60.

Kim, J.-B., and H. Shi. 2010. Voluntary IFRS adoption and stock price synchronicity: Do analyst following and institutional infrastructure matter? Working paper, City University of Hong Kong and Fudan University.

Kim, J.-B., B. Song, and L. Zhang. 2009. Internal control weakness and bank loan contracting: Evidence from SOX Section 404 disclosures. Working paper, City University of Hong Kong and Concordia University.

Kim, J.-B., J. S. L. Tsui, and C. H. Yi. Forthcoming. The voluntary adoption of International Financial Reporting Standards and loan contracting around the world. *Review of Accounting Studies*.

Kim, J.-B., and C. H. Yi. 2006. Ownership structure, business group affiliation, listing status, and earnings management: Evidence from Korea. *Contemporary Accounting Research* 23 (2): 427–64.

Kim, J.-B., and C. H. Yi. 2009. Does auditor designation by the regulatory authority improve audit quality? Korean evidence *Journal of Accounting and Public Policy* 28 (3): 207–30.

Larcker, D. K., and T. O. Rusticus. 2010. On the use of instrumental variables in accounting research. *Journal of Accounting and Economics* 49 (3): 186–205.

Lee, H. Y., T. O'Keefe, and M. Stein. 2003. Client characteristics, abnormal accruals, and auditor switch: An empirical study. *Asia-Pacific Journal of Accounting and Economics* 10 (1): 31–56.

Leuz, C., K. Lins, and F. Warnock. 2009. Do foreigners invest less in poorly governed firms? *Review of Financial Studies* 22 (8): 3245–85.

Leuz, C., and R. E. Verrecchia. 2000. The economic consequences of increased disclosure. *Journal of Accounting Research* 38 (Supplement): 91–124.

Mansi, S. A., W. F. Maxwell, and D. P. Miller. 2004. Does audit quality and tenure matter to investors? Evidence from the bond market. *Journal of Accounting Research* 42 (4): 755–93.

Mitton, T. 2002. A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis. *Journal of Financial Economics* 64 (2): 215–41.

Palmrose, Z.-V. 1988. An analysis of auditor litigation and audit service quality. *Accounting Review* 63 (1): 97–110.

Peek, E., R. Cuijpers, and W. Buijink. 2006. Creditors' and shareholders' demand for accounting conservatism in public vs. private firms. Working paper, Maastricht University.

Petersen, M., and R. Rajan. 1994. The benefits of lending relationships: Evidence from small business data. *The Journal of Finance* 49 (1): 3–37.

Pittman, J. A., and S. Fortin. 2004. Auditor choice and the cost of debt capital for newly public firms. *Journal of Accounting and Economics* 37 (1): 113–36.

Rajan, R. 1992. Insiders and outsiders: The choice between relationship and arms-length debt. *The Journal of Finance* 47 (4): 1367–1400.

Teoh, S., and T. J. Wong. 1993. Perceived auditor quality and the earnings response coefficient. *Accounting Review* 68 (2): 346–66.

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.