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## Article

# Effect of audit firm industry specialization on cost of debt financing: Evidence from Ghana

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## ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

# Effect of audit firm industry specialization on cost of debt financing: Evidence from Ghana

Ebenezer Nana Yeboah<sup>1</sup>, Zhou Yang<sup>1</sup>, Benedict Arthur<sup>2\*</sup> and Gabriel Kyeremeh<sup>3</sup>

**Abstract:** This study examines whether audit firm industry specialization affects the cost of debt finance of business. We hypothesize that audit firm industry specialization reduces client cost of debt since auditors with industry specialization are more likely to deter and detect questionable accounting practices and report material errors and irregularities. Thus, utilizing data from Ghanaian listed and unlisted firms, the study finds that audit firm industry specialization reduces the cost of debt. The finding is consistent with a robustness test in which an alternative measure of the audit firm's industry expertise was utilised. The study further submits that the influence of audit industry specialization on the cost of debt is more pronounced in the low-earning companies than high-earning companies, while no significant difference in impact exists between private companies and state-owned companies.

**Subjects:** Economics; Finance; Business, Management and Accounting

**Keywords:** audit firm industry specialization; cost of debt financing; audit firm; audit quality

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### PUBLIC INTEREST STATEMENT

Auditing is one of the key corporate governance mechanisms that helps to bridge the information gap between internal and external stakeholders by ensuring credibility of firms accounting information. Given the importance of accounting information transparency to lenders and shareholders, capital markets continue to investigate the function of auditor selection in reducing the uncertainties that users of financial statements may have about organizations. Accordingly, the study uncovers that auditors with industry specialization offer greater assurance of quality that decreases investors' monitoring costs and increases lenders' trust causing them to transfer these cost savings on to firms in the form of reduced interest rates. In other words, firms that use industry specialists' auditors have significantly lower cost of debt than firms that use non-specialist auditors.

## 1. Introduction

Debts predominantly finance businesses in Africa since it provides the company better advantages over equity finance. This is because most businesses are young, and their owners mostly do not want to share ownership. However, the associated cost of debt financing becomes a challenge for companies due to mismanagement by opportunistic managers. In response, owners of businesses demand intense monitoring to mitigate this agency problem. Auditing plays an important role in monitoring business as it serves as a tool for supervising management operations. This is done by assessing the books to ascertain that financial statements are prepared in accordance with the required financial reporting standards and are free from material misstatement.

Extent studies have shown that quality audit leads to a decrease in discretionary accruals since auditors are able to detect a material misstatement (Alzoubi, 2018; Le & Moore, 2021; Prawitt et al., 2009). In line, there has been much attention on the relationship between the cost of debt and audit quality in recent finance and accounting literature. However, little to none studies have considered auditors with industry specialization, which is one of the key contributors to improvement in audit quality and might, in turn, substantially affect the cost of debt.

Auditors with industry specialization are more likely to deter and detect questionable accounting practices and report material errors and irregularities than auditors without industry specialization. Research has it that auditors with industry specialization have a much more in-depth understanding of the operations and activities of that industry and hence are able to provide very quality audit work, which in turn improves the quality of earnings of those companies. Audit firms with industry specialization offer services that are of much importance to investors since they have much expertise and give better assurance due to adequate resources and information available to them (Campa, 2013). In light of this essence, the study is engrossed in examining the linkage between audit firm industry specialization and cost of debt, using the case of companies in Ghana.

Ghana is among the emerging economies in Africa, with an increase in trade and foreign direct investment for the past decade. Nevertheless, according to a report from the World Bank (Global doing Business report), the cost of doing business in Ghana has been rising significantly. However, with all these rising costs of doing business in Ghana, most studies have been silent on the relationship between the cost of debt and other variables that determine it. In Ghana, debt financing accounts for a high percentage of companies' financing. A significant percentage of companies in Ghana is financed by debt, but research has not contributed to how audit specialization could help reduce the cost of debt so that doing business in Ghana will be cheap and could attract more investors and boost the Ghanaian economy. Therefore, this study will contribute to the literature by investigating the effect of audit firm industry specialization on the cost of debt.

Clearly, there is a lack of empirical evidence that tests the effects of audit industry specialization on the cost of debt financing as the basis of the capital market. Therefore, it becomes very necessary to investigate this phenomenon using an emerging market where stock market participation is low and financial institutions rather play a critical role in raising business finance.

The rest of the paper is organized as follows: The next section is about the literature review. This part sheds more light on the research on industry specialization as well as an overview of audit firms in Ghana and theoretical analysis. The third section is the methodology aspect. It focuses on sampling selection and measurement of auditor industry specialization. The empirical results and discussions of the results are found in the fourth section, while the last section is about the conclusion and recommendations.

## 2. Literature review

### 2.1. Review of the structure of audit firms in Ghana

There are a number of audit firms in Ghana with both local and foreign companies. Obtaining a practicing license of auditor, thus an individual qualification, requires 4 years of practical

experience (of which three should be with an audit firm) and 2 years of post-qualification experience. Under the Companies Act 2019 (Act 992), all audits must be conducted by a Practising Accountant registered and licensed by the Institute of Chartered Accountants Ghana (ICAG). Just as the individual license is from ICAG, the audit firm license after company registration is issued by ICAG. The Institute of Chartered Accountants Ghana (ICAG) regulates the activities of all licensed audit firms in Ghana. The Big Four audit firms refer to Deloitte, PricewaterhouseCoopers (PwC), KPMG, and Ernst & Young. These firms are the four largest professional services firms in Ghana that provide audit, transaction advisory, taxation, consulting, risk advisory, and actuarial services. The Big Four perform audits on the majority of public companies and private companies throughout Ghana. There is no independent audit supervisory body in Ghana. Auditors are regulated by the Institute of Chartered Accountants (Ghana) (ICAG) in accordance with the Chartered Accountants Act 1963. ... ICAG was established by the Chartered Accountants Act (Act 170) 1963.

In Ghana, the Companies Code governs the requirement of corporate accounting, reporting, and auditing in Ghana (Appiah et al., 2016). The companies make it compulsory for companies listed on the Ghana Stock Exchange to provide an annual audit of the operations and publish it for all stakeholders, including the general public. Appiah et al. (2016) further indicate that Limited Liability Companies must appoint auditors in their registration processes and ensure their books are regularly audited for tax payment and other registration compliance. The Companies Act defines small audit firms as audit firms with an average number of employees not more than 50 and has an annual turnover not exceeding £6.5 million or a balance sheet total of not more than £3.26 million. Due to regulatory obligations and the fact that most companies cannot afford the services of the big four accounting due to huge audit fees, small audit firms have become preferred for most companies.

The auditing and accounting practices in Ghana are characterized by institutional weaknesses in regulation, enforcement, and compliance with rules and standards. Several weaknesses were identified in the legislative and regulatory framework that governs financial reporting. Although Ghana Accounting and Auditing Standards are modeled on International Standard on Auditing (ISA) and International Accounting Standards (IAS), they are outdated and do not meet international standards. Full compliance with Ghana National Accounting Standards is not readily achieved; some listed companies claim compliance with IAS inappropriately. There is inadequate compliance with professional ethics and auditing standards. Apart from the banking sector practice, enforcement and monitoring mechanisms are ineffective. Also, poor quality accounting education and training have contributed to weaknesses in the auditing and financial reporting framework. The policy recommendations provided in this study emphasize improving the statutory framework, upgrading professional education, and training, strengthening enforcement mechanisms, and capacity building of regulatory and professional bodies.

## **2.2. Review of the measures of industry specialization**

Research in the area of the measure of auditor specialization of the firm has grown enormously in the last decade, with a lack of consistency in the methodologies applied for considering firms as industry audit specialists. The utilization of different approaches to measure industry specialization in firms did not help in evaluating and comparing the findings regarding auditor specialization and its related benefits for improved audit quality, switching of auditors, restatements, and other issues pertaining to the audit and financial reporting process. Neal and Riley (2004) summarized prior 1981 research studies in auditor specialization in two main approaches: "(1) within industry differentiation across competing audit firms, the market share approach, and (2) within audit firm differentiation across industries, the portfolio share approach." They defined the market share approach in an industry specialist "as an audit firm that has differentiated itself from its competitors in terms of market share within a particular industry." The firm(s) with the largest market share, in terms of its important economic, strategic, and operational activities, has (have) acquired the largest knowledge base within that particular industry due to its significant

investments in developing industry-specific audit methodologies and technologies with the expected benefits being increased economies of scale and improved audit. Accordingly, the study adopted the within-industry differentiation across competing audit firms, the market share approach as the basis for estimating the auditor's industry specialization in this study.

### **2.3. Review of theoretical literature**

Agency theory offers one of the most excellent platforms to understand the function of audit and how it extends to affect the cost of debt of borrowers. Agency theory explains the agency relationship that emerges from the contract between the agent and the principal, in which the agent performs tasks for the principal's interest. Although the premise is mostly applied to bigger firms, agency problems may persist in smaller firms, especially those that are also complex and diverse. The difference of interest between the agent as the management of the firm and the principal as the owner of capital can occur in the carrying out of the agency relationship. Thus, to ensure good operational activities of the company, principal control is needed because the agent might humanly seek personal gain over his principal. Consequently, owing to the conflict of interest and agency cost, an independent third party, the auditor, is required to ensure the symmetry of information and transparency of financial statements, which mirrors the overall financial position of a company.

Similarly, since a principal-agent relationship exists between the firm and the lender, firms that look to raise funds through external debt will actively seek ways to improve the quality of their accounting information (Lin & Yen, 2022) and thereby reduce the information asymmetry between the firm and the lender. Thus, an external auditor will serve as a bridge between the firm and lender by giving assurance and credible information to resolve conflicts of interest and information gaps. Gandía & Huguet (2021) established that unaudited financial statements of businesses are twice as likely to have accounting errors as compared to firms with audited financial statements. Thus, according to agency theory's assumptions, audited financial statements should reduce firms' cost of debt as they reduce the information asymmetry between the firm and the lender. In essence, the quality of audit increases the trustworthiness of financial statements for users of accounting information, such as lenders, since it aids in the verification of management's operations and affairs and reduces the degree of user information risk. In other words, audit quality enhances the quality of earnings, makes financial statements acceptable to tax authorities and creditors, and the raising of both stock and debt financing.

Audit quality is defined as an auditor's ability to discover and disclose material misstatements in a company's financial statements and accounting system (DeAngelo, 1981). The likelihood of the auditor detecting material misrepresentation depends on his or her intense knowledge, and the likelihood of the auditor disclosing material misstatement depends on his or her independence. By implication, the audit quality increases as the auditor's knowledge level in the industry increases. As such, owing to the complex nature of the business and the regulations governing a business industry both internally and externally, auditors with industry specialization are expected to produce a high-quality audit since they have in-depth knowledge and expertise in the industry to detect material misstatements easily. Given that quality audit enhances the credibility of the financial reports of which auditors with industry specialize stand to provide high-quality audit, an audited financial statement by auditors with industry specialty is regarded as more transparent and reputable information by outsiders, particularly lenders and fund providers leading to a significant favorable impact on the access and cost of debt.

### **2.4. Empirical review and hypothesis development**

Auditing provides credibility for the quality of financial information and enhances the quality of information disclosure (Afenya et al., 2022). In line, signing particularly auditors with industry knowledge and expertise are more inclined to provide a high-quality audit, decrease information asymmetry and ultimately reduce debt financing costs. Empirically, high-quality accounting information has been demonstrated to be a more essential element in determining debt cost than restrictions in debt contracts (Spiceland et al., 2016). Karjalainen (2011) reveals that in Finland,

private enterprises with high audit quality (external audit) pay much lower interest rates on their debts than private firms with low audit quality (none audit). Also, Causholli and Knechel (2012) discovered that audit quality has a considerable impact on debt cost reduction in the United States. Furthermore, Gul et al. (2013) report that companies audited by Big 4-audit firms have much lower loan interest rates than firms examined by non-Big 4-audit firms. Similarly, Carmo et al. (2016) investigated the association between quality of earnings and credit cost for Portuguese private firms using an ordinary least square estimation. The study findings demonstrate that earnings quality has a stronger impact on debt reduction in enterprises with audited financial accounts. This account implies that banks place a higher value on audited financial information when determining interest rates. In a related study by Aldamen and Duncan (2012), it is established that the possibility of obtaining interest-bearing loans is connected to the quality of governance, which is mirrored by the utilization of external auditors services. Moreover, in a more recent study, Zaidan et al. (2021) established that the cost of debt is smaller for private Korean firms when auditing is voluntary.

Conversely, some studies investigated the relationship between debt cost and audit quality in public corporations, private companies, and a mixture of both groups and discovered no significant relationship between audit quality and debt cost (Huguet & Gandía, 2014; Fortin and Pittman 2004). For instance, Kim et al. (2011) discovered no significant association between voluntarily and involuntarily audited enterprises and their cost of debt. Likewise, Evinita (2022) and Fortin and Pittman (2007) also discovered no significant relationship between firms audited by Big 4 and smaller auditors and their cost of debt. Notwithstanding, the majority of the empirical research suggest that lenders value auditor presence over non-existence as it assures the credibility or quality of firms' reported financial positions. Thus, logically in line with the evidence that auditors with industry specialization have much in-depth understanding of the operations and activities of that industry and hence are able to provide high-quality audit work, which in turn improves the quality of earnings of those companies, we hypothesize that auditors with industry specialization or competence reduce the cost of debt financing for the firms. Hence, guided by our choice of theory and review of existing related empirical works, we hypothesize that **H1: Auditors with industry specialization reduce the cost of debt financing of the client firms.**

### 3. Methodology

#### 3.1. Sampling selection

The target sample of the study consists of all registered companies (both listed and unlisted firms) in Ghana as of the end of 2019. The initial plan was to conduct the research on all companies in Ghana, given the accounting specialization as the focus of this study. However, this was not possible due to the non-availability of firm-level data for some of the companies.

According to Ahlberg and Hult (2021), it is virtually unattainable for a researcher to gather all categories of objects being studied. Sulaiman and Yasin (2022)() also succumbed to the impossibility of gathering data on all the objects of interest by stating that it is not possible to study everyone everywhere and do everything when conducting research. Thus, a researcher must make an effort to obtain evidence from a section of the population through a sampling technique. Dwelling on the data search of all registered companies in Ghana, the initial search for data on all registered companies in Ghana was not successful due to the non-availability of data on some of the companies resulting in the elimination of these companies from the sample. After carefully examining the available data from the Ghana stock exchange and websites of the registered companies, the researcher settled on a hundred registered companies for 11 years. A hundred companies include all the 37 listed companies on the Ghana stock exchange, while the remaining 63 companies comprise unlisted companies.

### 3.2. Measuring auditor's industry specialization

As industry specialization is not directly observable, prior studies use several proxies (e.g., market share and portfolio share). Most measures are based on a firm's market share because industry expertise is obtained by repetition of the audit task in similar settings. Therefore, people perceive that auditing a large share of a certain industry indicates expertise (Isaac, 2022). Inayah and Prasetyo (2021) identifies industry specialists as "the largest supplier in each industry," as well as the second and third-largest suppliers in industries in which readily observable differences existed between the second and the third or between the third and the remaining suppliers. In this study, industry specialization is measured by the market share approach using total assets as the base. This approach assumes that by comparing the relative market shares of the audit firms in an industry, industry-specific knowledge can be gathered. The firm with the largest market share has the most knowledge about that particular industry, so in this study, the audit firm with the largest market share is indicated as the industry specialist.

$$MS_{ik} = \frac{\sum_{j=1}^{J_k} \sqrt{A_{ijk}}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_k} \sqrt{A_{ijk}}} \quad (1)$$

Where

$A_{ijk}$  = total assets of client firm  $j$  in industry  $k$  audited by auditor  $i$

$i = 1, 2 \dots I$  = an index for audit firms

$j = 1, 2 \dots J$  = an index for client firms

$k = 1, 2 \dots K$  = an index for client industries

$I_k$  = the number of audit firms  $i$  in industry  $k$

$J_k$  = the number of clients served by audit firm  $i$  in industry  $k$

Prior studies usually use information about an auditor's clients to infer information about the audit market structure, such as industry market share (Zeff & Fossum, 1967) and auditor concentration (1981). This study adopted the assets base market share model as the main measure for industry specialization. Two other alternate specialization measures are also adopted. For the main measure of specialization, SPEC, an audit firm that has the greatest market share in a given industry in a given year takes a value of 1 and, otherwise, 0.

### 3.3. The multivariate model for estimating the effect of specialization on cost of debt financing

To define the regressions to verify the hypothesis, a modified research design of Kim et al. (2011) is used.

$$IR_{it} = \beta_0 + \beta_1 SPEC_{it} + \beta_2 SIZE_{it} + \beta_3 TR_{it} + \beta_4 LEV_{it} + \beta_5 OPR_{it} + \beta_6 CFO_{it} + \beta_7 BIG4_{it} + \beta_8 CS_{it} + \epsilon_{it} \quad (2)$$

Where: IR is the Interest rate (the cost of debt).

$t$  is the time period.

BIG4 is the Big 4 audit firm.

SIZE is the Log of total assets.



TR is the Tangible fixed asset ratio.

LEV is the Leverage.

CS is the Change in sales.

The dependent variable of the above equation of this study is IR, which is the interest rate of the firm's debt. It is calculated by the quotient between the interest expense on debt and the average of the total debt of the current and previous year. This is similar to the method adopted by (Bepari et al., 2022). The variable BIG4 is the interest variable of the equation, being a variable that equals 1 for Big 4 audit firms and 0 otherwise. The SIZE variable is the log of total assets and is used to control the effects of the firm's size on the cost of debt. The variable TR that is also employed to control the dimension of the company on the cost of debt is compounded by the quotient between the tangible fixed assets and the total of assets. The LEV variable is employed to relate the capacity of the company to pay its debt and the risk of bankruptcy and is calculated by the quotient between the total of liabilities and total of assets. OPR is the client operation risk, which is directly measured by the efficiency ratio as the operating cost divided by the total revenue. CFO is the change in operating cash flow scaled by total assets. The last control variable is CS that is the change on sales, which objective is to control the growth of the companies and is calculated by the quotient of the difference of the sales of two consecutive periods (the current minus the previous one) and total assets, being negatively associated with the cost of debt.

#### 4. Empirical results

##### 4.1. Descriptive statistics

Table 1 illustrates the sample's descriptive statistics, including the mean scores and the standard deviation of each variable. Out of the 1100 observations, DEBT has an overall average of 0.033 with minimum and maximum values of -0.789 and 10.426, respectively, whereas Specialization (SPEC) has a mean of 0.271 and a standard deviation of 0.114. Similarly, total assets (SIZE) had an average of 18.982 and a standard deviation of 2.414.

Table 2 shows the univariate test results for the mean differences between the companies using accounting specialists and those using non-specialists. From the table, the difference between the cost of debt by specialists and non-specialists is 0.025\*, which is statistically significant. The results also show that there is a negative relationship between audit and the cost of debt for both specialized and non-specialized. The significant difference indicates that audit firm with industry specialization or Industry expertise aids in reducing the cost of debt for companies. Liquidity ratio (LR), the results show that it plays no significant role statistically (-0.977) in the type of auditor chosen by a company in auditing their accounts. The size of the company does not play a significant role in choosing audit firms with industry specialization and of audit firms with less

**Table 1. Descriptive statistics**

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
DEBT	1,100	0.033	0.020	0.385	-0.789	10.426
SPEC	1,100	0.271	0	0.114	0	1
LR	1,100	2.426	1.162	4.165	-0.898	14.510
SIZE	1,100	18.982	22.153	2.414	12.686	23.087
LEV	1,100	0.765	0.628	1.218	0.001	21.126
ROA	1,100	0.008	0.043	0.407	-5.649	0.715
GROWTH	1,100	0.256	0.114	0.461	-0.847	5.754
BIG4	1,100	0.835	1	0.372	0	1

**Table 2. Univariate test**

Variable	Non-specialist	Specialist	Difference
DEBT	-0.039	-0.14	0.025*
LR	1.719	2.696	-0.977
SIZE	19.467	19.968	-0.501
LEV	0.891	0.760	0.131
ROA	-0.021	0.021	-0.042*
BIG4	0.772	0.977	-0.205***
GROWTH	0.203	0.216	-0.013

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

or no industry specialization. Based on leverage (LEV), the difference in the type of auditor they choose to engage in auditing their accounts is statistically not significant (0.131). For return on assets (ROA), the difference in the type of auditor is statistically significant (-0.042\*). When it comes to the indicator variable (BIG4), most firms prefer specialists, giving a statistically significant value of -0.205\*\*\*. The growth in business is not statistically significant (-0.013) in deciding between a specialist and a non-specialist.

#### 4.2. Correlation analysis

The correlation coefficients as displayed in the correlation matrix in Table 3 show that the variables in the model for the effect of audit firm specialization on the cost of debt are free from the problem of multi-collinearity.

From Table 3, which shows the correlations among the study variables, there is a negative correlation between specialization (SPEC) and Cost of Debt (DEBT). This means that the higher the SPEC, the lower the cost of debt. Similarly, a negative relationship exists between the liquidity ratio (LR) and the Cost of Debt (DEBT). For total assets (SIZE) against Cost of Debt (DEBT), there was also a negative correlation. When the leverage calculated as the ratio of long-term liabilities and total assets of the company (LEV) rises, the Cost of Debt (DEBT) also rises, as given by a positive correlation. As the return (ROA) increases, the Cost of Debt (DEBT) decreases in the opposite direction. When the client operation risk is low in the same vein, there is a high discretionary accrual (DISAC). Relatively, the higher the growth of the company, the lower the Cost of Debt (DEBT), and the lower the growth, the higher the Cost of Debt (DEBT), as established by the negative correlation. The BIG4 audit firm is negatively correlated with the Cost of Debt (DEBT), indicating that moving from a non-BIG4 firm to a BIG4 firm results in a significant reduction in the Cost of Debt (DEBT) as signposted by the negative coefficient.

#### 4.3. Regression results

Table 4 offers the regression results for the effect of audit firm industry specialization on the cost of debt. Among them, the independent variable SPEC in column 1 is calculated based on the total assets of the customers audited by the audit company, and the independent variable SPEC in column 2 is calculated based on where the audit company receives revenue from the customer.

It is obvious from the results in Table 4 that all the two measures of specialization move in the same direction. Audit firm industry specialization (SPEC) across the two diverse measures has a negative significant impact on the cost of debt, which implies that audit firm specialization reduces the cost of debt financing. The results show a significant negative relationship between audit firm specialization and debt cost at 5% and 10% level of significance. The results confirm that there is a high chance of cost of debt reduction for companies that demand industry specialization. This supports our hypothesis, which states that all other things being equal, industry specialist audit firms will reduce the cost of debt. This study's results align with the findings of Moudud-Ul-Huq (2019), who

**Table 3. Correlation analysis**

Variables	DEBT	SPEC	LR	SIZE	LEV	BIG4	ROA	GROWTH
DEBT	1.000							
SPEC	-0.028***	1.000						
LR	-0.007	-0.018	1.000					
SIZE	-0.061**	0.205***	0.002	1.000				
LEV	0.005	-0.021	-0.026	-0.070**	1.000			
BIG4	-0.005	0.321***	-0.054	0.266***	0.009	1.000		
ROA	-0.057***	0.019	0.006	0.058*	0.317***	0.121***	1.000	
GROWTH	-0.011	0.006	-0.010	-0.007	-0.052	-0.008	0.001	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 4. Regression results for the effect of specialization on the cost of debt**

	<b>Model (1)</b>	<b>Model (2)</b>
SPEC	-0.0177** (0.036)	
SPEC-Revenue		-0.0219* (0.056)
LR	-0.0001*** (0.006)	-0.0001*** (0.006)
SIZE	-0.0067** (0.035)	-0.0064*** (0.005)
LEV	0.0020* (0.068)	0.0020* (0.057)
BIG4	-0.0242** (0.039)	-0.0263** (0.028)
ROA	-0.0570*** (0.009)	-0.0576** (0.049)
GROWTH	-0.0034** (0.016)	-0.0036** (0.014)
Constant	0.1734 (0.107)	0.1676 (0.108)
Year dummy	Yes	Yes
Industry dummy	Yes	Yes
No. of Obs.	1,100	1,100
R-Squared	0.5058	0.4060

P values in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

found that companies that employ well-known big audit firms do not yield an additional cost of debt. Industry specialists have clients with the lowest cost of debt. The study corroborates with the findings of Huguet and Gandía (2014), who researched the cost of debt capital and audit in Spanish SMEs. Their study found that audit decreases the cost of debt. Our findings provide empirical evidence consistent with the hypothesis that auditors with industry specialization reduce the cost of debt. The results in Tables 5–4 also reveal that the liquidity ratio (LR) negatively impacts the cost of debt (DEBT), and the effect is statistically significant at 5% and 1% level. This indicates that an increase in the liquidity ratio will decrease the cost of debt. This result is in conformity with the study of Huguet and Gandía (2014), who also found a negative impact of liquidity ratio on the cost of debt.

The cost of debt information is very important to the stakeholders, especially the investors, to know how much the company is indebted. Information asymmetry is reduced when the information level increases and accurate information is provided by an audit firm with industry specialization. In finance and ownership, managers having more information than stakeholders create information asymmetry. In situations where managers have more knowledge of the cost of debt financing than investors, resulting in information asymmetry puts the business at risk in the future. Audit industry specialization helps mitigate the risk involved with information asymmetry and the cost of debt financing.

Similarly, from the results, firms with high company size (SIZE) tend to have a low cost of debt, and the impact is statistically significant. When it comes to leverage (LEV), highly leveraged firms are likely to have a higher cost of debt (DEBT). The reason is that a firm that depends on huge leverage is more likely to engage in manipulation to look good and be trusted by creditors to acquire higher loans. Hence, increasing the cost of debt. The result is consistent with Hou et al.

**Table 5. Robustness results—cost of debt**

	<b>Dependent Variable: DEBT</b>
SPEC–Fraction	–0.1307** (0.018)
Constant	0.1819 (0.106)
Year dummy	Yes
Industry dummy	Yes
No. of Obs.	1,100
R-Squared	0.2244

P values in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

**Table 6. Further analysis based on earnings—cost of debt**

	<b>High-earning companies</b>		<b>Low-earning companies</b>	
	<b>Model (1)</b>	<b>Model (2)</b>	<b>Model (1)</b>	<b>Model (2)</b>
SPEC	–0.0181*** (0.005)		–0.0240** (0.015)	
SPEC–Revenue		–0.0344** (0.044)		–0.0581* (0.062)
LR	–0.0008** (0.014)	–0.0009** (0.015)	–0.0001*** (0.002)	–0.0001*** (0.002)
SIZE	–0.0171** (0.010)	–0.0165* (0.060)	–0.0020 (0.112)	–0.0020 (0.102)
LEV	0.0093* (0.093)	0.0095* (0.092)	0.0001** (0.032)	0.0001** (0.020)
BIG4	–0.0498** (0.038)	–0.0540 (0.178)	–0.0134* (0.068)	–0.0134** (0.018)
GROWTH	–0.0167** (0.038)	–0.0171** (0.039)	–0.0048** (0.027)	–0.0048** (0.016)
Constant	0.4237* (0.061)	0.4121** (0.043)	0.0038** (0.047)	0.0038** (0.048)
Year dum	Yes	Yes	Yes	Yes
Industry dum	Yes	Yes	Yes	Yes
No. of Obs.	591	591	509	509
R-Squared	0.5161	0.3164	0.4135	0.3135

Coefficient test between the High and Low earning firms

Model 1(Spec) chi2 (1) = 9.04 Prob > chi2 = 0.0008\*\*\*

Model 2 (Spec-Rev) chi2 (1) = 12.25 Prob > chi2 = 0.0000\*\*\*

P values in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

(2020). When it comes to the variable indicator BIG4, there exists a significant negative effect of the Big 4 audit firms on the cost of debt of companies in the study sample. Prior studies have also reported similar results, for example, Hou et al. (2020). With respect to return on asset (ROA), as it increases, the cost of debt tends to reduce. Considering the variable indicator GROWTH, when there is growth in the company, there is the likeliness of a company to ascertain a lower cost of debt.

**Table 7. Further analysis by ownership—cost of debt**

	State-owned Companies		Private Companies	
	Model (2)	Model (3)	Model (2)	Model (3)
SPEC	-0.0156** (0.016)		-0.0158*** (0.003)	
SPEC-Revenue		-0.0277* (0.065)		-0.0270** (0.022)
LR	-0.0126** (0.035)	-0.0127** (0.015)	-0.0080** (0.010)	-0.0100*** (0.001)
SIZE	-0.0025*** (0.002)	-0.0032*** (0.002)	-0.0210** (0.013)	-0.0210* (0.063)
LEV	0.0036** (0.019)	0.0025** (0.017)	0.0015*** (0.009)	0.0015*** (0.007)
BIG4	-0.0056** (0.015)	-0.0112** (0.015)	-0.1091* (0.061)	-0.1091 (0.111)
ROA	-0.1663*** (0.004)	-0.1642*** (0.003)	-0.0200** (0.049)	-0.0200* (0.089)
GROWTH	-0.0111** (0.017)	-0.0131** (0.016)	-0.0027** (0.028)	-0.0027** (0.028)
Constant	0.0032* (0.061)	-0.0112* (0.059)	0.4346* (0.064)	0.4346 (0.611)
Year dum	Yes	Yes	Yes	Yes
Industry dum	Yes	Yes	Yes	Yes
No. of Obs.	392	392	708	708
R-Squared	0.4694	0.3770	0.5118	0.2694

Coefficient test between the state-owned and private firms  
 Model 1(Spec)  $\chi^2(1) = 0.28$  Prob >  $\chi^2 = 0.9920$   
 Model 2 (Spec-Rev)  $\chi^2(1) = 0.17$  Prob >  $\chi^2 = 0.6818$   
 P values in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

#### 4.4. Robustness checks

An alternative measure of audit industry specialization was employed to check the robustness of the results of audit firm industry specialization on the cost of debt. Thus, unlike the main regression measure of audit industry specialization, here, we use the fraction of the number of auditors over the total number of auditors in an industry in a given year to measure specialization where a higher fraction indicates a specialist auditor. We run the regression with the new measure of (SPEC-Fraction) as the independent variable and the cost of debt as the dependent variable while controlling for firm-specific characteristics. The regression results shown in Table 4–5 display the regression for SPEC-Fraction as the independent variables. The results obtained from the robustness test using different specialization measures are consistent with the main results reported, confirming that specialization indeed reduces the cost of debt financing because specialist auditors have much expertise in the industry. The main regression result indicates that there is a negative relationship between audit specialization and cost of debt.

#### 4.5. Further analysis

As a further analysis, the sample was divided into low-earning companies and high-earning companies to examine the impact of audit firm industry specialization on the cost of debt on these two categories of companies. The results in table 6 showed that audit firm specialization

reduces the impact of the cost of debt on companies in both high-earning and low-earning. The impact of audit firm industry specialization was found to be statistically significant in the two categories but with a higher magnitude of impact on the cost of debt of low-earnings companies. This may be due to the fact that audit industry specialization firms are able to detect and rectify many possible material errors in the form of manipulations in the financial statement, which might have augmented the cost of debt of the low-earning companies.

The sample was also divided into state-owned and private companies to examine the impact of audit firm industry specialization on the cost of debt among those categories of companies. The results based on the ownership sub-samples presented in table 7 indicate that audit firm industry specialization reduces the cost of debt for both state-owned and privately owned companies. Despite the differences in these sub-groups, no statistical difference was found in the magnitude of the impact of specialization on the cost of debt of state-owned and privately owned companies.

### **5. Conclusion and recommendation**

This study examined the effect of audit firm industry specialization on Ghana's debt cost. A negative relationship between specialization (SPEC) and Cost of Debt (DEBT) was found, implying that audit firm specialization reduces the cost of debt. This supports the hypothesis, which states that all other things being equal, industry specialist audit firms will reduce the cost of debt financing. The result of the study is robust to the alternative measures of specialization. Specifically, applying the revenue measure also negatively impacted the cost of debt (DEBT). A consistent negative relationship was found, indicating that specialization reduces the cost of debt of the client of auditors. Additionally, the fractional-based measure also negatively impacted the cost of debts. Further analysis was conducted on high-earning and low-earning companies, state-owned and privately owned companies. The results indicated the magnitude of the impact of audit industry specialization on the cost of debt is relatively high in low-earning companies. This was attributed to the fact that audit industry specialization is able to detect and rectify possible manipulation of earnings, which might have been added to the cost of debt of the low-earning companies. The study also indicated that no statistical difference exists between private and state-owned companies regarding the impact of audit firm industry specialization on their cost of debt. Hence, audit firm industry specialization reduces the cost of debt for both companies.

It is therefore recommended that the Institute of Chartered Accountants Ghana (ICAG) should encourage audit firm industry specialization in Ghana to help reduce cost of debts financing for most companies. It could do so by providing professional guidelines and training to audit firms in terms of specialization.

Furthermore, auditing firms should constantly develop market strategies that will develop their industry expertise to enhance the quality of audit provided and expand market share.

However, despite the robustness of the study findings, the study entails some limitations, which open doors for further research to bring more insight into the topic under consideration. Future research can conduct a comparative study of Ghana, with other developing or African countries. This kind of study will be useful to see the influence of institutional setting on the level of audit industry specialization. Moreover, these studies will help explain how diverse regulatory requirements affect the audit firm industry specialization level in different institutional settings.

Also, the current study used a quantitative approach, and it is recommended that similar studies using a qualitative approach should be conducted so that the findings can be compared for effective decision-making.

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