








# “Can enhanced CSR quality reduce the cost of debt capital? An empirical analysis of CEO expertise and non-financial reporting practices in China”

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# CAN ENHANCED CSR QUALITY REDUCE THE COST OF DEBT CAPITAL? AN EMPIRICAL ANALYSIS OF CEO EXPERTISE AND NON-FINANCIAL REPORTING PRACTICES IN CHINA

## Abstract

This study aims to investigate whether stockholders and creditors place a positive value on corporate social responsibility (CSR) information disclosure when making decisions about providing financing to firms, thereby influencing their investment choices. Utilizing data from the China Stock Market & Accounting Research Database (CSMAR) and HEXUN, the study analyzes CSR disclosures and financial data of 7,123 firm-year observations of A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2012 to 2020. A comprehensive methodology involving regression analysis was applied to assess the relationship between CSR quality and the cost of debt capital. Various robustness tests, including different model specifications and alternative variable measurements, were conducted to ensure the reliability and validity of the findings. The results obtained indicate that higher CSR quality significantly correlates with a lower cost of debt capital, supporting the hypothesis that improved CSR disclosure reduces perceived credit risk. However, CEO financial expertise shows a significantly positive relationship with the cost of debt capital. Furthermore, the study reveals that CSR assurance and engagement with Big 4 accounting firms do not noticeably affect the price of debt capital, whereas mandatory CSR reporting does. The findings underscore the importance of CSR quality in financial decision-making, offering valuable insights.

## Keywords

cost of debt capital, CEO financial expertise, corporate social responsibility disclosure quality, non-financial reporting

## JEL Classification

G34, F34, M14, M41

## INTRODUCTION

The cost of capital is fundamentally significant, affecting investment project hurdle rates, corporate capital structure, operations, and profitability, thus playing a crucial role in various corporate decisions. Consequently, global attention has focused on reducing firms' cost of capital through diverse policy interventions (Aleksnevičienė & Stralkutė, 2023; Kuo et al., 2021; Li et al., 2022).

Recently, the scrutiny of the cost of debt capital has intensified due to its profound impact on firms' sustainable and stable operations. Contemporary research on the determinants of the cost of debt capital predominantly draws from information asymmetry theory and agency theory. These studies examine the interplay of debt-level, firm-level, market and industry-level, and country-level factors and their collective impact on the cost of debt capital (Aleksnevičienė & Stralkutė, 2023; Arora & Sharma, 2022; Gangi et al., 2021; Gao et al., 2022; Jiawei et al., 2022; Kuo et al., 2021; Li et al., 2022; Magnanelli & Izzo, 2017).

Pressures from the debt capital environment and economic landscape have escalated the cost of debt, prompting companies to mitigate financial risk proactively. Corporate social responsibility (CSR) has become a pivotal consideration, gaining increasing attention as firms seek solutions. Investors in global capital markets scrutinize CSR reports, recognizing CSR information as crucial in shaping investment decisions. CSR report disclosure aims to align with national policies, meet stakeholder needs, and enhance communication between firms and stakeholders. Prior research suggests an inverse relationship between information disclosure quality and a firm's cost of capital, highlighting the potential of stricter disclosure standards to reduce agency and information asymmetry issues, thereby lowering the cost of equity capital (Al-Qudah & Houcine, 2023; Bae et al., 2022; Gong et al., 2021; Oikonomou et al., 2014; Pasko, Zhang, et al., 2021).

Moreover, CSR reports as vital non-financial information help lower the cost of debt capital by mitigating information asymmetry in the disclosure mechanism. The distribution of decision-making power within a corporation, particularly vested in top executives, emerges as a critical dimension. CEO and top executive perspectives significantly influence investment, financing, and strategic decisions, shaping corporate practices and outcomes. However, the literature indicates that a dominant CEO may correlate with declining firm value (Agnihotri & Bhattacharya, 2024; Liu et al., 2024; Qiao, 2024; Z. Wang et al., 2024).

While the Chinese market has seen growing research on the relationship between CSR and the cost of capital, a notable gap remains in assessing how different CSR qualities impact a company's cost of debt capital. Similarly, studies exploring the relationship between executive characteristics and the cost of debt capital are limited, primarily hinging on corporate governance perspectives, necessitating a comprehensive exploration of manager-level characteristics.

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## 1. LITERATURE REVIEW AND HYPOTHESES

The current discourse around CSR and its implications for financial issues is broad and all-encompassing, dealing with diverging perspectives on finance, accounting, and corporate governance. With increasing discernment, stakeholders are looking at CSR reports for indicators of responsible corporate conduct, so the scrutiny of how quality dimensions are enshrined in these disclosures is becoming critical. Against this backdrop, the nexus between CSR report quality and cost of debt capital is placed within the broader context of information signaling theories and agency perspectives so that the veil can be taken off the intricate mechanisms through which these variables are allowed to interact.

CSR disclosure should also act as a signaling mechanism and provide extra non-financial information to a company's lenders regarding its commitment to ethical and sustainable practices. More openness may reduce information asymmetry between the firm and creditors, increase

trust, and possibly decrease the perceived risk. As a result, they would demand a lower cost of debt capital. Robust CSR practices in organizations are often associated with a good corporate reputation for that particular entity (Hendijani Zadeh, Magnan, et al., 2023; Hendijani Zadeh, Naaman, et al., 2023; Nguyen et al., 2023). If lenders view a company as socially responsible, such a company would be portrayed as one that potentially does not take high risks or engage in unethical behavior, reducing the perception of financial risk and, therefore, the cost of debt capital (AlKhoury & Suwaidan, 2023; Tarulli et al., 2023). Furthermore, CSR activities aimed at long-term sustainable operations can even create intangible assets related to brand value and customer loyalty (Gao et al., 2022). Such intangibles may serve as indirect collateral because, in this case, creditors are more assured of the firm's ability to generate stabilized cash flows over time (Pittman & Fortin, 2004; Xu & Li, 2020). This, in turn, may be related to a lower debt capital cost. Many countries are moving toward compulsory CSR reporting (Aleknevičienė & Stralkutė, 2023; Gong et al., 2021; Kuo et al., 2021; Pasko et al., 2022). Companies that adhere to this frame are not

only exempt from the likelihood of getting punished by the judiciary but, at the same time, send a positive signal that they behave ethically. This adherence to the standards of regulation may increase the respect of lenders toward the company and hence lead to a decrease in the cost of capital concerning debt (Aleknėvičienė & Stralkutė, 2023; Gong et al., 2021; Kuo et al., 2021; Li et al., 2022). By contrast, although CSR disclosure can serve as an affirmation of responsible business practices, it may also turn out that the latter makes the firm vulnerable to increased scrutiny. Lenders, armed with such additional information, may set higher expectations from the company; that is, they may demand a higher cost of debt capital to compensate for some increase in risk or uncertainty that their expectations will not be met (Duggal et al., 2024; Yang et al., 2024). In addition, financial resources deployed to conduct CSR activities can be diverted from the means available for servicing debt (Duggal et al., 2024; Yang et al., 2024).

This would indicate to the creditors that a too significant share of resources is invested in the non-core business operations and, for this reason, would be interpreted to the detriment of the company's ability to service its debt, hence raising the cost of debt capital (Hoepner et al., 2016). Furthermore, CSR reporting encompasses numerous subjective measures and has been deficiently standardized. Such subjectivity to such a reporting standard can quickly bring ambiguities to the lenders. Without clear, comparable metrics, creditors will tend to be wary in making CSR disclosure a dependable firm risk profile indicator, which could hurt the cost of debt capital value (La Rosa et al., 2018; Magnanelli & Izzo, 2017). Some studies show that investors and lenders react with a grain of skepticism toward CSR disclosures and consider them to be more than public relations actions rather than genuine intentions related to sustainability practice (Aleknėvičienė & Stralkutė, 2023; Pasko, Balla, et al., 2021). If CSR activities are seen to be shallow or greenwashing, the expected decrease in the cost of debt capital may not occur, and lenders may remain skeptical, asking for a higher interest rate (Al-Shaer, 2018; Hendijani Zadeh, Magnan, et al., 2023; Pasko, Chen, et al., 2021). Thus, a linkage between CSR disclosure and the cost of debt capital looks plausible; however, one has to remain aware of how complex these dynamics are. An empiri-

cal investigation regarding this issue needs to consider the setting, specifically the industry, and the complexities of the reporting procedure to achieve meaningful inferences.

It can be presumed that CEO financial expertise could also turn out to be a double-edged sword from the creditors' perspective (Fandella et al., 2023). On the one hand, financial expertise is positively linked to effective management; on the other hand, it may reflect a higher level of decision-making concentration in one hand, resulting in overconfidence and risky financial strategy (Qiao, 2024; Z. Wang et al., 2024). This perceived risk may cause creditors to ask for a higher cost of debt capital to compensate for the increased uncertainty related to CEOs. In addition, the financially sophisticated CEO is more inclined to weigh financial metrics versus non-financial in decision-making (Liu et al., 2024). This orientation might, therefore, result in myopic focuses on short-term financial gains while neglecting broader strategic considerations and non-financial risk factors. Creditors who sense this focused interest can view the firm as more at risk to economic shocks, giving them a more significant cost of debt capital (Liu et al., 2024; Qiao, 2024). On the other hand, CEO's financial expertise may have worsened agency problems in a firm. A financially astute CEO may exercise much influence in financial decision-making to the detriment of shareholders' interests, thus increasing the perceived risk even higher for creditors and calling for a cushion of more interest cost of debt capital from them (Agnihotri & Bhattacharya, 2024). Furthermore, while financial acumen is obviously essential, the CEO's other operational expertise potentially matters at least as much to overall firm performance. A CEO absorbed in finance might lack sufficient breadth in different forms of knowledge that are also key for cross-operational practice. Creditors might view this lack of experience concerning the firm's operation as a detriment and consequently demand a higher return on debt. On the other hand, CEO's financial expertise may positively affect the cost of debt capital by enhancing the quality of decision-making. A CEO with financial expertise will likely better handle complex financial landscapes, implement solid financial strategies, and manage financial risks effectively. Creditors are likely to perceive CEO's financial expertise firms as having a reduced credit

risk and, therefore, can help lower the cost of debt capital (Agnihotri & Bhattacharya, 2024; Gao et al., 2022; Z. Wang et al., 2024). Besides, CEO's financial expertise can instill confidence among investors and creditors as well (Ampofo & Barkhi, 2024; Dhoraisingam Samuel et al., 2022; Ur-Rehman et al., 2024; S. Wang et al., 2024). A financially knowledgeable CEO will more or less positively influence trust via regular communication about financial strategies and an adequate understanding of the firm's economic health. Greater transparency and communication may reduce concerns over asymmetrical information and, in turn, further reduce associated perceived risks and, hence, the cost of debt capital (Hussain et al., 2024; Liang et al., 2024; Osei Bonsu et al., 2024). This means that the relationship between CEO's financial expertise and the cost of debt capital is not direct but is determined by several contexts. While CEO's financial expertise may come with several risks, it also tends to lead to better financial decisions and risk management to mitigate an excessively costly debt capital. These are considerations that empirical analysis must take painstakingly into account to draw meaning from the proposed relationship.

Therefore, this paper investigates whether stockholders and creditors place a positive value on CSR information disclosure when making decisions about providing financing to the firm, thereby influencing their investment choices. The aim of this study is to address existing research gaps by examining the relationship between corporate social responsibility (CSR) quality and the cost of debt capital, as well as evaluating the impact of CEO's financial expertise on this cost. Utilizing data from China's capital market, the study investigates whether higher CSR quality correlates with a lower cost of debt capital and how CEO's financial expertise influences this relationship. Additionally, the study explores the moderating effects of CEO financial expertise on the CSR-cost of debt capital

relationship, while also considering the roles of CSR assurance, engagement with Big 4 accounting firms, and mandatory CSR reporting. This comprehensive analysis aims to extend the literature on CSR and external financing, providing valuable insights for companies in emerging markets, particularly Chinese firms, on enhancing their cost of debt capital.

Thus, based on a comprehensive review of existing literature and the underlying rationales discussed therein, this research proposes the following hypotheses for examination:

*H1: CSR disclosure quality is negatively related to the cost of debt capital (COD).*

*H2: CEO's financial expertise is positively related to the cost of debt capital (COD).*

## 2. METHODOLOGY

This study was focused on firms listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange. The data for CSR disclosure choices were obtained from the China Stock Market & Accounting Research Database (CSMAR), while the data for CSR disclosure substantiveness were sourced from the HEXUN website. As 2010 was the initial year when HEXUN.COM began developing CSR disclosure, only companies that published CSR reports between 2010 and 2020 were included. All financial data and CEO-related information required for empirical analysis were collected from the CSMAR database. To mitigate the influence of potential outliers, all continuous variables were winsorized at the 1st and 99th percentiles.

Table 1 reports the details of the sample selection process. From 35,070 observations between 2010

**Table 1.** Sample selection

Sample Selection Process	No. of Observations
Initial firm-year sample from 2010 to 2020	35070
Observations that are financial firms	398
Observations that are ST, *ST, and PT companies	1345
Observations with missing values for variables	26204
Final samples	7123

Note: ST, \*ST, and PT denote Special Treatment and Particular Treatment companies.

and 2020, samples were restricted to non-financial firms, resulting in the elimination of 398 observations. Additionally, 1,345 observations featuring abnormal operations were excluded. Furthermore, 26,204 observations with missing values for the variables used in the subsequent empirical tests were removed. This selection process resulted in a final sample of 7,123 firm-year observations.

This study defines its variables as follows. The cost of debt capital is defined as the dependent variable, representing the expenses related to raising and using debt capital, including interest paid on borrowed funds and borrowing-related expenses. The cost of debt capital is proxied by the ratio of interest expenses to total liabilities, given the availability of data.

Comprehensive CSR disclosure scores, sourced from HEXUN, a neutral third-party provider, are used as the independent variable. HEXUN evaluates CSR across five dimensions: shareholder responsibility, employee responsibility, supplier, customer, and consumer responsibility, environmental responsibility, and social responsibility. Scores range from 0 to 100, indicating the quality of CSR disclosure, and are widely utilized in CSR research.

CEO financial expertise is another independent variable, focusing on the impact of high financial expertise on the cost of debt capital. It is defined by holding positions such as Chief Financial Officer, Head of Finance, Chief Financial Officer, and Chief Accountant.

To exclude potential confounding effects, several control variables from prior research are included in the regression model. These are firm size (SIZE), leverage (LEV), profitability (ROE), the ratio of tangible assets (TANG), the age of the listed company (AGE), cash flow (CASH), capital expenditure (CAPITAL), and debt maturity structure (DEBT).

Corporate governance influences are controlled by including proxy variables such as the ratio of shares held by the largest shareholder (SHRCR1), the proportion of independent directors on the board (INDEP), the ratio of shares held by executives (EXESHARE), CEO duality (DUALITY), and annual report audit (AUDIT).

Variables such as age, education, gender, tenure, and MBA education are included to control for other personal characteristics of the CEO. Additionally, industry and year heterogeneity are accounted for. Details of these variables are specified in Table A1.

The testing of H1 and H2 is done holding other determinants of the cost of debt capital constant to parse out potential confounding effects. This paper relied on regression analysis to test the relationship between the quality of CSR disclosure and CEO financial expertise with the cost of debt capital. The main regression model 3 is specified as follows. To check whether CEO financial expertise (CEOFIN) has a mediating effect on COD and CSR, models 1, 2, and 3 were built according to Baron and Kenny (1986).

$$\begin{aligned} COD_{i,t} = & \alpha_0 + \alpha_1 CSR_{i,t} + \alpha_2 SIZE_{i,t} \\ & + \alpha_3 LEV_{i,t} + \alpha_4 ROE_{i,t} + \alpha_5 TANG_{i,t} + \alpha_6 AGE_{i,t} \quad (1) \\ & + \alpha_7 CASH_{i,t} + \alpha_8 CAPITAL_{i,t} + \alpha_9 DEBT_{i,t} \\ & + \sum INDUSTRY_{i,t} + \sum YEAR_{i,t} + \varepsilon_{i,t}, \end{aligned}$$

$$\begin{aligned} CEOFIN_{i,t} = & \beta_0 + \beta_1 CSR_{i,t} + \beta_2 SIZE_{i,t} \\ & + \beta_3 LEV_{i,t} + \beta_4 ROE_{i,t} + \beta_5 TANG_{i,t} + \beta_6 AGE_{i,t} \quad (2) \\ & + \beta_7 CASH_{i,t} + \beta_8 CAPITAL_{i,t} + \beta_9 DEBT_{i,t} \\ & + \sum INDUSTRY_{i,t} + \sum YEAR_{i,t} + \varepsilon_{i,t}, \end{aligned}$$

$$\begin{aligned} COD_{i,t} = & \gamma_0 + \gamma_1 CSR_{i,t} + \gamma_2 CEOFIN_{i,t} \\ & + \gamma_3 SIZE_{i,t} + \gamma_4 LEV_{i,t} + \gamma_5 ROE_{i,t} \\ & + \gamma_6 TANG_{i,t} + \gamma_7 AGE_{i,t} + \gamma_8 CASH_{i,t} \quad (3) \\ & + \gamma_9 CAPITAL_{i,t} + \gamma_{10} DEBT_{i,t} \\ & + \sum INDUSTRY_{i,t} + \sum YEAR_{i,t} + \varepsilon_{i,t}, \end{aligned}$$

where  $i$  indexes firm and  $t$  indexes time. In model 3,  $COD_{i,t}$  is the dependent variable and serves as the proxy for the cost of debt capital, which is measured by the ratio of interest expenses divided by the total debt in the firm  $i$ , year  $t$ . The independent variable  $CSR_{i,t}$  is used to proxy for the quality of CSR disclosure for a firm  $i$  in year  $t$ .  $CEOFIN_{i,t}$  is another independent variable, which is used to proxy for the financial expertise of CEO for a firm  $i$  in year  $t$ . The specifications of other variables used in the regression model are presented

in Table A1.  $\Sigma INDUSTRY_{i,t}$  and  $\Sigma YEAR_{i,t}$  index industry and year, which are controlled for potential industry and year effects.  $\varepsilon_{i,t}$  is the firm-year specific error term.

Regressions are then run to check for potential endogeneity bias in CEO financial expertise within the dataset. All variables are lagged by one year to avoid endogeneity in the results. The logistic regression model is specified as follows:

$$\begin{aligned} CEOFIN_{i,t} = & \alpha_0 + \alpha_1 DUALITY_{i,t-1} \\ & + \alpha_2 INDEP_{i,t-1} + \alpha_3 TANG_{i,t-1} + \alpha_4 AGE_{i,t-1} \\ & + \alpha_5 CASH_{i,t-1} + \alpha_6 CAPITAL_{i,t-1} \\ & + \Sigma INDUSTRY_{i,t} + \Sigma YEAR_{i,t} + \mu_{i,t}, \end{aligned} \quad (4)$$

where  $CEOFIN_{i,t}$  is an indicator variable that equals 1 if the CEO in firm  $i$  has financial expertise in year  $t$  and 0 otherwise, all other variables are defined in Table A1. In model 4, industry and year indicators are also included to control for potential industry and year effects.

### 3. RESULTS

Table 2 presents the descriptive analysis. The mean value of COD is 0.0226, which indicates that interest expense accounts for only 2.26% of total liabilities in the sampled firms. The standard deviation for COD is 0.0149, and the minimum and maximum values are 0.000124 and 0.0669, respectively, which shows that the cost of debt capital varies greatly among Chinese companies. The average CSR score is 23.73, the maximum is 75.51, and the minimum is -4.090. This suggests that CSR in China is still at an initial stage, and there is sig-

nificant variance among companies. The standard deviation of the CEOFIN is 0.305, and the mean is 0.104, which means that only 10.4% of CEOs have financial expertise in the samples. Regarding the other control variables, the mean of firm size is 22.62, average leverage is 0.470, average ROE is 0.0607, average tangible assets is 0.924, average AGE is 11.26, average CASH is 0.0389, average CAPITAL is 0.0532. About 18.5% of total liabilities are long-term liabilities.

Table 3 presents the correlation matrix among all variables. There is a high correlation between the dependent variable COD with CSR and CEOFIN. All coefficients are less than 0.5, and variance inflation factors (VIF) for all variables are lower than 2, suggesting that multicollinearity is not a significant issue in the study.

The data in this paper are panel data. A reasonable estimation model was selected through the Wald test and the Hausman test, and the test results support the use of a fixed effect model. The results of the model (3) regression analysis, which introduced COD as the dependent variable and CSR and CEOFIN as independent variables while controlling for other determinants of COD identified by previous studies, as well as industry and year fixed effects, are presented in Table A2.

First, H1, pertaining to a possible correlation between CSR reporting and the cost of debt capital (COD), was tested. The results in columns (1), (3), and (6) demonstrate that the coefficients of CSR (-0.000; -0.000; and -0.000), respectively, all reached the 1% level of significance. This result indicates that the quality of CSR disclosure tends to lower the cost of debt capital, supporting H1.

**Table 2.** Descriptive statistics

Variables	N	mean	sd	min	max
COD	7,123	0.0226	0.0149	0.000124	0.0669
CSR	7,123	23.73	16.38	-4.090	75.51
CEOFIN	7,123	0.104	0.305	0	1
SIZE	7,123	22.62	0.929	20.93	25.38
LEV	7,123	0.470	0.190	0.0901	0.897
ROE	7,123	0.0607	0.133	-0.646	0.358
TANG	7,123	0.924	0.0894	0.517	1.000
AGE	7,123	11.26	6.828	0	30
CASH	7,123	0.0389	0.0701	-0.189	0.227
CAPITAL	7,123	0.0532	0.0505	0.000246	0.244
DEBT	7,123	0.185	0.171	0	0.735

**Table 3.** Correlations matrix

VARIABLES	COD	CSR	CEOFIN	SIZE	LEV	ROE	TANG	AGE	CASH	CAPITAL	DEBT
COD	1										
CSR	-0.169***	1									
CEOFIN	0.022*	0.022*	1								
SIZE	-0.199***	0.325***	0.029**	1							
LEV	0.174***	-0.037***	0.050***	0.056***	1						
ROE	-0.257***	0.462***	0.00800	0.290***	-0.175***	1					
TANG	0.020*	0.083***	0.030**	-0.103***	0.185***	0.035***	1				
AGE	0.00700	0.00500	0.117***	0.185***	0.319***	-0.075***	-0.0190	1			
CASH	-0.00800	0.158***	0.00700	0.151***	-0.170***	0.216***	-0.071***	0.0130	1		
CAPITAL	0.022*	0.051***	-0.067***	-0.026**	-0.119***	0.100***	0.039***	-0.294***	0.129***	1	
DEBT	0.219***	0.060***	0.0170	0.134***	0.143***	-0.037***	-0.051***	0.214***	-0.0150	0.126***	1

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Next, H2, pertaining to a possible correlation between CEO financial expertise (CEOFIN) and the cost of debt capital (COD), was tested. The empirical results in columns (2), (4), and (6) of Table A2 demonstrate a significant positive association between the cost of debt for companies that utilized CEO financial expertise (coef = 0.01,  $p < 0.1$ ; coef = 0.01,  $p < 0.05$ ; and coef = 0.01,  $p < 0.05$ ), respectively. It may be that a CEO's financial expertise leads to a higher cost of debt capital, or companies with a higher cost of debt capital choose CEOs with financial expertise. Thus, these results support H2.

Based on mediation models, the mediation effect of CEOFIN on CSR and COD was tested empirically, and the results are shown in Table A2, columns (3), (5), and (6). In the first step test (column (3)), CSR is significantly negatively correlated with COD at the 1% statistical significance level. In the second step test (column (5)), CSR was positively correlated with CEOFIN, but not significantly. In the third step test (column (6)), CSR and COD are significantly negatively correlated at the 1% significance level. As the effect of CSR and CEOFIN is not significant in the second step test, it is necessary to continue with the Sobel test (Sobel, 1982, 1987). The Sobel test suggests no mediation ( $z = 0.9278$ ,  $p = 0.35351542$ ). The results of the Sobel test indicate that CEOFIN has no significant mediation effect on CSR and COD. This shows that, under the context of China's transition to a new normal economy, CEO financial expertise is not an effective way to lower the cost of debt capital of the company.

In respect of control variables, the results (column (6)) reveal that LEV (coef = 0.008,  $p < 0.01$ ), TANG (coef = 0.011,  $p < 0.01$ ), CASH (coef = 0.016,

$p < 0.01$ ), and DEBT (coef = 0.010,  $p < 0.01$ ) have a positive association with the cost of debt capital (COD), while SIZE, ROE, AGE, and CAPITAL show a negative association. These findings are in line with previous studies.

In Table A3, the impact of ASSURANCE, BIG4, and CSR\_MAN on the cost of debt capital (COD) in Chinese listed companies is explored. The results in columns (1) and (4) indicate no significant relationship between ASSURANCE and COD, possibly because CSR assurance is not prevalent in China, with only 30 companies in the sample providing CSR assurance. The results for CSR and CEOFIN with COD remain consistent with those reported in model 1, thereby supporting H1 and H2.

The results in columns (2) and (4) do not reveal a significant difference in the cost of debt capital (COD) between companies that used Big 4 accounting firms and those using non-Big 4 firms. There is no evidence to support the assertion that Big 4 firms provide any advantage in reducing the cost of debt capital, as suggested in previous studies (Kuo et al., 2021). The relationship between CSR and COD, as well as CEOFIN and COD, remains consistent with those reported in model 3, thus supporting H1 and H2.

Columns (3) and (4) test the relationship between CSR\_MAN and COD, with the coefficient of CSR\_MAN being significantly positive in the regression, suggesting that firms with mandatory CSR disclosures have a higher cost of debt capital. The association between CSR and CEOFIN with COD is consistent with the aforementioned results, fur-



ther supporting H1 and H2. The results of the control variables are qualitatively similar to the baseline results in Table A2.

In Table A4, several additional tests using classified samples for CSR\_RE, SOE, and CSR\_MAN were conducted. First, the sample was split between standalone and annual CSR reports based on the source of CSR reports, and the baseline regression was run to understand the impact of ASSURANCE, BIG4, and CSR\_MAN on the cost of debt capital (COD) from the CSR reports' source perspective. The results are presented in column (1) and column (2), respectively. For firms issuing standalone CSR reports, the findings in column (1) exhibit that CSR\_MAN (coef = 0.003,  $p < 0.05$ ) is significantly positively related to COD, suggesting that companies with high COD are required to disclose CSR reports mandatorily. The findings for companies issuing CSR reports in their annual reports, shown in column (2), demonstrate that CSR\_MAN is insignificant in influencing COD. ASSURANCE and BIG4 are insignificantly related to COD in both standalone CSR reports and annual reports. Additionally, CSR appears to have a significantly negative relationship with COD, and CEOFIN appears to have a positive relationship with COD, supporting H1 and H2. The results for control variables are qualitatively similar to the baseline results in Table A2, except for SIZE, which is significantly negatively related to COD in column (2) and insignificant in column (1).

Second, regressions were performed on the classified sample using state-owned and non-state-owned enterprises, as shown in column (3) and column (4) of Table A4. In column (3), the coefficients of BIG4 and CSR\_MAN are positive and statistically significant at the 5% and 10% level, respectively, indicating that state-owned enterprises that choose Big 4 accounting firms and those mandated to disclose CSR reports have high COD. Neither BIG4 nor CSR\_MAN is significant in non-state-owned enterprises. ASSURANCE is not significant in both state-owned and non-state-owned enterprises. CSR is significantly negatively related to COD in both state-owned and non-state-owned enterprises, supporting H1. However, CEOFIN is not significant in state-owned enterprises and significant in non-state-owned enterprises, reflecting that CEO financial expertise can lead to high

COD in non-state-owned enterprises. Regarding the control variables of both state-owned and non-state-owned enterprises, most results are consistent with Table A2.

In Table A4, column (5), further analysis found that CSR, CEOFIN, ASSURANCE, and BIG4 are not significantly correlated with COD in companies with mandatory disclosure. In column (6), the results for CSR, CEOFIN, and control variables remain the same, as reported in Table A2 in companies with voluntary disclosure, still supporting H1 and H2.

To ensure the reliability of the findings, model (1) was rerun with several additional tests, and the results are presented in Table A5. In column (1), a robustness test employing lag effects to measure the dependent variable COD with a one-year lag was conducted. The main variables revealed similar findings to the main baseline result in Table A2, concluding that the findings are robust across lag effects. To exclude the influence of other characteristics of CEO and corporate governance factors on the main empirical results, additional CEO characteristic variables and corporate governance variables were added in columns (2) and (3) of the main regression. Regardless of whether the CEO characteristic variables or corporate governance variables were controlled, the coefficient  $\beta_1$  of CSR remained negatively significant at the 1% level, and the coefficient  $\beta_2$  of CEOFIN remained positively significant at the 1% level, respectively. Its value and significance increased along with those of more control variables, thereby supporting H1 and H2. The results also demonstrated that CEOAGE, CEOMALE, and DUALITY are significantly positively related to the cost of debt capital (COD). These findings indicate that companies with CEO duality offer greater power to one person; as the CEO ages, their experience and knowledge increase, familiarity with the company environment grows, and social relationships widen, which may result in opportunistic behavior by the CEO. In terms of gender characteristics, male CEOs may have a greater tendency to take risks and behave aggressively compared to female CEOs, thereby increasing the company's risk of debt default. However, the coefficients of WSHRCR1, WEXESHARE, and AUDIT are significantly negatively related to the cost of debt cap-

ital (COD), indicating that a larger shareholding ratio of the largest shareholder and the executive, as well as a higher quality of the annual report audit, correlate with a lower cost of debt capital, implying that good corporate governance helps to lower the cost of debt capital. Most of the control variables are in line with previous results, suggesting that the main hypothesis remains valid.

Additionally, multiple regression models were utilized to provide more reliable inferences in Table A6 to exclude potential endogeneity bias. To control for potentially omitted variables that may simultaneously influence CSR, CEOFIN, and COD, Pooled OLS regressions and Random Effects Model regressions were performed on the full sample for model (1) in columns (1) and (2). The findings were mostly similar to the baseline results in Table A2, indicating that the main diversity results do not differ qualitatively, thereby suggesting that the findings are robust. Given that CEOFIN is likely determined by some omitted variables, the results may suffer from potential endogeneity. To address concerns of potential endogeneity and self-selection of CEOFIN, the Propensity Score Matching (PSM) and Heckman treatment effects model (Heckman) were employed for model (1) and model (2) as shown in columns (3) and (4). In column (3), the result suggests that CEOFIN remains significantly positive and CSR remains significantly negatively related to the cost of debt capital, even after controlling for potential self-selection bias. In column (4), the inverse Mills ratio (IMR) was introduced to the second-stage OLS regression to control for self-selection bias in the Heckman two-stage procedure. The coefficient of the inverse Mills ratio (IMR) was significantly positive at the 5% level, indicating no endogeneity issues. The coefficients of CEOFIN were significantly positive and CSR significantly negative with COD, consistent with previous results, suggesting that the main results are robust to the endogeneity test.

## 4. DISCUSSION

H1 suggested a negative relationship between CSR quality and the cost of debt capital. This means that it was expected that higher CSR quality would imply a lower cost of debt capital. This study sup-

ports this hypothesis and is consistent with previous studies (Bacha et al., 2021; Kuo et al., 2021). A negative relationship between the cost of debt capital and CSR quality was observed, which implies that companies with higher CSR quality will have lower costs of debt capital. It thus implies that enhanced CSR practices are more likely to allow for greater transparency and reduced information asymmetry, thereby lessening perceived risk to the lender.

H2 suggested a positive relationship between CEO financial expertise and the cost of debt capital, such that more excellent CEO financial expertise would be associated with a higher cost of debt capital. It is found that the hypothesis also holds good. In this respect, the results extend the findings of prior studies (Osei Bonsu et al., 2024; Qiao, 2024). In line with this argument, one possible interpretation is that CEOs with more significant financial expertise adopt more aggressive financial strategies that are perceived as riskier, leading to higher costs of debt capital.

It also evaluated the moderating effect of the CEO's financial expertise on the relationship between CSR quality and the cost of debt capital. However, because of the empirical findings, no proper moderator could be found in this relationship; in other words, the interaction of CSR quality with CEO financial expertise does not significantly affect its impact on the cost of debt capital.

Further, the study has complemented the past literature in contributing toward evaluating the influence of assurance of CSR, engagement with Big 4 accounting firms, and mandatory CSR reporting purposes on debt capital cost. Such studies have presented no effect of CSR assurance and engagement with Big 4 accounting firms on debt capital cost. This is contrary to the expectations and past studies (Kuo et al., 2021; Pasko et al., 2023). These findings imply that, although the assurance of CSRs and the involvement of Big 4 auditors may have some positive implications on the credibility of CSRs, they will not significantly influence the perceptions of risk held by the lenders.

On the other hand, mandatory CSR reporting manifested a robust impact on the cost of debt capital, where those firms that were obligated

to report CSR information experienced a lower cost of debt. This finding confirms that regulatory frameworks play intrinsic roles in promoting transparency and reducing information asymmetry, eventually decreasing the cost of capital.

These findings contribute to the existing literature by providing evidence on the role of CSR quality and CEO characteristics in explaining the

cost of debt capital. While some factors, such as CSR quality or even mandatory reporting, were proved to be positively related to a reduced price of debt, CEO financial expertise increased this cost. Hence, the study reveals the complicated dynamics among corporate governance, CSR practices, and their respective financial results. It sheds light on an essential lesson for Chinese listed companies willing to make better financial decisions.

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## CONCLUSION

The study researched a multifaceted relationship between CSR quality, CEO financial expertise, and the cost of debt capital in the Chinese market. The investigation focused on assessing how these factors correlate and influence corporate financial outcomes.

A lower cost of debt capital was found to be related to higher CSR quality. This evidence points to the role of robust CSR practices in enhancing a firm's transparency and reducing information asymmetry in a way that results in lower perceived risks by lenders and, thus, a reduced cost of debt capital.

Moreover, the study showed that CEO financial expertise displays a tremendously positive relationship with the cost of debt capital. This also serves to show that those CEOs with financial expertise may have more courageous financial strategies; those increase perceived risk, which finally leads to higher costs of debt capital. This finding also shows that the role of executive characteristics in explaining corporate financial outcomes is pretty complicated.

Finally, the moderating role of CEO financial expertise in the relationship between CSR quality and the cost of debt capital was also examined. In the empirical results, however, no proper moderating variable has been found that can firmly determine whether the interaction of CSR quality and CEO financial expertise significantly affects the cost of debt capital.

Further, the study extended the existing literature by deepening the analysis of the effect of assurance of CSR, engagement with Big 4 accounting firms, and mandatory CSR reporting on debt capital cost. It has also been discovered that CSR assurance and engagement with Big 4 accounting firms do not affect debt capital cost significantly. This is to say that while these practices may increase the credibility of CSR reports, they do not significantly affect the risk perception of the lenders.

These arguments cast valuable implications on Chinese firms' financial decision-making while extending the broader arguments on corporate governance and CSR. This paper stresses to practitioners the need to ensure that both structural and functional corporate governance mechanisms are observed to apply CSR logic in financial decision making effectively.

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## APPENDIX A

**Table A1.** Variables' definition and proxies

Variable	Symbol	Definition
Dependent variables	COD	The ratio of interest expenses divided by the total liabilities.
Independent variables	CSR	The overall rating score of CSR disclosure substantiveness for a firm <i>i</i> in year <i>t</i> , obtained from the website of HEXUN.
	CEOFIN	1 if the CEO has financial expertise, 0 otherwise.
Control variables	SIZE	The natural logarithm of the company's total assets.
	LEV	The leverage of the company calculated as the ratio of total debt divided by total assets as of fiscal year end.
	ROE	Net Profit/Net Assets.
	TANG	Tangible Assets/Book Assets.
	AGE	The number of years since the firm's listing.
	CASH	Operating cash flow/book assets.
	CAPITAL	Capital Expenditure/Total Assets.
	DEBT	Total long-term liabilities/Total liabilities.
CEO variables	CEOTEN	The tenure of CEO.
	CEOAGE	The age of CEO.
	CEOEDU	1 if the CEO's degree is below junior college, junior college is 2, undergraduate is 3, master is 4, doctor is 5, other is 6, and 7 is MBA/EMBA.
	CEOMALE	1 if the CEO is man, 0 otherwise.
Corporate governance variables	SHRCR1	Number of shares held by the largest shareholder/total number of shares issued by the company.
	INDEP	The proportion of independent directors serving on a board.
	EXESHARE	Number of shares held by executives/total number of shares issued by the company.
	DUALITY	1 if the same person occupies the CEO and the board chair roles, 0 otherwise.
	AUDIT	1 if the annual report is audited, 0 otherwise.
Additional variables	ASSURANCE	A value of 1 is assigned if the CSR report is audited by the third-party, otherwise 0.
	BIG4	A value of 1 is assigned if the auditor is from the Big Four accounting firm, otherwise 0.
	CSR_MAN	A value of 1 is assigned if the company is subject to mandatory CSR disclosure, otherwise 0.
	SOE	A value of 1 was assigned if the company is state-own company, otherwise 0.
	CSR_RE	Dummy variable that equals 1 if a firm <i>i</i> issues a standalone CSR report in year <i>t</i> , and otherwise 0.
Industry variables	INDUSTRY	Dummy variable that represents industry (CSRC two-digit industry code).
Year variables	YEAR	Dummy variable representing the year.

**Table A2.** Regression analysis – I

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	COD	COD	COD	COD	CEOFIN	COD
CSR	-0.000*** (-8.82)		-0.000*** (-2.98)		0.000 (0.87)	-0.000*** (-3.01)
CEOFIN		0.001* (1.87)		0.001** (2.16)		0.001** (2.19)
SIZE			-0.001*** (-2.62)	-0.001*** (-2.97)	-0.003 (-0.37)	-0.001*** (-2.61)
LEV			0.007*** (5.86)	0.008*** (5.99)	-0.041 (-1.42)	0.008*** (5.91)
ROE			-0.013*** (-10.75)	-0.014*** (-12.25)	-0.022 (-0.78)	-0.013*** (-10.73)
TANG			0.011*** (4.96)	0.011*** (4.95)	0.091* (1.73)	0.011*** (4.91)
AGE			-0.000*** (-4.52)	-0.000*** (-4.20)	0.006*** (3.79)	-0.000*** (-4.62)
CASH			0.016*** (7.54)	0.016*** (7.45)	-0.059 (-1.21)	0.016*** (7.58)
CAPITAL			-0.038*** (-11.44)	-0.038*** (-11.44)	0.030 (0.39)	-0.038*** (-11.45)

**Table A2 (cont.).** Regression analysis – I

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	COD	COD	COD	COD	CEOFIN	COD
DEBT			0.010*** (9.34)	0.010*** (9.30)	-0.034 (-1.38)	0.010*** (9.38)
INDUSTRY	YES	YES	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES	YES
Constant	0.021*** (10.18)	0.018*** (8.80)	0.026*** (3.36)	0.027*** (3.51)	0.113 (0.64)	0.026*** (3.34)
Observations	7,123	7,123	7,123	7,123	7,123	7,123
R-squared	0.082	0.071	0.154	0.153	0.045	0.155
Number of ID	852	852	852	852	852	852
Company FE	YES	YES	YES	YES	YES	YES
F test	0	0	0	0	0	0
r <sup>2</sup> <sub>a</sub>	-0.0554	-0.0680	0.0261	0.0254	-0.0997	0.0267
F	7.196	6.159	13.40	13.34	3.443	13.31

Note: t-statistics in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table A3.** Regression analysis – II

Variables	(1)	(2)	(3)	(4)
	COD	COD	COD	COD
CSR	-0.000*** (-3.00)	-0.000*** (-3.02)	-0.000*** (-3.41)	-0.000*** (-3.40)
CEOFIN	0.001** (2.19)	0.001** (2.18)	0.001** (2.27)	0.001** (2.25)
ASSURANCE	-0.000 (-0.11)			-0.000 (-0.14)
BIG4		0.001 (1.15)		0.001 (1.13)
CSR_MAN			0.001** (2.05)	0.001** (2.04)
SIZE	-0.001*** (-2.61)	-0.001*** (-2.64)	-0.001*** (-3.03)	-0.001*** (-3.06)
LEV	0.008*** (5.90)	0.007*** (5.87)	0.007*** (5.78)	0.007*** (5.74)
ROE	-0.013*** (-10.73)	-0.013*** (-10.74)	-0.013*** (-10.43)	-0.013*** (-10.44)
TANG	0.011*** (4.91)	0.011*** (4.93)	0.011*** (4.88)	0.011*** (4.90)
AGE	-0.000*** (-4.61)	-0.000*** (-4.63)	-0.000*** (-4.47)	-0.000*** (-4.48)
CASH	0.016*** (7.58)	0.016*** (7.60)	0.016*** (7.59)	0.016*** (7.62)
CAPITAL	-0.038*** (-11.45)	-0.038*** (-11.42)	-0.038*** (-11.46)	-0.038*** (-11.43)
DEBT	0.010*** (9.37)	0.010*** (9.34)	0.010*** (9.35)	0.010*** (9.32)
INDUSTRY	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
Constant	0.026*** (3.34)	0.026*** (3.36)	0.030*** (3.71)	0.030*** (3.73)
Observations	7,123	7,123	7,123	7,123
R-squared	0.155	0.155	0.155	0.155
Number of ID	852	852	852	852
Company FE	YES	YES	YES	YES
F test	0	0	0	0
r <sup>2</sup> <sub>a</sub>	0.0266	0.0268	0.0272	0.0271
F	13.15	13.17	13.21	12.92

Note: t-statistics in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



**Table A4.** Regression analysis – III

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	CSR_RE==1	CSR_RE==0	SOE==1	SOE==0	CSR_MAN==1	CSR_MAN==0
CSR	-0.000*** (-2.64)	-0.000*** (-7.71)	-0.000*** (-3.12)	-0.000* (-1.80)	-0.000 (-0.35)	-0.000*** (-3.57)
CEOFIN	0.002* (1.71)	0.001* (1.79)	0.000 (0.20)	0.002** (2.06)	0.000 (0.12)	0.001* (1.90)
SSURANCE	0.000 (0.20)	-0.006 (-0.58)	0.001 (0.43)	-0.002 (-0.51)	-0.001 (-0.42)	-0.000 (-0.05)
BIG4	-0.000 (-0.12)	0.003 (1.32)	0.004** (2.44)	-0.000 (-0.30)	0.001 (0.42)	0.001 (0.67)
CSR_MAN	0.003** (2.21)	-0.000 (-0.07)	0.002* (1.91)	0.001 (0.95)		
SIZE	-0.001 (-1.51)	-0.001* (-1.67)	-0.001*** (-2.72)	-0.001** (-2.16)	-0.003*** (-2.71)	-0.001** (-2.41)
LEV	0.005* (1.91)	0.005*** (3.53)	0.006*** (2.75)	0.006*** (3.61)	0.001 (0.19)	0.007*** (5.08)
ROE	-0.008*** (-3.50)	-0.007*** (-4.08)	-0.005*** (-2.59)	-0.014*** (-9.20)	-0.011*** (-2.82)	-0.013*** (-9.50)
TANG	0.002 (0.29)	0.012*** (4.43)	0.002 (0.33)	0.013*** (4.93)	-0.030** (-2.49)	0.013*** (5.14)
AGE	-0.000*** (-3.85)	-0.000** (-2.53)	-0.000*** (-4.17)	-0.000*** (-2.98)	0.000 (0.28)	-0.000*** (-4.42)
CASH	0.011*** (2.82)	0.018*** (6.92)	0.017*** (5.25)	0.016*** (6.05)	0.003 (0.46)	0.017*** (7.51)
CAPITAL	-0.057*** (-9.02)	-0.030*** (-7.44)	-0.046*** (-8.11)	-0.038*** (-9.44)	-0.056*** (-5.46)	-0.036*** (-10.03)
DEBT	0.011*** (5.69)	0.009*** (7.03)	0.010*** (5.24)	0.011*** (7.95)	0.006* (1.90)	0.010*** (8.61)
INDUSTRY	YES	YES	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES	YES
Constant	0.034** (2.16)	0.025** (2.49)	0.051*** (3.87)	0.027*** (2.60)	0.118*** (4.27)	0.026*** (2.95)
Observations	1,868	5,255	2,241	4,882	658	6,465
R-squared	0.203	0.164	0.216	0.161	0.244	0.152
Number of ID	302	735	302	626	158	832
Company FE	YES	YES	YES	YES	YES	YES
F test	0	0	0	0	0	0
r2_a	0.0110	0.00961	0.0614	0.0197	-0.0735	0.0113
F	6.190	10.46	7.580	10.04	4.028	11.52

Note: *t*-statistics in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table A5.** Regression analysis – IV

Variables	(1)	(2)	(3)
	COD_lag	COD	COD
CSR	-0.000* (-1.75)	-0.000*** (-3.03)	-0.000*** (-2.92)
CEOFIN	0.002*** (3.25)	0.002*** (2.73)	0.002*** (2.92)
SIZE	-0.001*** (-3.96)	-0.001*** (-2.74)	-0.001*** (-2.58)
LEV	-0.001 (-0.49)	0.008*** (5.94)	0.007*** (5.23)
ROE	-0.006*** (-4.80)	-0.013*** (-10.65)	-0.011*** (-8.72)

**Table A5 (cont.).** Regression analysis – IV

Variables	(1)	(2)	(3)
	COD_lag	COD	COD
TANG	0.008*** (3.09)	0.011*** (4.89)	0.012*** (5.31)
AGE	0.001 (0.94)	-0.000*** (-4.83)	-0.000*** (-5.79)
CASH	0.016*** (6.56)	0.016*** (7.55)	0.016*** (7.40)
CAPITAL	-0.028*** (-7.41)	-0.038*** (-11.49)	-0.037*** (-11.06)
DEBT	0.000 (0.28)	0.010*** (9.25)	0.010*** (9.37)
CEOTEN		0.000 (0.01)	-0.000 (-0.33)
CEOAGE		0.000** (2.19)	0.000** (2.27)
CEOEDU		0.000 (0.69)	0.000 (0.84)
CEOMALE		0.002** (2.55)	0.002*** (2.67)
SHRCR1			-0.000*** (-4.45)
INDEP			-0.002 (-0.61)
EXESHARE			-0.005** (-2.39)
DUALITY			0.001** (2.08)
AUDIT			-0.004*** (-5.13)
INDUSTRY	YES	YES	YES
YEAR	YES	YES	YES
Constant	0.035*** (2.93)	0.022*** (2.83)	0.028*** (3.52)
Observations	6,271	7,123	7,123
R-squared	0.104	0.156	0.164
Number of ID	836	852	852
Company FE	YES	YES	YES
F test	0	0	0
r2_a	-0.0500	0.0282	0.0362
F	7.540	12.88	12.90

Note: t-statistics in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table A6.** Endogeneity test

Variables	(1)	(2)	(3)	(4)
	OLS	RE	PSM_OLS	Heckman
	COD	COD	COD	COD
CSR	-0.000*** (-6.40)	-0.000*** (-4.10)	-0.000*** (-5.07)	-0.000*** (-6.36)
CEOFIN	0.001* (1.76)	0.001** (2.36)	0.002*** (3.31)	0.001** (2.50)
SIZE	-0.002*** (-7.58)	-0.001*** (-4.19)	-0.002*** (-5.70)	-0.002*** (-7.45)
LEV	0.014*** (14.42)	0.010*** (9.31)	0.013*** (6.54)	0.014*** (13.80)

**Table A6 (cont.).** Endogeneity test

Variables	(1)	(2)	(3)	(4)
	OLS	RE	PSM_OLS	Heckman
	COD	COD	COD	COD
ROE	-0.018*** (-13.21)	-0.014*** (-11.88)	-0.018*** (-6.68)	-0.018*** (-12.49)
TANG	-0.000 (-0.15)	0.006*** (2.69)	0.001 (0.32)	-0.000 (-0.16)
AGE	-0.000*** (-3.84)	-0.000 (-0.76)	-0.000 (-1.44)	-0.000 (-1.57)
CASH	0.013*** (5.65)	0.016*** (7.55)	0.013** (2.95)	0.013*** (5.25)
CAPITAL	-0.024*** (-6.79)	-0.033*** (-10.35)	-0.023*** (-4.02)	-0.026*** (-6.72)
DEBT	0.018*** (17.82)	0.012*** (12.07)	0.019*** (9.86)	0.018*** (16.66)
IMR				0.002** (2.44)
INDUSTRY	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
Constant	0.072*** (10.61)	0.055*** (5.05)	0.079*** (9.28)	0.071*** (9.71)
Observations	7,123	7,123	6271	6271
R-squared	0.289		0.321	0.303
F test	0	0	0	0
r2_a	0.280	.		0.293
F	31.06	.	.	29.50

Note: t-statistics in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .