



ESG Disclosure Quality and Cost of Debt in Chinese A Shares under Ownership Heterogeneity

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Abstract. Against the backdrop of increasingly stringent global disclosure regimes for sustainable development, this study investigates the mechanism through which the quality of environmental, social, and governance (ESG) disclosure influences corporate costs of debt. Using A-share listed firms in Shanghai, Shenzhen, and Beijing from 2019 to 2024 as the sample, the analysis reveals pronounced ownership heterogeneity in the ESG disclosure – cost of debt relationship. Specifically, a higher quality of ESG disclosure is significantly associated with lower cost of debt financing for state-owned enterprises, whereas no significant relationship is observed for non-state-owned enterprises. The underlying mechanism for state-owned firms involves the coordinated alignment of government implicit guarantees and policy financing instruments, which allows high-quality ESG disclosure to channel firms toward lower-cost funding sources such as green credit. Non-state-owned firms face greater difficulty in converting disclosure advantages into financing benefits owing to limited information credibility and prevailing financing constraints. Greater ownership concentration attenuates the effect of ESG disclosure on financing costs in both ownership types, although the transmission channels differ. Finally, the moderating role of firm growth is significant only for state-owned enterprises. By integrating information disclosure quality into the analysis of cost of debt, this study delineates the institutional boundaries of ESG value realization from the information supply perspective and offers implications for differentiated regulation and the optimization of corporate financing strategies.

Keywords: ESG Disclosure Quality, Cost of Debt, Ownership Heterogeneity, Ownership Concentration, Corporate Growth.

1 Introduction

With the acceleration of the global sustainable development agenda and the deepening implementation of China's "dual carbon" strategy, corporate environmental, social, and governance (ESG) practices are transitioning from marginal voluntary disclosure to institutionalized compliance [1]. In 2024, the three principal stock exchanges in Shanghai, Shenzhen, and Beijing China issued the Corporate Sustainability Reporting Guide-

lines, inaugurating a new phase of mandatory and standardized ESG information disclosure in China [1]. Concurrently, cost of debt remains the principal funding channel for Chinese firms and directly affects corporate financial stability and the efficiency of resource allocation. Situating ESG disclosure quality and cost of debt within a unified analytical framework addresses the long-standing question of whether nonfinancial information produces financial consequences and is consistent with recent institutional developments, including the deepening of registration system reform and strengthened information disclosure oversight in China's capital market. Nonetheless, it remains an open empirical question, within the Chinese institutional context, whether ESG disclosure can be converted into a financing advantage for firms or whether it will remain a form of regulatory compliance.

The extant literature on the relationship between ESG performance and cost of debt has generated substantive insights but leaves three important gaps. First, prior studies have largely relied on comprehensive ESG ratings or single performance dimensions and have insufficiently examined the information generation and transmission role of disclosure quality, limiting the ability to distinguish the economic effects of substantive disclosure from those of greenwashing. Second, although ownership heterogeneity has been considered in some frameworks, there is a paucity of systematic explication of the institutional logic that differentiates state-owned and non-state-owned enterprises. Third, research on moderating mechanisms typically emphasizes external factors such as industry competition and analyst coverage while paying limited attention to how internal firm structures shape the effectiveness of ESG disclosure as a signal. To address these gaps, this study examines A-share listed firms in Shanghai, Shenzhen, and Beijing over the period 2019 to 2024 and employs the *Bloomberg* ESG disclosure quality score to measure corporate ESG information disclosure. The analysis systematically evaluates the primary effect of ESG disclosure quality on cost of debt financing, examines ownership heterogeneity, and tests the moderating roles of ownership concentration and firm growth. The objective is to provide empirical evidence on the mechanisms through which ESG information generates value in the Chinese context.

This study contributes on two levels. At the theoretical level, it introduces *Bloomberg's* ESG disclosure quality indicator into the cost of debt literature, diverging from the commonly used ESG performance or composite third-party ratings. This measure more directly captures the completeness, veracity, and usability of corporate disclosure and therefore more precisely identifies the influence of information supply characteristics on credit market pricing. Meanwhile, by incorporating ownership concentration and firm growth within a single moderating framework, the study demonstrates that the effect of ESG disclosure is not universal but contingent on internal governance structures and development stage, thereby extending the boundary conditions of Signaling Theory in transitional economies. At the conclusion level, the study finds that high-quality ESG disclosure significantly reduces cost of debt for state-owned enterprises, while the effect is statistically insignificant for non-state-owned enterprises. This ownership heterogeneity reflects two distinct institutional logics. Moreover, ownership concentration attenuates the effect of ESG disclosure in both ownership types, albeit via different mechanisms. In state-owned firms, the attenuation operates through substitution of ESG signals by government implicit guarantees; in non-state-owned firms, it

operates through erosion of disclosure quality by controlling shareholders. These findings offer micro foundations for regulators seeking to design differentiated ESG disclosure policies and for policymakers aiming to advance green finance reforms through classification. They also provide practical guidance for firms to refine disclosure strategies and governance arrangements to optimize financing costs.

2 Theoretical Basis and Research Hypotheses

2.1 The Relationship between ESG Disclosure Quality and Cost of Debt

Information Asymmetry Theory highlights the informational gap between firm insiders and external stakeholders such as creditors, which can give rise to adverse selection and moral hazard and thereby increase a firm's financing costs and risk premia [2]. From this perspective, the quality of ESG disclosure, as the primary conduit of nonfinancial information, directly affects creditors' ability to assess firm-specific risks. High-quality ESG disclosure can mitigate information gaps, lower creditors' perceived risk, and consequently reduce debt financing costs. Creditors traditionally emphasize financial metrics such as repayment capacity and cash flow stability; however, ESG-related risks may also crystallize into financial losses. For example, inadequate environmental disclosure may obscure potential hazards such as excessive emissions or insufficient environmental controls. Regulatory sanctions for environmental breaches, including fines, production restrictions, or shutdowns, can impair cash flows and asset values and increase default probability [3]. Similarly, inadequate disclosure of social responsibility matters may conceal labor abuses in supply chains; subsequent exposure can precipitate reputational crises, litigation costs, and material erosion of debt-servicing ability [4]. Thus, high-quality ESG disclosure enables creditors to identify nonfinancial risks proactively and to avoid pricing biases arising from informational blind spots.

Signaling Theory further suggests that firms can alleviate information asymmetry and secure stakeholder recognition by issuing credible positive signals regarding operational stability and risk management [5]. For signals to be informative, they must satisfy a cost-differentiation condition, meaning that the cost of producing signals differs materially across firms; absent such differences, low-quality firms can mimic high-quality firms and signal failure results. In the ESG context, producing high-quality disclosure typically requires substantial investments in systems and processes, such as emissions monitoring, supply-chain social audits, substantive compliance improvements, and third-party verification [6]. By contrast, low-quality disclosure often consists of template-driven, superficial reporting and is relatively inexpensive [6]. This cost differential renders high-quality ESG disclosure a costly-to-imitate and thus credible signal, allowing creditors to distinguish genuinely sustainable firms from those engaging in greenwashing and to extend lower credit risk compensation to the former. Consequently, the quality of ESG disclosure functions as an important signal of a firm's sustainability capacity, enabling creditors to more accurately identify environmental, social, and governance risks, reduce credit risk premia, and lower costs of debt. On the basis of the foregoing theoretical arguments and prior findings, the study advances the following Hypothesis 1.

H1: There exists a significant negative relationship between ESG disclosure quality and corporate cost of debt.

2.2 The Moderating Role of Ownership Concentration

Agency Theory identifies ownership structure as a critical institutional determinant of agency costs and information disclosure quality [7]. In firms with dispersed ownership, the principal agency conflict typically arises between managers and shareholders, and transparent, high-quality ESG disclosure can constrain managerial opportunism and mitigate information asymmetry. In contrast, when ownership is highly concentrated, agency conflicts shift toward controlling shareholders versus minority shareholders. Controlling owners may appropriate corporate resources through related-party transactions, asset transfers, or abusive guarantees, thereby harming external creditors. Under concentrated ownership, controlling shareholders often dominate disclosure decisions, increasing the risk that ESG reports serve as a legitimizing veneer rather than an accurate signal of sustainable practices. Consequently, creditor confidence in ESG disclosures diminishes, and the capacity of disclosure quality to reduce information asymmetry and lower cost of debt is attenuated. Thus, the study advances the Hypothesis 2.

H2: Ownership concentration negatively moderates the relationship between ESG disclosure quality and cost of debt; that is, greater ownership concentration weakens the effect of ESG disclosure quality on reducing cost of debt financing.

2.3 The Moderating Role of Firm Growth

Based on the Resource-Based View, ESG performance reflects a firm's capability to acquire and sustain strategic resources that are pivotal for the survival and expansion of high-growth firms [8]. High-growth firms depend heavily on intangible assets such as human capital, technological capabilities, and external stakeholder networks; the formation and preservation of these assets are closely linked to ESG practices. High-quality ESG disclosure signals to creditors that a firm possesses the organizational capacity to secure essential resources sustainably and that its growth trajectory is more likely to be enduring. Creditors, perceiving stronger resource acquisition and recovery potential, may demand lower debt financing premia because firms with abundant strategic resources have greater capacity to restore solvency through internal or external resource mobilization in the face of short-term shocks. Therefore, a Hypothesis 3 is proposed.

H3: Firm growth exerts a positive moderating effect. The greater the firm's growth, the stronger the effect of ESG disclosure quality in reducing cost of debt.

3 Data and Methodology

3.1 Sample Selection and Data Sources

The study employs annual data for A-share listed firms in Shanghai, Shenzhen, and Beijing over the period 2019-2024. Primary data sources are *Bloomberg* ESG database

and the *Choice* financial data terminal. Samples are screened according to standard empirical research protocols. First, firms in the financial and insurance sectors would be excluded since their capital structures and financing models differ substantially from nonfinancial firms and therefore the transmission mechanisms of ESG disclosure are not comparable. Second, firms classified as ST, *ST, or delisted are removed because their abnormal operating conditions render their costs of debt and risk profiles unrepresentative and likely to bias regression results. Third, observations with missing values are excluded to avoid sample selection bias. Continuous variables are winsorized at the 1st and 99th percentiles. Since the dependent variable retains extreme values after this procedure, it is further adjusted using the 5th and 95th percentiles to mitigate the influence of outliers on estimation. After these procedures, the final sample comprises 2,369 firm-year observations.

3.2 Variable Definition and Measurement

Explained Variable – Cost of Debt (*Cost of Debt*). The cost of debt financing measures the ratio of total financing-related expenses to the scale of debt and serves as a key indicator of the efficiency and financial risk of corporate borrowing. It calculates *Cost of Debt* by the ratio of financial expenses to long-term borrowings. Financial expenses include interest costs, handling fees, and other financing-related expenditures, thereby capturing the comprehensive cost of debt. Given that long-term borrowings constitute the principal source of debt financing for firms, their cost more accurately reflects a firm's bargaining position in the credit market and the pricing of its credit risk; therefore, long-term borrowings are used as the denominator [9]. The indicator is expressed as a percentage; higher values indicate higher long-term debt financing costs.

Explanatory Variable – ESG Disclosure Quality Score (*ESG*). The ESG disclosure quality score is obtained from the *Bloomberg* ESG database, a widely used provider of ESG data with strong recognition among international institutional investors and in the academic community [10]. *Bloomberg* constructs its disclosure score from publicly available corporate materials, including sustainability reports and annual reports, and evaluates firms along three core dimensions: disclosure completeness, information veracity, and indicator usefulness. The scoring framework incorporates China-specific ESG metrics where applicable. A higher score indicates superior overall ESG disclosure quality, greater nonfinancial information transparency, and a stronger positive signal to market participants. The score is measured on a 0-100 scale.

Moderator Variables. ① Ownership concentration (*TSH1*): This variable is measured as the shareholding ratio of the largest shareholder. A higher *TSH1* indicates greater ownership concentration, which is typically associated with more stable governance but also different agency dynamics. ② Firm growth (*GROWTH*): It is measured as the year-on-year growth rate of operating revenue, calculated as the change in operating revenue from the prior year divided by the prior year's operating revenue.

Higher growth signals greater development potential while potentially increasing operational risk.

Control Variables. Following prior literature, the analysis includes the following control variables: firm size (*SIZE*), measured as the natural logarithm of total assets at year-end; leverage ratio (*LEV*); return on equity (*ROE*); and firm age (*AGE*), defined as the difference between the observation year and the firm's listing year.

3.3 Empirical Models

Building on Hypothesis 1, the study estimates a regression model to test the relationship between ESG disclosure quality and corporate cost of debt. The baseline specification is presented in equation (1).

$$\text{Cost of Debt}_{i,t} = \alpha_0 + \alpha_1 \text{ESG}_{i,t-1} + \alpha_2 \text{Controls}'_{i,t-1} + \sum \text{Industry} + \sum \text{Year} + \varepsilon_{i,t} \quad (1)$$

Here, **Controls** denotes the vector of control variables, which includes the moderator variables in section 3.2.3 as covariates. $\sum \text{Industry}$ is an industry dummy controlling for industry fixed effects; $\sum \text{Year}$ is a year dummy controlling for time fixed effects; and $\varepsilon_{i,t}$ denotes the idiosyncratic error term capturing unobserved influences on cost of debt. A statistically significant negative coefficient α_1 on the *ESG* supports H1.

Equation (2) introduces an interaction term between ESG disclosure quality and ownership concentration (*TSH1*) to test the moderating role of ownership concentration. The statistical significance of the interaction coefficient β_3 indicates whether *TSH1* moderates the ESG-cost of debt relationship.

$$\text{Cost of Debt}_{i,t} = \beta_0 + \beta_1 \text{ESG}_{i,t-1} + \beta_2 \text{TSH1}_{i,t-1} + \beta_3 (\text{ESG}_{i,t-1} \times \text{TSH1}_{i,t-1}) + \beta_4 \text{Controls}'_{i,t-1} + \sum \text{Industry} + \sum \text{Year} + \varepsilon_{i,t} \quad (2)$$

Equation (3) introduces an interaction term between *ESG* and *GROWTH* to test the moderating role of firm growth. The significance of this interaction coefficient indicates whether *GROWTH* moderates the ESG-cost of debt relationship.

$$\text{Cost of Debt}_{i,t} = \mu_0 + \mu_1 \text{ESG}_{i,t-1} + \mu_2 \text{GROWTH}_{i,t-1} + \mu_3 (\text{ESG}_{i,t-1} \times \text{GROWTH}_{i,t-1}) + \mu_4 \text{Controls}'_{i,t-1} + \sum \text{Industry} + \sum \text{Year} + \varepsilon_{i,t} \quad (3)$$

4 Research Results and Analysis

4.1 Descriptive Analysis

Table 1 reports descriptive statistics for the main variables. Over the sample period, the mean *Bloomberg* ESG disclosure quality score (*ESG*) is 44.04 with a standard deviation

of 10.4137 and a median near the mean. This suggests that overall ESG disclosure quality in the sample is modest and approximately symmetrically distributed, while inter-firm variation is sizeable. The gap between the maximum and minimum scores reaches about 30 points. The average cost of debt financing is 8.69 percent with a standard deviation of 19.13 percent; the minimum and maximum values are -30.34 percent and 64.09 percent, respectively. The distribution of *Cost of Debt* is markedly right-skewed, indicating that most firms bear low to moderate financing costs while a minority face substantially higher costs. Negative values reflect cases in which net interest income exceeds interest expense or where long-term borrowings are quite small. The mean *GROWTH* is 14.38 percent with a standard deviation of 0.2464 and exhibits right skewness, implying that a few high-growth firms raise the overall average. The mean ownership concentration (*TSH1*) is 35.36 percent with a standard deviation of 0.1523; its observed range is 12.23 percent to 64.14 percent and is right-skewed, indicating large heterogeneity in largest-shareholder holdings. Other variables display distributions within reasonable bounds.

Table 1. Descriptive statistical results.

Variable	Count	Mean	Standard deviation	Minimum	Median	Maximum
<i>ESG</i>	2369	44.0421	10.4137	29.2727	43.2351	62.0762
<i>Cost of Debt</i>	2369	8.6920	19.1294	-30.3383	5.4656	64.0876
<i>SIZE</i>	2369	24.0405	1.1155	22.2101	23.9142	26.3863
<i>LEV</i>	2369	0.5323	0.1545	0.2481	0.5417	0.7901
<i>ROE</i>	2369	0.0746	0.0979	-0.1590	0.0759	0.2576
<i>GROWTH</i>	2369	0.1438	0.2464	-0.2568	0.1159	0.7211
<i>TSH1</i>	2369	0.3536	0.1523	0.1223	0.3347	0.6414
<i>AGE</i>	2369	17.8257	7.6153	4.0000	19.0000	29.0000

4.2 Multicollinearity Test

To assess potential multicollinearity among explanatory variables, the variance inflation factors (VIFs) are computed. VIFs for all core explanatory and control variables are well below the common threshold of 10, with a minimum of 1.0789 (*AGE*), a maximum of 1.6239 (*SIZE*), and a mean of 1.2630. These results indicate low pairwise correlations, satisfactory independence among regressors, and no multicollinearity concerns. Consequently, the model specification is appropriate and all variables are retained for regression analysis.

4.3 Panel Regression Analysis

Results of Hypothesis 1. Table 2 reports baseline multiple regression results estimated for the full sample and for subsamples of state-owned enterprises and non-state-owned enterprises. In the full sample, the coefficient on *ESG* is -0.0583 but is not statistically

significant ($p = 0.2960$), indicating no discernible overall effect of ESG disclosure quality on cost of debt at the aggregate level. The absence of significance for the pooled sample does not preclude economically meaningful heterogeneity across ownership types. Column-specific results for the grouped regressions reveal pronounced ownership heterogeneity. For state-owned enterprises, the ESG coefficient is negative and statistically significant (coefficient = -0.2363 , $p = 0.0111$), whereas for non-state-owned enterprises the ESG coefficient is not significant ($p = 0.8919$). These contrasting results suggest that differences in property rights produce offsetting effects in the pooled estimation and that the direction and magnitude of the ESG-cost of debt relationship differ fundamentally by ownership.

A plausible interpretation is that creditors evaluate firms differently according to ownership. State-owned firms benefit from implicit government support that reduces default risk and prompts creditors, particularly state-owned banks, to place greater weight on indicators of long-term sustainability when pricing credit. High-quality ESG disclosure by state-owned firms communicates governance transparency and social responsibility, lowering creditors' information search and monitoring costs and thereby reducing costs of debt. Moreover, state-owned firms frequently perform policy-oriented functions and are more likely to access policy-related financing instruments [11]. Instruments such as green bonds and sustainability-linked debt typically carry pricing advantages relative to market-rate funding, and state-owned firms have comparative advantages in obtaining such financing. Thus, high ESG disclosure quality increases the likelihood that state-owned firms are identified as policy-compliant entities and thereby receive greater access to lower-cost funding, which lowers overall cost of debt.

By contrast, non-state-owned firms lack government credit endorsement and are assessed more on verifiable hard information such as collateral and short-term repayment capacity. Soft information conveyed by ESG disclosure is therefore less likely to translate into financing advantages. In addition, managers of non-state firms may prioritize financial performance and shareholder value, treating ESG-related investments as cost centers; this incentive structure can foster selective disclosure or greenwashing, undermining the credibility and completeness of disclosed information and limiting creditor trust. Non-state firms also rely on a broader set of financing channels, including private lending, trust financing, and leasing, where creditors typically focus on short-term cash flows and profitability and give less weight to nonfinancial metrics [12]. Finally, the smaller long-term borrowing scale of many non-state firms makes their observed debt costs more sensitive to market interest rate movements and liquidity conditions, further muting any marginal effect of ESG disclosure. Hence, the coefficient is not significant.

The analysis further employs the *Bloomberg* social-dimension disclosure score (*S_Score*) as an alternative explanatory variable to assess whether disclosure quality within a specific ESG dimension correlates with cost of debt. The social dimension is selected for two reasons. First, it encompasses issues such as employee rights, supply chain responsibility, product safety, and social contribution, which align closely with China-specific ESG evaluation criteria and more accurately reflect the institutional role of state-owned enterprises in fulfilling policy and social responsibilities. Second, social-dimension indicators are relatively quantifiable and comparable, facilitating their

incorporation into creditors' credit-risk assessment frameworks [13]. The results reported in the last two columns indicate that the S_Score coefficient for state-owned enterprises is negative and statistically significant at the 5% level, consistent in sign with the main regression. By contrast, it is insignificant for non-state-owned enterprises. These extended findings suggest that the social dimension, as a core component of ESG evaluation with Chinese characteristics, independently enhances creditor recognition of state-owned firms. The persistent insignificance (and in some specifications nonnegative point estimates) for non-state firms in both composite and social-dimension scores underscores ownership as a boundary condition, that is, within China's transitional economy, the extent to which ESG disclosure is converted into financing benefits appears to depend materially on government-related credit endorsement mechanisms.

Table 2. Regression results of Hypothesis 1.

	<i>ESG → Cost of Debt</i>			<i>S_Score → Cost of Debt</i>	
	Full sample	State-owned firms	Non-state-owned firms	State-owned firms	Non-state-owned firms
<i>ESG</i>	-0.0583	-0.2363**	0.0095	/	/
<i>S_Score</i>	/	/	/	-0.2019**	0.0390
<i>SIZE</i>	-3.3961***	-3.0234***	-3.6457***	-3.3329***	-3.7734***
<i>LEV</i>	42.769***	49.511***	40.769***	48.825***	40.954***
<i>ROE</i>	-23.382***	-28.173***	-20.211***	-27.648***	-20.388***
<i>GROWTH</i>	-2.3970	-1.1836	-2.9988	-1.3448	-3.1283
<i>TSH1</i>	-5.8050*	-8.5135	-5.4206	-7.8409	-5.6254
<i>AGE</i>	0.0375	-0.0525	0.1139	-0.0367	0.1135
<i>Industry FE</i>	Yes	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.2245	0.2892	0.2201	0.2888	0.2205
<i>N</i>	2369	799	1570	799	1570

Note: The data in the table are regression coefficient of each variable, and ***, **, and * are significant at the significance level of 1%, 5% and 10% respectively.

Results of Hypothesis 2 & 3. Hypothesis 2 examines whether ownership concentration moderates the relationship between ESG disclosure quality and cost of debt financing. Following the ownership heterogeneity framework, the benchmark model incorporates an interaction term ($ESG \times TSH1$) between ESG disclosure quality and the largest shareholder's shareholding ratio to capture the marginal effect of ownership concentration. Grouped regression results are reported in Table 3.

For state owned enterprises, the coefficient on $ESG \times TSH1$ is positive and significant at the 10% level, indicating that greater ownership concentration attenuates the

negative effect of ESG disclosure on cost of debt. In other words, as the largest shareholder's stake increases, the cost reducing effect of ESG disclosure diminishes. This pattern is consistent with a substitution mechanism, that is when ownership concentration is high, implicit government guarantees and the credit endorsement associated with major stakeholders serve as dominant signals for creditors, reducing their sensitivity to incremental informational signals conveyed by ESG disclosure and producing a ceiling effect. Conversely, in state-owned firms with more dispersed ownership, ESG disclosure functions as a differentiated signal and plays a stronger role in lowering financing costs. In the non-state-owned subsample, the coefficient on $ESG \times TSH1$ is also positive and statistically significant at the 5% level. The interpretation differs. Higher ownership concentration in non-state firms strengthens controller influence and increases incentives for private benefit extraction. Under such control, ESG reports are more likely to be instrumentalized as image management or selective disclosure, which undermines information veracity and creditor trust. Additionally, concentrated ownership may weaken external governance, prompting creditors to rely more on the personal credit or collateral of controlling shareholders than on firm ESG attributes. Thus, while the sign of the moderating effect is consistent across ownership types, the underlying mechanisms diverge: substitution by government guarantees in state owned firms and erosion of disclosure quality by controlling shareholders in non-state firms.

Hypothesis 3 tests whether firm growth moderates the ESG-cost relationship by including an interaction term ($ESG \times GROWTH$) between ESG disclosure quality and operating revenue growth. In the state-owned sample, the coefficient on $ESG \times GROWTH$ is positive (0.3531) and significant at the 10% level, indicating that higher growth weakens the cost of debt reduction associated with ESG disclosure. A plausible economic rationale is that high growth state-owned firms often undertake policy-oriented investments and receive government credit support and fiscal subsidies; consequently, creditors place relatively less weight on ESG disclosure quality. In addition, rapid scale expansion may dilute the marginal returns to ESG investment, reducing the signal value of disclosure. In the non-state-owned sample, the $ESG \times GROWTH$ coefficient is positive but insignificant, suggesting that growth does not materially moderate the ESG-cost relationship for non-state firms. This contrast may reflect that high growth in non-state firms is financed primarily through market mechanisms and contingent on short term solvency and collateral. Non-state creditors therefore focus on hard financial indicators and remain cautious about ESG signals, especially given the higher volatility and potential risk associated with aggressive expansion. Overall, these results extend the main hypothesis by demonstrating that the effect of ESG disclosure on cost of debt depends not only on ownership type but also on the firm's growth stage and financing model, offering empirical guidance for differentiated ESG disclosure regulation.

Table 3. Regression results of Hypothesis 2 & 3.

	Hypothesis 2		Hypothesis 3	
	State-owned firms	Non-state-owned firms	State-owned firms	Non-state-owned firms
<i>ESG</i>	-0.5626**	-0.1922*	-0.2822***	-0.0049

	Hypothesis 2		Hypothesis 3	
	State-owned firms	Non-state-owned firms	State-owned firms	Non-state-owned firms
<i>ESG × TSHI</i>	0.8559*	0.5892**	/	/
<i>TSHI</i>	-44.015*	-32.658**	-7.9367	-5.2677
<i>ESG × GROWTH</i>	/	/	0.3531*	0.0741
<i>GROWTH</i>	-0.8088	-2.7645	-15.854*	-6.3394
<i>SIZE</i>	-3.0373***	-3.6317***	-3.0158***	-3.6336***
<i>LEV</i>	48.653***	40.698***	49.350***	40.698***
<i>ROE</i>	-26.469**	-19.376***	-28.162***	-20.174***
<i>AGE</i>	-0.0466	0.1135*	-0.0471	0.1154
<i>Industry FE</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.2929	0.2224	0.2911	0.2202
<i>N</i>	799	1570	799	1570

Note: The data in the table are regression coefficient of each variable, and ***, **, and * are significant at the significance level of 1%, 5% and 10% respectively.

5 Conclusion

This paper uses data on Chinese A share listed firms for 2019-2024 and employs the *Bloomberg* ESG disclosure quality score to systematically examine the effect of ESG disclosure quality on corporate cost of debt, the ownership heterogeneity of the effect, and the moderating roles of ownership concentration and firm growth. The main findings are as follows.

First, the debt cost reduction effect of ESG disclosure quality exhibits significant ownership heterogeneity, and the null result for the full sample arises from offsetting effects across ownership types. In China's transitional institutional context, the value realization of ESG disclosure is conditional rather than universal. The mechanism by which ESG disclosure reduces costs of debt for state-owned firms embodies a dual policy and market logic. The failure of ESG disclosure to lower costs for non-state owned firms stems from dual constraints in information effectiveness and available financing channels. Second, ownership concentration moderates the ESG disclosure effect in a consistent direction across ownership types but via distinct mechanisms. In state-owned firms the effect manifests as a substitution of government guarantees for ESG signals, while in non-state-owned firms, the effect appears as an erosion of disclosure quality by controlling shareholders. Third, firm growth moderates the ESG disclosure effect only for state-owned enterprises, since high growth dilutes the informational value of ESG signals and reduces creditors' sensitivity to incremental ESG information. It is insignificant for non-state-owned firms, suggesting that under market-oriented growth paths, ESG disclosure has difficulty entering creditors' risk pricing frameworks.

Based on these findings, the paper proposes targeted policy recommendations. First, regulators should establish differentiated ESG disclosure guidance. For state-owned

firms, it is important to strengthen the linkage between ESG disclosure and policy financing by incorporating ESG performance into eligibility and assessment criteria for green credit and sustainable bonds. For non-state-owned firms, enhancing disclosure oversight and third-party assurance to deter greenwashing, and guide traditional creditors such as banks to incorporate ESG factors into credit risk models to broaden market-based pricing channels for ESG disclosure might be helpful. Second, state-owned firms could promote moderate equity diversification by introducing strategic investors while maintaining state control, thereby lowering the ceiling effect of implicit government guarantees and restoring the signaling value of ESG disclosure [14]. Non-state-owned firms should improve corporate governance regulations, strengthen the supervisory role of independent directors and minority shareholders over ESG disclosure, and curb the instrumentalization of disclosure under dominant shareholder control to enhance market credibility. Third, regulatory authorities should implement a dynamic evaluation mechanism for ESG investment in high growth state-owned firms to prevent scale expansion from crowding out ESG practices. For non-state-owned firms, they should design tiered ESG disclosure requirements by growth stage and tighten mandatory disclosure norms. Creditors should be encouraged to treat credible ESG performance as a risk mitigation factor rather than a cost burden when evaluating high growth firms, thereby promoting the development of a market-oriented ESG investment culture.

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