

# The Impact of ESG Information Disclosure on Corporate Financing Costs and Its Optimization Research

Yun Wang, Shiwei Song, Xinyue Hu, Xufeng Zhang

Liaoning University of International Business and Economics, Dalian, Liaoning, 116000, China

## ABSTRACT

With the integration of sustainable development into global economic and social development, ESG information disclosure has become a key channel for enterprises to convey non-financial information. Using 2019 - 2023 panel data of Chinese A-share listed companies, this paper empirically studies the impact of ESG information disclosure quality on corporate financing costs (equity and debt) and explores the moderating effect of property right nature and the mediating effect of information asymmetry. The empirical results are as follows: (1) Improving ESG information disclosure quality can significantly reduce both corporate equity and debt financing costs, and this conclusion holds after robustness tests; (2) Heterogeneity analysis shows that the effect of reducing financing costs by ESG information disclosure is more obvious in non - state - owned enterprises than in state - owned enterprises; (3) Mechanism tests confirm that ESG information disclosure alleviates information asymmetry between enterprises and investors/creditors, thus lowering corporate financing costs, and information asymmetry plays a partial mediating role. This study enriches researches the economic consequences of ESG information disclosure in emerging capital markets, and provides practical references for enterprises to optimize financing strategies, investors and creditors to improve decision - making systems, and regulatory authorities to perfect the ESG information disclosure system.

## KEYWORDS

ESG information disclosure; Equity financing cost; Debt financing cost; Information asymmetry; Property right nature

## 1 Introduction

### 1.1 Research Background

The sustainable development concept has integrated into global economic and social development, and ESG has become a core criterion for stakeholders to evaluate corporate value and risks. With the improvement of regulatory systems like the EU's CSRD and China's Guidelines on ESG Information Disclosure of Listed Companies, the ESG report disclosure ratio of Chinese A - share listed companies rose from 37.1% in 2019 to 68.3% in 2023. Financing cost is the core of corporate financial management, and information asymmetry causes high financing costs. ESG information disclosure, as a key way to transmit non - financial information, can reduce the information gap between enterprises and stakeholders. However, existing studies have controversial conclusions. Moreover, in China's capital under the "dual - track system" of property rights. In the market, there are significant financing environment differences between SOEs and non - SOEs. Whether property right nature moderates the impact of ESG information disclosure on financing costs needs empirical verification.

### 1.2 Research Significance

#### 1.2.1 Theoretical Significance

This study supplements empirical evidence on ESG information disclosure's economic consequences in emerging markets, deepens research on its mechanism affecting corporate financing costs, enriches application scenarios of information asymmetry and signal transmission theories. It also reveals the moderating effect of property right nature on the relationship between ESG disclosure and financing costs, offering a new perspective on corporate financing heterogeneity in China's capital market.

#### 1.2.2 Practical Significance

The research conclusions offer practical references for enterprises to optimize ESG disclosure strategies and ease financing constraints, for investors and creditors to improve investment and credit decision - making by including ESG information, and for regulatory authorities to improve the ESG disclosure system and promote high - quality capital market development. Meanwhile, it helps promote corporate sustainable development and achieve global sustainable development goals.

## 2 Literature Review and Research Hypotheses

### 2.1 Literature Review

#### 2.1.1 ESG Information Disclosure and Corporate Financing Costs

The relationship between ESG information disclosure and corporate financing costs is a hot academic topic. Most

scholars think ESG information disclosure can effectSome studies find that high - quality ESG information disclosure can actively reduce corporate equity and debt financing costs as it sends positive signals of corporate sustainable development, reduces investors' and creditors' risk perception, and lowers the required rate of return and loan interest rate. However, Cheng et al. (2014) argue that ESG information disclosure increases enterprises' operational and disclosure costs, and potential benefits can't offset cost input, so it's hard to bring positive financing returns. In China's capital market, research conclusions on this issue are inconsistent and need verification with the latest sample data.

### 2.1.2 The Mediating Role of Information Asymmetry

Information asymmetry causes high corporate financing costs. ESG information disclosure, as a non - financial information transmission way, can make up for financial report information deficiency and reduce information asymmetry between enterprises and stakeholders. Existing studies show that the mediating effect of information asymmetry in the relationship between ESG information disclosure and financing costs is affected by the institutional environment, marketization level and corporate. Governance structure. In China's capital market with imperfect information - disclosure system, whether information asymmetry significantly mediates the impact of ESG information disclosure on financing costs needs further testing.

## 2.2 Research Hypotheses

Based on the literature review and theoretical analysis aboveThis paper puts forward the following research hypotheses: H1: Improvement of ESG information disclosure quality significantly reduces corporate equity financing costs. H2: It also significantly reduces corporate debt financing costs. H3: Information asymmetry mediates the relationship between ESG information disclosure and corporate financing costs, i. e., ESG disclosure reduces costs by alleviating asymmetry. H4: The financing cost reduction effect of ESG disclosure is more significant in non - SOEs than in SOEs.

## 3 Research Design

### 3.1 Sample Selection and Data Sources

This paper selects Chinese A - share listed companies from 2019 - 2023 as the initial sample and conducts screening: (1) Exclude financial industry companies due to special business and indicators. (2) Exclude ST/\*ST and delisted companies with abnormal operations. (3) Exclude companies with missing data. Additionally, it conducts 1% winsorization on continuous variables to eliminate extreme values. After screening, 10,236 firm - year observations are obtained. The ESG information disclosure quality data are from the ESG rating reports of Hexun.com[source], which are widely used in domestic ESG research. Comprehensive evaluation system with high data credibility. Corporate financing cost and control variable data are from CSMAR and Wind Database, main domestic financial and economic research databases.

### 3.2 Model Construction

To test the research hypotheses, this paper constructs multiple linear regression, mediating effect and moderating effect models.

#### 3.2.1 Main Effect Models

To test H1 and H2 on the impact of ESG information disclosure quality on equity and debt financing costs, main effect models are constructed $COE_{i,t} = \alpha_0 + \alpha_1 \times ESG_{i,t} + \alpha_2 \times Controls_{i,t} + Industry + Year + \epsilon_{i,t}$  (1). Among them,  $COE_{i,t}$  and  $COD_{i,t}$  are the equity and debt financing costs of enterprise  $i$  in year  $t$  respectively;  $ESG_{i,t}$  is the ESG information disclosure quality of enterprise  $i$  in year  $t$ ;  $Controls_{i,t}$  is the set of control variables;  $Industry$  and  $Year$  are industry and year dummy variables;  $\alpha_0$  and  $\beta_0$  are  $\alpha_1, \alpha_2, \beta_1, \beta_2, \epsilon_{i,t}$

#### 3.2.2 Mediating Effect Model

To test H3 on the mediating effect of information asymmetry, this paper constructs a mediating effect model referring to Wen Zhonglin et al. (2004)'s stepwise regression method.  $COE/COD_{i,t} = \gamma_0 + \gamma_1 \times ESG_{i,t} + \gamma_2 \times Controls_{i,t} + Industry + Year + \epsilon_{i,t}$  (Model1)  $ASYMM_{i,t} = \delta_0 + \delta_1 \times ESG_{i,t} + \delta_2 \times Controls_{i,t} + Industry + Year + \epsilon_{i,t}$  (Model2)  $COE/COD_{i,t} = \theta_0 + \theta_1 \times ESG_{i,t} + \theta_2 \times ASYMM_{i,t} + \theta_3 \times Controls_{i,t} + Industry + Year + \epsilon_{i,t}$  (Model3) Among them,  $ASYMM_{i,t}$  is the information asymmetry degree of enterprise  $i$  in year  $t$ ; other variables are as above. If regression coefficients  $\gamma_1, \delta_1$  and  $\theta_2$  are significant, and the absolute value of  $\theta_1$  is smaller than that of  $\gamma_1$ , information asymmetry has a partial mediating role.

#### 3.2.3 Moderating Effect Model

To test H4 on the moderating effect of property right nature, moderating effect models are constructed by adding the cross - term of ESG information disclosure quality and property right nature $COE_{i,t} = \lambda_0 + \lambda_1 \times ESG_{i,t} + \lambda_2 \times SOE_{i,t} + \lambda_3 \times ESG_{i,t} \times SOE_{i,t} + \lambda_4 \times Controls_{i,t} + Industry + Year + \epsilon_{i,t}$  (3). Among them, is the cross - term; other variables are  $COD_{i,t} = \mu_0 + \mu_1 \times ESG_{i,t} + \mu_2 \times SOE_{i,t} + \mu_3 \times ESG_{i,t} \times SOE_{i,t} + \mu_4 \times Controls_{i,t} + Industry + Year + \epsilon_{i,t}$  (4) as above. The regression coefficient of the cross - term reflects the  $ESG_{i,t} \times SOE_{i,t}$  moderating effect of property right nature.

## 4 Empirical Results and Analysis

### 4.1 Descriptive Statistics

Table 1 shows the descriptive statistical results of main variables. The mean of equity financing cost (COE) is 0.082, with a standard deviation of 0.023 and a range of 0.031 to 0.145, indicating differences in equity financing costs among listed companies. The mean value of debt financing cost (COD) is 0.047 with a standard deviation of 0.018 and a range of 0.012 to 0.098, showing a relatively small difference in debt financing costs compared to equity financing costs. The mean value of ESG information disclosure quality (ESG) is 3.260 with a standard deviation of 0.890 and a range of 1.000 to 5.000, indicating the overall ESG information disclosure quality of Chinese A - share listed companies is at a medium level and there's a large gap between different enterprises. The mean value of information asymmetry (ASYMM) is 0.053 with a standard deviation of 0.041, reflecting different degrees of information asymmetry among enterprises. The mean value of property right nature (SOE) is 0.430, meaning state - owned enterprises account for 43% of the sample, and the sample structure is relatively balanced, which is conducive to subsequent heterogeneity analysis.

Table 1 shows the descriptive statistics of main variables

Variable Name	Variable Symbol	Observations	Mean	Standard Deviation	Minimum	Maximum
Equity Financing Cost	COE	10236	0.082	0.023	0.031	0.145
Debt Financing Cost	COD	10236	0.047	0.018	0.012	0.098
ESG Information Disclosure Quality	ESG	10236	3.260	0.890	1.000	5.000
Information Asymmetry	ASYMM	10236	0.053	0.041	0.002	0.216
Property Right Nature	SOE	10236	0.430	0.495	0.000	1.000

### 4.2 Correlation Analysis

Table 2 reports the Pearson correlation analysis results of main variables. The correlation coefficients between ESG and COE, COD are - 0.23 and - 0.18 respectively, both significantly negative at the 1% level, preliminarily verifying H1 and H2, i. e., the improvement of ESG information disclosure quality is negatively correlated with corporate financing costs. The correlation coefficient between ESG and ASYMM is - 0.21, significantly negative at the 1% level. ESG information disclosure quality is negatively correlated with information asymmetry, laying a foundation for the subsequent mediating effect test. Also, the absolute values of correlation coefficients between all variables are less than 0.7, meaning no serious multicollinearity problem and being conducive to subsequent regression analysis.

Table 2 shows Pearson Correlation Analysis of Main Variables

Variable	COE	COD	ESG	ASYMM	SOE
COE	1.000	0.450***	-0.230***	0.320***	-0.080**
COD	0.450***	1.000	-0.180***	0.270***	-0.110***
ESG	-0.230***	-0.180***	1.000	-0.210***	0.150***
ASYMM	0.320***	0.270***	-0.210***	1.000	-0.090**
SOE	-0.080**	-0.110***	0.150***	-0.090**	1.000

\*\*\*, \*, \* indicate significance at the 1%, 5% and 10% levels respectively.

### 4.3 Main Effect Regression Results

Table 3 reports the main effect models' regression results. After adding control variables and controlling industry and year fixed effects, the regression coefficient of ESG on COE is -0.005 (significant at 1%, t - value = 4.28), indicating a 0.5 - percentage - point decrease in corporate equity financing cost for every 1 - level increase in ESG information disclosure quality, verifying H1. The regression coefficient of ESG on COD is -0.003 (significant at 1%, t - value = 3.76), indicating a 0.3 - percentage - point decrease in corporate debt financing cost for every 1 - level increase in ESG information disclosure quality, verifying H2. The regression results of the control variables show that enterprise size (Size) and return on equity (ROE) are significantly negatively correlated with financing costs, while asset-liability ratio (Lev) is significantly positively correlated with financing costs, which is consistent with the research conclusions of existing literature.

### 4.4 Mediating Effect Regression Results

Table 4 reports the regression results of the mediating effect model. The results show that the regression coefficient of ESG on COE and COD in Model 1 is significantly negative, which is consistent with the main effect regression results. In Model 2, the regression coefficient of ESG on ASYMM is -0.012, significant at the 1% level (t-value=5.31), indicating that ESG information disclosure quality can significantly alleviate the information asymmetry of enterprises. In Model 3, after adding the mediating variable ASYMM, the regression coefficients of ESG on COE and COD are still significantly negative, and the absolute values are reduced to -0.003 and -0.002 respectively, while the regression coefficient of ASYMM on COE and COD is significantly positive at the 1% level. The mediation effect test shows that the mediating effect of information

Table 3 Main Effect Regression Results

Variable	Dependent Variable: COE	Dependent Variable: COD
ESG	-0.005***(4.28)	-0.003***(3.76)
Size	-0.006***(5.11)	-0.004***(4.33)
Lev	0.032***(6.89)	0.025***(5.97)
ROE	-0.045***(7.23)	-0.031***(6.12)
Board	-0.002**(2.45)	-0.001*(1.98)
Indep	-0.003**(2.51)	-0.002**(2.34)
Big4	-0.004***(3.12)	-0.003***(2.89)
Industry	Controlled	Controlled
Year	Controlled	Controlled
Constant Term	0.326***(9.21)	0.215***(8.34)
N	10236	10236
Adj-R <sup>2</sup>	0.286	0.214

\*Note: \*\*\*, \*\*, \* indicate significance at the 1%, 5% and 10% levels respectively; t-values are in parentheses.

asymmetry accounts for 20.0% in the relationship between ESG and COE, and 16.8% in the relationship between ESG and COD, both of which are partial mediating effects. This verifies H3, that is, ESG information disclosure reduces corporate financing costs by alleviating information asymmetry.

Table 4 Mediating Effect Regression Results

Variable	COE (Model 1)	ASYMM (Model 2)	COE (Model 3)	COD (Model 1)	COD (Model 3)
ESG	-0.005***(4.28)	-0.012***(5.31)	-0.003***(3.15)	-0.003***(3.76)	-0.002***(2.89)
ASYMM	-	-	0.083***(6.78)	-	0.042***(5.43)
Control Variables	Controlled	Controlled	Controlled	Controlled	Controlled
Industry/Year	Controlled	Controlled	Controlled	Controlled	Controlled
N	10236	10236	10236	10236	10236
Adj-R <sup>2</sup>	0.286	0.234	0.321	0.214	0.245

\*Note: \*\*\*, \*\*, \* indicate significance at the 1%, 5% and 10% levels respectively; t-values are in parentheses.

#### 4.5 Moderating Effect Regression Results

Table 5 reports the regression results of the moderating effect model. The regression coefficient of the cross term ESG×SOE on COE is 0.002, significant at the 5% level (t-value=2.45), and the regression coefficient on COD is 0.001, significant at the 10% level (t-value=1.76). This indicates that the nature of property right has a significant negative moderating effect on the relationship between ESG information disclosure and corporate financing costs, that is, compared with non-SOEs, the financing cost reduction effect of ESG information disclosure in SOEs is significantly weaker, which verifies H4. The reason is that SOEs have government credit endorsement, low financing constraints and low information asymmetry, so the marginal effect of ESG information disclosure on reducing financing costs is relatively small; while non-SOEs face more serious financing difficulties and information asymmetry, and high-quality ESG information disclosure can effectively transmit positive signals to the market, thus significantly reducing financing costs.

Table 5 Moderating Effect Regression Results

Variable	Dependent Variable: COE	Dependent Variable: COD
ESG	-0.007***(4.56)	-0.004***(3.98)
SOE	-0.003**(2.34)	-0.002**(2.11)
ESG×SOE	0.002**(2.45)	0.001*(1.76)
Control Variables	Controlled	Controlled
Industry/Year	Controlled	Controlled
N	10236	10236
Adj-R <sup>2</sup>	0.293	0.219

\*Note: \*\*\*, \*\*, \* indicate significance at the 1%, 5% and 10% levels respectively; t-values are in parentheses.

#### 4.6 Robustness Tests

To ensure the reliability of the research conclusions, this paper conducts robustness tests from the following aspects: (1) Replace the core variables: re-measure the equity financing cost with the Fama-French three-factor model, and re-measure the ESG information disclosure quality with the ESG ratings of other third-party institutions; (2) Adjust the sample interval: exclude the sample data of 2023 and re-regress with the sample data from 2019 to 2022; (3) Endogenous treatment: adopt the instrumental variable method, select the lagged term of ESG information disclosure quality as the instrumental variable to re-estimate the model. The results of the above robustness tests show that the core regression coefficients are still significant and consistent with the original research conclusions, indicating that the research results of this paper are robust and reliable.

## 5 Research Conclusions and Implications

### 5.1 Research Conclusions

Based on the panel data of Chinese A-share listed companies from 2019 to 2023, this paper empirically studies the impact of ESG information disclosure quality on corporate financing costs and its internal mechanism and boundary conditions, and the main research conclusions are as follows:

The improvement of ESG information disclosure quality can significantly reduce both corporate equity financing costs and debt financing costs, and this conclusion remains robust after a series of robustness tests such as core variable replacement, sample interval adjustment and endogenous treatment. Specifically, for every 1-level increase in ESG information disclosure quality, the equity financing cost decreases by 0.5 percentage points and the debt financing cost decreases by 0.3 percentage points.

Information asymmetry plays a partial mediating role in the relationship between ESG information disclosure and corporate financing costs. ESG information disclosure can alleviate the information asymmetry between enterprises and investors/creditors, and then reduce corporate financing costs. The mediating effect accounts for 20.0% and 16.8% in the impact on equity and debt financing costs respectively.

The nature of property right has a significant moderating effect on the relationship between ESG information disclosure and corporate financing costs. The financing cost reduction effect of ESG information disclosure is more significant in non-SOEs, while the effect is relatively weak in SOEs due to the government credit endorsement and low financing constraints.

### 5.2 Theoretical Implications

This study enriches the research on the economic consequences of ESG information disclosure in emerging capital markets. Most existing studies focus on the research of mature markets such as Europe and the United States, and this paper verifies the financing cost reduction effect of ESG information disclosure with the latest sample data of Chinese A-share listed companies, supplementing the empirical evidence of ESG research in emerging markets.

This paper deepens the understanding of the internal mechanism of ESG information disclosure affecting corporate financing costs, and confirms that information asymmetry is an important transmission path, which enriches the application of information asymmetry theory and signal transmission theory in the field of ESG research.

This paper reveals the moderating effect of property right nature on the relationship between ESG information disclosure and financing costs, which provides a new perspective for understanding the heterogeneity of corporate financing behavior in China's special institutional background, and enriches the research on the institutional environment of corporate financing.

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