ESG PERFORMANCE AND FINANCING COSTS OF A-SHARE LISTED FIRMS: AN EMPIRICAL ANALYSIS

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In recent years, driven by China's carbon peaking and carbon neutrality targets, the regulatory framework for semi-mandatory environmental information disclosure has become more complete, and ESG report publication has expanded rapidly. Drawing on information asymmetry and related theories, this study investigates how ESG performance influences corporate financing costs. Using a sample of 1,044 A-share listed companies from 2016 to 2020, the paper compiles and analyzes ESG disclosure and rating data to construct firm-level ESG performance indicators, and then develops an empirical model to test the relationship between ESG performance and financing costs. The analysis further examines whether this relationship varies across different types of firms, and evaluates the moderating roles of firm size and media attention in shaping the ESG–financing cost linkage. The results indicate that firm size plays a positive moderating role in the effect of ESG performance on financing costs.

Index Terms — corporate esg performance, financing cost, corporate heterogeneity, media attention

INTRODUCTION

Financial regulators and major government agencies have progressively introduced policy guidelines for ESG governance and disclosure among listed firms, motivated by the goal of advancing a broad green transition in both the economy and society [1, 2]. In our country, ESG disclosure by publicly listed companies has shown a steady upward trajectory under national policy direction during 2009–2021. By 2020, approximately 27% of A-share listed enterprises had published ESG reports. Notably, among the disclosures released in 2020, 300 Shanghai and Shenzhen listed companies issued 259 ESG reports (exceeding 86%), suggesting a strong level of ESG reporting awareness at the corporate headquarters level [3, 4].

Influenced jointly by market forces and regulatory orientation, ESG ratings are increasingly being referenced by stakeholders across society as an important signal for investment decision-making. Although ESG investing in our country has only started to expand in recent years [5], its growth trend has become more evident over time, and financial markets are showing rising interest in allocating capital toward ESG-related areas [6].

Access to financing is central to firm expansion and to the efficient allocation of resources in both operational development and managerial decision-making. Financing costs, in particular, directly shape firms' financing choices and strategies, and in turn affect corporate growth prospects and profitability [7]. At present, external funding for listed firms in our country is primarily obtained through debt financing and equity financing. However, because the securities market developed relatively late and the supporting regulatory framework remains imperfect, persistent challenges—including information asymmetry—continue to appear in market operations [8]. Issues such as weaker overall firm quality, incomplete disclosure practices, and insufficient oversight constrain investor behavior, often leading to a generally high cost of equity capital; consequently, debt financing has become the dominant funding channel for many listed companies [9]. Financing costs are also shaped by factors such as the extent of information asymmetry and the strength of corporate governance. As a form of non-financial performance reflecting governance quality, social responsibility, and environmental outcomes, ESG performance may help alleviate information asymmetry and related concerns, thereby influencing corporate financing costs [10]. Evidence in [11] further indicates that greater ESG-related investment can contribute to lower corporate financing costs.

Based on a panel of 1,044 A-share listed companies from 2016 to 2020, this study empirically examines how ESG performance affects firms' financing costs. In addition, it investigates whether firm size and media attention moderate the relationship between ESG performance and corporate financing costs.

RELATED WORK

Information asymmetry theory

Information asymmetry theory suggests that external investors often lack sufficient channels to access complete firm-level information, which makes it difficult for them to fully understand both the financial and non-financial conditions of a company [11]. As a result, the periodic financial statements and broader non-financial disclosures issued by firms become the primary sources through which outside stakeholders evaluate corporate performance. In this context, both the extent and the credibility of disclosed information can influence the return demanded by investors. More transparent disclosure can narrow information gaps, reduce perceived uncertainty, and ultimately lower firms' financing costs by decreasing the rate of return required by capital providers [12]. ESG reporting, in particular, can reduce funding costs by offering investors richer information relevant to firm value and risk. Prior evidence also indicates that firms that proactively improve ESG performance tend to be more willing to allocate resources to development-related risks, choose

investment portfolios that support growth while limiting risk exposure, and adopt more appropriate capital structures [13].

Equity financing cost perspective

Synthesizing findings from both domestic and international literature, many studies report a negative association between equity financing costs and corporate social responsibility (CSR) performance. For example, [14] shows that improvements in overall corporate governance among listed firms are linked to lower costs of both debt and equity financing, with governance exerting a stronger effect on equity financing costs than on debt costs. In addition, [15] argues that listed companies can reduce agency-related expenses—including costs arising from adverse selection and moral hazard—through governance and incentive arrangements such as strengthened managerial compensation structures or equity-based incentives, which can further decrease the cost of raising equity capital. Using a large sample of more than 3,000 listed firms from 1990 to 2013, [16] finds a significant negative relationship between equity financing costs and governance and environmental dimensions, while the link betwee

AN EMPIRICAL ANALYSIS OF THE IMPACT OF ESG PERFORMANCE ON FINANCING COSTS

The relationship between ESG performance and financing costs

According to stakeholder theory, stronger ESG performance is positively associated with broader stakeholder engagement. The disclosure of corporate ESG reports enhances transparency in capital markets, reduces information asymmetry, and consequently improves firms' access to external financing [17].

Equity financing channels are particularly sensitive to regulatory interventions. Since equity investors primarily consist of stock market participants who have limited direct access to internal corporate information, they tend to rely more heavily on non-financial disclosures—such as CSR and ESG reports—when forming investment decisions. Investors who emphasize non-financial metrics are often more responsive to market signals and more inclined to follow ESG-oriented investment philosophies. Empirical evidence suggests that ESG performance is associated with lower debt financing costs, and the effect is even more pronounced for equity financing costs. As noted in [18], ESG indicators are increasingly incorporated into credit evaluation processes to satisfy both regulatory expectations and investor demands. Once ESG risk compliance is embedded in credit mechanisms, perceived investment risk can be reduced, investor confidence can be strengthened, and firms' financing costs may decline (see Figure 1).

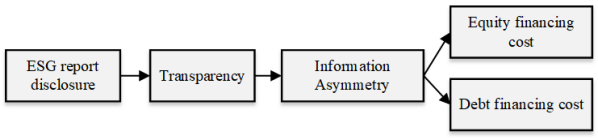

Figure 1: Logical framework of H1 and H2

Based on the above discussion, the following hypotheses are proposed:

- **H1:** Firms can reduce their equity financing costs by improving their ESG performance.
- **H2:** Improved ESG performance can reduce a firm's debt financing costs.

Data sources

Since ESG disclosure among Chinese listed firms has expanded substantially since 2016, this study focuses on the period from 2016 to 2020. Financial data for listed companies are obtained from the Wind and CSMAR databases. An unbalanced panel dataset is constructed, consisting of 3,484 observations from 1,044 firms. Data processing is conducted using Python and Stata 16. To mitigate the influence of extreme values, all continuous variables are winsorized at the 1% and 99% levels. The sampled firms cover 71 industries classified according to the first-level categories defined by the China Securities Regulatory Commission. In addition, the sample is organized by ownership type, firm size, and industry characteristics.

Variable definitions

The cost of equity financing represents the compensation demanded by investors for providing equity capital, reflecting the transfer of ownership claims from firms to shareholders. Common approaches to estimate equity financing costs include the capital asset pricing model (CAPM), the arbitrage pricing model, the Fama–French three-factor model, and dividend discount models along with their derivatives (e.g., PEG, OJN, CT, and GLS models).

Because CAPM, the arbitrage pricing model, and the three-factor model use historical returns to infer future expected returns—and given the relative inefficiency of the domestic market—these models are not adopted in this study. Although the standard dividend discount model does not require a highly efficient market, it involves difficulties in obtaining reliable period-by-period dividend estimates, and is therefore excluded. Instead, this paper employs the PEG model, which is comparatively simple and incorporates analysts' forward-looking earnings expectations.

Under the PEG framework, the long-term dividend growth rate and long-run EPS growth are assumed to be zero, while short-term EPS growth remains positive. The specific estimation is:

$$EF = \frac{ESP_2 - ESP_1}{P_0}, \tag{1}$$

where ESP_1 and ESP_2 denote analysts' forecasted earnings per share for periods t_1 and t_2, respectively, and P_0 is the stock price per share at the end of the period. Here, EF is the equity financing cost variable. Analyst forecast data are obtained from the CSMAR database.

Table 1: Descriptive statistical analysis

Variable	N	Mean	P25	P50	P75	SD	Min	Max
EF	3626	0.061	0	0	0.108	0.082	0	0.314
DF	3626	-0.014	0	0.030	0.051	0.229	-1.306	0.297
score	3626	5.158	5	5	6	0.944	3	7
ROE	3626	9.747	4.130	9.503	16.150	15.030	-47.760	47.430
TAT	3626	0.679	0.375	0.590	0.874	0.442	0.050	2.147
ZCFZ	3626	42.450	26.050	41.020	56.880	20.690	7.875	91.280
CFI	3626	0.219	0.029	0.136	0.321	0.332	-0.357	1.415
Growth	3626	19.050	1.895	10.910	26.390	30.290	-26.630	134.200
top1	3626	33.290	21.900	30.950	42.860	14.430	10.000	68.260
indepen	3626	0.350	0.333	0.333	0.429	0.102	0.000	0.500

To support subsequent correlation and regression analyses, descriptive statistics are first computed for all variables, with continuous variables winsorized at the 1% and 99% levels to reduce the influence of outliers.

The descriptive statistics are reported in Table 1. The ESG performance indicator (score) shows substantial cross-firm variation (standard deviation = 0.944), with a mean of 5.158 and a range from 3 to 7, indicating moderate average ESG performance in the sample.

Model specification

The correlation test results among key variables are presented in Table 2. The maximum absolute correlation coefficient is 0.481 (below 0.5), indicating relatively weak pairwise correlations and suggesting that severe multicollinearity is unlikely.

Table 2: Correlation analysis of key variables

Variables	**EF**	**DF**	**score**	**ROE**	**TAT**	**ZCFZ**
EF	1.000	–	–	–	–	–
DF	-0.009	1.000	–	–	–	–
score	0.062***	-0.024***	1.000	–	–	–
ROE	0.178***	-0.054***	0.023	1.000	–	–
TAT	0.103***	0.049***	-0.045***	0.377***	1.000	–
ZCFZ	0.053***	0.255***	0.110***	-0.131***	0.021***	1.000
CFI	0.075***	-0.221***	-0.040**	0.339***	0.131***	-0.481***
Growth	0.096***	-0.014**	-0.002	0.346***	0.154***	-0.125***
top1	0.078***	-0.059***	0.057***	0.171***	0.104***	0.004
indepen	-0.020**	-0.017**	0.047***	-0.174***	-0.147***	0.002

In line with the hypotheses, the regression models include the following control variables: return on equity (ROE), gearing ratio (ZCFZ), ownership concentration (top1), total asset turnover (TAT), solvency (CFI), total asset growth (Growth), independent director proportion (indepen), and year dummy variables to control for time effects.

To further validate the regression setup, variance inflation factors (VIFs) are computed. Table 3 reports the VIF values for the fitted models (4.2) and (4.3). All VIFs are well below the conventional threshold of 10, indicating that multicollinearity is not a serious concern.

Table 3: Multicollinearity test (VIF) for total samples

Variable	**VIF (4.2)**	**VIF (4.3)**
CFI	1.56	1.56
ZCFZ	1.52	1.48
ROE	1.39	1.40
Growth	1.28	1.27
TAT	1.09	1.09
score	1.07	1.06
top1	1.06	1.05
indepen	1.01	1.01
Mean VIF	1.24	1.28

MODERATING EFFECTS OF FIRM SIZE AND MEDIA ATTENTION ON THE ESG–FINANCING COST RELATIONSHIP

Moderating effect of firm size

From the standpoint of information asymmetry, larger firms generally disclose more comprehensive and transparent information. As a result, they tend to communicate business risks more effectively than smaller and less transparent firms, which helps reduce uncertainty faced by outside investors. Large firms are typically more mature and better able to withstand both internal shocks and external turbulence; consequently, investors often place greater trust in them and require a lower expected return. In addition, as firm size increases, resilience to operational and financial risks strengthens, the probability of default declines, and the cost of debt is therefore expected to be lower than that of smaller firms.

By contrast, smaller enterprises often face tighter resource constraints and are more vulnerable to adverse business conditions. Many small firms remain in a growth stage, and as they expand they gradually build relationships with suppliers, partners, and other resource providers, which can support firm development and reduce overall risk. To attract the external capital needed for growth, smaller firms may particularly benefit from demonstrating strong non-financial fundamentals, including environmental responsibility, social engagement, and sound governance. Moreover, corporate reputation and organizational legitimacy may deliver comparatively larger marginal benefits for smaller firms than for well-established large firms (see Figure 2).

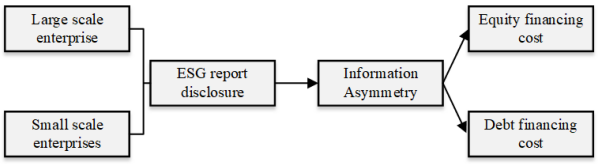

Figure 2: H5 logical framework

In summary, this study proposes the following hypothesis for firms of different sizes:

H5: Firm size moderates the relationship between ESG performance and financing costs.

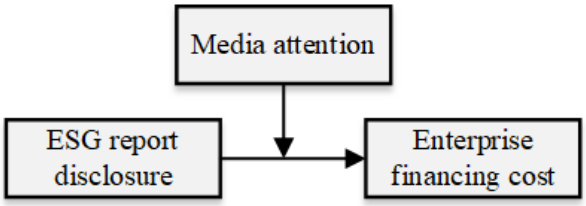

Figure 3: H6 logical framework

Moderating effect of media attention

Regarding external governance mechanisms, media scrutiny can constrain corporate decision-making by functioning as an independent monitor. When corporate misconduct or violations are reported, negative information can spread quickly, amplifying reputational damage and drawing the attention of additional regulatory bodies. Anticipating such exposure, firms may strengthen internal controls under sustained media oversight, and senior managers may adopt more prudent decision-making behaviors. Over time, this form of external monitoring can encourage firms to pursue more stable and sustainable development trajectories,

enhance competitive strength within their industries, increase investor confidence, and ultimately reduce financing costs (see Figure 3).

The regression results linking ESG performance to financing costs are reported in Table 4. The dependent variables are equity financing cost (EF) and debt financing cost (DF). Standard errors (or p-values as reported) are shown in parentheses, and year effects are controlled.

Table 4: Regression results: ESG performance and financing costs

	(1) EF	**(2) DF**
score	-0.00398**	-0.00922***
	(0.020)	(0.009)
ROE	-0.000703***	-0.000193
	(0.001)	(0.522)
TAT	0.0146***	0.0401***
	(0.001)	(0.001)
CFI	0.00702	-0.213***
	(0.345)	(0.000)
top1	0.000261***	-0.00101***
indepen	0.0404	-0.0134
	(0.194)	(0.835)
Growth	-0.000183**	-0.000412**
	(0.048)	(0.034)
ZCFZ	0.000504***	0.00151***
	(0.001)	(0.000)
cons	-0.00133	0.0213
	(0.931)	(0.512)
Year fixed effects	Controlled	Controlled
N	2609	3484
R^2	0.1611	0.1359

Overall, this study advances the following moderating-effect hypothesis associated with external media governance:

H6: Media attention moderates the relationship between ESG performance and financing costs.

ANALYSIS OF EMPIRICAL RESULTS

The regression outcomes for the full sample are reported in Table **??**. The estimates indicate that ESG performance (score) is significantly associated with firms' equity financing costs. Specifically, the coefficient on *score* in the equity financing cost (EF) regression is -0.00398, and it is statistically significant at the 5% level, implying that better ESG performance is linked to lower equity financing costs. Therefore, Hypothesis H1 is supported. Column (1) presents results with EF as the dependent variable, while Column (2) reports the estimates for debt financing cost (DF).

Turning to the control variables, profitability (ROE) enters with a negative coefficient in both the EF and DF regressions, suggesting that more profitable firms tend to face lower financing costs. Total asset turnover (TAT) shows positive coefficients in both specifications, implying that higher turnover is associated with higher financing costs in the sample. Regarding debt-servicing capacity, the coefficient on CFI is negative

and significant in the DF regression, indicating that stronger solvency is related to lower debt financing costs. The coefficients on firm growth (Growth) are negative in both models, which suggests that faster-growing firms tend to experience lower financing costs. Finally, ownership concentration (top1) is positive in the EF regression but negative in the DF regression, implying that greater equity concentration does not help reduce the cost of equity financing, but it appears to reduce the cost of debt financing.

Robustness checks

To verify robustness, the baseline ESG rating measure is replaced with an alternative rating indicator (RATE). As shown in Table 5, the signs of the key coefficients in Models (3) and (4) remain unchanged, and the reported *p*-values do not vary materially, supporting the robustness of the main conclusions.

In addition, alternative variable constructions are adopted: Tobin's *Q* (TBQ) is used as a replacement performance indicator, and the ratio of financing costs to interest-bearing debt (DF2) is employed as an alternative proxy for debt financing cost. The results in Table 6 show that the signs of the main variables in Models (3) and (4) remain consistent and the statistical significance does not change substantially.

Table 5: Test of total sample: replacement of explanatory variables

	(1) EF	**(2) DF**
score	-0.0105***	-0.0176***
	(0.001)	(0.001)
ROE	0.000488***	0.000105
	(0.001)	(0.610)
TAT	0.0106***	0.0403***
	(0.001)	(0.001)
CFI	0.0172***	-0.209***
	(0.000)	(0.001)
top1	0.000171***	-0.00103***
	(0.001)	(0.001)
indepen	-0.0172	0.111*
	(0.195)	(0.066)
Growth	0.000127***	0.000150
	(0.001)	(0.163)
ZCFZ	0.000486***	0.00326***
	(0.001)	(0.001)
cons	-0.0166***	-0.0822***
	(0.006)	(0.003)
Year fixed effects	Controlled	Controlled
N	13393	16061
R^2	0.2105	0.1972

CONCLUSION

In recent years, alongside the broader agenda of carbon neutrality and green development, the concept of ESG-oriented investing has gained increasing recognition. International investment institutions have promoted and implemented responsible investment practices grounded in ESG principles, and a growing number of

Table 6: Test of total sample: substitution of explained variables

	(1) TBQ	**(2) DF2**
score	-0.0561**	-0.488
	(0.012)	(0.591)
ROE	0.00809***	-0.0636
	(0.001)	(0.300)
TAT	0.0706	2.526
	(0.120)	(0.172)
CFI	1.285***	-2.936
	(0.001)	(0.500)
top1	-0.00743***	-0.00765
	(0.001)	(0.885)
indepen	0.834**	2.836
	(0.022)	(0.848)
Growth	0.00871***	0.00949
	(0.001)	(0.839)
ZCFZ	-0.0183***	0.0856*
	(0.001)	(0.085)
cons	2.844***	-5.925
	(0.001)	(0.451)
Year fixed effects	Controlled	Controlled
N	3605	3406
R^2	0.2014	0.1735

domestic and overseas investors have gradually incorporated ESG considerations into mainstream portfolio decisions.

Building on the existing literature, this study constructs a panel regression framework using ESG rating data for 1,044 A-share listed companies over the period 2016–2020. The empirical evidence indicates that stronger ESG performance is associated with lower equity financing costs and lower debt financing costs in the full sample. Within the industry subsample, the effect of ESG performance on equity financing costs is stronger for non-polluting enterprises than for polluting enterprises. A plausible explanation is that investors may discount environmental improvement efforts by polluting firms due to prior beliefs and reputational expectations.

In addition, firm-level heterogeneity suggests that larger firms tend to be trusted more by investors because they disclose more transparent information and provide signals about a wider range of business risks. Consistent with this, larger firms face lower debt financing costs because they are more resilient to shocks and have a lower default risk than smaller firms.

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