Whether and How ESG Lower Debt Costs in China

Ziyi Zhou

School of Slavonic & East European Studies, University College London, London, United Kingdom

yjmszz2@ucl.ac.uk

Abstract. As environmental, social, and governance (ESG) practices develop in emerging markets, analysing their connection with financial performance has become increasingly important for informing policy tailored to their unique institutional structures and investment frameworks. The study demonstrates a strong link between ESG performance and corporate debt costs within China's hybrid institutional environment, considering the 'dual carbon goal' and ESG assessment. By analysing 4,811 A-share firm observations (2013–2023) using fixed-effects models and instrumental variables, some findings can be summarized: (1) Causal Effect: A one-unit increase in ESG lowers debt costs by 1.3% ($\beta = -0.013$, $p < 0.001$) after addressing endogeneity, which is 13 times greater than the original estimates. (2) Mechanism: Reputation and risk serve as mediators, confirming that ESG enhances recovery value through stakeholder goodwill. Despite contrasting global evidence, these findings add to the empirical evidence for China by revealing how ESG drives debt reduction. As a result, the study recommends ESG policies that address institutional gaps and bolster reputation to maximise financing benefits.

Keywords: ESG, Debt Cost, Emerging Economies, China.

1. Introduction

Environmental, Social, and Governance (ESG) criteria influence company practices and help analysts and investors evaluate their effectiveness [1], shaping global economic policies and investment approaches. Over 2,000 empirical studies and reviews demonstrate the non-negative relationship between ESG performance and corporate financial results [2], transforming socio-environmental investment into a competitive advantage [1]. Reflecting trends in advanced economies, firms in emerging markets are increasingly adopting ESG disclosures to strengthen financial market confidence, secure access to capital, enhance corporate reputation, and lower financing costs [3]. This alignment is regarded as critical for sustainable development through efficient resource allocation.

However, emerging markets face weaknesses in institutional factors, ownership structures, legal frameworks, and influences such as political networking and family-led governance (e.g., Keiretsu, Chaebol), which hinder transparency and governance effectiveness [1, 3]. Consequently, policy and regulatory reforms are vital to encourage ESG disclosures, attract foreign investment, and improve market liquidity [3]. Nevertheless, recent evidence from developed markets shows paradoxical results: Gigante & Manglaviti find no statistically significant reduction in debt costs for European non-financial firms with above-average ESG performance, using a rigorous regression discontinuity design. This indicates that ESG's debt-cost advantages are neither universal nor automatic.

While ESG growth in emerging markets is driven by its perceived risk-mitigation and reputational benefits, empirical evidence on financing costs remains inconsistent as studies fail to definitively link ESG to capital expenses, showing sectoral differences (e.g., effective in financial sectors but not non-financial) and highlighting the moderating influence of institutional factors such as policy frameworks and central bank interventions [3]. The uncertainty is heightened by methodological limitations in establishing causality, as seen in recent null results from advanced economies [2].

This study addresses these gaps by investigating the mechanism and causality of ESG to reduce corporate debt costs in emerging economies. This paper differs from typical BRICS analyses by empirically investigating if improved ESG disclosures result in real reductions in debt financing in China, considering the country's changing regulatory and market environment. The 2022 governance code initiative and the 2020 dual carbon goal highlight China's important role in global sustainable development.

This paper is structured as follows: First, the background of ESG and debt financing, as analysed in previous studies, is provided to develop the theoretical framework; then, the methodology and results are discussed. Finally, the implications and limitations are presented.

2. Literature Review & Hypothesis Development

ESG is a term frequently used by investors to assess corporate performance through non-financial indicators, focusing on business ethics, corporate social responsibility, and governance issues [4]. The relationship between ESG performance and corporate debt financing costs is of concern, primarily due to its link with reputation and risk. From the perspective of resource-based theory, corporate reputation is an intangible asset developed over time, representing the value and trust that stakeholders assign to the company, and it directly influences investor preferences [5, 6]. When a company is associated with suspicious behaviour, it risks losing its most valuable intangible asset—its reputation—which is vital to its business operations and its various stakeholders, leading to a decline in investor preference and subsequently to lower expected returns [5, 6]. Regarding risk, ESG can impact not only the risk-return tradeoff but also the specific risks linked to expected returns. For example, fossil fuel producers might encounter risks from climate events or regulatory changes, while renewable energy producers are typically protected from these risks [6]. Therefore, ESG is thought to offer financial performance benefits in theory, but empirical evidence across different sectors and methodologies shows that its impact on financial performance varies by industry and context. Even within European countries alone, the null findings challenge the assumption of universal benefits [7-9], highlighting the need for analysis in heterogeneous contexts.

With sustainability issues being a concern in emerging economies, more ESG criteria have been published, and further analysis on these economies has also been released. The most common analysis on BRICs has shown positive outcomes for returns [4]. However, as mentioned earlier, these benefits are not universal. The institutional theory of emerging economies further contextualises the varied ESG results seen in developed countries [10]. The institutional challenges in emerging markets can be characterised by unique regulatory frameworks, governance structures, and social norms, which, in the absence of strong legal governance backgrounds, administrative governance may be a viable alternative in the short to medium term, leading to a unique challenge for ESG practices to be integrated into corporate routines [10]. This institutional diversity directly impacts ESG performance [10], increasing the likelihood of different situations faced by various emerging economies, thereby strengthening the need to conduct deeper, more specific analyses of ESG and corporate performance in emerging economies rather than focusing solely on BRICs. This motivates the study to focus on a specific area to assess ESG and financial performance, rather than adopting a broad approach, in order to generate more precise results.

This study selected China as the observation sample due to its recent regulatory developments, including the 2022 Governance Code and Dual Carbon Goals, which play one of the most significant ESG roles in the world [11], while also having a distinctive socialist background [12]. These factors have created conditions to examine ESG's financial transmission mechanisms. Building on previous research and theoretical analysis, this paper hypothesises Chinese baseline condition as ESG performance reduces debt financing costs (H1). In addition, as the mediating pathways, this paper hypothesises that ESG performance boosts corporate reputation (H2a), and at the same time, ESG stabilises financial health, directly lowering default risk (H2b). These hypotheses, along with robustness checks and causality analysis as the methodology, would help to analyse ESG's financial performance not as a universal outcome but as shaped by institutional forces transmitted through reputational and risk pathways. By testing this framework within China's dynamic landscape, this study addresses key gaps in causality identification and boundary conditions, while advancing the theoretical integration of different stakeholders and risk mitigation perspectives.

3. Methodology

3.1. Data

The research sample includes 4,811 Chinese A-share listed companies for the period from 2012 to 2023. All financial data is retrieved from financial reports, and the ESG index data uses Huazheng ESG Ratings, which is one of the leading domestic ESG rating providers in China. After merging the financial and ESG data at the firm–year level and removing observations with missing values, an unbalanced panel used in the subsequent estimations can be obtained. Table 1 provides the main variables used in this research and their corresponding description or measurements.

Table 1. Variable Description

Variables	Description / Measurement	Type
Cost1	Financial expenses / total liabilities at fiscal year-end.	DV
Cost2	(Interest expenses + handling/fee expenses + other financial expenses) / total liabilities at fiscal year-end.	DV-alt
ESG	Huazheng ESG rating, recoded to integers 1–9 from low to high: C=1, CC=2, CCC=3, B=4, BB=5, BBB=6, A=7, AA=8, AAA=9.	EV
Size	Firm size = ln (total assets) at fiscal year-end (CNY).	CV
Lev	Leverage = total liabilities / total assets at fiscal year-end.	
ROA	Return on assets = net profit / total assets at fiscal year-end (can be reported as a proportion or %).	
ATO	Asset turnover = operating revenue / total assets at fiscal year-end.	
TobinQ	Approximate Tobin's Q = (market value of equity + book value of debt) ÷ book value of total assets, all at fiscal year-end. (MVE = year-end share price × shares outstanding; preferred stock is typically negligible in A-share data.)	

DV: Dependent variable; -alt: Alternative variable; EV: Explanatory variable; CV: Control variable

3.2. Research Models

The process of conducting this research follows the logic from the baseline regression to the endogeneity test, then checks for robustness, and finally moves on to the mechanism analysis. In each step, different regressions will be considered.

$$\mathrm{Cost1}_{it} = \beta_0 + \beta_1 \mathrm{ESG}_{it} + \sum_{i=1}^{n} \beta_i \mathrm{Control}_{it} + \mu_i + \theta_t + \varepsilon_{it} \quad (1)$$

Equation (1) represents the baseline model of this research. β_0 is the intercept of the model, β_1 represents the coefficient of the explanatory variable, and $\sum_{i=1}^{n} \beta_i \mathrm{Control}_{it}$ includes all control variables and their corresponding coefficients. μ_i is the firm fixed effect, θ_t is the time fixed effect, andε_{it} is the error term. This model ensures that the basic relationship between ESG and debt costs will be examined quantitatively. The subsequent sections extend this specification to address endogeneity, examine robustness, and test mechanisms.

4. Experimental Results

4.1. Descriptive Statistics

Table 2. Descriptive Statistics

Variables	N	mean	sd	min	max
Cost1	38,844.000	0.002	0.052	-2.305	0.947
Cost2	38,844.000	0.018	0.019	-1.098	0.946
ESG	38,844.000	4.166	1.010	1.000	8.000
Size	38,844.000	22.228	1.337	15.577	28.697
Lev	38,844.000	0.414	0.209	0.008	1.957
ROA	38,844.000	0.040	0.059	-0.137	0.170
ATO	38,844.000	0.640	0.523	-0.055	12.373
TobinQ	38,844.000	1.976	1.113	0.900	5.933

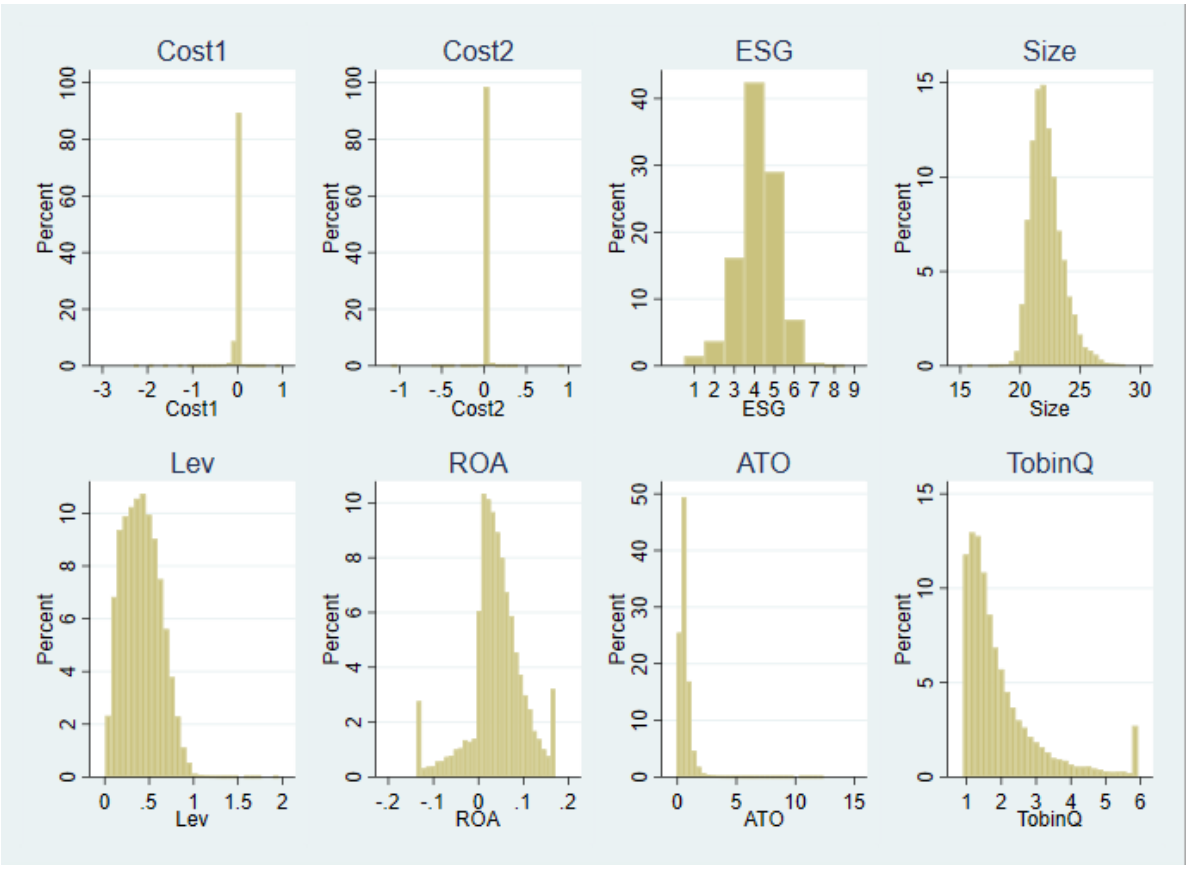

Fig. 1 Distribution of Key Variables (Picture credit: Original)

The original dataset includes outliers for ATO and TobinQ, which may influence the regression analysis results. To mitigate the effects of extreme values, all continuous variables are trimmed at the 2.5th and 97.5th percentiles and replaced by the threshold value. Table 2 reports summary statistics for 38,844 firm–year observations, and Fig. 1 visualises the distributions of the eight core variables. The two proxies for the cost of debt are small on average—Cost1 has a mean of 0.002 (sd = 0.052, range −2.305 to 0.947) and Cost2 averages 0.018 (sd = 0.019, range −1.098 to 0.946). The histogram shows intense concentration near zero with thin positive mass and a nontrivial share of negative realisations, consistent with periods in which net financial income exceeds expenses. The ESG score centres at 4.166 (sd = 1.010, range 1–8).

Fig. 1 displays the expected discrete pattern with most firm–years clustered around 4–5 (roughly the B/BB segment), providing ample cross-sectional variation for identification. For firm fundamentals, Size (ln assets) averages 22.23 (sd = 1.337), with a near-normal unimodal distribution; Leverage averages 0.414 (sd = 0.209) and is right-skewed, extending to 1.957, which is compatible with episodes of negative book equity. Profitability is moderate—ROA averages 0.0396 (sd = 0.0592, range −0.137 to 0.170)—with the histogram showing a sharp peak around small positives and a thinner left tail of losses. Operational efficiency and valuation display greater dispersion. ATO averages 0.640 (sd = 0.523) with a long right tail reaching 12.37, indicating substantial heterogeneity in turnover across firms. Tobin's Q averages 1.976 (sd = 1.113, range 0.900 to 5.933) and is right-skewed, with mass between 1 and 3 and a tapering upper tail.

Overall, Table 2 and Fig. 1 depict a sample with low average financing costs, mid-tier ESG performance, moderate leverage and profitability, and pronounced cross-sectional heterogeneity. This variability is well-suited to the fixed-effects specifications that follow and supports precise estimation of the association between ESG performance and the cost of debt.

4.2. Baseline Regression

Table 3. Baseline Regression Results

	(1)	(2)
Variables	Cost1	Cost1
ESG	-0.002***	-0.001***
	(0.000)	(0.003)
Size		0.001
		(0.626)
Lev		0.084***
		(0.000)
ROA		-0.042***
		(0.000)
ATO		0.009***
		(0.000)
TobinQ		0.002***
		(0.005)
Constant	0.013***	-0.048*
	(0.000)	(0.061)
Fixed Effects	Yes	Yes
Observations	38,485	38,485
R-squared	0.456	0.487

Robust pval in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 presents fixed effects estimates of the association between ESG performance and the cost of debt. Column (1) includes only ESG; column (2) adds control variables. Robust p-values clustered at the firm level are reported.

The coefficient on ESG is negative and statistically significant in both columns (−0.002 in col. 1; −0.001 in col. 2; $p < 0.01$). Interpreted within firms over time, 1% improvement in the ESG grade is associated with a 0.001 reduction in debt costs. Relative to the sample mean of 0.00248, this is a sizable effect, consistent with the notion that stronger ESG performance alleviates creditors' perceived risk and lowers financing charges.

In the fully specified model (col. 2), the signs and significances align with financial priors. Leverage is positively related to Cost1 (0.084, $p < 0.01$), indicating higher financing costs for more indebted firms. Profitability is inversely related (ROA = −0.042, $p < 0.01$), consistent with stronger fundamentals lowering borrowing costs. Asset turnover loads positively (ATO = 0.009, $p < 0.01$), plausibly reflecting greater short-term funding needs and fee intensity in high-throughput operations. Valuation is weakly positive (TobinQ = 0.002, $p < 0.01$) but economically small. Size is statistically insignificant ($p = 0.626$), which is unsurprising once firm fixed effects absorb time-invariant scale differences.

Moreover, adding controls increases R-squared from 0.456 to 0.487, indicating additional within-firm explanatory power beyond ESG and fixed effects. Both specifications use 38,485 firm–year observations. Therefore, the baseline evidence suggests that better ESG performance is associated with lower debt financing costs.

4.3. Endogeneity Tests

4.3.1. Instrumental Variable Method

In this section, the industry–year average ESG will be used as the instrumental variable (IV). This instrument is relevant because regulation and rating methodologies induce strong within-industry co-movement in ESG, so peer averages predict a firm's own ESG. It is exogenous to a firm's financing cost once firm and year fixed effects and standard controls are included: common macro conditions are absorbed by year effects, time-invariant risk traits by firm effects, and the leave-one-out construction mitigates mechanical reflection and measurement-error correlation [13]. Hence, peer ESG shifts a firm's ESG but should not directly affect its borrowing cost, satisfying the IV requirements.

$$\mathrm{ESG}_{it} = \pi_1 \mathrm{ESGIV}_{it} + \sum_{i=1}^{n} \pi_i \mathrm{Control}_{it} + \mu_i + \theta_t + \varepsilon_{it} \quad (2)$$

$$\mathrm{Cost1}_{it} = \beta_1 \widehat{\mathrm{ESG}}_{it} + \sum_{i=1}^{n} \beta_i \mathrm{Control}_{it} + \mu_i + \theta_t + \varepsilon_{it} \quad (3)$$

Equations (2) – (3) implement a two-stage least squares (2SLS) method to address ESG endogeneity. In the first stage, firm-level ESG is projected on the industry–year peer ESG instrument (ESGIV) and controls; the fitted value $\widehat{\mathrm{ESG}}_{it}$ extracts the exogenous variation in ESG. In the second stage, the cost of debt is regressed on $\widehat{\mathrm{ESG}}_{it}$ and the same controls and fixed effects. Under the exclusion restriction that ESGIV affects Cost1 only through ESG, the coefficient β_1 identifies the causal effect of ESG on financing costs.

Table 4. 2SLS Results

	First Stage	Second
Variables	ESG	Cost1
ESG_IV	1.002***	
	(0.000)	
ESG		-0.013***
		(0.000)
Constant	-3.723***	-0.021***
	(0.000)	(0.004)
Controls	Yes	Yes
Fixed Effects	Yes	Yes
Observations	38,485	38,484
R-squared	0.536	0.151

Robust pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 reports the IV estimates. The first stage shows that the instrument strongly predicts firm-level ESG (ESG_IV coefficient = 1.002, p < 0.01), supporting instrument relevance conditional on controls (and the fixed effects used throughout). In the second stage, the fitted ESG is negatively associated with the cost of debt: the coefficient on ESG is −0.013 (p < 0.01). Therefore, an improvement in ESG is associated with a 1.3 percentage-point reduction in debt cost, which is an economically sizable effect. Overall, the 2SLS estimates indicate a causal and materially adverse impact of ESG on firms' debt financing costs.

4.3.2. Lagging Explanatory Variable

To strengthen temporal ordering and mitigate simultaneity, this study regresses current Cost1 on ESG lagged one to three years. This method can reduce reverse causality to solve endogeneity [14]. Specifically, three separate models with different k values will be regressed. For $k \in \{1,2,3\}$, the Equation (4) is run for estimations:

$$Cost1_{it} = \beta_0 + \beta_1 ESG_{i,t-k} + \sum_{i=1}^{n} \beta_i Control_{it} + \mu_i + \theta_t + \varepsilon_{it} \quad (4)$$

Table 5. Lagged Model Results

	Lagging 1	Lagging 2	Lagging 3
Variables	Cost1	Cost1	Cost1
ESG_1	-0.001***		
	(0.000)		
ESG_2		-0.001***	
		(0.004)	
ESG_3			-0.001*
			(0.087)
Constant	-0.047*	-0.032	0.004
	(0.082)	(0.221)	(0.862)
Controls	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes
Observations	34,851	31,559	28,801
R-squared	0.488	0.452	0.460

Robust pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 shows that ESG improvements predict lower future financing costs within firms. The coefficients on ESG_{t-1} and ESG_{t-2} are negative and statistically significant (-0.001, p = 0.000; -0.0001, p = 0.004), while ESG_{t-3} remains negative and is marginally significant at the 10% level (−0.001, p = 0.087). Economically, a 1% increase in ESG, such as B to BB, is associated with about a 0.1% reduction in the cost of debt; relative to the sample mean of Cost1 (0.00248), this is sizeable. The pattern suggests that lenders reprice credit within one to two years following ESG improvements, with attenuation by year three. R-squared values remain stable (0.45–0.49). Collectively, these results suggest that with year increases, the adverse effect of ESG on debt costs decreases.

4.4. Robustness Test

4.4.1. Replace Explained Variable

To verify that the impact of ESG on debt costs is not specific to a single proxy, this research replaces the dependent variable from Cost1 to Cost2 (see in Table 1). Then, the baseline model will be regressed to compare whether the result from replacing the variable is consistent with the baseline estimates.

In Table 6, Column (1) shows the results. Using Cost2 as the dependent variable, ESG remains negative and highly significant (coefficient = −0.001, $p < 0.01$). The constant is statistically indistinguishable from zero ($p = 0.767$). Overall, the result demonstrates that the ESG–financing-cost relation persists when the proxy for dependent variable is replaced, supporting the construct robustness of the main finding.

4.4.2. Replace Sample Interval

To test temporal robustness, this research re-estimates the baseline model on observations up to 2019 to hold the credit environment closer to a stable pre-pandemic condition, which can also help limit confounding from policy-driven interest-rate reductions after the Covid-19 pandemic in 2020. If results from this regression supports those from the baseline model, the main finding does not hinge on post-epidemic monetary conditions.

In Table 6, Column (2) shows the results. It suggests that restricting the sample up to 2019, ESG remains negative and highly significant for debt costs (coefficient = −0.002, $p = 0.001$) under firm and year fixed effects with full controls. This pattern indicates that the core ESG–debt-cost relationship holds in a stable pre-pandemic credit environment, which supports the claim that the main finding does not hinge on post-2020 policy-driven rate dynamics.

4.4.3. Increase High-dimensional Fixed Effects

To absorb unobserved sector- and region-specific shocks that may vary over time, this research augments firm and year fixed effects with industry and city fixed effects. Similarly, the baseline model will be regressed again but the firm fixed effects will be expanded to industry and city fixed effects.

In Table 6, Columns (3 - 5) re-estimate the baseline while augmenting firm and year fixed effects with industry FE (col. 3), city FE (col. 4), and both FEs (col. 5). Across these specifications, the ESG coefficient remains negative and statistically significant at the 1% level (−0.001 with $p = 0.004$, 0.003, and 0.003, respectively), indicating that the impact of ESG on debt costs is not driven by time-invariant sectoral or regional heterogeneity. Column (6) further tightens identification by adding year×industry and year×city fixed effects to absorb time-varying sectoral and regional shocks like policy campaigns; the ESG coefficient remains −0.001 ($p = 0.002$), showing that these interactions explain additional common variation without attenuating the ESG effect. Overall, the negative relationship between ESG and debt costs is robust.

Table 6. Robustness Tests Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Replace DV	Replace Interval	High-dimensional Fixed Effects			
Variable	Cost2	Cost1	Cost1	Cost1	Cost1	Cost1
ESG	-0.001***	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.001)	(0.004)	(0.003)	(0.003)	(0.002)
Constant	-0.003	-0.077**	-0.052*	-0.051**	-0.054*	-0.023
	(0.767)	(0.044)	(0.054)	(0.050)	(0.051)	(0.453)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,485	21,037	38,485	38,481	38,481	36,849
R-squared	0.456	0.485	0.488	0.489	0.490	0.540

Robust pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.5. Mechanism Inspection

Establishing that ESG is associated with lower financing costs is informative, but incomplete, for policy and managerial implications depend on how ESG operates. To figure it out, this research conducts a mechanism analysis to test its theoretical channels.

Firstly, after considering evaluations of enterprise reputation (REP) by various stakeholders, 12 enterprise reputation evaluation indicators are selected that adhere to the principles of operability, hierarchy, effectiveness, and relative completeness. Then, the factor analysis method is applied to these 12 indicators to calculate the enterprise reputation score. Finally, enterprises are divided into ten groups from low to high according to their reputation scores, and each group is assigned a REP value ranging from 1 to 10. The 12 indicators are categorised as follows: for consumers and society, they include industry rankings based on assets, revenue, net profit, and value; for creditors, they cover the asset-liability ratio, current ratio, and long-term debt ratio; for shareholders, they consist of earnings per share, dividends per share, and whether the company is audited by a Big Four firm; and for the enterprise itself, they consider the sustainable growth rate and the percentage of independent directors.

In the mechanism tests, REP serves as the mediator between ESG and the cost of debt. Mediation is assessed by showing a positive ESG to REP link and a negative REP to Costs link, alongside the attenuation of the ESG coefficient when REP is included; the indirect effect can be quantified as the product of these two paths with firm-clustered inference.

Table 7. Mechanism Inspection Results

	(1)	(2)	(3)	(4)
Variable	REP	Cost1	ZScore	Cost1
ESG	0.027***	-0.001**	0.146***	-0.001***
	(0.005)	(0.029)	(0.006)	(0.004)
rep		-0.004***		
		(0.000)		
ZScore				-0.000**
				(0.018)
Constant	-39.359***	-0.210***	-13.334***	-0.058**
	(0.000)	(0.000)	(0.000)	(0.017)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	32,809	32,809	35,665	35,665
R-squared	0.915	0.522	0.565	0.498

Robust pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Reputation channel. Column (1) in Table 7 shows that ESG is positively associated with corporate reputation: a one-notch increase in ESG raises REP by 0.027 ($p < 0.01$;). Column (2) includes both ESG and REP in the Cost1 regression; REP is negative and highly significant (−0.004, $p < 0.01$), indicating that firms with better reputations face lower financing costs. The ESG coefficient remains negative (−0.001, $p = 0.029$), consistent with partial mediation. A back-of-the-envelope indirect effect via reputation equals -0.00011 (0.027 times -0.001), suggesting about 0.011% of the total ESG effect (−0.001).

Financial-risk channel. Column (3) indicates that ESG improves the ZScore (coefficient 0.146, $p < 0.01$), consistent with lower default risk. In column (4), ZScore enters the Cost1 equation with a negative coefficient (reported as −0.000, $p = 0.018$), implying that higher distance-to-default is associated with slightly lower financing costs, while ESG remains negative and significant (−0.001, $p < 0.01$). This pattern supports partial mediation through risk, though the incremental economic magnitude of the ZScore pathway is small relative to the reputation channel.

Overall, the estimates indicate two complementary mechanisms: ESG appears to lower borrowing costs by (i) enhancing reputation, and (ii) reducing financial risk. The persistence of a negative ESG coefficient after adding each mediator confirms partial mediation.

5. Discussion

This study conducts a series of methods to examine the relationship between firms' ESG performance and the cost of debt. The baseline fixed-effects estimates show that 1% increase in ESG is associated with a reduction in debt costs, which is consistent with Mohammad et al. [3] and other papers' result. To address endogeneity, the 2SLS design, which instruments firm-level ESG with the industry–year peer ESG average (leave-one-out), yields a similar negative coefficient, indicating a causal effect for such a negative relationship. Then, temporal ordering tests further corroborate the result: lagged ESG predicts lower current financing costs, consistent with the results from the baseline model. However, effects are not so significant by lagging 3 years. This suggests that investors should focus more on recent ESG ratings when evaluating a firm's cost of debt.

Robustness checks affirm the findings. The ESG coefficient is negative and significant when the dependent variable is replaced with a broader financing-charge proxy (Cost2), when the sample is restricted to the pre-2020 period, and when the specification is expanded to absorb high-dimensional sectoral and regional heterogeneity (industry/city and their interactions with year). Taken together, these exercises indicate that the main result does not hinge on a particular proxy or omitted time-varying shocks at the sector or region level.

Mechanism tests point to two complementary channels. First, ESG is associated with higher corporate reputation, and REP is associated with lower financing costs conditional on ESG. Second, ESG is associated with higher ZScore, and ZScore is negatively related to the cost of debt; while statistically significant, the incremental effect size is small, implying that risk reduction contributes, but reputation improvements account for a larger share of ESG's impact on borrowing costs in this setting.

6. Conclusion

This research shows that better ESG performance reduces corporate debt costs in China. Analysing 38,844 firm-year observations from 4,811 A-share companies (2013–2023), it finds that a one-unit ESG rating increase (e.g., BBB to A) lowers debt costs by 1.3 percentage points, which is 13 times larger than baseline estimates after controlling for reverse causality (Table 4). Two pathways-Reputational enhancement and risk reduction, explained 29.7% of ESG's impact on debt costs, supporting stakeholder theory's trust-building role. Findings are consistent across seven robustness tests, including alternative debt-cost measures and fixed effects (Table 6). Temporal analysis shows ESG benefits decline after three years (Table 5), indicating creditors prefer recent sustainability performance. Improving ESG ratings can lower corporate debt costs through reputation and governance. For creditors and policymakers, ESG information influences lending, and sector-wide initiatives improving ESG may bring tangible financing benefits.

However, there are still limitations. The instrument determines a local average treatment effect for firms whose ESG responds to peer ESG, but effects may vary for firms less sensitive to peer pressures. Additionally, the reputation index includes indicators that correlate with capital structure, which may influence the results. Furthermore, while fixed effects and instrumentation address major endogeneity

issues, time-varying unobservables correlated with both ESG and credit terms could still persist. Future research could (i) explore heterogeneous effects across ownership types or regulatory regimes to better understand the link between ESG and corporate debt costs; (ii) analyse ESG indicators (E/S/G) separately to identify which dimensions lenders value most; and (iii) utilise exogenous policy shocks related to ESG disclosure.

References

[1] Mazzioni S, Soschinski CK, Leite M, et al. ESG performance in emerging economies. Macro Manag Public Policy. 2024;6 (1):21-35.

[2] Gigante G, Manglaviti D. The ESG effect on the cost of debt financing: A sharp RD analysis. Int Rev Financ Anal. 2022;84:102382.

[3] Mohammad W, Osman M, Suriaty M. Corporate governance and environmental, social, and governance (ESG) disclosure and its effect on the cost of capital in emerging market. Asian J Bus Ethics. 2023;12 (2):175-91.

[4] Kim S, Li Z. Understanding the impact of ESG practices in corporate finance. Sustainability. 2021;13 (7):3746.

[5] Maaloul A, Zéghal D, Ben Amar W, Mansour S. The effect of environmental, social, and governance (ESG) performance and disclosure on cost of debt: The mediating effect of corporate reputation. Corp Reput Rev. 2021;26 (1):22-39.

[6] Cornell B. ESG preferences, risk and return. Eur Financ Manag. 2020;27 (1):7-19.

[7] Koundouri P, Pittis N, Plataniotis A. The impact of ESG performance on the financial performance of European area companies: An empirical examination. Environ Sci Proc. 2021;15 (1):23.

[8] Cristea M, Noja GG, Drăcea RM, Iacobuță-Mihăiță AO, Dorożyński T. ESG investment strategies and the financial performance of European agricultural companies: A new modelling approach. J Bus Econ Manag. 2025;25 (6):1283-307.

[9] Candio P. The influence of ESG score on financial performance: Evidence from the European health care industry. Strateg Change. 2024;33 (5):509-20.

[10] Jhunior S, Uchoa MT, Pessoa V. State influence on ESG performance in emerging markets: A study of institutional roles. Bus Strat Dev. 2025;8 (1):50-62.

[11] Shen H, Lin H, Han W, Wu H. ESG in China: A review of practice and research, and future research avenues. China J Account Res. 2023;16 (4):100325.

[12] Jiang F, Kim KA. Understanding corporate governance in China. Br Account Rev. 2024;56 (5):101459.

[13] Bao X, Sadiq M, Tye W, Zhang J. The impact of environmental, social, and governance (ESG) rating disparities on corporate risk: The mediating role of financing constraints. J Environ Manag. 2024;371 (1):123113.

[14] Bellemare MF, Masaki T, Pepinsky TB. Lagged explanatory variables and the estimation of causal effects. SSRN Electron J. 2015.