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The Impact of ESG Performance on the Cost of Corporate Debt Financing in China's A-share Market: A Study of Listed Companies

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Abstract: In recent years, the swift advancement of China's economy has resulted in significant environmental and societal challenges. To harmonize economic growth with social and environmental considerations, the idea of Environmental, Social, and Governance (ESG). emerged. ESG represents a business performance across three essential aspects: capabilities in environmental stewardship, social accountability, and governance practices. Debt financing remains a primary method for companies to raise capital. Traditionally, investors focus on internal factors such as financial performance and management quality, but in recent times, non-financial information, particularly ESG performance, has gained attention as a key indicator of sustainable progress. This research examines the connection between ESG performance and the cost of corporate debt financing, utilizing a selection of A-share listed companies in China from 2010 to 2021. A bidirectional within-effects model is constructed to investigate how ESG performance affects the costs of obligation financing and the role of property rights in this relationship.

Keywords: ESG, Debt Financing Cost, Bidirectional Effect Model.

1. Introduction

ESG (Environmental, Social, and Governance) reflects a company's performance across three dimensions: environmental protection, social responsibility, and governance capabilities. It has evolved into a standard for evaluating the sustainable development of enterprises, urging companies to consider not only economic benefits but also their environmental impact, social contributions, and governance quality throughout their operations[1]. Over the last few years, China's rapid economic advancement has adversely affected both the environment and society. To balance economic development with environmental and social considerations, a series of relevant laws and regulations have been introduced[2-3]. Developing a green and sustainable economy is not only a necessary choice for China to pursue sustainable development and a harmonious relationship between humanity and nature, but also a powerful driver for the global economy to achieve higher quality growth. With the growing influence of the sustainability concept in the economy and society, ESG has become a focal point for investors and continues to shape the long-term strategies of businesses. As a measure

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of non-financial performance, ESG ratings provide critical insights for capital market participants and serve as a lasting incentive for corporate social responsibility.[4-5]

Financing is a crucial objective of information disclosure by quoted companies, and obligation financing is the primary means of raising funds. This type of financing enables companies to secure stable, long-term, and low-cost capital without diluting equity or losing control. This supports the day-to-day operations and growth of businesses while reducing financing costs and enhancing profitability and return on investment. Studies have shown that corporate debt financing now accounts for over 50% of total social financing. The costs associated with raising capital through borrowing or bond issuance are referred to as debt financing costs.

ESG considerations are increasingly vital in both business and investment decisions. In China, listed companies are required not only to disclose their financial status but also to actively report non-financial information related to ESG factors to promote transparency and reduce information asymmetry. Against this backdrop, this paper examines all companies listed on the A-share market from 2010 to 2021, focusing on the role of ESG performance in influencing corporate debt financing costs. Through the construction of a two-dimensional fixed-effects model, the evaluation reveals a inverse relationship between ESG performance and obligation financing costs—improving ESG performance can remarkably diminish these fees. Further inspection on the heterogeneity of business ownership shows that ESG's impact on obligation financing costs is more pronounced in non-state-owned enterprises.In conclusion: (1) ESG performance significantly affects the obligation financing costs of enterprises, with better ESG performance leading to lower costs. (2) The degree to which ESG performance reduces debt financing costs differs between state-owned and non-state-owned enterprises, with the impact being more pronounced in the latter.

2. Variable description

2.1. Explained variables

Corporate debt financing cost (COD1), this paper addresses the findings of [6] and [7], and determines the first indicator, which is financial expenses/total liabilities.

$$\text{Debt financing cost (COD1)}=\frac{Financial\ expense}{Total\ liabilities}$$

"Financial expenses" includes "interest expenses", "interest income", "handling fees", "exchange gains and losses", and "other" five detailed items.

2.2. Explanatory Variables

ESG Performance (ESG): Refers to the environmental, social, and governance performance of enterprises. The ESG index from Shanghai Huazheng Index Information Service Co. Ltd. is used to measure this variable, calculated as:

$$\ln(1+ESG)$$

2.3. Control Variables

In addition to the ESG performance, the debt financing cost of an enterprise is also affected by the book-to-market ratio (BM), Liquid ratio (Liquid), Cashflow ratio (Cashflow), total asset growth rate (AGR), tangible asset ratio (Tang), corporate equity concentration (Top1), equity ratio (DER). Independent director ratio (Indep), Dual position of chairman and general manager (Dual), and the nature of enterprise property rights (Stata).

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Table 1: definitions of key variables

	Variable identification	Variable name	Variable definition
Explained variable	CDO	Corporate debt financing costs	Finance expenses/total liabilities
Explanatory variable	ESG	Shanghai Huaseng Index Information Service Co., LTD. ESG	Ln(1+ESG)
Control variable	Liquid	Current ratio	Current assets/current liabilities
	Cashflow	Cash flow ratio	Net operating cash flow/current liabilities
	AGR	Growth rate of total assets	(Total assets - Total assets of previous period)/Total assets of previous period
	Tangible	Tangible assets ratio	Total tangible assets/total assets
	Top1	Enterprise ownership concentration	The proportion of the largest shareholder
	DER	Equity ratio	Total liabilities at year-end/owners' equity at year-end
	Indep	Independent director ratio	Proportion of independent directors on the board
	Dual	The two positions of chairman and general manager are combined	Whether the chairman and the general manager are concurrently held by the same person, if so, the value is 1, otherwise 0
	BM	Book-to-market ratio	Shareholders' equity/Company market value
	ID	Individual fixation effect	Individual dummy variable
	Year	Time-fixed effect	Annual dummy variable

3. Empirical process

3.1. Model Construction

With the aim of study the influence of ESG performance on corporate debt financing costs, the subsequent measurement model is constructed:

$$CDO_{it} = \alpha_0 + \alpha_1 ESG_{it} + \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it}$$

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Among them, CDO represents the expense associated with corporate debt financing., ESG represents the ESG performance of the enterprise, Controls represents other control variables, ε is the random disturbance term, i represents the individual enterprise, t represents the year, μ_i represents the individual fixed effect, γ_t represents the time fixed effect.

3.2. Descriptive statistics

This paper begins with descriptive statistics. Table 2 shows that the mean debt financing cost (COD) of the explained variable is 0.0043, with a maximum of 0.9466 and a minimum of -2.4545, indicating significant variation in financing costs among enterprises. The average ESG score for sample companies is 25.8515, ranging from 0.4925 to 79.3224, suggesting diverse ESG performance across China's A-share listed firms. Some companies prioritize ESG more than others, indicating room for improvement in overall ESG levels.

Regarding control variables, equity ratio (DER) and liquidity ratio (Liquid) serve as measures of solvency. The mean DER is 1.07%, with values ranging from 0.03% to 9.86%, highlighting considerable differences in long-term solvency. A lower DER suggests a higher proportion of equity, enhancing the company's ability to manage long-term debt. Differences in Liquid values further reflect variations in short-term solvency across firms. The average tangible assets ratio (Tangible) is 92.03%, ranging from 45.23% to 100%, indicating a high proportion of tangible assets among these companies.

On corporate governance, independent directors (Indep) average 37.45%, with little variance among firms. Around 28.29% of companies have dual employment situations. The ownership concentration (Top1) averages 34.63%, with a range of 8.02% to 75.84%, highlighting discrepancies in the largest shareholder's stake, which raises principal-agent concerns. Lastly, the mean book-to-market ratio (BM) is 0.6235, where lower values indicate a company's market value exceeds its book value.

Table 2: description of the data

Variable	Obs	Mean	Std.dev	Min	Max
ESG	41543	25.85146	11.1045	0.4925	79.3224
CDO	41543	0.0042599	0.0549881	-2.454517	0.946624
DER	41543	1.069481	1.213062	0.028217	9.856387
Liquid	41543	2.638017	2.950497	0.2361502	35.50117
Cashflow	41543	0.04791	0.0704769	-0.2233263	0.2825168
Tang	29683	0.9202831	0.089998	0.4522756	1
AGR	38716	0.178316	0.3757696	-0.3826486	5.115677
Indep	41507	37.45431	5.34711	25	60
Dual	41543	0.2829117	0.4504193	0	1
Top1	41510	34.62649	14.91882	8.0204	75.8434
BM	40987	0.6234655	0.2433435	0.064075	1.246239

3.3. Baseline regression analysis

The first column of regression results shows that the regression coefficient of COD and ESG performance (ESG) is -0.0000659, which indicates that ESG performance has a significant negative impact on corporate debt cost. In summary, the regression results are in line with the theoretical expectations of this paper. The better ESG performance, the greater the effect on the reduction of corporate debt financing cost.

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Table 3: baseline regression

	COD
ESG	-0.0000659^{*}
	(0.000034)
DER	-0.0012^{***}
	(0.0003)
Liquid	-0.0165^{***}
	(0.0001)
Cashflow	-0.0030
	(0.0039)
Tang	-0.0103^{**}
	(0.0040)
AGR	-0.0013^{**}
	(0.0006)
Indep	0.0000204
	(0.0001)
Dual	0.0010
	(0.0008)
Top1	-0.0001^{***}
	(0.0000367)
BM	-0.0042^{**}
	(0.0017)
Firm	Yes
Year	Yes
Constant	0.0628^{***}
	(0.0046)
N	27544
$Adj - R^2$	0.6289

3.4. Heterogeneity analysis of property rights

According to the law of sample enterprises, this paper believes that the ESG performance of enterprises with different property rights will show different characteristics on the debt financing cost of enterprises. Therefore, this paper makes a heterogeneity analysis of sample enterprises according to property rights attributes, and divides the sample enterprises into state-owned enterprises and non-state-owned enterprises according to whether the first major shareholder of the sample enterprises is a state-owned enterprise. And performed regression analysis on two different samples, the regression results are shown as Table 4.

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Table 4: Heterogeneity regression

	(1) Non-state-owned enterprise COD	(2) State-owned enterprise COD
ESG	-0.000107^{**}	-0.0000469^{**}
	(0.0000481)	(0.0000235)
DER	-0.0020^{***}	0.0003^{*}
	(0.0005)	(0.0002)
Liquid	-0.0164^{***}	-0.0110^{***}
	(0.0002)	(0.0002)
Cashflow	-0.0103^{*}	0.0089^{***}
	(0.0053)	(0.0028)
AGR	0.0003	-0.0052^{***}
	(0.0008)	(0.0005)
Indep	$6.24e-06$	0.0001^{**}
	(0.0001)	(0.0000423)
Dual	-0.0001	0.0002
	(0.0010)	(0.0007)
Top1	-0.0001^{**}	0.0000384
	(0.0000538)	(0.0000259)
BM	-0.0056^{**}	0.0061^{***}
	(0.0023)	(0.0012)
Firm	Yes	Yes
Year	Yes	Yes
Constant	0.0589^{***}	0.0239^{***}
	(0.0044)	(0.0021)
N	22865	14685
$Adj-R^2$	0.5466	0.6375

Based on the data from Table 4, the ESG (Environmental, Social, and Governance) performance of both state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs) has a significant impact on the cost of debt financing, with the regression coefficients being negative. This indicates that regardless of the type of enterprise, ESG performance is negatively correlated with the cost of debt financing. In other words, as the ESG performance of an enterprise improves, its debt financing costs decrease. However, the impact coefficients for SOEs and non-SOEs are different. Specifically, the regression coefficient for SOEs is -0.0000469, which is significant at the 5% level, while the regression coefficient for non-SOEs is -0.000107, also significant at the 5% level. This suggests that the effect of ESG performance on debt financing costs is more pronounced in non-SOEs.

The main reasons for this phenomenon are as follows: First, non-SOEs generally rely more on market financing, and investors tend to place greater emphasis on corporate social responsibility and sustainable development. Good ESG performance can boost investor confidence and lower their perceived risks, thereby reducing the enterprise's debt financing costs. Second, in terms of policy support, some national and regional governments encourage companies to improve ESG standards by offering policy incentives and support. While SOEs can also benefit from these policies, non-SOEs are often more proactive and flexible in accessing these resources and support. Third, SOEs receive more backing from the state, and their financing sources are relatively stable. In contrast, non-

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SOEs face greater challenges in obtaining financing, so a strong ESG rating can effectively enhance the brand image and reputation of non-SOEs, helping to reduce their debt financing costs. Finally, SOEs are required to shoulder more environmental and social responsibilities, whereas non-SOEs can convey positive signals by disclosing more information.

This helps improve creditors' assessments of their solvency and default risk, leading to more financing and investment opportunities, which in turn lowers corporate debt financing costs.

4. Conclusions and Suggestions

4.1. Conclusions

As the concepts of sustainable development and responsible investment gain prominence worldwide, the ESG investment philosophy is becoming inevitable. For China, the inclusion of ecological civilization in its national strategy emphasizes the importance of green economy, social responsibility, and improved governance. Based on the research of A-share listed companies from 2010 to 2021, this study concludes that ESG performance significantly influences corporate debt financing costs. Enterprises with higher ESG ratings tend to benefit from lower financing costs, as improved ESG performance signifies better risk management, a stronger public image, and more diverse financing channels.

4.2. Suggestions

(1) Companies should actively integrate sustainable development strategies and improve their ESG performance. This includes developing a clear ESG strategy, regularly disclosing ESG reports, and aligning ESG goals with financial targets. By doing so, companies can strengthen investor confidence, reduce expected risks, and ultimately lower debt financing costs.

(2) Investors and creditors should incorporate ESG metrics into their investment and credit evaluation processes. Focusing on companies with strong ESG performance not only mitigates risks but also offers long-term financial returns. Creditors are encouraged to offer favorable loan terms to companies with high ESG ratings.[8-10]

(3) Governments and regulatory bodies should promote ESG standardization and encourage companies to disclose ESG information voluntarily. Policies that incentivize sustainable practices and transparent ESG reporting will help create a fair and competitive market environment.[11-12]

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