Does corporate ESG Performance have an Impact on Financial Distress

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Abstract: Under the background of unstable external environment, with the increasing emphasis on the concept of sustainable development, how the ESG performance of enterprises affects the financial difficulties of enterprises has received widespread attention. This paper examines the impact of ESG performance on corporate financial distress. Empirical analysis of data from 437 listed companies from 2012 to 2019 shows that ESG performance can reduce the likelihood of companies falling into financial distress.

Keywords: ESG Performance; Financial Distress; Empirical Research

1. Introduction

With the advancement of new technologies, enterprises have gained new opportunities, but also ushered in new challenges, especially in the context of changing external factors, which also weaken the ability of businesses to withstand risk, thereby increasing the likelihood of financial distress.

Financial distress is typically characterized by the inability to fulfill obligations or repay debts on time, negative net assets, bankruptcy liquidation and interrupted cash flow (Altman et al., 2019). Initially, the impact of financial indicators on financial distress was the main object of scholars' attention. With the progress of research, scholars gradually recognize the limitations of considering only financial indicators, and expand their scope to non-financial aspects at the micro and macro levels(Boubaker et al., 2020; Cladera et al., 2021).

Since the concept of ESG was proposed, it has received more and more attention. Compared to traditional corporate social responsibility (CSR), ESG not only affects a company's ability to raise capital and attract investors, but also helps companies create value (Bheenick et al., 2023).

In light of these benefits, scholars both domestically and internationally have conducted empirical research on the relationships between ESG and various aspects of listed companies, with a particular emphasis on financial performance and corporate value, but the research on the relationship between the comprehensive dimension of ESG and financial distress is relatively lacking.

Therefore, this paper uses the z-score model as a measurement tool to assess the financial distress of a company, and uses the occurrence or non-occurrence of ESG events within a company as a proxy variable for its ESG performance to construct an ESG score. By analyzing a sample of China's A-share listed companies from 2012 to 2019, we find a significant negative correlation between ESG performance and the likelihood of financial distress, reminding corporate managers to take active actions in the areas of environmental protection, social responsibility fulfillment, and corporate governance to reduce corporate risks.

2. Literature Review and Hypothesis Development

2.1 Factors Influencing Financial Distress

Previous studies have consistently demonstrated that financial ratios, such as profitability ratio, solvency ratio, debt ratio, and ROE, can significantly affect a company's likelihood of experiencing financial distress.

Recent studies have shown that non-financial indicators also have an impact on financial distress. Various factors, such as corporate social responsibility, board diversity and innovation management, have been identified as influential factors. Firstly, Boubaker et al. (2020) find that corporate social responsibility (CSR) can affect the level of financial distress risk (FDR) suggests that better CSR performance makes companies more creditworthy and easier access to financing, leading to fewer financial defaults. Secondly, Cladera et al. (2021) found that having a small and independent board with a high percentage of female directors reduced the likelihood of financial distress.

2.2 Economic consequences of ESG disclosure

With the introduction of ESG concepts, scholars have recognized the significance of non-financial factors in assessing the environmental, social, and corporate governance performance of enterprises.

Research shows that actively fulfilling ESG responsibilities and timely disclosing ESG performance can enhance a company's reputation and protect it from negative news, consequently improving its financial performance (Nirino et al., 2021; Chen et al., 2022).

2.3 ESG and Financial Distress

The research on the impact of ESG performance on financial distress is still in its nascent stage, with the majority of studies focusing on the impact of individual dimensions of ESG performance on financial distress.

Jia et al. (2022) indicate that good environmental performance improves stakeholder relationships and helps enterprises to enhance management quality, thus lowering the risk of financial distress. Boubaker et al. (2020) find that companies with higher levels of social responsibility had lower risk of financial distress among companies with strong governance mechanisms and competitive product markets. Lee et al. (2023) find that companies with a higher proportion of female directors on the board exhibit lower risk of financial distress.

Based on the literature review, it is evident that existing studies primarily explore the economic implications of ESG performance and disclosure. However, limited research exists on the relationship between ESG and financial distress, with most studies focusing on individual dimensions of ESG rather than a comprehensive approach. To address this deficiency, an attempt is made to investigate whether ESG composite performance has an impact on corporate financial distress.

2.4 Hypothesis Development

The impact of ESG performance on corporate may be explained from the following aspects. Firstly, by actively fulfilling social responsibilities, a company can build trust with investors and consumers. This, in turn, allows the company to access more social resources and decrease the likelihood of encountering financial difficulties. Secondly, according to the principal-agent theory, in the absence of effective institutional arrangements, the agent's behavior may ultimately harm the interests of the principal, and thus the interests of the enterprise. Based on the aforementioned considerations, we hypothesize that:

H1:ESG performance exhibits a negative relationship with financial distress of a company, indicating that the better the ESG performance, the lower the likelihood of a company experiencing financial distress.

3. Research Design

3.1 Sample selection and data sources

We collect the necessary data for our research from various sources. Information on financial distress was obtained from the CSMAR database, while data on corporate ESG events was sourced from the China Research Data Service Platform (CNRDS). Other data were collected from the CSMAR database.

Initially, our sample consisted of listed companies listed on the Chinese stock market between 2012 and 2019. To ensure the quality and relevance of the data, we excluded company years that belonged to the finance and insurance sectors and excluded unrelated ESG events that had little to no correlation with financial distress. After these steps, our final sample includes 3,496 company-years of observations, covering 437 companies.

3.2 ESG initiative measures

This study reclassifies the six categories of ESG-related data in CNRDS (environment, charity, volunteer activities and social disputes, corporate governance, products, diversification, employee relations) into the three dimensions of Environmental (E), Social (S), and Governance (G). Subsequently, the scores within each dimension are aggregated to obtain the final ESG score, aligning with the practice of these scholars.

3.3 Financial distress measures

This study adopts the widely used Z-score model to measure the financial distress of companies:

$$Zscore=1.2x_1+1.4x_2+3.3x_3+0.6x_4+1.0x_5 \tag{1}$$

Where, x_1 represents the current ratio of the enterprise, x_2 represents the quick ratio of the enterprise, x_3 represents the asset-liability ratio of the enterprise, x_4 represents the interest coverage ratio of the enterprise, and x_5 represents the market capitalization to total liabilities ratio of the enterprise.

3.4 Other variable

We include the following control variables in our analysis: size, leverage (LEV), return on assets (ROA), total asset turnover (TAT), Total asset growth (TAG), and the shareholding ratio (SSR) of the top 10 shareholders.

Additionally, we control for industry and year fixed effects using several dummy variables to account for specific industry characteristics and year-specific factors.

Table 1. Variable Summary

Variable type	Variable name	Symbol	Illustrate
Dependent variable	Z-score	Zscore	The data comes from CSMAR database and is calculated according to the calculation method of Altman Z value
Independent variable	ESG score	ESG	Calculated based on CESG data in the CNRDS database
Control variables	Enterprise size	Size	Take the logarithm of the total assets of the enterprise
	Asset-liability ratio	Lev	
	Return on total assets	ROA	
	Total asset turnover	TAT	
	Total asset growth rate	TAG	
	Total shareholding ratio of the top 10 shareholders	SSR	Measure the concentration of a company's equity

3.5 Model specification

To test Hypotheses 1 , we formulate the following regression model:

$$Zscore=\alpha_0+\alpha_1 ESG_{i,t}+\sum\alpha_2 Control_{i,t}+\sum\alpha_3 Industry_{i,t}+\sum\alpha_4 Year_{i,t}\ \varepsilon_{i,t} \tag{2}$$

The same model was used to test the three factors E, S, and G:

$$Zscore=\alpha_0+\alpha_1 E_{i,t}+\sum\alpha_2 Control_{i,t}+\sum\alpha_3 Industry_{i,t}+\sum\alpha_4 Year_{i,t}\ \varepsilon_{i,t} \tag{3}$$

$$Zscore=\alpha_0+\alpha_1 S_{i,t}+\sum\alpha_2 Control_{i,t}+\sum\alpha_3 Industry_{i,t}+\sum\alpha_4 Year_{i,t}\ \varepsilon_{i,t} \tag{4}$$

$$Zscore=\alpha_0+\alpha_1 G_{i,t}+\sum\alpha_2 Control_{i,t}+\sum\alpha_3 Industry_{i,t}+\sum\alpha_4 Year_{i,t}\ \varepsilon_{i,t} \tag{5}$$

In the above equation, the subscripts i and t represent company indicators and year indicators, respectively. Z-score is the dependent variable, representing a company's financial distress risk. ESG/E/S/G is the independent variable, defined as the ESG score of a company based on the occurrence of ESG events. Control is a control variable. If the independent variable has a significant negative coefficient, it supports Hypothesis 1.

4. Empirical results

4.1 Descriptive statistic

Table 2 presents the descriptive statistics of the key variables. As can be seen from Table 2, the explanatory variable Z-Score exhibits a standard deviation of 1.456, ranging from a minimum of -9.663 to a maximum of 26.73. This indicates significant variability in the likelihood of financial distress among the companies in the sample. Furthermore, the mean value of the Z-Score is 2.015, which exceeds the threshold of 1.8, suggesting a relatively low likelihood of financial difficulty among the sampled companies.

In terms of the explanatory variable ESG, the average value is 7.510, with a range from a minimum of -1 to a maximum of 19, indicating substantial variations in ESG performance among the sampled companies. As for the remaining variables, the average values are as follows: e (environment) is 2.784, s (social) is 2.820, g (governance) is 1.906, Size is 23.41, LEV is 0.512, ROA is 0.039, TAT is 0.662, TAG

is 0.143 and SSR is 0.580.

Table 2 Decriptive statistics

Variables	N	Mean value	p50	The standard deviation	Minimum	The maximum
Z-score	3496	2.015	1.732	1.456	-9.663	26.73
esg	3496	7.510	7	3.159	-1	19
e	3496	2.784	3	1.575	-1	7
s	3496	2.820	3	1.493	-1	7
g	3496	1.906	2	1.220	-1	6
size	3496	23.41	23.333	1.455	19.20	28.180
lev	3496	0.512	0.529	0.201	0.034	2.290
roa	3496	0.039	0.033	0.064	-0.957	0.598
tat	3496	0.662	0.554	0.478	0.011	4.516
tag	3496	0.143	0.083	0.876	-0.972	47.93
ssr	3496	0.580	0.584	0.163	0.090	0.965

4.2 Correlation analysis

This paper adopts Pearson correlation test to test all variables in the model, and the test results are shown in Table 3.

As can be seen from Table 3, the absolute value of the correlation coefficient between variables is 0.763 (not exceeding 0.8), so there is no serious multicollinearity problem between the variables in the model constructed in this paper, and the model regression analysis can be performed in the next step.

In addition, we can initially see from the correlation test that financial distress (Z-Score) exhibits a negative correlation with ESG, E, and S, indicating that higher ESG scores, as well as stronger environmental and social performance, are associated with a lower likelihood of financial distress. However, the correlation between financial distress and G (governance) is not statistically significant and requires further investigation.

Table 3 Correlation Analysis

	Z-score	esg	e	s	g	size	lev	roa	tat	tag	ssr
Z-score	1										
esg	-0.049***	1									
e	-0.047***	0.763***	1								
s	-0.003***	0.761***	0.334***	1							
g	-0.062	0.673***	0.276***	0.315***	1						
size	-0.399***	0.386***	0.302***	0.246***	0.309***	1					
lev	-0.567***	0.092***	0.107***	0.030*	0.064***	0.519***	1				
roa	0.559***	0.072***	0.052***	0.057***	0.048***	-0.041**	-0.445***	1			
tat	0.382***	0.035**	0.015	0.063***	-0.005	-0.00600	-0.0160	0.169***	1		
tag	-0.004	-0.0160	-0.015	-0.013	-0.005	0.044**	0.029*	0.073***	0.0130	1	
ssr	-0.033*	0.212***	0.160***	0.152***	0.157***	0.371***	0.088***	0.101***	0.052***	0.053***	1

4.3 Regression analysis of the relationship between ESG performance and financial distress

Table 4 presents the test results for Hypothesis 1. The findings reveal a statistically significant positive correlation between ESG scores and the Z-score. This suggests that as the ESG performance improves, the Z-score also increases, indicating a lower likelihood of a company experiencing financial distress. This finding provides support for Hypothesis H1.

In the further analysis, it is evident that the Z-score demonstrates a significant positive correlation with the E and S dimensions, while the positive correlation between the G dimension and the Z-score is not statistically significant, suggesting that ESG primarily influences financial distress through the environmental and social dimensions, indicating that the impact of the environmental and social dimensions on financial distress is more pronounced than that of the governance dimension.

Table 4 Regression results of ESG performance and financial distress

Variables	Hypothesis 1	Further analysis		
	ESG	E	S	G
esg	0.015**			
e		0.021*		

			0.024*	
s			0.024*	
g				0.014
size	-0.287***	-0.281***	-0.280***	-0.277***
lev	-1.720***	-1.731***	-1.725***	-1.730***
roa	7.558***	7.560***	7.557***	7.564***
tat	0.872***	0.871***	0.872***	0.874***
tag	-0.062***	-0.062***	-0.062***	-0.062***
ssr	0.789***	0.799***	0.799***	0.800***
Constant term	8.068***	7.974***	7.929***	7.914***
Ind/Year	Control			
Sample size	3496			

4.4 Robustness Test

Firstly, we utilized the O-score obtained from the CSMAR database as an alternative measure to assess corporate financial distress. The results after incorporating this replacement are presented in the first column of Table 5. Secondly, we adjusted the annual data range by excluding the data for the years 2018 and 2019, which were affected by changes in accounting standards. The findings after this adjustment are presented in the second column of Table 5. Finally, we incorporated lagged variables for the independent variables. The results, considering a lag of one period for the independent variables, are displayed in the third column of Table 5.

These results provide further evidence supporting Hypothesis 1, highlighting the significant negative relationship between ESG performance and corporate financial distress.

Table 5 Robustness test

Variables	(1)	(2)	(3)
	O-score	Z-score	Z-score
esg	-0.014*(0.008)	0.020***(0.007)	0.020***(0.007)
size	-0.166***(0.029)	-0.334***(0.022)	-0.334***(0.022)
lev	6.666***(0.183)	-1.501***(0.145)	-1.501***(0.145)
roa	-13.625***(0.379)	9.382***(0.353)	9.382***(0.353)
tat	0.367***(0.070)	0.874***(0.056)	0.874***(0.056)
tag	0.050**(0.022)	-0.073***(0.019)	-0.073***(0.019)
ssr	-0.698***(0.194)	0.730***(0.145)	0.730***(0.145)
Sample size	3,496	2622	3496
Ind/Year	Control		

5. Conclusion

This paper theoretically analyzes the relationship between ESG performance and financial distress. The results demonstrate that the improvement of ESG performance of listed companies is beneficial to the improvement of the company's financial status and helps businesses reduce the likelihood of financial distress, in which the E dimension and the S dimension play a role in it, while the G dimension does not. At the same time, it also brings us the following enlightenment:

First of all, by prioritizing environmental and social responsibilities, optimizing governance structures, and enhancing governance systems, companies can mitigate risks. Secondly, when formulating relevant policies, policymakers should focus on aspects such as environmental performance assessment, disclosure requirements and corporate governance mechanisms to improve their overall performance. Thirdly, managers should develop strategic plans that contribute to the development of the enterprise from the perspective of sustainable development, and establish a positive corporate image and promote the further development of the enterprise through effective implementation and supervision.

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